

Ecological Impact Assessment

Aglish 110kV Substation and Grid Connection

Co. Cork

Report prepared for Aglish Solar Farm Ltd

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16th February 2026



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1 Introduction

Greenleaf Ecology was commissioned by Aglish Solar Farm Ltd. to undertake an Ecological Impact Assessment (EclA) of the proposed development of Aglish 110kV Substation and Grid Connection, Co. Cork, hereafter referred to as “the proposed development”.

This report forms part of the Strategic Infrastructure Development (SID) application for the same development which has been submitted to An Coimisiún Pleanála in accordance with section 182A of the Planning and Development Act 2000. The proposed 110kV substation and grid connection will service Aglish Solar Farm, which is currently the subject of a planning application on appeal to An Coimisiún Pleanála (Reference: ACP-323402-25).

The proposed site is located in the townland of Aglish and Currahaly in County Cork. The layout of the proposed development is illustrated in Figure 1-1.

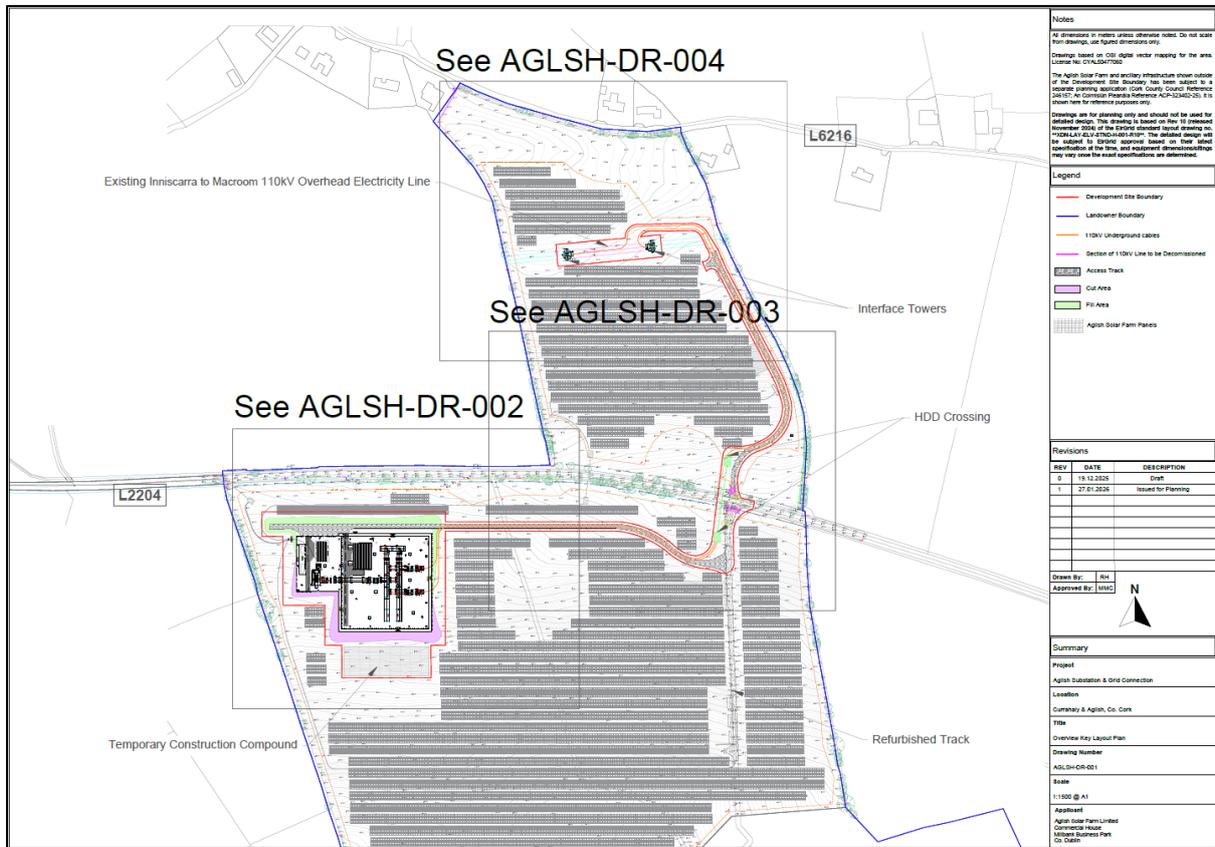


Figure 1-1: Site Layout Plan

For clarity, the location of the proposed solar farm lands , as well as the substation and grid connection which is subject to this application to An Coimisiún Pleanála are shown in Figure 1-2. It should be noted that the solar farm is located within parcels 1-6 and the substation and grid connection is located in parcels 5-6 only. This EclA considers both the SID development site as well as the wider solar farm, for the purposes of completing a robust assessment of the entire project.

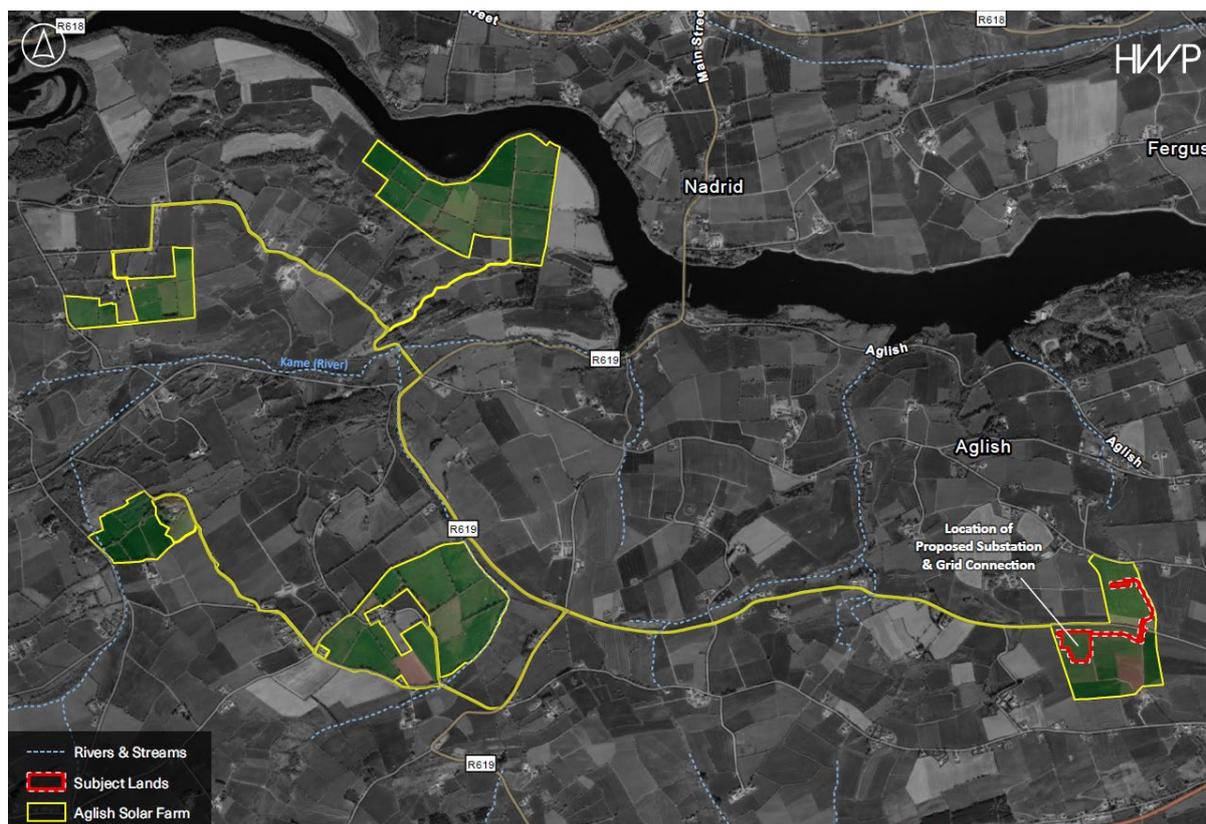


Figure 1-2: Proposed Aglish Solar Farm and Substation and Grid Connection Site Location Map

The aims of this ecological impact assessment are to:

- Establish baseline ecological data for the proposed development site;
- Determine the ecological value of the identified ecological features;
- Identify, describe and assess the likely significant effects of the proposed development on biodiversity;
- Propose effective mitigation measures to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on biodiversity; and
- Identify any residual effects predicted to arise after mitigation.

This report focuses on terrestrial ecology. An Aquatic Ecological Impact Assessment prepared for the proposed Aglish Solar Farm development is enclosed in Appendix E for clarity and further information.

1.1 Statement of Competence

This ecological impact assessment was undertaken by Karen Banks, MCIEEM. Karen is an ecologist with Greenleaf Ecology and has 19 years' experience in the field of ecological assessment. Karen has extensive experience in the production of Ecological Impact Assessments (EclIA) including those for solar farms, transport infrastructure, small to large scale housing and mixed-use developments, flood alleviation schemes and wind farms.

1.2 Project Description

1.2.1 General

The proposed development comprises of:

1. A 110kV Air Insulated Switchgear (AIS) electricity substation with single-storey substation building, single-storey Independent Power Producer (IPP) control room building, High Voltage

(HV) electrical equipment and associated infrastructure (to include transformer, lightning protection masts, back-up diesel generator, fire/blast wall, telecoms pole, perimeter security fencing, security lighting, water and drainage infrastructure, and temporary construction compound) to connect to and serve a solar farm;

2. Associated loop-in / loop out infrastructure to connect into an existing 110kV overhead transmission line (including underground 110kV cabling [lengths of ca.790 and 880m from proposed substation to interface towers, including HDD crossing of L2204 road], 2 No. new interface towers and decommissioning of ca. 75m of existing 110kV overhead line);
3. Construction and operational access from the public road L2204;
4. All ancillary site development, landscaping and earthworks. The development subject to this application forms part of grid connection and access arrangements which will facilitate the connection of the proposed Aglish Solar Farm (Cork County Council Reference 24/6157 / An Coimisiún Pleanála ACP-323402-25) to the national grid.

The operational lifetime of the solar farms is assumed to be 40 years. However, following the decommissioning of the solar farm, it is envisaged that the substation (and underground cable grid connection) will remain in situ as a valuable functioning and operational part of the electricity transmission network managed by the Transmission Systems Operator, EirGrid.

1.2.2 Substation

The substation will be based on EirGrid design specifications. The substation compound will consist of a two-storey GIS substation building, single-storey IPP Control Room building, HV electrical equipment and associated infrastructure including palisade fences and concrete post and rail fences. The installation of HV electrical equipment will include a transformer with associated equipment along with:

- Cable Sealing End (CSE);
- Surge Arrestor (SA);
- Earth Disconnect (DA, DB, DL, DT);
- Current /Voltage Transformer (CT/VT);
- House Transformer (HoT);
- Circuit Breaker (CB);
- Lightning Masts (LM);
- Back-Up Diesel Generator;
- Harmonic filters if required by EirGrid;
- Capacitor Bank if required by EirGrid;
- Fire/Blast Wall;
- Telecoms Pole;
- 110kV underground cable which will connect into the existing Inniscarra Macroom overhead line via 2 no. new Interface Towers

The substation compound has a total area of 11,996m².

Earthworks will be undertaken so the compound is level, with a finish compound level of 123.2m.

1.2.3 Site Access

The site will be accessed for both the construction and operational phases by means of two entrances from the L2204. These entrances will be subject to some upgrades, including removal of existing roadside sod and stone ditch to provide new gate as presented under Cork County Council Reference 24/6157. The entrances will be suitably splayed and have been subject to sight line and autotrack

analysis, with the latter including modelling of abnormal load delivery for the transformer. Operational sightlines will be maintained by trimming back hedgerows with all necessary land within ownership.

A 4.5 metre wide compacted access track will extend from the entrance to the substation compound. The design includes a temporary construction track to cater for deliveries, which will be decommissioned post the construction phase (and land reinstated), as well as an operational access track. The track will include a geotextile base and filter membrane and 200 mm of Clause 804 sub-base.

1.2.4 Connection to National Grid

In order to connect to the transmission network, it is proposed to connect the 110kV substation into the national grid via a 'loop-in / loop-out' underground 110kV cable grid connection which will connect into the existing 110kV Inniscarra-Macroom overhead transmission line.

Two new steel lattice interface towers of approximately 16 m in height will form part of the existing overhead line and both towers will connect to the proposed 110kV substation via underground 110kV cables. The interface towers are approximately 75 metres apart, therefore the same length of the existing 110kV Inniscarra-Macroom overhead line will need to be decommissioned. The underground cable is comprised of 3 no. power ducts, 2 no. telecom ducts and 1 no. earth continuity duct. The cables to each interface tower are ca.790 and 880m metres in length. The crossing of the L2204 will be by means of Horizontal Directional Drill (HDD).

This connection method will constitute a new node of the transmission network, connecting the proposed substation and associated solar farm generation to the national electricity grid. The construction method for the interface towers and decommissioning of 110kV overhead lines is set out in the Aglish Substation & Grid Connection Construction Methodology prepared by Aglish Solar Farm Limited.

All works will be carried out in accordance with international best practice and full compliance with health and safety requirements.

1.2.5 Temporary Construction Compound

As outlined in the submitted site layout plans, it is proposed to provide a temporary construction compound south of the proposed substation, accessed from the entrance from the L2204. The temporary compound will include the following facilities at a minimum:

- Adequate canteen space to allow for all workers during the peak period;
- Office space with lighting, heating and internet facilities;
- Toilets and adequate welfare facilities for construction staff in accordance with the relevant statutory Health & Welfare guidelines;
- Parking space for both light and heavy vehicles;
- Designated skips and temporary storage areas.

1.2.6 Surface Water Drainage and Water Services

Surface water drainage proposals for the development have been developed to mimic the natural drainage patterns of the site and thereby be in accordance with the best management practices of Sustainable Drainage Systems (SuDS) including those set out in the SuDS Manual (C753) published by CIRIA in 2015. Specifically, this includes the following:

- The compound construction is formed with permeable stone thus mimicking a soakaway scenario. ESB compound stone is single sized for the first 150mm for safety purposes. It then changes to a graded 6F2 material.
- The main areas to be drained includes the roofs and the compound road. These equate to approximately 663m². The compound road will be drained via series of road gullies.
- Assuming even the most basic of infiltration rates down through the permeable compound stone, the existing greenfield situation is easily maintained.

The surface water generated in the hardstanding and bunded areas will discharge to the soakaway via a Class 1 Full Retention Oil Separator. The electrical transformer in the substation is oil filled equipment and, as such, is protected with impermeable bunds. Surface water generated in this bund will be pumped out by an oil sensitive pump ensuring that only non-contaminated water enters the site drainage network.

In relation to wastewater, a 5m³ foul holding tank is proposed as part of the operational development. These tanks are normally used in ESB substations. It will be emptied periodically, with the capacity in excess of modelled holding requirements.

It is proposed to provide the required potable water demand of the station with a bored well on site. The potable water demand within the site will be low as the proposed station is to be unmanned. To avoid issues like stagnation in the water supply line and problems resulting from this, there will be a continual water demand of 24 litres per week from automatically flushing WCs within the station.

1.2.7 Site Restoration and Landscaping

This will involve the reinstatement of all other excavated materials and associated landscaping works. It will include the replacement of topsoil in disturbed ground areas such as access tracks and the removal of the construction compound and other temporary work areas.

The submitted Landscape Mitigation Plan identifies that c.31 no. metres of existing hedgerow and 2 no. trees will be removed to facilitate access to the fields that include the proposed substation and grid connection. These removal works are included in the wider solar farm application which provides for removal of a total of 86 no. linear metres of hedgerow and 3 trees, which will be offset by 872 linear metres of new hedgerow planting, as well as the bolstering of an additional 22,296 linear metres, where necessary, to fill any gaps in existing hedgerows.

1.2.8 Other Planned Works

Cork County Council Reference 24/6157 (ACP-323402-25)

It is intended that the proposed 110kV substation and grid connection will service the Aglish Solar Farm, which is currently the subject of a planning application to Kilkenny County Council. At the time of writing, the solar farm application is undetermined.

The solar farm with a total area of circa 161 hectares. The solar farm will consist of solar panels on ground mounted frames, 23 no. single storey electrical inverter/transformer stations, 6 no. single storey spare parts containers, 3 no. Ring Main Units, 7 no. weather stations, underground electrical ducting and cabling within the development site, private lands and within the L62031, L6203, R619, L6207, L22012 and L2204 public roads to connect solar farm field parcels, security fencing, CCTV, access tracks, 4 no. stream/drain deck crossings, 6 no. horizontal directional drill crossings (under watercourses/drains/public road), temporary construction compounds, landscaping and all associated ancillary development and drainage works. Construction and operational access will be via 7 no.

entrances from the L62031, L6203, L22012, L6398 and L2204 local roads. The operational lifespan of the solar farm will be 40 years and planning permission is requested for this duration.

The solar farm will contribute directly to a carbon dioxide emission reduction of 28,657 tonnes per annum or the equivalent of approximately 1,146,298 tonnes of CO₂ over the 40 year lifetime of the project.

2 Methodology

This report will describe the receiving environment of the proposed 110kV Substation and Grid Connection development and, for clarity, includes a description of the proposed solar farm site. The proposed solar farm site comprises six distinct field parcels, as illustrated in Figure 1-2; the proposed substation development is located within Parcel 5 and Parcel 6 of the proposed solar farm site. The description of the proposed site will refer to these land parcels where relevant.

2.1 Relevant Planning Policy and Legislation

This report has been prepared with regards to the following legislation, policy documents and guidelines as relevant:

- CIEEM (2017) Guidelines for Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester;
- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester;
- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government;
- European Communities (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission;
- EC (2021) European Commission Notice Brussels C(2021) 6913 final 'Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC';
- EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. European Commission;
- EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission;
- EPA (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports. Environmental Protection Agency;
- Fossitt, J., 2000. A Guide to Habitats in Ireland. The Heritage Council, Kilkenny;
- National Parks and Wildlife Service (NPWS) (2025) The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht;
- NRA (2009) Guidelines for the Assessment of Ecological Impacts of National Road Schemes Rev. 2. National Roads Authority;
- NRA (2009) NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes). National Roads Authority; and
- NRA Environmental Assessment and Construction Guidelines (both adopted and draft versions)

Studies were also carried out in accordance with the following legislation:-

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and Directive 2009/147/EC (codified version of Directive (79/409/EEC as amended (Birds Directive)) – transposed into Irish law as European Communities (Birds and Natural Habitats) Regulations 2011;
- European Communities (Environmental Impact Assessment) Regulations, 1989 to 2006;
- European Communities (Environmental Liability) Regulations, 2008 (S.I. No. 547 of 2008);
- European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 84 of 1988);

- Flora Protection Order, 2022;
- Planning and Development Act, 2000 (as amended);
- Water Framework Directive (2000/60/EC); and
- Wildlife Act 1976, as amended.

2.2 Desk Study

The sources of published material that were consulted as part of the desk study for the purposes of the ecological appraisal are as follows:

- Review of the National Parks & Wildlife Service (NPWS) natural heritage database for designated areas of ecological interest and sites of nature conservation importance within the proposed site and its environs;
- Review of Ordnance Survey maps and ortho-photography;
- Review of the National Biodiversity Data Centre (NBDC) database for records of rare and protected species within a 0.5km radius of the proposed site, including:
 - Annex I habitats, Annex II species and their habitats, and Annex IV species and their breeding sites and resting places (wherever they occur) as identified in the EU Habitats Directive;
 - The presence of species of flora and fauna as identified and strictly protected under the European Communities (Birds and Natural Habitats) Regulations, 2011;
 - Species of fauna and flora which are protected under the Wildlife Acts (Revised), ‘Protected species and natural habitats’ as defined in the Environmental Liability Directive (2004/35/EC) and European Communities (Environmental Liability) Regulations, 2008;
- Review of the NBDC database of records of bats within a 4km radius of the proposed site¹;
- 1:50,000 Ordnance Survey (OS) Map; Discovery Series; and
- Environmental Protection Agency mapping (<http://gis.epa.ie/Envision>).

¹ A 4km radius search distance was selected to encompass records of bat roosts within Core Sustainance Zones (CSZ) of the site for Irish species of bat. A CSZ refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the conservation status of the colony using the roost (Collins, 2023).

2.3 Field Survey

A walkover survey of the proposed site was carried out by ecologist Ms Karen Banks on the 28th March 2024, 8th July 2024 and 10th July 2024. Flora and habitats within the proposed site were surveyed using the methodology outlined in the guidance document *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.*, 2011). The habitats found in the proposed site (shown on Figure 3-3 to Figure 3-5), were classified in accordance with the guidelines set out in 'A Guide to Habitats in Ireland' (Fossitt, 2000), which classifies habitats based on the vegetation present and management history. The classification is a standard scheme for identifying, describing and classifying wildlife habitats in Ireland. The classification is hierarchical and operates at three levels, outlining the correlation between its habitat categories and the phytosociological units (plant communities) of botanical classifications. Dominant species, indicator species and/or species of conservation interest were recorded and species recorded were given both their Latin and common names, following the nomenclature as given in the 'New flora of the British Isles' (Stace, 2010). Habitat potentially linked to European Annex I habitats was assessed based on the *Interpretation Manual of EU Habitats* (European Commission, 2013) and *The Status of EU Protected Habitats and Species in Ireland* (NPWS, 2019).

A survey for invasive species was conducted during the habitat and botanical survey undertaken on the 8th and 10th July 2024. This survey included the identification and mapping of Invasive Alien Plant Species (IAPS). This survey was conducted in accordance with the NRA publication "Guidelines for the Management of Noxious Weeds and Non- Native Invasive Plant Species on National Roads".

The site walkover conducted on the 8th and 10th July 2024 included an assessment of the presence, or likely presence, of protected species. The survey was conducted in accordance with the standard protected species survey guidelines contained in the National Roads Authority publication 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (2009). The surveys were conducted for areas of habitat that might support protected mammals in addition to recording any field signs, such as well-used pathways, droppings, places of shelter and features or areas likely to be of particular value as foraging resources. Any badger setts present were recorded during the site walkover, along with potential pine marten den sites. In addition, the suitability of the habitat for pygmy shrew, hedgehog, Irish stoat, pine marten, amphibians and invertebrates were recorded.

Targeted faunal surveys were undertaken as detailed in Section 2.3.1 to Section 2.3.4 below.

2.3.1 Badger Survey

A badger survey was conducted within the proposed site boundary on the 28th March 2024, 8th July 2024 and 10th July 2024. Further survey was conducted on 28th and 29th February 2025. The badger survey was conducted in accordance with Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009).

Field signs of badger activity are characteristic and sometimes quite obvious and can include tufts of hair caught on barbed wire fences and scrub, conspicuous badger paths, footprints, small excavated pits or latrines in which droppings are deposited, scratch marks on trees, and snuffle holes, which are small scrapes where badgers have searched for insects and plant tubers (NRA, 2009).

Notes were made on signs of other mammals in order to deduce the likelihood of faint tracks and/or feeding signs belonging to badgers. The objectives of the badger survey were to:

- Confirm whether or not badger setts occur within the area surveyed.
- Confirm where possible the status of any setts identified in survey.
- Describe field signs of badger activity.

In 2025, camera traps were deployed outside an old badger sett in Parcel 4 and adjacent to an area of extensive digging on the eastern boundary of Parcel 6 to check for current use by badger or other

mammals. The camera traps were deployed between 28th February 2025 and 29th April 2025 in Parcel 4 and between 29th April 2025 and 8th May 2025 in Parcel 6.

2.3.2 Otter Survey

An otter survey of the extent of the River Lee adjoining the northern boundary of Parcel 2 (c.4.2km north-west of the proposed substation and grid connection site), the Cooldrum stream on the western boundary of Parcel 3 (c.5.4km west of the proposed site) and Rathonoane stream on the eastern and southern boundary of Parcel 4 (c.3.2km west of the proposed site) was conducted on the 28th March 2024, 8th July 2024 and 10th July 2024. There are no watercourses within the proposed substation and grid connection site boundary, therefore the requirement for further targeted otter surveys at this location was scoped out.

The banks of the watercourses were searched for field signs including:

- Sleeping and resting places including holts, couches and natal dens;
- Breeding sites;
- Spraints;
- Pathways/ trails;
- Slides;
- Hairs;
- Footprints; and
- Food remains.

Natal dens tend to be well hidden and therefore can be hard to locate. Survey for natal dens was undertaken by searching for field signs including:

- Any heavily used path or paths from the water into dense cover or an enclosed structure;
- Bedding within the structure which may consist of grass, ferns or reeds (bedding may also be present in other types of resting places);
- A latrine containing a large number of spraints at the den or within 2m of it (however, it is important to note that there are often no droppings at a natal den as the female will excrete in the water to ensure that there are no signs of occupation near the natal den);
- A cub play area which may be a well-worn area around a tree or on a bank; and
- Different sized otter prints.

2.3.3 Bats

2.3.3.1 Preliminary Roost Assessment

The trees within the proposed site were surveyed in conjunction with the site walkover for potential roost sites and signs of bats. A detailed inspection of the exterior of trees was undertaken to look for features that bats could use for roosting (Potential Roost Features, or PRFs) from ground level. The aim of the survey was to determine the actual or potential presence of bats and the need for further survey and/or mitigation.

A detailed inspection of each tree within the site was undertaken. The inspection was carried out in daylight hours from ground level, and information was compiled about the tree, PRFs and evidence of bats. All trees, or groups of trees, surveyed were numbered and marked on a map and a description of each PRF observed was recorded. PRFs that may be used by bats include:

- Rot holes;
- Hazard beams;
- Other horizontal or vertical cracks or splits (e.g. frost cracks) in stems or branches;
- Lifting bark;
- Knotholes arising from naturally shed branches or branches previously pruned back to the branch collar;

- Man-made holes (e.g. flush cuts) or cavities created by branches tearing out from parent stems;
- Cankers in which cavities have developed;
- Other hollows or cavities;
- Double leaders forming compression forks with included bark and potential cavities;
- Gaps between overlapping stems or branches;
- Partially detached ivy with stem diameters in excess of 50mm; and
- Bat or bird boxes.

Signs of a bat roost (excluding the actual presence of bats), include:

- Bat droppings in, around or below a PRF;
- Odour emanating from a PRF;
- Audible squeaking at dusk or in warm weather; and
- Staining below the PRF.

It should be noted that bats or bat droppings are the only conclusive evidence of a roost and many roosts have no external signs. In the current survey, potential roost sites were viewed by a bat specialist working from ground level. Trees were categorised according to the highest suitability PRF present.

Structures

There are no structures present within the proposed substation and grid connection site. An old dwelling to the south of Parcel 2 (c.4.5km to the north-west of the proposed site) was surveyed on 5th May 2025 for potential roost sites and signs of bats. The survey utilised close focussing binoculars, a high-powered torch and an endoscope (Explorer Premium 8803 with 9mm camera) where required. The external inspection involved looking for bat droppings on the ground, stuck to walls, windowsills or in crevices in the stonework and recording suitable entry and exit points. As noted above, there are no structures within the proposed site boundary, therefore the requirement for targeted surveys within the proposed site was scoped out.

The criteria for categorisation of suitability for bats is described further in Table 2-1.

Table 2-1: Suitability of Habitats for Bats

| Suitability | Description Roosting habitats in structures | Potential flight paths and foraging habitats |
|-------------------|--|---|
| None | No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/ suitable shelter at all ground/ underground levels). | No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/ protection for flight-lines, or generate/ shelter insect populations available to foraging bats). |
| Negligible | No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion. | No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour. |
| Low | A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity | Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub. |

| | | |
|-----------------|---|---|
| | and not a classic cool/stable hibernation site, but could be used by individual hibernating bats). | |
| Moderate | A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation- the categorisation described in this table are made irrespective of species conservation status, which is established after presence is confirmed). | Continuous habitat connected to the wider landscape that could be used by bats for flight paths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water. |
| High | A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roosts e.g. maternity or classic cool/stable hibernation site. | Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts. |

2.3.3.2 Bat Activity Survey

Emergence Roost Survey

A dusk survey of the disused dwelling located to the south of Parcel 2 of the proposed solar farm site was undertaken on 5th May 2025 in order to watch and listen for bats exiting bat roosts to determine the presence or absence of bats at the time of survey. The dusk emergence survey commenced approximately 15 minutes before sunset and ended approximately 90 minutes after sunset. The weather at dusk was 10°C, Beaufort Force 2 with no rain.

Passive Monitoring

Passive monitoring was completed across the proposed solar farm site, including the proposed substation and grid connection site, between 29th April 2025 and 5th May 2025 (i.e. a bat detector is left in the field, there is no observer present and bats which pass near enough to the monitoring unit are recorded and their calls are stored for later analysis). The passive detectors record bat ultrasonic calls on a continuous basis and store the information onto an internal SD card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded.

Weather conditions were dry with light wind during the monitoring, however temperatures during the night were low. Nine Anabat Swift monitors were deployed for the survey and were positioned in or adjacent to hedgerows that will be subject to removal to facilitate access; a monitor was also positioned on the southern boundary of Parcel 2 of the proposed solar farm site to detect a possible flight line into the site from a roost located to the south of the site. Two monitors were deployed at the proposed substation and grid connection site: one adjacent to a hedgerow to the west of the site and one in a section of hedgerow subject to removal to facilitate access. The detectors were set to record from approximately 30 minutes before sunset until sunrise and recorded for 5 nights at each location. Data were then downloaded and bat echolocation calls were later analysed by the Anabat

Insight software analysis programme version 2.1.4. Each time-stamped file was analysed and the species of bat recorded was noted as a bat pass. The location of the passive monitors is illustrated in Figure 2-1.



Figure 2-1: Aglish Solar Farm- location of passive bat monitors

2.3.4 Avifauna

A late wintering/ early breeding bird survey of the proposed solar farm site, including the proposed substation and grid connection site was undertaken on 28th March 2024 and breeding bird surveys were undertaken on 8th July 2024 and 10th July 2024. Winter bird surveys were undertaken on 27th and 28th February 2025 and breeding bird surveys were undertaken on 29th and 30th April 2025.

Winter Bird Survey Methodology

A survey transect was walked through each land parcel of the proposed solar farm, including the proposed substation and grid connection site, allowing a view of habitats such as open fields, dense hedgerows and scrub or woodland edge. Important habitats such as woodland and standing water or ponds adjacent to the proposed site were also included within the transect. The approximate location of all species recorded was marked on a map.

Parcel 2 is located adjacent to Inniscarra Reservoir, therefore a targeted search for evidence of use of this portion of the site by waterbirds was included within the winter bird survey conducted in February 2025. The survey included a visual search for roosting or feeding waterbirds and evidence of use such as droppings or feathers. The proposed substation and grid connection site was included within the survey transects completed across the proposed solar farm site (see Figure 2-2). However, the proposed site is located c.1.5km to the south of Inniscarra Reservoir, therefore the requirement for a targeted search for evidence of use by waterbirds (as described above) was scoped out.

Breeding Bird Survey

A survey transect was walked through each land parcel of the proposed solar farm site, including the proposed substation and grid connection site, allowing a view of habitats such as open fields, dense hedgerows and scrub or woodland edge. Important habitats such as woodland and standing water or ponds adjacent to the proposed site were also included within the transect.

Approximate locations of all birds seen or heard, their numbers and behaviour were recorded by annotating field maps and taking notes. Breeding evidence such as singing males, agitated behaviour, carrying food and recently fledged young was recorded. The breeding status of all species encountered during surveys were classified into four categories: Confirmed (Br), Probable (Pr), Possible (Po) and Nonbreeder (N), based on British Trust for Ornithology (BTO) categories of breeding evidence, as detailed in Table 2-2. The surveys were conducted under dry, calm and light weather conditions.

Table 2-2: BTO categories of breeding bird evidence

| Breeding status | Confirmed breeder (Br) | Probable breeder (Pr) | Possible breeder (Po) | Non-breeder (N) |
|---------------------|--|---|--|---------------------------|
| Observed behaviours | Distraction display or injury feigning (DD) | Pair in suitable nesting habitat (P) | Observed in suitable nesting habitat (H) | Flying Over (F) |
| | Used nest or eggshells found from current season (UN) | Permanent Territory (T) | Singing Male (S) | Migrant (M) |
| | Recently fledged young or downy young (FL) | Courtship and Display (D) | | Summering non-breeder (U) |
| | Adults entering or leaving nest site indicating occupied nest (ON) | Visiting probable nest site (N) | | |
| | Adult carrying faecal sac or food for young (FF) | Agitated Behaviour (A) | | |
| | Nest containing eggs (NE) | Brood patch of incubating bird (I) | | |
| | Nest with young seen or heard (NY) | Nest Building or excavating nest hole (B) | | |



Figure 2-2: Agligh Solar Farm- location of wintering and breeding bird transects

2.4 Impact Assessment Criteria

The information gathered from desk study and survey has been used to make an ecological impact assessment (EclA) of the proposed development upon the identified ecological features. The EclA has been undertaken following the methodology set out in CIEEM (2018). EclA is based upon a source-pathway-receptor model, where the source is defined as the individual elements of the proposed development that have the potential to affect identified ecological features. The pathway is defined as the means or route by which a source can affect the ecological features. An ecological feature is defined as the species, habitat or ecologically functioning unit of natural heritage importance. Each element can exist independently however an effect is created where there is a linkage between the source, pathway and feature.

A significant effect is defined in CIEEM (2018) as:

“an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’.... or for biodiversity in general”.

Further, BS 42020:2013 states that if an effect is sufficiently important to be given weight in the planning balance or to warrant the imposition of a planning condition, e.g. to provide or guarantee necessary mitigation measures, it is likely to be “significant” in that context at the level under consideration. The converse is also true: insignificant effects would not warrant a refusal of permission or the imposition of conditions.

The geographical reference used for ecological valuation follows NRA (2009) *Guidelines for the Assessment of Ecological Impacts of National Road Schemes Rev. 2.*, as detailed in Appendix A. Ecological features might also be important because they play a key functional role in the landscape as ‘stepping stones’ for migratory species to move during their annual migration cycle, as well as for

species to move between sites, to disperse populations to new locations, to forage, or move in response to climate change.² Features of lower ecological value are not assessed.

2.5 Survey Constraints

All surveys were conducted within the appropriate survey period. No significant constraints on the survey information gathered are noted.

² Ref Article 10 of the Habitats Directive: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0043:EN:HTML>

3 Receiving Environment

3.1 Designated Sites

A review of European designated sites within a 15km radius of the proposed site was undertaken (www.npws.ie). Special Areas of Conservation (SACs) are sites of international importance due to the presence of Annex I habitats and / or Annex II species listed under the EU Habitats Directive. Special Protection Areas (SPAs) are designated for birds based on the presence of internationally significant populations of listed bird species.

A review of nationally designated sites within a 10km radius of the proposed site was also undertaken. Natural Heritage Areas (NHAs) are sites deemed to be of national ecological importance and are afforded protection under the Wildlife Acts. The proposed Natural Heritage Area (pNHA) have not been statutorily proposed or designated; however they do have some protection under agri-environmental farm planning schemes such as Rural Environment Protection Scheme (REPS 3 and 4) and Agri Environmental Options Scheme (AEOS), Forest Service requirement for NPWS approval for afforestation grants in pNHA lands and recognition of the value of pNHAs by Planning and Licensing Authorities.

There are three European sites within 15km of the proposed site. The proposed site is located c.8km east of the Gearagh SAC and c.9.3 east of the Gearagh SPA. A review of nationally designated sites indicates that there are no Natural Heritage Areas (NHAs) and four proposed Natural Heritage Areas (pNHAs) within 10km of the proposed development.

A list of European sites recorded within 15km of the proposed development is presented in Table 3-1 and a list of nationally designated sites within 10km is presented in Table 3-2; these tables include distance measurements and a description of connectivity between the designated sites and both the proposed solar farm and substation and grid connection sites.

Table 3-1: European sites within 15km of the proposed development

| Site Name and Code | Qualifying Interests | Distance from Proposed Site (km) ³ | Connectivity |
|---------------------------------|--|--|---|
| The Gearagh SAC (000108) | <p>Annex I Habitats</p> <p>Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260]</p> <p>Rivers with muddy banks with Chenopodium rubri p.p. and Bidention p.p. vegetation [3270]</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p> <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0]</p> <p>Annex II Species</p> <p><i>Lutra lutra</i> (Otter) [1355]</p> | <p><u>Solar Farm</u> 8.0km</p> <p><u>Substation and Grid Connection</u> 13.5km</p> | <p><u>Solar Farm</u></p> <p>There is no connectivity via surface water, groundwater, or any other pathway.</p> <p><u>Substation</u></p> <p>There is no connectivity via surface water, groundwater, or any other pathway.</p> |
| The Gearagh SPA (004109) | <p>Bird Species</p> <p>Wigeon (<i>Anas penelope</i>) [A050]</p> <p>Teal (<i>Anas crecca</i>) [A052]</p> | <p><u>Solar Farm</u> 9.3km</p> | <p><u>Solar Farm</u></p> |

³ Distance measured “as the crow flies”

| | | | |
|---|---|--|--|
| | Mallard (<i>Anas platyrhynchos</i>) [A053] Coot (<i>Fulica atra</i>) [A125] Wetland and Waterbirds [A999] | <u>Substation and Grid Connection</u> 14.8km | There is no connectivity via surface water, groundwater, or any other pathway. <u>Substation</u> There is no connectivity via surface water, groundwater, or any other pathway. |
| Mullaghanish to Musheramore Mountains SPA (004162) | Bird Species Hen Harrier (<i>Circus cyaneus</i>) [A082] | <u>Solar Farm</u> 12.4km <u>Substation and Grid Connection</u> 18.2km | <u>Solar Farm</u> There is no connectivity via surface water, groundwater, or any other pathway. <u>Substation</u> There is no connectivity via surface water, groundwater, or any other pathway. |

Table 3-2: Nationally designated sites within 10km of the proposed development

| Site Name and Code | Qualifying Interests | Distance from Proposed Development (km) ⁴ | Connectivity |
|---|---|--|--|
| Lough Gal pNHA (001067) | This site is situated 22.5km north-west of Bandon near the small village of Bealnamorive in Co. Cork. The outflow of the lough flows into the Glashgarriff River. The plant communities include floating fen with some peat development especially in the south-west corner. This site contains unusual habitats for the area. The flora of the lough and surrounding wetlands also appear to be of interest. | <u>Solar Farm</u> 4.3km <u>Substation and Grid Connection</u> 9.1km | <u>Solar Farm</u> There is no connectivity via surface water, groundwater, or any other pathway. <u>Substation</u> There is no connectivity via surface water, groundwater, or any other pathway. |
| Glashgarriff River pNHA (001055) | This site is situated 22km north north-west of Bandon, about 1km south of Bealnamorive Bridge and about 1km east of Lough Gal which is also a Natural Heritage Area. This site consists of a small stream and wooded river valley. This site includes one of the few waterfalls in the county. The flora of ferns and nonflowering plants in the glen are of interest. The presence of two protected mammal species (otter and badger) adds further importance to the site. | <u>Solar Farm</u> 2.7km <u>Substation and Grid Connection</u> 7.2km | <u>Solar Farm</u> There is no connectivity via surface water, groundwater, or any other pathway. <u>Substation</u> There is no connectivity via surface water, groundwater, or any other pathway. |
| Lee Valley pNHA (000094) | This site occupies five separate sections of the valley of the River Lee, immediately to the west of Cork City. A diverse range of semi-natural habitats occurs here, including wet broadleaved woodland, wet grassland, dry broadleaved woodland, unimproved dry | <u>Solar Farm</u> 7.0km <u>Substation and Grid Connection</u> | <u>Solar Farm</u> Theoretically, there is potential remote and indirect connectivity via a drainage ditch adjacent to the L2204 which drains |

⁴ Distance measured “as the crow flies”

| | | | |
|----------------------------------|---|---|--|
| | grassland, freshwater marsh and wetland bird species. | 7.0km | towards the River Bride; this pNHA is located downstream of the Bride/ Lee confluence in the valley of the River Lee. <u>Substation</u> There is no connectivity via surface water, groundwater, or any other pathway. |
| The Gearagh pNHA (000108) | See the Gearagh SAC and SPA, Table 3-1. | <u>Solar Farm</u> 7.9km <u>Substation and Grid Connection</u> 13.5km | <u>Solar Farm</u> There is no connectivity via surface water, groundwater, or any other pathway. <u>Substation</u> There is no connectivity via surface water, groundwater, or any other pathway. |

European sites are illustrated in Figure 3-1 and proposed Natural Heritage Areas are illustrated in Figure 3-2.

A report to inform Appropriate Assessment Screening (Greenleaf Ecology, 2026) addressing likely significant effects on European designated sites (SACs and SPAs) within the zone of influence of the proposed development is provided as a separate report with the current planning application.

Figure 3-1: European sites within 15km of the proposed development

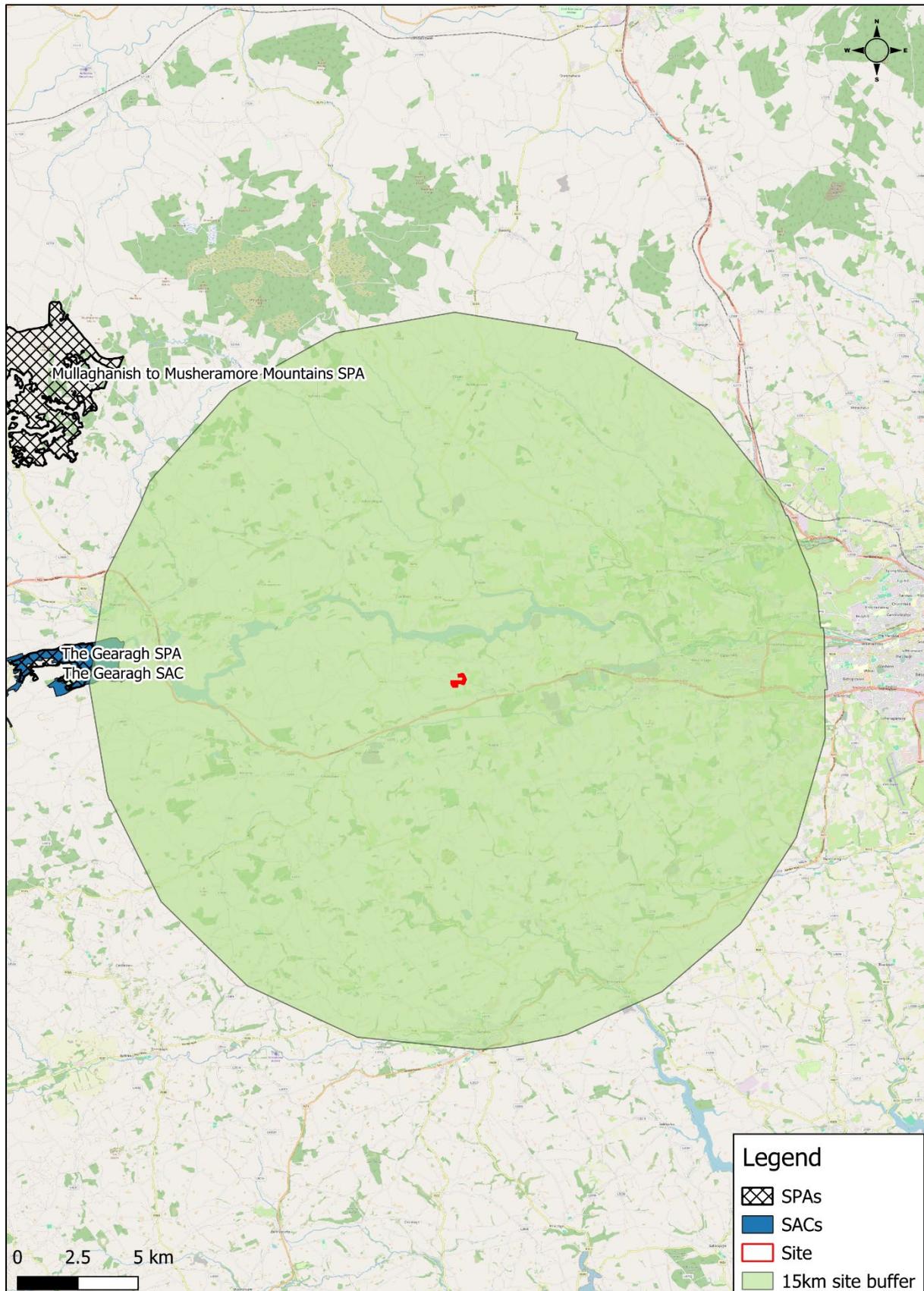
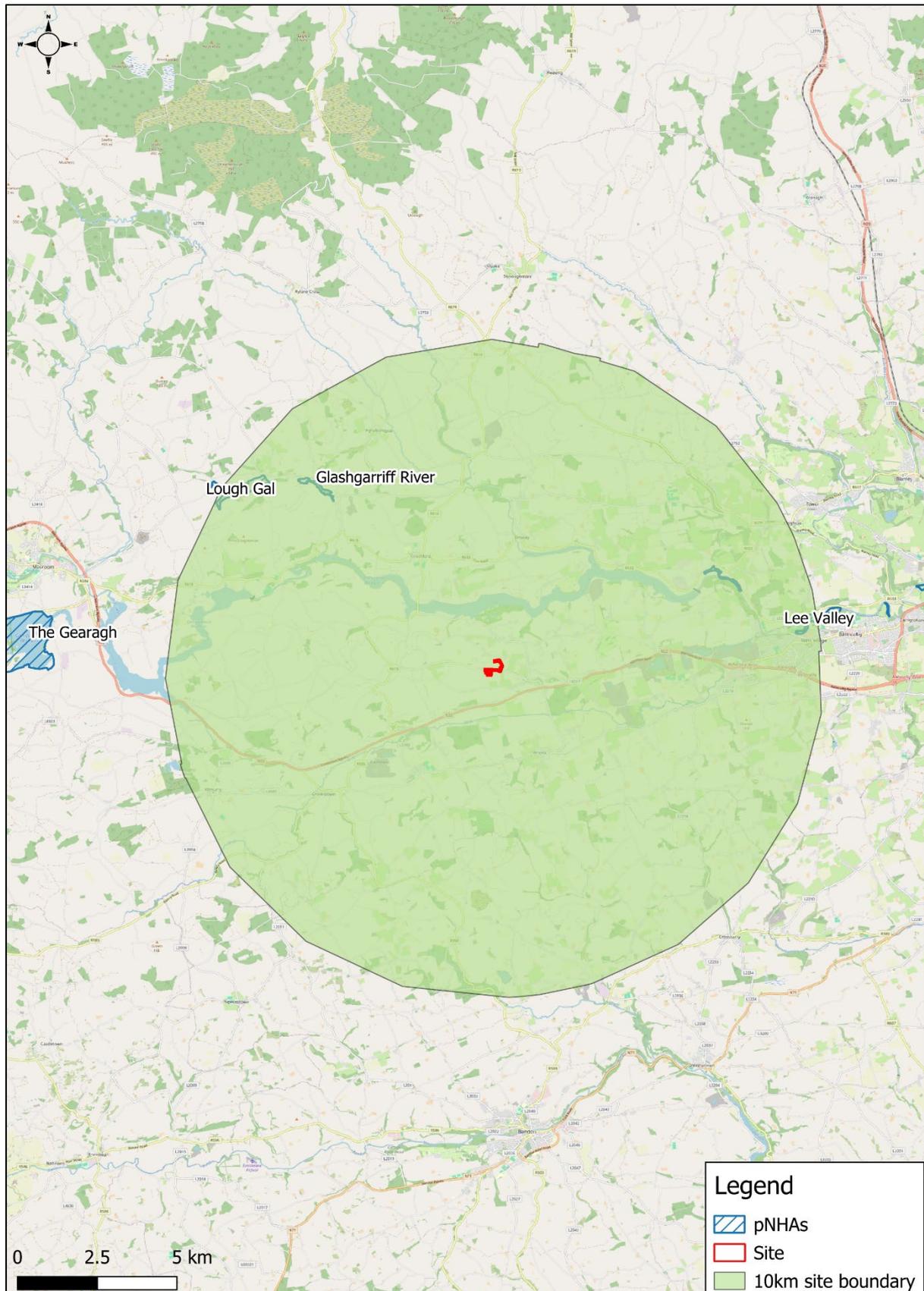


Figure 3-2: Nationally designated sites within 10km of the proposed development



3.2 Terrestrial Ecology

3.2.1 Habitats

A description of the habitats within the proposed Aglish 110kV Substation and Grid Connection and Aglish Solar Farm site is presented below. Habitat maps (See Figure 3-3 to Figure 3-5) have been prepared to illustrate and classify habitats identified within the footprint of the proposed development and its immediate environs. The footprint of the 110kV substation and solar farm supports improved agricultural grassland associated with ongoing livestock farming practices. The improved grassland is fringed by linear woodland habitats and drainage channels.

Depositing Lowland Rivers (FW2)

Parcels 1 to 4 of the proposed solar farm drain via small tributary streams (Kame, Cooldrum, Rathonoane) of the River Lee entering at the south bank of the Inniscarra Reservoir just south of Coachford.

There are no watercourses within Parcel 5 and Parcel 6 of the proposed solar farm site, including the proposed substation and grid connection site.

Further detail on the Aquatic Ecology of the receiving environment of the proposed solar farm is provided in the Aquatic EclA enclosed in Appendix E.

Drainage ditches (FW4)

Active drainage ditches are present in association with treelines or earth banks at some field boundaries within Parcels 4, 5 and 6, however, they are not a frequent feature of field boundaries within the proposed site. The active field drains within Parcels 4, 5 and 6 generally supported a low flow of running water at the time of survey (March and July 2024), with localised areas of standing water. The field drains within the proposed solar farm site, including the proposed substation and grid connection site, are not of fisheries value.

Instream and marginal plant species include occasional and localised Fool's Watercress (*Apium nodiflorum*), Soft Rush (*Juncus effusus*), Sweet-grass (*Glyceria* spp), Brooklime (*Veronica beccabunga*), Hoary Willowherb (*Epilobium parviflorum*) and Nettle (*Urtica dioica*).

Hedgerows (WL1)

The agricultural grassland and horticultural field within the proposed solar farm site are bound by a network of hedgerow habitats that are set upon earth banks. There are examples of relatively species rich, hedgerows at the proposed site, with species including Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Holly (*Ilex aquifolium*) and Crab Apple (*Malus sylvestris*); with occasional Beech (*Fagus sylvatica*), Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*) and Oak (*Quercus robur*) standard trees. However, some of the hedgerows at the site comprise defunct Hawthorn dominated hedges set on earth banks, with several gaps between the shrubs.

Field boundaries within the proposed substation and grid connection site comprise relatively sparsely vegetated earth banks, with associated drainage channels.

Treelines (WL2)

Treelines at the proposed solar farm site are variable in species composition. Species rich treelines are similar in composition to the species rich hedgerows, as detailed above, with Scot's Pine (*Pinus*

sylvestris) and Elm (*Ulnus* spp) also recorded in Parcel 4. Gaps in the treeline in some areas are filled with Bramble (*Rubus fruticosus* agg) and Gorse (*Ulex europaeus*).

The proposed 33kV grid connection route runs along the L62031, L6203, R619, L6207, L22012 and L2204 public roads which are lined by earth banks, hedgerows and treelines of a similar species composition to those present within the proposed solar farm lands, with Willow (*Salix cinerea*) also present locally in wet areas.

The linear woodland habitats (hedgerow and treelines) within the proposed solar farm site provide an important corridor functionality for mammals and avifauna at the site and its surrounding environs.

There are no treelines present within the proposed substation and grid connection site.

Earth Bank (BL2)

Earth banks at the site are vegetated with Bramble, Bracken (*Pteridium aquilinum*), Ivy (*Hedera helix*) and grasses including Red Fescue (*Festuca rubra*), False Oat-grass (*Arrhenatherum elatius*) and Cock's-foot (*Dactylis glomerata*). The earth banks support occasional Hawthorn and standard trees such as Sycamore, Beech and Ash, however, where tree and shrub species are not the dominant feature, the linear habitat is classified within the 'earth bank' habitat category.

Field boundaries within the proposed substation and grid connection site comprise relatively sparsely vegetated earth banks, with associated drainage channels.

Improved Agricultural Grassland (GA1)

This is the dominant habitat within the proposed solar farm site. This habitat is a result of ongoing management practices associated with cattle and sheep farming which includes ongoing fertilisation and reseeded of grassland swards. As a result, these management practices influence the development of mono-specific grassland swards with occasional occurrences of broadleaved herbs that can thrive in nutrient rich, continually grazed environments. The improved grassland habitat supports dominant Perennial Rye-grass (*Lolium perenne*) with occasional Sweet Vernal-grass (*Anthoxanthum odoratum*), Crested Dog's-tail (*Cynosurus cristatus*), Timothy (*Phleum pratense*), Yorkshire Fog (*Holcus lanatus*), White Clover (*Trifolium repens*), Common Mouse-ear (*Cerastium fontanum*), Dandelion (*Taraxacum* agg.), Broad-leaved Dock (*Rumex obtusifolius*) and Creeping Buttercup (*Ranunculus repens*).

The proposed 110kV substation is located within improved grassland at its location within the proposed solar farm site (see Figure 1-2).

Horticultural (BC2)

A field growing potatoes and vegetables is present within Parcel 4 of the proposed solar farm site.

Wet Oak-Ash Woodland (WN4)

Woodland present adjacent to the Rathonoane stream in Parcel 4 of the proposed solar farm site and Inniscarra Reservoir adjoining Parcel 2 comprises species including Alder (*Alnus glutinosa*), Willow, Oak, Hawthorn and Ash, with occasional Rowan (*Sorbus aucuparia*); the ground flora comprises Remote Sedge (*Carex remota*), Creeping Buttercup, Soft Rush (*Juncus effusus*) and grasses.

There is no woodland within the proposed substation and grid connection site.

Mixed broadleaved woodland (WD2)

Mixed broadleaved woodland is present in small parcels within Parcels 1 and 3 of the proposed solar farm site. Species present in these areas include Sycamore, Larch (*Larix* spp), Sitka Spruce (*Picea sitchensis*), Beech, Ash, Scot's Pine, Hawthorn, Blackthorn and Cherry Laurel (*Prunus laurocerasus*).

There is no woodland within the proposed substation and grid connection site.

Mixed conifer woodland (WD3)

Mixed conifer woodland bounds Parcel 3 of the proposed solar farm site to the east and, as such, has been mapped as a linear habitat in Figure 3-4. This habitat comprises Sitka Spruce and Cypress (*Cupressus* spp) trees.

There is no woodland within the proposed substation and grid connection site.

Scrub (WS1)

Two small parcels of mature scrub are present within Parcel 2. Species present include Oak, Ash, Willow, Sycamore, Hawthorn, Silver Birch (*Betula pendula*), Bramble and Gorse.

There is no woodland within the proposed substation and grid connection site.

Buildings and artificial surfaces (BL3)

This habitat is present along access tracks and the regional and local road system forming the route of the proposed 33kV UGC interconnector. A local road is also present between Parcel 5 and Parcel 6 of the proposed solar farm, within which the proposed substation and grid connection site is located.

The habitats at the proposed site are illustrated in Figure 3-3, Figure 3-4 and Figure 3-5.

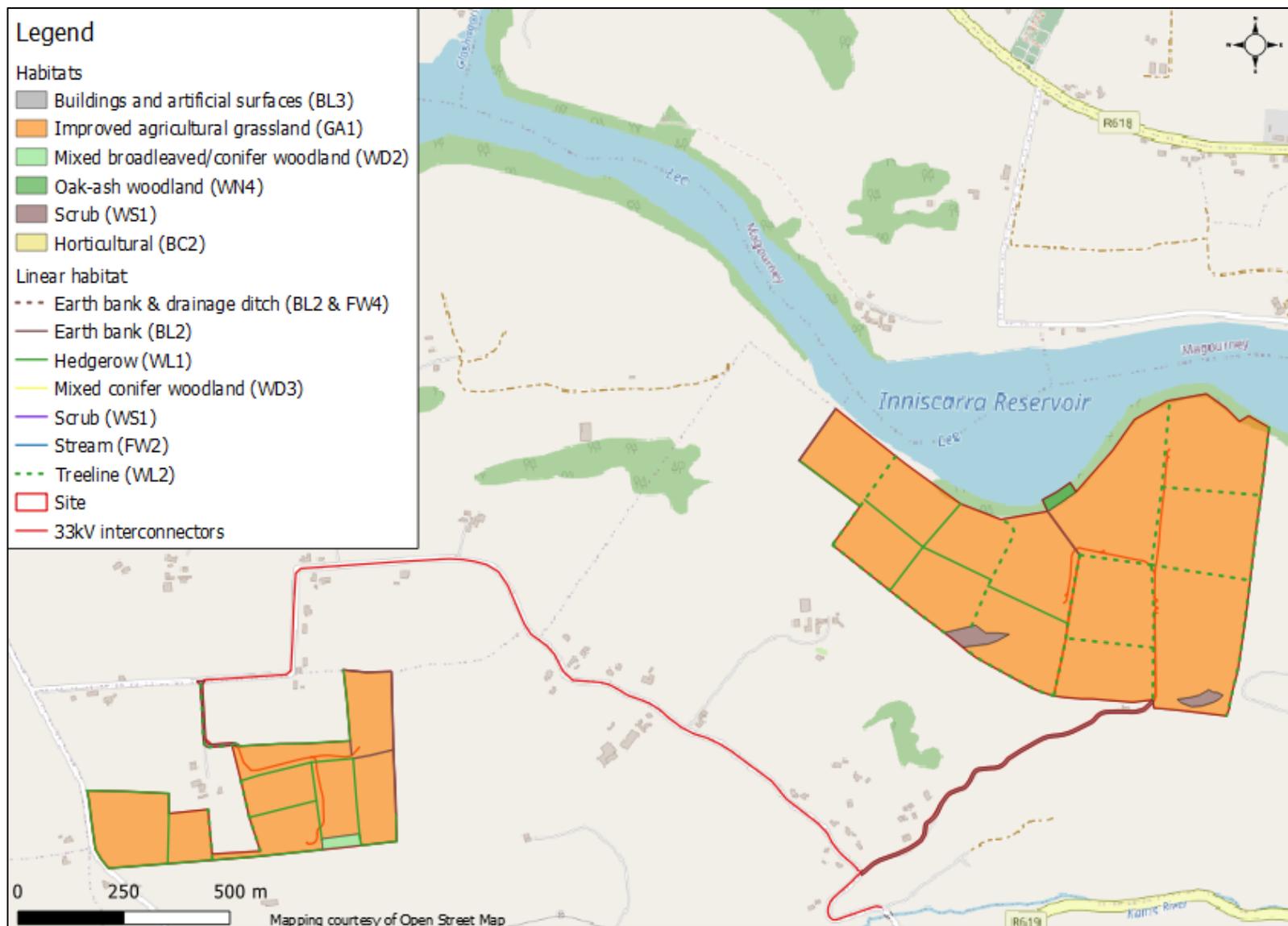


Figure 3-3: Habitats present at Parcel 1 and Parcel 2

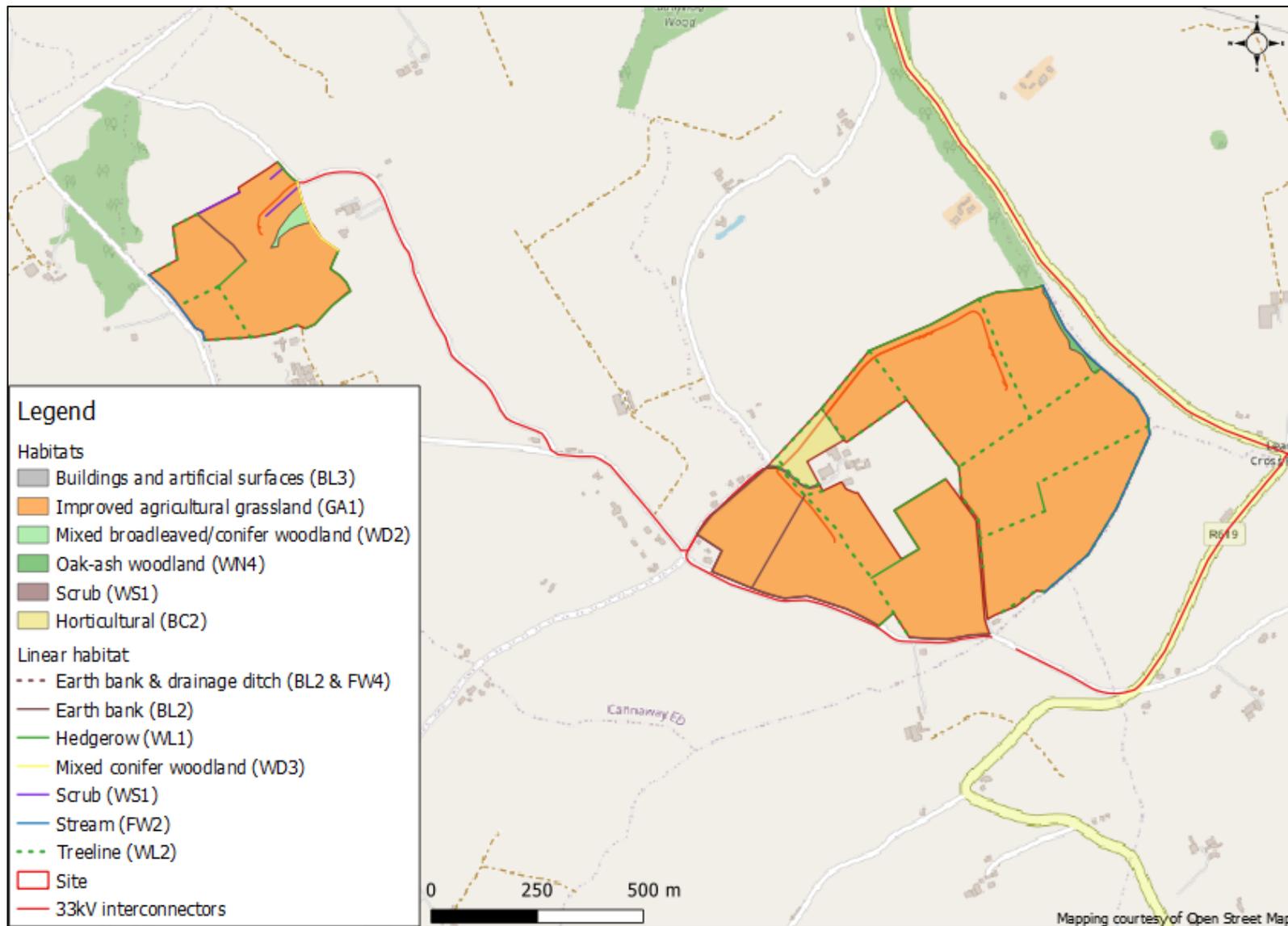


Figure 3-4: Habitats present at Parcel 3 and Parcel 4

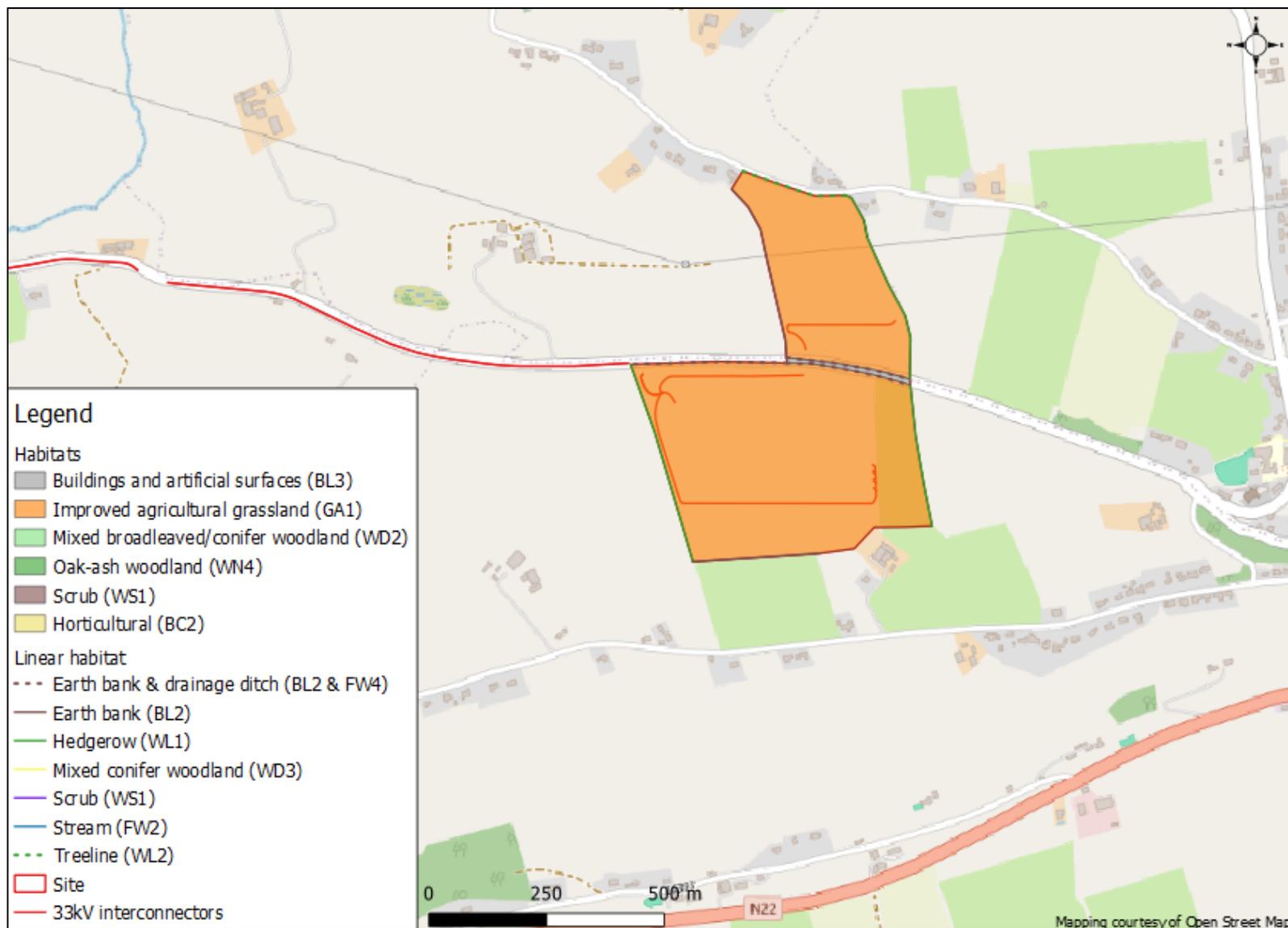


Figure 3-5: Habitats present at Parcel 5 and Parcel 6; the proposed Substation and Grid Connection Site is located within these Parcels

3.2.2 Species

This section describes the species that have been recorded historically within the vicinity of the proposed 110kV substation and grid connection and the wider solar farm site, results from site surveys and the potential for the proposed site to support protected species. Species records extracted from the NBDC database are included in Appendix B.

3.2.2.1 Amphibians and Reptiles

The NPWS hold records of smooth newt from Carrigadrohid, c.1.4km north-west of the proposed site, last recorded in 2009.

No amphibians or reptiles were recorded during the site walkover survey. Most of the proposed solar farm site is unsuitable for amphibians given its lack of standing water and waterlogged habitats. However, seasonally wet areas of ground within Parcel 2 and some of the more sluggish areas of drainage ditches present within Parcel 4, Parcel 5 and Parcel 6 and the proposed substation and grid connection site may provide suitable breeding habitat and refugia for common frog (*Rana temporaria*).

3.2.2.2 Avifauna

The NBDC hold records of five species included in Annex I of the EU Bird's Directive from the environs of the site, namely Kingfisher, Little Egret, Merlin, Peregrine Falcon and Whooper Swan. Eight BoCCI Red List species (Gilbert, G. *et al* (2021)) have been recorded from the environs of the site: Barn Owl, Black-headed Gull, Common Redshank, Eurasian Curlew, Herring Gull, Northern Lapwing, Northern Shoveler and Yellowhammer.

Twenty-three species of bird were recorded across the proposed solar farm site, including the proposed substation and grid connection site, during the winter bird surveys undertaken in February 2025 (Table 3-3). Individual Snipe were flushed out from grassland in Parcel 2, Parcel 3, Parcel 4 and damp grassland on flat ground at the north of Parcel 6 and Redwing was recorded field feeding in Parcel 2, Parcel 3 and Parcel 4; these species are included on the BoCCI Red list. Three Amber listed species were recorded, namely Goldcrest, Greenfinch and House Sparrow. The remaining eighteen species recorded are common and widespread species within Ireland and are considered to be of least conservation concern (Green listed on the BoCCI). Observations of waterbirds were limited to Mallard utilising a seasonally flooded area to the south of Parcel 2, outside of the proposed site boundary. No areas of standing water suitable for use by waterbirds were recorded within the proposed site. No evidence of field feeding waterbirds, such as direct observation or the presence of droppings or feathers was recorded across the proposed site.

The proposed substation site is located within Parcel 5 and Parcel 6 of the overall proposed solar farm site. Avifaunal species recorded in Parcel 5 and Parcel 6 predominantly comprised species that are Green listed on the BoCCI, with the exception of a single Snipe at the north of Parcel 6, as noted previously.

Table 3-3: Agligh Solar Farm- results of winter bird survey February 2025

| Species | BoCCI | Parcel 1 | Parcel 2 | Parcel 3 | Parcel 4 | Parcel 5 | Parcel 6 |
|-----------|-------|----------|----------|----------|----------|----------|----------|
| Blackbird | Green | √ | √ | √ | √ | √ | √ |
| Blue Tit | Green | | √ | √ | √ | | |
| Bullfinch | Green | √ | | | | | |
| Buzzard | Green | √ | √ | √ | √ | √ | |
| Chaffinch | Green | | √ | √ | √ | √ | √ |
| Coal Tit | Green | | | | √ | | |

| | | | | | | | |
|-----------------|-------|---|---|---|---|---|---|
| Fieldfare | Green | | √ | | | | |
| Goldcrest | Amber | | | √ | √ | | |
| Greenfinch | Amber | | | √ | | | |
| Great Tit | Green | √ | √ | √ | √ | √ | √ |
| Hooded Crow | Green | | √ | | √ | √ | |
| House Sparrow | Amber | √ | | | | | |
| Jackdaw | Green | √ | √ | √ | | | |
| Jay | Green | | √ | | | | |
| Long-tailed Tit | Green | | √ | | √ | | |
| Mistle Thrush | Green | | | √ | √ | | |
| Redwing | Red | | √ | √ | √ | | |
| Robin | Green | √ | √ | √ | √ | √ | |
| Rook | Green | | √ | √ | √ | √ | |
| Snipe | Red | | √ | √ | √ | | √ |
| Song Thrush | Green | √ | √ | | | √ | |
| Wood Pigeon | Green | | | √ | √ | | |
| Wren | Green | √ | √ | √ | √ | | |

The findings of the breeding bird survey completed at the proposed solar array including the substation and grid connection on 28th March 2024, 8th July 2024 and 10th July 2024 are presented in Table 3-4. The results of the breeding bird surveys completed at the proposed site on 29th April 2025 and 30th April 2025 are presented in Table 3-5.

Avifaunal species recorded at the proposed solar farm site reflected the habitats present. The fields of agriculturally improved pasture supported relatively low levels of avifaunal diversity, with species recorded restricted to corvids, with Redwing present within Parcel 1 in late March 2024 and Swallow flying over the fields in early July 2024 and April 2025. Buzzard was recorded flying over Parcel 2, Parcel 3 and Parcel 5 and are breeding within Parcel 4.

The treeline and hedgerow habitats at the field boundaries supported a higher diversity of bird species. Passerines such as Robin, Wren, Great Tit, Chaffinch, Goldfinch, Blackcap, Song Thrush and Mistle Thrush were recorded, in addition to several Blackbird. Of the bird species recorded at the proposed solar site, Redwing are on the BoCCI Red List (Highest Conservation Concern), Swallow, Greenfinch, Goldcrest, Willow Warbler, Starling and House Sparrow are on the Amber List (Moderate Conservation Concern); the remaining species are on the Green List (Least Conservation Concern).

Of the above species, Blackbird was recorded breeding in a mature hedgerow in Parcel 1 and probably breed in Parcel 4 and Starling breed in outbuildings adjacent to the southern boundary of Parcel 6, outside of both the proposed solar farm and substation and grid connection site boundaries. As detailed in Table 3-4 and Table 3-5, several species were displaying behaviour that indicated that they possibly breed at the proposed site, such as singing or being present within suitable breeding habitat.

Table 3-4: Results of breeding bird survey (March and July 2024)

| Transect | Common Name | Species Name | BOCCI | Breeding Evidence ⁵ |
|-------------|-------------------------|--------------------------------|-------------------------------|--------------------------------|
| Parcel 1 | Blackbird | <i>Turdus merula</i> | Green | P0 (H & S) |
| | Robin | <i>Erithacus rubecula</i> | Green | P0 (H) |
| | Wren | <i>Troglodytes troglodytes</i> | Green | |
| | Siskin | <i>Spinus spinus</i> | Green | Po (H) |
| | Greenfinch | <i>Chloris chloris</i> | Amber | Po (s) |
| | Redwing | <i>Turdus iliacus</i> | Red | Po (S & H) |
| | Goldfinch | <i>Carduelis carduelis</i> | Green | Po (s) |
| | Jackdaw | <i>Coloeus monedula</i> | Green | N (F) |
| | Magpie | <i>Pica pica</i> | Green | N (F) |
| | Rook | <i>Corvus frugilegus</i> | Green | N (F) |
| Parcel 2 | Chiffchaff | <i>Phylloscopus collybita</i> | Green | Po (s) |
| | Robin | <i>Erithacus rubecula</i> | Green | Po (s) |
| | Rook | <i>Corvus frugilegus</i> | Green | N (F) |
| | Chaffinch | <i>Fringilla coelebs</i> | Green | Po (s) |
| | Pheasant | <i>Phasianus colchicus</i> | Green | P0 (H) |
| | Blackbird | <i>Turdus merula</i> | Green | P0 (H) |
| | Hooded Crow | <i>Corvus cornix</i> | Green | N (F) |
| | Blue Tit | <i>Cyanistes caeruleus</i> | Green | Po (s) |
| | Mistle Thrush | <i>Turdus viscivorus</i> | Green | Po (s) |
| | Song Thrush | <i>Turdus philomelos</i> | Green | Po (s) |
| | Great Tit | <i>Parus major</i> | Green | Po (s) |
| | Wood Pigeon | <i>Columba palumbus</i> | Green | P0 (H) |
| | Long-tailed Tit | <i>Aegithalus caudatus</i> | Green | P0 (H) |
| | Blue Tit | <i>Cyanistes caeruleus</i> | Green | P0 (H) |
| | Goldfinch | <i>Carduelis carduelis</i> | Green | Po (s) |
| | Great Black-backed Gull | <i>Larus marinus</i> | Green | N (F) |
| | Wren | <i>Troglodytes troglodytes</i> | Green | Po (s) |
| | Swallow | <i>Hirundo rustica</i> | Amber | N (F) |
| | Buzzard | <i>Buteo buteo</i> | Green | N (F) |
| | Parcel 3 | Chiffchaff | <i>Phylloscopus collybita</i> | Green |
| Wood Pigeon | | <i>Columba palumbus</i> | Green | N (F) |
| Blackbird | | <i>Turdus merula</i> | Green | P0 (H & S) |
| Robin | | <i>Erithacus rubecula</i> | Green | P0 (H) |
| Wren | | <i>Troglodytes troglodytes</i> | Green | Po (s) |
| Rook | | <i>Corvus frugilegus</i> | Green | N (F) |
| | Wood Pigeon | <i>Columba palumbus</i> | Green | Po (H) |

⁵ In accordance with BTO categories of breeding bird evidence, see Table 2-1

| | | | | |
|-----------------|-------------------------------|--------------------------------|--------|-------------------------------|
| Parcel 4 | Chaffinch | <i>Fringilla coelebs</i> | Green | Po (H) |
| | Blackbird | <i>Turdus merula</i> | Green | Po (H) |
| | House Sparrow | <i>Passer domesticus</i> | Amber | Po (H) |
| | Buzzard | <i>Buteo buteo</i> | Green | Br (as reported by landowner) |
| | Robin | <i>Erithacus rubecula</i> | Green | Po (S) |
| | Goldfinch | <i>Carduelis carduelis</i> | Green | Po (S) |
| | Swallow | <i>Hirundo rustica</i> | Amber | N (F) |
| | Magpie | <i>Pica pica</i> | Green | N (F) |
| | Wren | <i>Troglodytes troglodytes</i> | Green | Po (H) |
| Chiffchaff | <i>Phylloscopus collybita</i> | Green | Po (s) | |
| Parcel 5 | Great Tit | <i>Parus major</i> | Green | P0 (H) |
| | Swallow | <i>Hirundo rustica</i> | Amber | N (F) |
| | Robin | <i>Erithacus rubecula</i> | Green | Po (S) |
| | Wood Pigeon | <i>Columba palumbus</i> | Green | Po (H) |
| Parcel 6 | Rook | <i>Corvus frugilegus</i> | Green | N (F) |
| | Blackbird | <i>Turdus merula</i> | Green | Po (H) |

Table 3-5: Agligh Solar Farm- results of breeding bird survey April 2025

| Species | BoCCI | Parcel 1 | Parcel 2 | Parcel 3 | Parcel 4 | Parcel 5 | Parcel 6 |
|-----------------------|-------|------------|------------|------------|------------|----------|----------|
| Blackbird | Green | Br (FF) | Po (S & H) | Po (S & H) | Pr (A) | Po (S) | |
| Blackcap | Green | | Po (S) | Po (S & H) | Po (S) | | |
| Blue Tit | Green | Po (S) | Po (S) | Po (S) | Po (S) | | |
| Buzzard | Green | | N (F) | N (F) | Po (H) | N (F) | |
| Chaffinch | Green | Po (S) | Po (S) | Po (S) | Po (S) | | |
| Chiffchaff | Green | Po (S) | Po (S) | Po (S) | Po (S) | | |
| Coal Tit | Green | | | Po (S) | | | |
| Dunnock | Green | | Po (S) | Po (S) | | | |
| Goldcrest | Amber | Po (S) | | Po (S) | Po (S) | | |
| Greenfinch | Amber | | | Po (S) | Po (S) | | |
| Great Tit | Green | Po (S) | Po (S) | | Po (S) | Po (S) | |
| Hooded Crow | Green | N (F) | | | | | N |
| House Sparrow | Amber | Po (S) | | | | | |
| Jackdaw | Green | N (F) | N | N | | | |
| Magpie | Green | | | N | | | |
| Mallard | Amber | | | | N (F) | | N (F) |
| Mistle Thrush | Green | | Po (S) | | Po (S) | | |
| Pheasant | Green | N | | | | N | |
| Robin | Green | Po (S & H) | | |
| Rook | Green | Po (S) | Po (S) | Po (S) | Po (S) | | N (F) |
| Song Thrush | Green | | Po (S) | | | | |
| Starling | Amber | | | | | | Pr (N) |
| Swallow | Amber | N (F) | N (F) | N (F) | N (F) | N (F) | N (F) |
| Willow Warbler | Amber | Po (S) | | Po (S) | | | |

| | | | | | | | |
|--------------------|-------|--------|--------|--------|--------|--|--------|
| Wood Pigeon | Green | N (F) | Po (H) | N (F) | N (F) | | |
| Wren | Green | Po (S) | Po (S) | Po (S) | Po (S) | | Po (S) |

3.2.2.3 Flora

There are no records of protected species of vascular plants or bryophytes from the footprint of the proposed site including the substation and grid connection site and no rare or protected species of flora were recorded during the site survey.

3.2.2.4 Invasive Plant Species

The following invasive plant species have been recorded in the environs of the proposed site:

- Canadian Waterweed (High Impact, included in Invasive Species Regulation S.I. 477 (Ireland))
- Giant Hogweed (High Impact, included in Invasive Species Regulation S.I. 477 (Ireland))
- Japanese Knotweed (High Impact, included in Invasive Species Regulation S.I. 477 (Ireland))
- Nuttall’s Waterweed (High Impact, included in Invasive Species Regulation S.I. 477 (Ireland))

Invasive plant species recorded within the proposed site were limited to Rhododendron, which is present at the north of Parcel 4. Rhododendron has also been recorded to the south of Parcel 4 (outside of the site boundary), along with Giant Rhubarb (*Gunnera tinctoria*) and Skunk Cabbage (*Lysichiton americanus*). The location of these species is illustrated in Figure 3-6. No invasive plant species were recorded within the proposed substation and grid connection site in Parcel 5 and Parcel 6.

Figure 3-6: Invasive plant species recorded at the proposed site



3.2.2.5 Invertebrates

The NBDC does not hold any records of protected species of invertebrate from the proposed site and its environs. The improved grassland dominating the proposed solar farm and substation and grid connection site is of low suitability to support protected species of invertebrates and no rare or protected species of invertebrate were recorded at the proposed site during the site survey.

3.2.2.6 Bats

The review of existing records of bat species in the environs of the study area indicates that nine of the ten known Irish species of bat have been recorded within a 4km radius of the proposed site (last checked February 2026). These bats include common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*) and Nathusius' pipistrelle (*P. nathusii*), Leisler's bat (*Nyctalus leisleri*), brown long-eared bat (*Plecotus auritus*), Daubenton's bat (*Myotis daubentonii*), whiskered bat (*M. mystacinus*), Natterer's bat (*M. nattereri*) and lesser horseshoe bat (*Rhinolophus hipposideros*) as shown in Table 3-6 below. Of these species, soprano pipistrelle, common pipistrelle, Leisler's, brown long-eared, Daubenton's, whiskered bat and Natterer's bat have all been recorded roosting within 4km of the proposed site.

Table 3-6: NBDC bat records from within a 4km radius of the proposed site.

| Common Name | Scientific Name | Present | Known Roost (to OS 1km grid square) | Date of Last Record |
|-------------------------|---|---------|---|---------------------|
| Pipistrelle sp. | <i>Pipistrellus pipistrellus sensu lato</i> | √ | W4273, W4172, W4475 | 30/07/2019 |
| Soprano Pipistrelle | <i>Pipistrellus pygmaeus</i> | √ | W4372, W4273, W4172, W4871 | 20/08/2019 |
| Common Pipistrelle | <i>Pipistrellus pipistrellus</i> | √ | W4273, W4072 | 20/08/2019 |
| Nathusius's Pipistrelle | <i>Pipistrellus nathusii</i> | √ | None | 18/08/2005 |
| Leisler's Bat | <i>Nyctalus leisleri</i> | √ | W4273, | 11/06/2018 |
| Brown Long-eared Bat | <i>Plecotus auratus</i> | √ | W4773, W4372, W4273, W4374, W4266 | 08/08/2011 |
| Daubenton's Bat | <i>Myotis daubentonii</i> | √ | W4372 | 11/06/2018 |
| Whiskered Bat | <i>Myotis mystacinus</i> | √ | W4372, W4273, W4374 | 20/05/2008 |
| Natterer's Bat | <i>Myotis nattereri</i> | √ | W4871, W4273 | 11/06/2018 |
| Lesser Horseshoe Bat | <i>Rhinolophus hipposideros</i> | √ | None | 17/08/2008 |
| Brandt's Bat | <i>Myotis brandtii</i> | x | n/a | n/a |

The bat landscape association model (Lundy *et al*, 2011) suggests that the study area is part of a landscape that is of moderate to high suitability for bats including common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle, brown long-eared, Leisler's, Daubenton's, Natterer's and whiskered bat. The study area and its environs are of low suitability for Nathusius' pipistrelle and lesser horseshoe bat.

Review of aerial photography and the results of the site walkover indicate that the site comprises agricultural fields bound by hedgerows, treelines, occasional drainage ditches and watercourses. These linear features connect the proposed site to suitable bat foraging areas in the wider landscape. In accordance with the criteria outlined in Table 2-1, the commuting and foraging habitats at the proposed site and its environs are of moderate to high suitability for bats.

Trees

Most trees at the proposed site were semi-mature, thin boled and did not support large crevices, apertures or dense Ivy growth that could provide suitable roosting habitat for bats. No potential roosting features were recorded within trees at the proposed site, however there is potential for hidden roosting features to be present in some of the more mature trees within the field boundaries.

Activity Survey Results

The passive monitors deployed at the proposed solar farm site, including the proposed substation and grid connection site, in April/May 2025 recorded eight species of bat, namely common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat, Natterer's bat, whiskered bat, Daubenton's bat and lesser horseshoe bat. Calls from the *Myotis* genus (unidentifiable to species level) were also recorded.

Common pipistrelle was the most frequently recorded species within the proposed site, followed by soprano pipistrelle then Leisler's bat. Brown long-eared bat was recorded in each parcel of the proposed site, with the highest level of activity recorded in Parcel 1 and Parcel 2. *Myotis* species, including Daubenton's, whiskered and Natterer's bat were recorded across the proposed site, with a higher level of activity recorded on PM3 in Parcel 2. A low level of lesser horseshoe bat activity was recorded on PM6 and PM7, located in Parcel 3 and Parcel 4 respectively.

Leisler's bat was recorded commuting 30 minutes before sunset on PM1. Common pipistrelle was recorded c.30 minutes after sunset on PM1, PM3, PM4, PM5, PM6, PM7 and PM8; and soprano pipistrelle was recorded 3 minutes after sunset on PM8 and c.20-25 minutes after sunset on PM1, PM2 and PM3. There are no buildings located within the proposed site boundary, however the results of the passive monitoring indicate the likely presence of roosts for Leisler's bat, common pipistrelle and soprano pipistrelle in the vicinity of the proposed site.

The level of bat activity recorded across the site was variable, with a low level of activity recorded on PM9 located in Parcel 1, a relatively low level of activity on PM8, also located in Parcel 1 and PM5, located adjacent to the local road between Parcel 5 and Parcel 6. A high level of activity was recorded on PM1, located in Parcel 2, PM7, located in Parcel 3 and PM 6, located at Parcel 4 (the location of monitors is illustrated in Figure 2-1). Overall, a high diversity of bats was recorded across the proposed site. At the proposed substation and grid connection site, a moderate amount of activity from a relatively high diversity of species was recorded on PM4 to the west of the site boundary. As noted previously, a relatively low level of activity from at least five species was recorded on PM5 adjacent to the local road.

The number of bat passes per night recorded on the passive monitors is summarised in Table 3-7. The location of the passive monitors is illustrated in Figure 2-1.

Table 3-7: Aglish Solar Farm- results of passive monitoring April/May 2025

| Species | PM1 | PM2 | PM3 | PM4 | PM5 | PM6 | PM7 | PM8 | PM9 | Total |
|------------------------------------|------|------|------|------|------|------|------|------|-----|--------------|
| Common Pipistrelle | 4375 | 1639 | 2157 | 2140 | 1904 | 6507 | 7386 | 810 | 24 | 26942 (61%) |
| Soprano Pipistrelle | 2204 | 2013 | 1452 | 3748 | 422 | 901 | 476 | 1567 | 6 | 12789 (29%) |
| Pipistrelle spp⁶ | 49 | 63 | 46 | 47 | 15 | 21 | 0 | 30 | 0 | 271 (1%) |
| Leisler's | 362 | 330 | 789 | 186 | 718 | 444 | 666 | 210 | 0 | 3705 (8%) |
| Daubenton's | 2 | 0 | 34 | 8 | 0 | 2 | 34 | 4 | 0 | 84 (0%) |
| Whiskered | 0 | 6 | 0 | 4 | 0 | 4 | 2 | 0 | 0 | 16 (0%) |
| Natterer's | 0 | 0 | 0 | 8 | 0 | 2 | 0 | 4 | 0 | 14 (0%) |
| Myotis sp | 10 | 27 | 185 | 10 | 11 | 1 | 0 | 10 | 0 | 254 (1%) |
| Brown Long-eared | 18 | 24 | 14 | 0 | 4 | 4 | 8 | 12 | 0 | 84 (0%) |
| Lesser Horseshoe | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 7 (0%) |
| NoID | 4 | 5 | 3 | 0 | 0 | 1 | 0 | 5 | 0 | 18 (0%) |
| Total | 7024 | 4107 | 4680 | 6151 | 3074 | 7892 | 8574 | 2652 | 30 | 44184 (100%) |

Bat Roost Inspection and Emergence Survey

A disused dwelling located to the south-west of Parcel 2, outside of the proposed solar farm site boundary and c.4.5km to the north-west of the proposed substation and grid connection site, supports a flat roof extension with bat droppings recorded stuck to the outside of a window on the eastern elevation of the building in April 2025. An emergence survey of this building was conducted on 5th May 2025. No bats were recorded emerging from the building.

3.2.2.7 Badger

The NBDC hold records of badger from OS 1km Grid Squares overlapping within Parcel 2, Parcel 4 and Parcel 6 (see Appendix B) of the proposed solar farm. There is suitable habitat for this species within field boundaries and the small parcels of scrub and woodland within Parcel 1, Parcel 2, Parcel 3 and Parcel 4; Parcel 5 and Parcel 6, including the proposed substation and grid connection site, are of low suitability for badger.

No badger setts were recorded within the proposed solar farm site during the site survey, however old disused setts were recorded adjacent to the northern boundary of Parcel 2, mammal tracks and old setts are present on the northern boundary of Parcel 4 and a badger dropping was recorded in Parcel 4. No evidence of recent badger activity was recorded at any of the disused setts in Parcel 2 and Parcel 4 during the badger survey conducted in 2025. No badger were recorded entering an old badger sett on the northern boundary of Parcel 4 on the camera trap recording at this location between 28th February 2025 and 29th April 2025. Activity at the sett was limited to occasional fox and rabbit.

⁶ *Pipistrellus* spp. which have frequency of maximum energy, FMAXE, of c. 50kHz which cannot reliably be assigned to Common Pipistrelle (typical FMAXE of c. 45kHz) or Soprano Pipistrelle (FMAXE c. 55kHz)

Extensive rabbit activity is present across the boundaries of Parcel 6, within which the proposed substation is located. Some of the excavation on the eastern boundary of Parcel 6 has left a large entrance into the hedge bank, the characteristics of which were consistent with use by rabbit or potentially fox. Camera trap monitoring at this location in April/ May 2025 recorded a fox entering and exiting the mammal hole on one occasion. A single badger was recorded walking past the monitor, however no badger were recorded entering the mammal hole. In summary, there is no evidence that badgers currently utilise the proposed solar farm site, including the proposed substation and grid connection site as a breeding or resting place, however it is likely that the proposed site forms part of the foraging territory of the local badger population.

3.2.2.8 Other Mammals

The NBDC holds a record of otter from the R619 bridge over Inniscarra Reservoir, last recorded in 2010. No evidence of otter was recorded during the site survey and the small streams draining the proposed site are unlikely to provide a sustained foraging resource for this species. However, there is potential for otter to utilise these streams occasionally to forage and commute through the landscape. Inniscarra Reservoir provides suitable habitat for foraging and commuting otter and it is likely that otter forage and commute along the reservoir adjacent to the proposed site. There is no suitable habitat for otter within the proposed substation and grid connection site and its immediate environs.

The NBDC holds general records of red squirrel from the environs of the site, last recorded in Coachford in 2022. There is potential for red squirrel to utilise the small parcels of woodland and treelines within the proposed solar farm site and red squirrel has been observed within Parcel 4. However, no squirrel dreys were recorded at the proposed site during the site survey. There is no suitable habitat for red squirrel within the proposed substation and grid connection site.

Hedgehog has been recorded to the west of Parcel 4, last recorded in 2023. No evidence of hedgehog was recorded during the site survey, however, there is potential for this species to utilise the hedgerows, treelines, woodland and scrub present at the solar farm site. The proposed substation and grid connection site predominantly comprises improved agricultural grassland and is of limited potential to support hedgehog, however this species may shelter within hedgerows at field boundaries adjacent to the proposed site.

The NBDC hold records of Sika deer and Fallow deer from the 10km OS grid squares within which the site is located (W47 and W46), last recorded in 2008. No evidence of deer was recorded during the site surveys.

3.3 Summary of Ecological Evaluation

Table 3-8 summarises all identified ecological features. Ecological features have been identified as being at risk of potentially significant impacts via a source-pathway-receptor link. Important ecological features are valued as being of local ecological importance (higher value) or above as per the criteria set out in Appendix A.

Table 3-8: Ecological features within the proposed site and it's receiving environment

| Site/ Habitat/ Species | Ecological Value ⁷ | Important Ecological Feature |
|--|---|------------------------------|
| European Site | International. There is no connectivity to European sites within the likely zone of influence of the proposed development (see Table 3-1). | No |
| Natural Heritage Area | National. There is hydrological connectivity between the proposed solar array and nationally designated sites. There is no hydrological connectivity between the proposed substation development and nationally designated sites (see Table 3-2). | Yes |
| Depositing Lowland Rivers (FW2) and Inniscarra Reservoir | As detailed in the Aquatic EclA for the proposed solar farm, Kame River main channel in its lower reaches supports good trout spawning and nursery habitat with reasonably natural hydromorphology. Its tributaries (Cooldrum and Rathonoane) comprise fair to good trout spawning and nursery habitats. County Importance. Nadrid Stream and its tributary (crossed by the grid connection) are a small system with some potential salmonid habitat in the lower reaches, but no salmonid potential at the proposed upper sub-catchment HDD crossing locations. Local Importance (Lower Value). Inniscarra Reservoir is a large water body with good water quality, a well-known coarse fishery and high amenity value (angling, rowing, swimming) and is of County Importance. There are no waterbodies within the proposed substation and grid connection site. | Yes |
| Drainage Ditches (FW4) | Local importance (higher value). Drainage ditches at the proposed site are not of fisheries value and do not support a diverse flora. However, they provide connectivity in the landscape and are considered to be of local importance to avifauna, common frog and small mammals as a viable foraging habitat and localised refuge. | Yes |
| Hedgerows (WL1) | Local importance (higher value). Linear woodland habitats such as hedgerows and treelines provide valuable ecosystem services for other semi-natural habitats and faunal species in the locality in terms of cover, refuge and connectivity. This is particularly the case for areas dominated by improved grassland habitats, such as the proposed site and its environs. | Yes |
| Treelines (WL2) | Local importance (higher value). Linear woodland habitats such as hedgerows and treelines provide valuable ecosystem services for other semi-natural habitats and faunal species in the locality in terms of cover, refuge and connectivity. This is particularly the case for areas dominated by improved grassland habitats, such as the proposed site and its environs. There are no treelines within the proposed substation and grid connection site. | Yes |

⁷ In accordance with NRA (2009) Guidelines for the Assessment of Ecological Impacts of National Road Schemes Rev. 2. National Roads Authority

| Site/ Habitat/ Species | Ecological Value ⁷ | Important Ecological Feature |
|--|--|------------------------------|
| Earth banks (BL2) | The earth banks at the proposed site are variable in their vegetative composition, generally support occasional shrub and tree species and are not of botanical importance. Nonetheless, they do provide connectivity in the landscape and provide habitat for avifauna and small mammals and are considered to be of Local Importance (Higher Value). | Yes |
| Improved Agricultural Grassland (GA1) | Local importance (lower value). A habitat of low ecological value for flora, habitats and non-volant mammals comprising poor floristic diversity. | No |
| Horticultural (BC2) | Local importance (lower value). A habitat of low ecological value for flora, habitats and non-volant mammals. Not present within the proposed substation and grid connection site. | No |
| Wet Oak-Ash woodland (WN4) | Local importance (higher value). Woodland provides suitable habitat for avifauna, bats and ground mammals and can also provide valuable ecosystem services for other semi-natural habitats and faunal species in the locality in terms of cover, refuge and connectivity. Not present within the proposed substation and grid connection site. | Yes |
| Mixed broadleaved/conifer woodland (WD2) | Local importance (higher value). While this habitat is not semi-natural, woodland provides suitable habitat for avifauna, bats and ground mammals and can also provide valuable ecosystem services for other semi-natural habitats and faunal species in the locality in terms of cover, refuge and connectivity. Not present within the proposed substation and grid connection site. | Yes |
| Mixed conifer woodland (WD3) | Local importance (lower value). This habitat is dominated by non-native species and would provide limited habitat for avifauna, bats and ground mammals. However, this habitat is present at the site boundary and would provide connectivity within the landscape. Not present within the proposed substation and grid connection site. | No |
| Scrub (WS1) | Local importance (higher value). Two areas of mature scrub that would provide suitable habitat for avifauna, bats and ground mammals and can also provide valuable ecosystem services for other semi-natural habitats and faunal species in the locality in terms of cover, refuge and connectivity. Not present within the proposed substation and grid connection site. | Yes |
| Buildings and artificial surfaces (BL3) | Negligible ecological value. This habitat includes the local road network and access tracks. | No |
| Amphibians & Reptiles | Local importance (higher value). There is potential breeding habitat for common frog within drainage ditches at Parcels 4, 5 and 6. The proposed substation and grid connection site are located within Parcel 5 and Parcel 6.. | Yes |
| Avifauna | Two species of highest conservation concern and a range of species of moderate and lowest conservation concern were recorded at the proposed solar farm site | Yes |

| Site/ Habitat/ Species | Ecological Value ⁷ | Important Ecological Feature |
|------------------------|--|------------------------------|
| | during winter and breeding bird surveys. One species of highest conservation concern was recorded adjacent to the proposed substation site. Avifauna as they occur within the proposed site are considered to be of local importance (higher value). | |
| Bats | The proposed solar farm site supports a number of mature trees that may support hidden roosting features. The hedgerows and treelines at the proposed solar farm and substation and grid connection site provide foraging and commuting habitat for bats and the site is located within a landscape of moderate to high suitability for foraging and commuting bats. Eight species of bat commute to the site to forage. Bats, as they occur at the site, are considered to be of local importance (higher value). | Yes |
| Otter | No evidence of otter was recorded at the proposed site. However, it is likely that otter forage throughout Inniscarra Reservoir. The habitats at the proposed substation and grid connection site are not suitable to support otter. | Yes |
| Badger | Local importance (higher value). No active badger setts were recorded within the proposed site. Inactive setts are present adjacent to the solar farm site boundary and mammal tracks and badger droppings were recorded within the site. No badger setts were recorded within the proposed substation and grid connection site, however, it is likely that badger forage throughout the proposed site. | Yes |
| Hedgehog | The presence of hedgehog at the periphery of the site cannot be ruled out. | Yes |
| Red squirrel | No evidence of red squirrel was recorded within the site; however, this species has been recorded in the environs of the site and may occasionally use the hedgerows and pockets of woodland and scrub at the solar farm site. The habitats at the proposed substation and grid connection site are not suitable to support red squirrel. | Yes |
| Other mammals | The site is of low suitability as a sustained resource for other mammal species, including deer. | No |

4 Potential Impacts of the Proposed Development

This section identifies in detail the potential effects of the proposed development on habitats and species of conservation value (i.e. important ecological features as identified in Table 3-8) that have been identified as present, or that have the potential to be present, at its receiving environment.

As noted in Section 1, the proposed substation, interface towers and underground cable grid connection works are the subject of a separate Strategic Infrastructure Development planning application. Notwithstanding this dual consent process, this impact assessment considers the full combined development for the purposes of completing a robust assessment of the entire project.

4.1 Do Nothing Scenario

If the proposed development does not proceed, the solar farm site, including the proposed substation and grid connection site, will remain as predominantly improved agricultural grassland bound by hedgerows and treelines for the foreseeable future.

4.2 Construction Phase

The important ecological features that, in the absence of mitigation, may potentially be affected by the construction phase of the proposed development and the significance of these effects are set out in the following sections.

4.2.1 Designated Sites

Potential impacts on European sites are considered in the screening for Appropriate Assessment report accompanying the planning application.

As detailed in Table 3-2, there are four sites designated nationally for nature conservation within 10km of the proposed solar farm site. One of these sites (the Gearagh pNHA) is also designated as a European site and so is considered within the report to inform Appropriate Assessment accompanying the solar farm planning application. An assessment of potential source-pathway-receptor links between the proposed solar farm site and the three remaining nationally designated conservation sites within 10km of the proposed solar farm site did not reveal links to two of these designated sites (Table 3-2). There is potential remote hydrological connectivity to the Lee Valley pNHA via drainage of Parcels 1, 2, 3 and 4 to the Kame River, which flows into Inniscarra Reservoir. There is no direct hydrological connectivity directly between Parcel 2 and Inniscarra Reservoir because the land parcel slopes southwards draining to the Kame and there is a broad, mature woodland scarp (40m wide) separating Parcel 2 and the reservoir. The Lee Valley pNHA is located c.14.5km downstream of the confluence point of the River Kame with Inniscarra Reservoir. The Lee Valley pNHA is of conservation interest for a range of habitats, including wet broadleaved woodland, wet grassland, dry broadleaved woodland, unimproved dry grassland, freshwater marsh and wetland bird species. These habitats and species are predominantly located on the margins of the Lee in the river valley and are not considered to be highly sensitive to fluctuations in water quality. In view of the nature and scale of the proposed works, the distance from the proposed solar farm site (7km straight line distance and c.14.5km downstream) and the location and characteristics of the features of conservation interest within this pNHA, no significant negative effects on the Lee Valley pNHA are anticipated to arise from the solar farm proposals. There is no connectivity between the proposed substation site and any European site or nationally designated site via surface water, groundwater or any other pathway. Therefore, there will be no significant effects on designated sites during the construction phase.

4.2.2 Habitats

4.2.2.1 *Depositing/lowland rivers*

There are no watercourses within the proposed substation and grid connection site and its immediate environs.

For clarity, a detailed assessment of potential impacts on aquatic ecology as a result of the proposed solar farm is provided in the Aquatic EclA enclosed in Appendix E.

4.2.2.2 *Drainage ditches*

For the wider solar farm development, the centre line of the panels will be set back from hedgerows/treelines and their associated drainage ditches by a minimum distance of 10m. The landscaping plan includes for measures including hedgerow planting, hedgerow enhancement and provision of field margins managed for biodiversity (see Section 4.2.2.3 and the Biodiversity Management Plan (BMP) in Appendix C for further details). These measures will assist in minimising adverse impacts on water quality within drainage ditches. However, there is potential for export of sediments and other pollutants such as hydrocarbons to drainage ditches during the construction phase to result in a reduction in water quality locally. For the proposed substation and grid connection development, there is potential for export of sediments and other pollutants to the drainage ditches located either side of the local road bisecting the proposed site. If this were to occur, it may potentially result in a short term significant adverse effect at the local level.

4.2.2.3 *Hedgerows, treelines and earth banks*

Hedgerow, treeline and earth bank habitats are classified distinctly within the Fossitt classification system. However, as these habitats are represented within the proposed site, the distinction is not always clear (for example treelines that are essentially grown out hedgerows, or earth banks that support sparse tree and shrub cover). For this reason, potential impacts on these habitats are considered together within this assessment.

It is estimated that c.31 no. metres of existing hedgerow and 2 no. trees will be removed to facilitate access to the fields within the proposed substation and grid connection site. These removal works are included in the wider solar farm application which provides for removal of a total of 86 no. linear metres of hedgerow and 3 trees

The following enhancement measures have been included within the project design for the solar farm, including the proposed substation and grid connection site, (as illustrated in Landscaping Plan drawings accompanying the planning application):

- C.22,296 linear metres of existing hedgerows/treelines will be enhanced as required to fill gaps throughout the site.
- C.872 linear metres of new hedgerow comprising native species will be planted along the site boundary.
- All hedgerow planting will comprise native species from native stock.
- Field margins will be planted and/or managed in accordance with the BRIDE project EIP techniques⁸.

The access tracks and cable trenches have been designed to avoid hedgerows/trees and any associated root protection zones (RPZs) unless this is unavoidable for the purposes of providing access or electrical connectivity between field systems. As noted previously, there will be a loss of c.86m of

⁸ Field Margin action of the BRIDE project, which involves placing a wire fence c.2m from the hedgerow base to allow vegetation to grow and provide habitat for birds, small mammals and invertebrates. This area should be flailed every year between Sept. 15th and Feb 28th.

hedgerow across the proposed solar farm site, which includes c.31 no. metres of existing hedgerow and 2 no. trees within the proposed substation and grid connection site, in the short-term. In the absence of mitigation, this would be a permanent significant adverse effect at the local level. However, with the successful implementation of these landscaping proposals, there will be a net gain of 786 linear metres of hedgerow across the proposed solar farm site, including the proposed substation and grid connection site, in the medium to long term, which will offset the loss of hedgerows or any associated RPZs.

Trees within the site may offer nesting opportunities for breeding bird species. In the absence of mitigation this work is likely to impact upon breeding birds, through disturbance, injury or loss of potential nesting site as discussed in Section 4.2.3.2.

4.2.2.4 *Wet Oak-Ash woodland*

Oak-Ash woodland is present at the north of Parcel 2 and the east of Parcel 4 of the proposed solar farm site. This habitat is located outside of the solar panel array footprint and will be fenced off and excluded from grazing. The landscaping plan includes for bolstering of this habitat with native species as required. The final planting specification will be appropriate for the existing habitat and agreed with the project ecologist and project landscaper at implementation.

There is no wet Oak-Ash woodland within the proposed substation and grid connection site.

No significant adverse effects on this habitat will occur during the construction phase.

4.2.2.5 *Mixed broadleaved/ conifer woodland*

Mixed woodland is present in small parcels within Parcels 1 and 3 of the proposed solar farm site. No works are proposed within this habitat and these areas will be fenced off from the footprint of the development. No significant adverse effects on this habitat will occur during the construction phase.

There is no mixed broadleaved/conifer woodland within the proposed substation and grid connection site.

4.2.2.6 *Mixed conifer woodland*

This habitat is present on the boundary of Parcel 3 of the proposed solar farm site. No removal of this habitat is proposed, and this area of linear woodland will be enhanced with native species as required. No significant adverse effects on this habitat will occur during the construction phase.

There is no mixed conifer woodland within the proposed substation and grid connection site.

4.2.2.7 *Scrub*

Two areas of mature scrub are present within Parcel 2 of the proposed solar farm site. No works are proposed within this habitat and these areas will be fenced off from the footprint of the development. No significant adverse effects on this habitat will occur during the construction phase.

There is no scrub within the proposed substation and grid connection site.

4.2.3 *Species*

4.2.3.1 *Amphibians*

Sluggish drainage ditches provide potential habitat for common frog. As detailed in Section 4.2.2.2 and Section 4.2.2.3, the landscaping plan includes measures such as new hedgerow planting, hedgerow enhancement and provision of grass buffer strips at field margins. These measures will minimise the risk of adverse impacts on water quality within drainage ditches. However, there is potential for export of sediments and other pollutants such as hydrocarbons to drainage ditches

during the construction phase to result in a reduction in water quality locally. For the proposed substation and grid connection development, there is potential for export of sediments and other pollutants to the drainage ditches located either side of the local road bisecting the site. If this were to occur, it may potentially result in a short-term adverse effect on common frog, which would be significant at the local level.

4.2.3.2 *Avifauna*

The results of the bird surveys conducted in March 2024 and February 2025 indicate that the use of the fields within the proposed solar farm, including the proposed substation and grid connection site, by wintering birds was limited to foraging Redwing and occasional foraging by single Snipe. No evidence of regular use by foraging or roosting waterbirds was recorded. In view of these findings, there will be no significant adverse effects on waterbirds as a result of disturbance or loss of foraging or roosting habitat during construction. There is potential for disturbance to winter foraging Snipe and Redwing within the proposed solar farm, including the proposed substation and grid connection site, during construction, however, given the wide availability of other foraging areas within agricultural fields adjoining the proposed site and within the surrounding landscape, effects on these species would be minor and temporary to short-term and population-level effects (i.e. significant effects) are not likely.

The proposed solar farm, including the proposed substation and grid connection site, is dominated by improved agricultural grassland and lacks areas of tussocky grassland favoured by ground nesting birds. Further, no evidence of ground nesting birds was recorded during the bird surveys conducted in 2024 and 2025. The footprint of the proposed solar farm and the proposed substation and grid connection will result in a relatively small amount of habitat loss (see Section 4.2.2) and potential disturbance to breeding avifaunal species currently utilising the treeline and hedgerow habitats bounding fields and small pockets of scrub and woodland. In consideration of the presence of suitable alternative habitat surrounding and adjoining the proposed solar farm site, including the proposed substation and grid connection site, the impacts to avifauna in this regard are considered to be of a negligible magnitude. For most bird species, the displacement period is likely to only occur during the construction phase.

The hedgerows and trees at the proposed solar farm site, including the proposed substation and grid connection site, and immediately adjacent areas offer suitable breeding and foraging habitat for a range of passerines, including six BoCCI Amber List species and a range of Green List species that are common in the agricultural landscape, as recorded during the site surveys (Table 3-3). As hedgerow is an abundant habitat within the application area and adjacent landscape, the removal of small sections of hedgerow, including c.31m to facilitate the proposed substation and grid connection, will have a negligible impact on local bird species from loss of habitat. Further, the site's landscaping plan will enhance and increase hedgerow and treeline networks at the site, providing greater foraging and dwelling habitat and improving ecological connectivity.

4.2.3.3 *Bats*

There are no structures within the proposed site. No potential roosting features were recorded within trees at the proposed solar farm site, including the proposed substation and grid connection site, however, the potential for hidden roosting features to be present within mature trees cannot be ruled out. Applying the precautionary principle, it is assumed that there is potential for loss of potential roosting features for bats as a result of the removal of hedgerow habitat during the construction phase. Should potential or actual roosting habitat be present within any tree required for removal, this would represent a significant adverse effect on bats at the local geographic scale.

Eight species of bat, namely common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat, Natterer's bat, whiskered bat, Daubenton's bat and lesser horseshoe bat commute and forage at

the solar farm site, with a high level of activity and diversity of species recorded in Parcel 2, Parcel 3 and Parcel 4. The proposed development will require the removal of 2 no. 6m sections of hedgerow in Parcel 2 and 3 no. 5m sections and 1 no. 6m section of hedgerow in Parcel 4, no hedgerow will be removed in Parcel 3. Small sections of hedgerow will also require removal within land parcels with lower levels of recorded bat activity, including the proposed substation and grid connection within Parcel 5 and Parcel 6, as detailed on the Landscape Mitigation Plans submitted with the planning application. As outlined in the BMP (Appendix C), the site's landscaping plan will enhance and increase hedgerow and treeline networks across the proposed site, providing greater foraging and commuting habitat and improving ecological connectivity. Further, there is an extensive network of hedgerows in the wider landscape and the majority of hedgerows and treelines at the proposed site will remain in place. Overall, the removal of small sections of hedgerow/ treeline within the proposed solar farm site, including the proposed substation and grid connection site, during construction may result in a temporary to short-term slight, but not significant, effects on bats.

Hedgerows, treelines, woodland edge and scrub edge habitats provide important flyways and feeding sites for a diversity of bats. Artificial lighting at night may have an adverse effect on foraging bats as light-averse bats may be repelled from lit areas and restrict their use of commuting or feeding space. In the absence of mitigation, disturbance of bats due to lighting used during the construction phase, should it be required, would have an indirect, significant negative effect at the local level. The effect would be temporary and would persist for the duration of construction.

4.2.3.4 Otter

The use of the proposed site by otter is likely limited to occasional foraging and commuting along the small streams draining the solar farm site and foraging and commuting within Inniscarra Reservoir. The potential for temporary visual and noise disturbance to otters within Inniscarra Reservoir in the vicinity of the site during construction of the proposed solar farm cannot be discounted. However, otters are generally nocturnal, with a peak of activity occurring around dawn and dusk, therefore the main activity period for otter is outside standard construction working hours. In view of these factors, and in consideration of the abundance of available aquatic habitat upstream and downstream of the proposed site, disturbance impacts as a result of the proposed solar farm would not be expected to have a significant adverse effect on otters.

The proposed development will not form a barrier to otter commuting through the landscape.

There is potential for a reduction in water quality to have an adverse effect on aquatic organisms and in turn a reduction in prey species available for otter that forage within the receiving watercourses of the proposed solar farm site. However, any reduction in water quality is likely to be short term and localised. The high mobility and large foraging range of otter means that they are likely to be able to accommodate such localised temporary changes in prey distribution and abundance.

There are no habitats within the proposed substation and grid connection site suitable to support otter, therefore there will be no adverse effects on otter as a result of the proposed development.

4.2.3.5 Badger

No evidence of active badger setts was recorded within the proposed solar farm site, including the proposed substation and grid connection site. However, badgers create new setts regularly, and the use of the site by badger for foraging and new sett excavation in the field boundaries and small parcels of scrub and woodland habitat present at the site and its immediate environs cannot be discounted. There is potential for disturbance to badgers during construction work. In the absence of mitigation,

the construction of the proposed development has the potential to affect badger if present at the time of construction. This would be a temporary effect that would be significant at a local level.

4.2.3.6 Hedgehog

There is potential for hedgehog to utilise the hedgerows, treelines scrub and woodland parcels at the proposed solar farm site, including the proposed substation and grid connection site, and its immediate environs. As noted previously, the site's landscaping plan will enhance and increase hedgerow and treeline networks at the site, providing greater foraging and commuting habitat and improving ecological connectivity. Further, there is an extensive network of hedgerows in the wider landscape and the majority of hedgerows and treelines at the proposed site will remain in place. Therefore, the removal of small sections of hedgerow/ treeline will not result in a significant loss of foraging/ commuting habitat for hedgehog and will not have a significant effect on this species.

4.2.3.7 Red Squirrel

There is potential for red squirrel to utilise the hedgerows, treelines scrub and woodland parcels at the proposed solar farm site and its immediate environs. However, no squirrel dreys were recorded within the proposed solar farm site and its immediate environs during the site surveys and it is likely that the proposed solar farm site forms part of the foraging and commuting range for the local red squirrel population. The site's landscaping plan will enhance and increase hedgerow and treeline networks at the site, providing greater foraging and commuting habitat and improving ecological connectivity. Further, there is an extensive network of hedgerows and small parcels of woodland in the wider landscape and the majority of hedgerows and treelines at the proposed site will remain in place. Therefore, the removal of small sections of hedgerow/ treeline during the construction phase will not result in a significant loss of foraging/ commuting habitat for bats and will not have a significant effect on the local red squirrel population.

The proposed substation and grid connection site, within Parcel 5 and Parcel 6 of the proposed solar farm site, comprises improved agricultural grassland and is isolated from scrub and woodland habitats present in the wider landscape. As such, the proposed substation and grid connection site is not suitable to support red squirrel. The proposed substation and grid connection development will not result in adverse effects on red squirrel during the construction phase.

4.2.3.8 Invasive Species

Rhododendron is present at the north of Parcel 4 and outside of the solar farm site, to the south of Parcel 4. Giant Rhubarb (*Gunnera tinctoria*) and Skunk Cabbage (*Lysichiton americanus*) were also recorded to the south of Parcel 4, outside of the site boundary. Rhododendron, Giant Rhubarb and Skunk Cabbage are included in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). There are no works proposed to the Rhododendron, Giant Rhubarb and Skunk Cabbage located outside of the proposed solar farm site boundary, therefore there will be no spread of these plants during the construction phase. Applying the precautionary principle, there is potential for the proposed solar farm development to result in the spread of Rhododendron located within Parcel 4 during the construction phase of the proposed solar farm.

No invasive plant species were recorded within Parcel 5 and Parcel 6, therefore the proposed substation and grid connection development is not expected to result in the spread of invasive plant species.

4.3 Operational Phase

This section details the principle potential impacts of the proposed development during the operational phase, in the absence of mitigation.

4.3.1 Designated Sites

Potential effects on European sites are considered in the report to inform Screening for Appropriate Assessment accompanying the Planning Application.

No adverse effects on nationally designated sites will occur during the operational phase.

4.3.2 Habitats

No significant adverse effects on habitats are anticipated during the operational phase of the proposed solar farm or proposed substation and grid connection development.

The successful implementation of the landscaping proposals (see Section 4.2.2.3 and Appendix C) will improve the biodiversity and structure of the solar farm and substation and grid connection site's hedgerow and treeline network and will improve their ecosystem value to the wider area. As such, it is anticipated that the proposals will have a positive impact on hedgerow and treeline habitats at the site in the long term during the operational phase.

4.3.3 Fauna

4.3.3.1 Amphibians

No significant adverse effects on amphibians are anticipated during the operational phase of the proposed solar farm development or the proposed substation and grid connection development.

4.3.3.2 Avifauna

Breeding bird species recorded at the proposed solar farm site, including the proposed substation and grid connection site, were limited to widespread species typical of the agricultural landscape at the site and its environs. No ground nesting birds were recorded within the proposed solar farm site, including the proposed substation and grid connection site. Potential nesting habitat for birds within hedgerows and treelines at the site will be retained and enhanced. There will be no significant loss of available habitat for ground nesting birds. Non-breeding birds recorded at the proposed solar farm site included field foraging Redwing and a low number of individual foraging Snipe. The footprint of the solar farm and substation and grid connection developments will entail a small amount of loss of agricultural grassland, however, given the wide availability of agricultural grassland adjacent to the proposed solar farm and substation and grid connection site and within the surrounding landscape, plus the provision of wide field margins and biodiversity enhancement zones within the proposed site (see Appendix C), no significant effects on field feeding birds are expected during the operational phase.

The "lake effect", where birds mistake a reflective solar facility for a water body, leading to potential fatalities, is thought to be of concern primarily where the solar array is located in close proximity to a large stop-over site for water birds.⁹ However, as noted by Bennun *et al.* (2021), to date, there is little evidence to support the existence of the suggested 'lake-effect'. The nearest site designated for the presence of waterbirds is the Gearagh SPA, located c.9.3km to the west of the site, Cork Harbour SPA is located c.21.5km to the east (straight line distance). It is proposed to use an anti-reflective coating on the solar panels at the proposed development. In view of the separation distance between the Gearagh SPA and Cork Harbour SPA and the proposed site, and the use of anti-reflective coating on the solar panels, there is no potential for likely significant effects on the SCI for the Gearagh SPA and Cork Harbour SPA as a result of the lake effect. Similarly, in view of the anti-reflective coating proposed for the solar panels, there will be no significant effects as a result of the lake effect on waterbirds

⁹ Kosciuch K, Riser-Espinoza D, Geringer M, Erickson W (2020) A summary of bird mortality at photovoltaic utility scale solar facilities in the Southwestern U.S.. PLoS ONE 15(4): e0232034

utilising Inniscarra Reservoir, which is located adjacent to the northern boundary of Parcel 2. Potential impacts as a result of the lake effect are not relevant to the proposed substation and grid connection development.

The solar farm land parcels will connect via internal underground interconnector cabling and will not require additional overhead transmission lines.

No significant adverse effects on avifauna are anticipated during the operational phase of the proposed solar farm.

The proposed substation and grid connection will require two new steel lattice interface towers of approximately 16 m in height which will form part of the existing overhead line and both towers will connect to the proposed 110kV substation via underground 110kV cables. The interface towers are approximately 75 metres apart, therefore the same length of the existing 110kV Inniscarra-Macroom overhead line will need to be decommissioned. The addition of the 2 no. interface masts and the underground grid connection cabling will not result in any increased risk to birds in terms of collision impact.

No significant adverse effects on avifauna are anticipated during the operational phase of the proposed substation and grid connection.

4.3.3.3 Bats

Some recent research suggests that solar farms may lead to reduced activity of several insectivorous bat species (Szabadi *et al.*, 2023; Tinsley *et al.*, 2023) and may decrease foraging habitat quality for bats (Barré *et al.*, 2023). There is a lack of data on the use of solar farms by bats in Ireland, in particular there are no temporal studies of sites from baseline conditions to operational phase solar farm or mechanistic studies to determine if and how bat behaviour is affected by the presence of solar infrastructure and why. Applying the precautionary principle, it is assumed that there is potential for an adverse effect on foraging bats during the operational phase of the proposed Aglish Solar Farm as a result of a reduction in foraging habitat quality. However, Tinsley *et al.* (2023) suggests that appropriate mitigation for potential effects on foraging bats includes ensuring that boundary habitat is maintained and improved in its area and diversity, and ensuring appropriate planting to improve foraging resources for those species identified as being at risk from the development. Barré *et al.* (2023) further suggest improving the carrying capacity of the food web within the proposed site by actions such as sowing native flowering plant species, creating agroecological features such as hedgerows and flower meadows and livestock grazing to benefit bats and minimise adverse effects. As detailed in the BMP (Appendix C), the proposed landscaping plan for Aglish Solar Farm includes for the enhancement of c.22,296 linear metres of hedgerow and the provision of 872 linear metres of new hedgerow, to comprise native species from native stock plus provision of field margins and biodiversity enhancement zones which will allow flowering species from the existing seed bank in the soil to grow.

With the successful implementation of the proposed landscaping plan, it is expected that bat foraging habitat quality within the proposed solar farm site will be maintained and enhanced in the medium to long-term. Overall, it is anticipated that there may be a minor initial effect on foraging bats during the operational phase of the proposed solar farm, however, as the landscape planting matures, the effect of the development on foraging bats is likely to be neutral in the medium to long-term.

The proposed substation and grid connection site is located within Parcel 5 and Parcel 6 of the proposed solar farm site; therefore, the proposed landscaping plan will also ensure the retention,

maintenance and enhancement of hedgerows in the immediate environs of the proposed development.

No lighting is required for the operational phase of the proposed solar farm or substation and grid connection development.

No significant adverse effects on bats are anticipated during the operational phase of the proposed solar farm or substation and grid connection development.

4.3.3.4 *Otter*

No significant adverse effects on otter are anticipated during the operational phase of the proposed solar farm or substation and grid connection development.

4.3.3.5 *Badger*

While no evidence of active badger setts was recorded at the proposed solar farm site, including the proposed substation and grid connection site, the site forms part of the foraging area of a badger population. There is potential for fencing at the solar farm site perimeter to exclude badger from part of their foraging area. However, the project design includes for 300mm x 300mm gaps at the base of the security fence at 100m distances for mammal access. In view of the incorporation of this feature into the project design, no significant adverse effects on badger are expected during the operational phase.

No significant adverse effects on badger are anticipated during the operational phase of the proposed substation and grid connection development.

4.3.3.6 *Hedgehog*

There is potential for fencing of the site boundary to create a barrier to the movement of hedgehog through the landscape. However, as noted in Section 4.3.3.5, the project design includes for 300mm x 300mm gaps at the base of the security fence at 100m distances for mammal access. In view of the incorporation of this feature into the project design, no significant adverse effects on hedgehog are expected during the operational phase.

No significant adverse effects on hedgehog are anticipated during the operational phase of the proposed substation and grid connection development.

4.3.3.7 *Red Squirrel*

No significant adverse effects on red squirrel are anticipated during the operational phase of the proposed solar farm or substation and grid connection development.

4.3.4 *Decommissioning*

The proposed solar farm is considered to be temporary in nature, with an operational lifetime of 40 years. Decommissioning will commence with removing the solar panels, followed by the mounting frames, then removal of the pile driven steel supports. This will be followed by the removal of the electrical cabling, inverters, CCTV systems, fencing and all above ground infrastructure. Access tracks will only be removed to leave a clear field if they are not required for future agricultural use. The field will then be prepared for return to the landowner for agricultural use.

No significant adverse effects on habitats are expected during the decommissioning phase of the proposed solar farm. There is potential for disturbance to local fauna during decommissioning. However, in view of the expected characteristics of the decommissioning phase of the proposed solar farm, these impacts would be temporary and are not expected to result in a significant adverse effect on local populations of fauna.

Following the decommissioning of the solar farm, it is envisaged that the substation (and underground cable grid connection) will remain in situ. Therefore, no adverse effects as a result of decommissioning of the proposed substation and grid connection development are anticipated.

4.3.5 Cumulative Impacts

Aglish Solar Farm (ABP Ref: 323402)

The solar farm will be served by a 110kV substation and a 'loop-in / loop-out' underground 110kV cable grid connection which will connect into the existing Inniscarra-Macroom overhead transmission line via 2 no. new Interface Towers (the subject of this planning application). The proposed 110kV substation and 110kV underground cable will be located on improved agricultural grassland of low ecological importance. As described in Section 3 of this report, the proposed solar farm site is also predominantly comprised of improved agricultural grassland. These habitats are of low ecological value. With the effective implementation of the proposed landscaping plans for the solar farm, it is expected that there will be a positive residual effect on biodiversity in the short to medium term. No significant cumulative adverse effects with the proposed solar farm are expected.

In view of the proposed location and scale of the proposed substation and grid connection, no significant cumulative adverse effects with the proposed solar farm are expected.

Aghabullogue GAA, Proposed Floodlighting (CCC Ref: 254354)

This development is to upgrade existing floodlighting at the pitch and car park of the GAA Club. No potential for adverse effects on biodiversity was identified within the planners report. No significant cumulative adverse effects with the proposed development are expected.

Coachford College (CCC Ref: 234312)

The EclA completed for the development concluded that, with the implementation of best design practice and mitigation measures provided within the report, residual impacts will be neutral, with the possible exception of bat species that may use structures proposed for demolition. These buildings shall be checked for bats prior to demolition. No bat roosts will be affected by the proposed solar farm and substation development at Aglish, therefore no cumulative impacts with the Coachford College development are expected to occur.

Alterations to Residential Development (ABP Ref: 313728)

This development relates to the alteration of house types and associated works. No concerns regarding ecology were raised within the inspectors report.

No potential significant cumulative effects on terrestrial ecology with the Alterations to Residential Development have been identified.

Quarry (Ref: 310214)

No ecology issues were raised within the inspectors report and with regards to EIA Screening the Inspectors found that: *"Having regard to the consideration of the likely environmental significance of the proposal, it may reasonably be concluded that the characteristics of the development, its location, and the type and characteristics of the potential impacts arising from the construction and operation of the development would not result in a significant environmental impact"*.

No potential significant cumulative effects on terrestrial ecology with the Quarry development have been identified.

Castlemore Quarry, Crookstown, Co. Cork (Ref: 309891)

Potential effects included slight negative effect on water quality within the Brouen River. Peregrine Falcon was present within the quarry and a Peregrine Falcon Conservation Management Plan was prepared to address avoidance of impacts on this species. No residual impacts were anticipated.

No potential significant cumulative effects on terrestrial ecology with the Quarry development have been identified.

Solar Farm modification (Ref: 22/4909)

The Ecological Impact Assessment (EclA) completed for the development concluded that the proposed development footprint will primarily impact habitat features of lower local value and landscaping proposals will result in a net gain of pollinator friendly native hedgerow at the site. No potential for significant effects on any aspect of diversity in the absence of mitigation was identified. There will be a slight positive for habitats/ flora and fauna overall in relation to habitat changes.

No potential significant cumulative effects on terrestrial ecology with the Solar Farm Modification have been identified.

Solar Farm, Ballytrasna (Ref: 204916)

The Planners Report states that neither an EIA or appropriate assessment were required in this instance/location (and this was assessed during the original application).

No potential for significant residual effects on biodiversity was identified within the documentation for the original application (14/06644).

No potential significant cumulative effects on terrestrial ecology with the Solar Farm development at Ballytrasna have been identified.

5 Mitigation

5.1 Construction Phase

5.1.1 Designated Sites

As detailed in the report to inform Appropriate Assessment accompanying the planning application, no likely significant adverse effects on European sites have been identified, therefore no specific mitigation measures are required.

No significant adverse effects on nationally designated sites have been identified, therefore no specific mitigation measures are required.

5.1.2 Habitats

Mitigation measures for the protection of aquatic habitats, including active drainage ditches within the proposed substation and grid connection site, are provided in the Aquatic EclA. A copy of the Aquatic EclA is enclosed in Appendix E for reference; in the interests of avoiding repetition, these mitigation measures are not duplicated within this report.

5.1.2.1 Hedgerows

As detailed in Section 4.2.2.3, it is anticipated that the proposed landscaping plan will result in a net gain in hedgerow habitat across the proposed solar farm site, including the proposed substation and grid connection site, in the medium to long term. In order to protect the retained hedgerow habitat at the proposed site during the construction phase an Ecological Clerk of Works will monitor construction of access tracks and/or cable trenches located in proximity to hedgerows/trees and, in the event that any RPZs are identified, compensatory measures shall be adopted as per the agreed construction phase CEMP. As appropriate, these measures will include:

- Excavations should only be undertaken by hand digging. No machinery is to be utilised when excavating trenches.
- When hand digging, carefully work around the roots, retaining as many as possible.
- Don't cut roots over 25mm in diameter.
- Prune roots that have to be removed with a sharp tool and make a clean cut leaving as small a wound as possible.
- Backfill the trenches with the excavated topsoil. Compact the backfill with care around the retained roots
- Don't store spoil of building materials, including chemicals and fuels within the precautionary zone.
- If the trenches are left open overnight during cooler periods, cover the roots with dry sacking to avoid damage.

As part of ongoing monitoring and maintenance measures, it is also proposed that a hedgerow/tree condition survey will be undertaken by a qualified arboriculturist three years post-construction to identify any signs of decline or decay. The arboriculturist will then make recommendations towards any further management measures.

5.1.3 Species

5.1.3.1 Amphibians

Mitigation measures for the protection of aquatic habitats, including potential common frog habitat within active drainage ditches, are provided in the Aquatic EclA prepared for the proposed Aglish Solar Farm, enclosed in Appendix E for reference. In the interests of avoiding repetition, these mitigation measures are not duplicated within this report. No further specific mitigation measures are required.

5.1.3.2 Avifauna

All vegetation clearance will be completed outside of the bird breeding season (1st March to 31st August).

Enhancement measures outlined in Section 6, such as installing bird boxes, will provide further breeding opportunities for the local bird population.

5.1.3.3 Bats

Potential Roosting Habitat

In accordance with best practice, pre-construction Potential Roost Feature (PRF) inspection/presence absence surveys of all trees scheduled for felling shall be undertaken. Following this examination, should any of the trees be identified as a bat roost then a derogation licence application will be made to the NPWS to exclude the bats and fell the tree.

Where bats are recorded roosting in the trees scheduled for felling, the following mitigation will be required:

- **Timing:** tree-felling of any trees identified as having bat roost potential can be undertaken from late August to late October/early November and all works should ideally be undertaken in this period. During this period bats are still capable of flight having not entered hibernation and undertaking works in this period may reduce the risks of tree-felling if proper measures are undertaken. To carry out the works any later in the bat season creates an additional risk that bats may be in hibernation and thus unable to fly out from a tree that is being felled, although bats can be removed by hand by a licenced bat handler if required. Additionally, disturbance during winter may reduce the likelihood of survival as the bats' body temperature is too low and they may have to consume too much body fat to survive.

Trees to be felled under the supervision of the bat specialist (as identified during the pre-construction survey) will be examined and where bats are found, they will be translocated to an area where bat boxes will already be installed on appropriate trees within the proposed site.

The proposed process for felling the trees with PRFs is outlined below:

- The bat specialist will be present during the tree felling works;
- Works will be undertaken in mild weather to ensure that if bats are found during works that they can be released or safely removed;
- Tree(s) identified as having potential to support bats will be surveyed during the daytime for bats prior to felling, on the day the felling is due to take place. The bat specialist will inspect all potential bat roost features of the tree, including those above ground level. This will require the services of a qualified arborist to climb the trees/ use a cherry picker and fell the tree in sections and lower potential roost features slowly to the ground to allow the bat specialist to inspect them. This will include visual inspection as well as use of an endoscope to inspect cavities/crevices;
- The arborist will be briefed on the technique to be followed prior to the commencement of operations. Felling will follow best practice and mitigation measures, including wedging open cracks/crevices prior to load removal and cutting limbs in sections and lowering to the ground. Trees will only be felled in longer sections if the bat worker is satisfied that there are no potential roost features present;
- When using a chainsaw, the rate of fall of branches will not be accelerated by the use of a chain and vehicle;

- Any bats found in the trees will be removed by hand to a bat box and will then be relocated to the bat boxes installed in advance of works. Notes of any such activities will be maintained;
- The tree and/or tree sections will be left on the ground for a minimum period of 24 hours to enable any unidentified bats residing in deeper crevices to make good their escape during night time hours.

Lighting

To minimise disturbance to bats and other fauna that are active at night, construction operations during the hours of darkness will be kept to a minimum. If construction lighting is required during the bat activity period (April to September), lighting shall be directed away from all known roosts and woodland habitats to be retained. This can be achieved by using directional lighting (i.e. lighting which only shines on the proposed works and not nearby countryside) to prevent overspill. This shall be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only.

5.1.3.4 Otter

No significant adverse effects on otter have been identified, therefore no specific mitigation measures are required.

5.1.3.5 Badger

A pre-construction survey of the proposed solar farm site, including the proposed substation and grid connection site, shall be undertaken prior to the commencement of construction to re-confirm the finding of this ecological assessment and to identify potential active badger setts occurring within the site.

In the event of badger setts being identified within proximity to the proposed works area, the following mitigation measures shall be undertaken to ensure no disturbance of the local badger population during the construction phase of the proposed works (NRA 2005):

- A buffer distance of 10m from sett entrances shall be employed in instances where light works such as digging by hand or in the event of scrub clearance.
- A buffer distance of 20m from Badger sett entrances shall be incorporated where light machinery (generally wheeled vehicles) are in operation within the site.
- A buffer distance of 30m from Badger setts shall be employed where heavy machinery is in operation within the site.
- None of the above activities shall be undertaken within 50m of active setts during the breeding season (1st December to 31st June inclusive).
- In the unforeseen event that the project requires works to be undertaken within the recommended buffer distances outlined above, further measures as outlined in NRA (2009) will be adopted in liaison with local NPWS staff.

All excavations shall be securely covered or a suitable means of escape provided at the end of each working day to prevent accidental trapping of badgers.

5.1.3.6 Hedgehog

No significant adverse effects on hedgehog have been identified, therefore no specific mitigation measures are required.

5.1.3.7 Invasive Species

The Third Schedule IAS species *Rhododendron* is present within Parcel 4 of the proposed solar farm site. An Invasive Species Management Plan has been prepared to accompany the planning application.

No invasive plant species have been identified within the proposed substation and grid connection site, therefore no specific mitigation measures are required.

5.2 Operational Phase

5.2.1 Designated Sites

No likely significant effects on European sites have been identified, therefore no specific mitigation measures are required.

No significant adverse effects on nationally designated sites have been identified, therefore no specific mitigation measures are required.

5.2.2 Habitats

No significant impacts on habitats have been identified during the operational phase, therefore no specific mitigation measures are required.

Site management options, as outlined in Section 6, are recommended to further enhance the habitats at the site for biodiversity.

5.2.3 Species

5.2.3.1 Amphibians

No significant impacts on amphibians have been identified during the operational phase, therefore no specific mitigation measures are required.

5.2.3.2 Avifauna

No significant impacts on avifauna have been identified during the operational phase, therefore no specific mitigation measures are required.

5.2.3.3 Bats

As detailed in Section 4.3.3.3, with the successful implementation of the landscaping plan, no significant adverse effects on foraging bats are expected in the long-term. However, in recognition of the current lack of data on the effects of operational phase solar energy developments on bats in an Irish context, monitoring will be completed to compare pre-construction baseline data to operational phase data. A minimum of 11 monitoring stations will be established at suitable locations within the proposed site. Baseline data will be gathered during the bat activity season prior to the commencement of any construction works, and operational phase monitoring will be repeated at the same locations in years 1, 2 and 3 post-construction. Annual operational phase monitoring reports will be submitted to Cork County Council. While no potential for significant effects on foraging and commuting bats as a result of the proposed substation and grid connection development has been identified, it is noted that the monitoring described above will include the proposed substation and grid connection site, which is located within Parcel 5 and Parcel 6 of the proposed solar farm site.

5.2.3.4 Otter

No significant adverse effects on otter have been identified, therefore no specific mitigation measures are required.

5.2.3.5 Badger

No significant impacts on badger have been identified during the operational phase, therefore no specific mitigation measures are required.

5.2.3.6 Hedgehog

No significant impacts on hedgehog have been identified during the operational phase, therefore no specific mitigation measures are required.

5.3 Residual Impacts

A summary of residual impacts is presented in Table 5-1 below.

Table 5-1: Summary of residual impacts, Aglish Solar Farm and Aglish 110kV Substation and Grid Connection

| Ecological Features | Residual Impacts |
|---------------------------|--|
| Habitats and Flora | <p>Hedgerows and treelines are considered to be of local importance (higher value) given their value to wildlife and biodiversity. It is estimated that approximately 86m of hedgerows/ treelines will be removed to accommodate site access and access tracks across the proposed solar farm site, of which, c.31m are located within the proposed substation and grid connection site. The landscaping proposals across the proposed solar farm site include the planting of approximately 872m of new hedgerows using native hedgerow species from native stock and enhancement of approximately 22,296m of existing hedgerows at the site using native hedgerow species and field margins will be managed for biodiversity (see BMP, Appendix C). The successful implementation and establishment of landscaping proposals for this development will result in a positive impact over the medium term to long term.</p> |
| Fauna | <p>In the absence of mitigation, the proposals have the potential to impact on protected/notable species, through loss of habitat, damage to habitat and potential disturbance during the construction phase. However, with the successful implementation of landscaping proposals for the site and the specific mitigation measures outlined in Section 5, no significant adverse residual impacts to fauna are anticipated.</p> <p>Landscaping proposals will enhance the existing network of hedgerows and will provide a net gain of approximately 786m of new hedgerows across the proposed solar farm site. These proposals will provide foraging, commuting and shelter for mammals, birds and invertebrates and an enhanced ecological network. Field margins will be managed in accordance with the BRIDE project EIP techniques (see Appendix C). The landscaping proposals are expected to have a positive impact over the short to medium term.</p> |

6 Enhancement Opportunities

Solar farm developments that are sensitively located and designed to the surrounding area have the potential to support wildlife and increase biodiversity when constructed using best practice guidance¹⁰. The following enhancement measures have been included within the project design for the proposed solar farm as a whole (as illustrated in Landscaping Plan drawings accompanying the planning application):

- C.22,296 linear metres of existing hedgerows/treelines will be enhanced as required to fill gaps throughout the site.
- C.872 linear metres of new hedgerow comprising native species will be planted along the site boundary.
- All hedgerow planting will comprise native species from native stock.
- Field margins will be planted and/or managed in accordance with the BRIDE project EIP techniques¹¹.

A Biodiversity Management Plan (BMP) has been prepared and is included in Appendix C.

The following sections provide options that can be taken to enhance the biodiversity within the site and contribute to biodiversity in the wider landscape.

6.1 Site Management

6.1.1 Hedgerows

Where possible, hedges will be cut on a minimum 3 year cycle instead of annually. This reduces disturbance to the habitat, enhances structure and promotes flowering and fruiting. Where hedgerows must be cut along the roadside for safety, allow the inside to flower.¹²

6.1.2 Grazing

The site may be grazed by sheep at a low stocking rate so that the grassland obtains structural diversity. However, grazing will be at the discretion of the landowner and the alternative is that the grass and vegetation between the rows of panels will be mowed using a small standard agricultural vehicle for such purposes. Mowing will only take place where necessary to allow access between the panel rows and to ensure grass does not grow to a height which may affect the efficiency of the solar panels.

6.2 Artificial Structures

A variety of structures can be built to provide suitable habitat for nesting, roosting and hibernation. The following structures are recommended to enhance biodiversity at the proposed site.

Hibernacula

Hibernacula: log, rock and stone piles designed to create suitable conditions for reptiles and amphibians to hibernate¹³. The proposed biodiversity enhancement area adjacent to the Rathonoane watercourse at Parcel 4 would be ideal for a hibernacula.

Habitat for Invertebrates

As recommended in the All-Ireland Pollinator Plan, additional invertebrate habitat can be created by creating log piles or installing bug or bee hotels¹⁴. Log piles should consist of a mixture of hard wood

¹⁰ BRE (2014) Biodiversity Guidance for Solar Developments. Eds G E Parker and L Greene.

¹¹ Field Margin action of the BRIDE project, which involves placing a wire fence c.2m from the hedgerow base to allow vegetation to grow and provide habitat for birds, small mammals and invertebrates. This area should be flailed every year between Sept. 15th and Feb 28th.

¹² https://pollinators.ie/wordpress/wp-content/uploads/2018/04/Farmland_actions-to-help-pollinators-2018-WEB.pdf

¹³ For an example see <https://www.froglife.org/info-advice/log-piles-and-rockeries/>

¹⁴ https://www.biodiversityireland.ie/wordpress/wp-content/uploads/Pollinator-How-to-Guide-1-ALT_FINAL.pdf

and soft wood and left undisturbed to rot down. Log piles should be placed in both sunny and shady habitats to benefit the widest variety of invertebrates. Butterflies and solitary bees prefer sunny areas while stag beetles prefer shade. Log piles can also provide suitable conditions for reptiles, amphibians, lichens and fungi. Biodiversity enhancement areas in Parcel 3 and Parcel 4 would be ideal for invertebrate habitats.

Bat Boxes

Providing bat boxes will increase opportunities for roosting bats within the proposed site. It is recommended that 18 no. boxes are mounted on existing mature trees at the boundary of Parcels 1, 2, 3 and 4.

The Schwegler 1FF bat box is recommended, due to the open bottom design preventing the build-up of bat droppings¹⁵.

Bird Boxes

In order to enhance the site for nesting birds, it is recommended that a number of bird boxes are placed throughout the site. Several types of nest boxes should be installed at suitable locations to favour a variety of bird species.

Open-fronted boxes will provide enhanced nesting opportunities for species such as robins, pied wagtails and spotted flycatchers. Boxes with entrance holes (26mm and 32mm) are suitable for tits, wren and tree sparrows.

Bird boxes should be mounted so that they face between the south-east and north to avoid direct sunlight. They should be tilted forwards so that rain is directed away from the entrance.

It is recommended that three 1B Schwegler nest boxes (five 32mm and five 26mm holes) and three 2H Schwegler robin boxes are installed¹⁶.

¹⁵ For an example of the 1FF please see: <https://www.nhbs.com/1ff-schwegler-bat-box-with-built-in-wooden-rear-panel>

¹⁶ See <https://www.nhbs.com/1b-schwegler-nest-box>

7 Conclusion

With the implementation of mitigation measures as outlined in Section 5.1 and 5.2 of this report and the measures detailed in the Biodiversity Management Plan, no potential significant adverse residual effects on biodiversity as a result of the proposed Aglish 110kV Substation and Grid Connection have been identified. These measures, together with the aftercare commitments, will benefit local biodiversity and are in keeping with Cork County Development Plan 2022-2028 (relevant policies and objectives are enclosed in Appendix D).

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Appendix A: Geographic Reference for Ecological Assessment

| Ecological Valuation |
|---|
| <p>International Importance:</p> <p>'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. Proposed Special Protection Area (pSPA). Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). Features essential to maintaining the coherence of the Natura 2000 Network. Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). Biosphere Reserve (UNESCO Man & the Biosphere Programme). Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). Biogenetic Reserve under the Council of Europe. European Diploma Site under the Council of Europe. Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).</p> |
| <p>National Importance:</p> <p>Site designated or proposed as a Natural Heritage Area (NHA). Statutory Nature Reserve. Refuge for Fauna and Flora protected under the Wildlife Acts. National Park. Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.</p> |
| <p>County Importance:</p> <p>Area of Special Amenity. Area subject to a Tree Preservation Order. Area of High Amenity, or equivalent, designated under the County Development Plan. Resident or regularly occurring populations (assessed to be important at the County level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. County important populations of species or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared. Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.</p> |

Local Importance (higher value):

Locally important populations of Priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;

Resident or regularly occurring populations (assessed to be important at the Local level) of the following:

Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;

Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;

Species protected under the Wildlife Acts; and/or

Species listed on the relevant Red Data list.

Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;

Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;

Sites or features containing non-native species that are of some importance in maintaining habitat links.

Appendix B: NBDC Records

NBDC Species Records from within a 0.5km radius of the Proposed Site

| Species name | Date of last record | Designation |
|---|---------------------|---|
| Smooth Newt (<i>Lissotriton vulgaris</i>) | 31/12/2009 | Wildlife Acts |
| Barn Owl (<i>Tyto alba</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Red List |
| Barn Swallow (<i>Hirundo rustica</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Black-headed Gull (<i>Larus ridibundus</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Red List |
| Common Coot (<i>Fulica atra</i>) | 31/07/1991 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Common Goldeneye (<i>Bucephala clangula</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Common Kestrel (<i>Falco tinnunculus</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Common Kingfisher (<i>Alcedo atthis</i>) | 31/12/2011 | Wildlife Acts, Annex I Bird Species, Birds of Conservation Concern - Amber List |
| Common Linnet (<i>Carduelis cannabina</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Common Pheasant (<i>Phasianus colchicus</i>) | 20/03/2022 | Wildlife Acts |
| Common Pochard (<i>Aythya ferina</i>) | 29/02/1984 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Common Redshank (<i>Tringa totanus</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Red List |
| Common Sandpiper (<i>Actitis hypoleucos</i>) | 31/07/1972 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Common Snipe (<i>Gallinago gallinago</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Common Starling (<i>Sturnus vulgaris</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Common Swift (<i>Apus apus</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Common Wood Pigeon (<i>Columba palumbus</i>) | 17/08/2017 | Wildlife Acts |
| Eurasian Curlew (<i>Numenius arquata</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Red List |
| Eurasian Teal (<i>Anas crecca</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Eurasian Wigeon (<i>Anas penelope</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Eurasian Woodcock (<i>Scolopax rusticola</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Goosander (<i>Mergus merganser</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Great Bittern (<i>Botaurus stellaris</i>) | 12/01/1900 | Wildlife Acts |
| Great Cormorant (<i>Phalacrocorax carbo</i>) | 25/02/2017 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Great Crested Grebe (<i>Podiceps cristatus</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |

| | | |
|---|------------|---|
| Herring Gull (<i>Larus argentatus</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Red List |
| House Martin (<i>Delichon urbicum</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| House Sparrow (<i>Passer domesticus</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Jack Snipe (<i>Lymnocyptes minimus</i>) | 31/12/2011 | Wildlife Acts |
| Lesser Black-backed Gull (<i>Larus fuscus</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Little Egret (<i>Egretta garzetta</i>) | 31/12/2011 | Wildlife Acts, Annex I Bird Species |
| Little Grebe (<i>Tachybaptus ruficollis</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Mallard (<i>Anas platyrhynchos</i>) | 06/08/2017 | Wildlife Acts |
| Merlin (<i>Falco columbarius</i>) | 31/12/2011 | Wildlife Acts, Annex I Bird Species, Birds of Conservation Concern - Amber List |
| Mute Swan (<i>Cygnus olor</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Northern Lapwing (<i>Vanellus vanellus</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Red List |
| Northern Shoveler (<i>Anas clypeata</i>) | 29/02/1984 | Wildlife Acts, Birds of Conservation Concern - Red List |
| Peregrine Falcon (<i>Falco peregrinus</i>) | 31/12/2011 | Wildlife Acts, Annex I Bird Species |
| Rock Pigeon (<i>Columba livia</i>) | 31/12/2011 | Wildlife Acts |
| Sand Martin (<i>Riparia riparia</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Sky Lark (<i>Alauda arvensis</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Spotted Flycatcher (<i>Muscicapa striata</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Stock Pigeon (<i>Columba oenas</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Tufted Duck (<i>Aythya fuligula</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| Water Rail (<i>Rallus aquaticus</i>) | 31/12/2011 | Wildlife Acts, Birds of Conservation Concern - Amber List |
| White-tailed Eagle (<i>Haliaeetus albicilla</i>) | 31/12/2011 | Wildlife Acts |
| Whooper Swan (<i>Cygnus cygnus</i>) | 29/02/1984 | Wildlife Acts, Annex I Bird Species, Birds of Conservation Concern - Amber List |
| Yellowhammer (<i>Emberiza citrinella</i>) | 20/05/2021 | Wildlife Acts, Birds of Conservation Concern - Red List |
| Canadian Waterweed (<i>Elodea canadensis</i>) | 25/07/2008 | High Impact Invasive Species, Invasive Species Regulation S.I. 477 (Ireland) |
| Giant Hogweed (<i>Heracleum mantegazzianum</i>) | 31/12/1986 | High Impact Invasive Species, Invasive Species Regulation S.I. 477 (Ireland) |
| Japanese Knotweed (<i>Fallopia japonica</i>) | 27/04/2017 | High Impact Invasive Species, Invasive Species Regulation S.I. 477 (Ireland) |
| Nuttall's Waterweed (<i>Elodea nuttallii</i>) | 07/07/2017 | High Impact Invasive Species, Invasive Species Regulation S.I. 477 (Ireland) |
| American Mink (<i>Mustela vison</i>) | 31/08/2010 | High Impact Invasive Species, Invasive Species Regulation S.I. 477 (Ireland) |
| Bank Vole (<i>Myodes glareolus</i>) | 07/07/2012 | Medium Impact Invasive Species |

| | | |
|--|------------|---|
| Brown Long-eared Bat (<i>Plecotus auritus</i>) | 11/08/2001 | Annex IV, Wildlife Acts |
| Daubenton's Bat (<i>Myotis daubentonii</i>) | 17/09/2000 | Annex IV, Wildlife Acts |
| Eurasian Badger (<i>Meles meles</i>) | 29/08/2016 | Wildlife Acts |
| Eurasian Pygmy Shrew (<i>Sorex minutus</i>) | 03/06/2017 | Wildlife Acts |
| Eurasian Red Squirrel (<i>Sciurus vulgaris</i>) | 24/07/2022 | Wildlife Acts |
| European Otter (<i>Lutra lutra</i>) | 31/08/2010 | Annex II, Annex IV, Wildlife Acts |
| European Rabbit (<i>Oryctolagus cuniculus</i>) | 12/08/2015 | Medium Impact Invasive Species |
| Fallow Deer (<i>Dama dama</i>) | 31/12/2008 | High Impact Invasive Species, Invasive Species Regulation S.I. 477 (Ireland), Wildlife Acts |
| Natterer's Bat (<i>Myotis nattereri</i>) | 25/09/1999 | Annex IV, Wildlife Acts |
| Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>) | 17/07/2001 | Annex IV, Wildlife Acts |
| Sika Deer (<i>Cervus nippon</i>) | 31/12/2008 | High Impact Invasive Species, Invasive Species Regulation S.I. 477 (Ireland), Wildlife Acts |
| Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>) | 20/07/2001 | Annex IV, Wildlife Acts |
| West European Hedgehog (<i>Erinaceus europaeus</i>) | 03/12/2023 | Protected Species: Wildlife Acts |
| Whiskered Bat (<i>Myotis mystacinus</i>) | 20/07/2001 | Annex IV, Wildlife Acts |

Appendix C Biodiversity Management Plan

Biodiversity Management Plan

Aglish Solar Farm

Co. Cork

Report prepared for Aglish Solar Farm Ltd

By Karen Banks MCIEEM

14th October 2024



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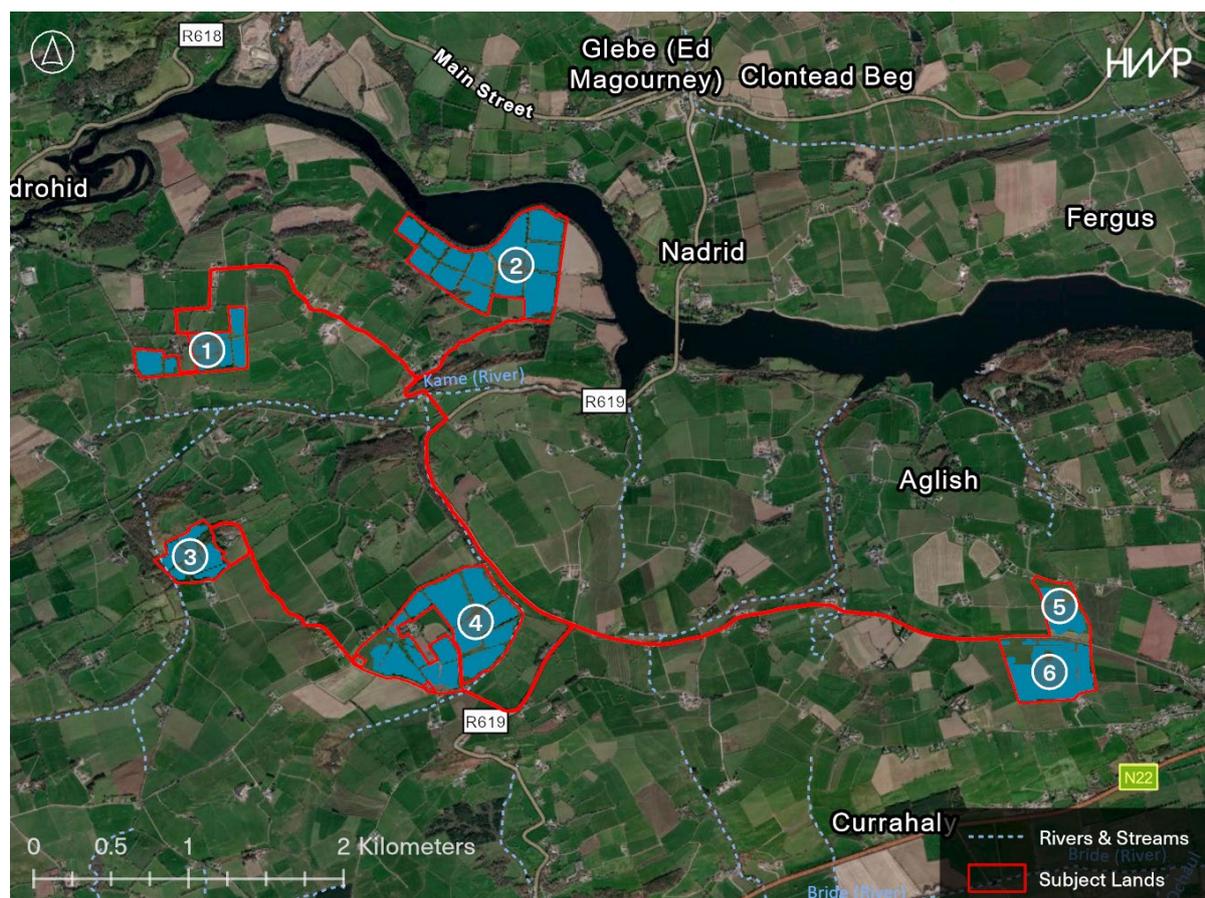
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1 Introduction

Greenleaf Ecology was commissioned by Aglish Solar Farm Ltd. to prepare a Biodiversity Management Plan (BMP) for the proposed development of a Solar Farm with a total area of circa 165 hectares in the townlands of Aglish, Currahaly, Farnanes, Farran, Knockavullig, Knocknagoul, Knockshanawee, Loughleigh, Mahallagh, Nettleville Demesne, Rathonoane, Rooves Beg, Rooves More and Shandangan East in County Cork. The location of the proposed site is illustrated in Figure 1-1 and the proposed development layout is illustrated in Figure 2-4 to Figure 2-8.

Figure 1-1: Site location map



1.1 Project Description

Aglish Solar Farm Limited intend to apply for a 10 Year Planning Permission for a solar farm with a total area of circa 165 hectares in the townlands of Aglish, Currahaly, Farnanes, Farran, Knockavullig, Knocknagoul, Knockshanawee, Loughleigh, Mahallagh, Nettleville Demesne, Rathonoane, Rooves Beg, Rooves More and Shandangan East in County Cork.

The solar farm will consist of solar panels on ground mounted frames, 23 no. single storey electrical inverter/transformer stations, 6 no. single storey spare parts containers, 3 no. Ring Main Units, 7 no. weather stations, underground electrical ducting and cabling within the development site, private lands and within the L62031, L6203, R619, L6207, L22012 and L2204 public roads to connect solar farm field parcels, security fencing, CCTV, access tracks, 4 no. stream/drain deck crossings, 6 no. horizontal directional drill crossings (under watercourses/drains/public road), temporary construction

compounds, landscaping and all associated ancillary development and drainage works. Construction and operational access will be via 7 no. entrances from the L62031, L6203, L22012, L6398 and L2204 local roads. The operational lifespan of the solar farm will be 40 years and planning permission is requested for this duration.

1.2 Objective of the Biodiversity Management Plan

Greenleaf Ecology and Macro Works Ltd. have developed a suite of measures that seek to achieve biodiversity net gain and are in keeping with Objectives BE 15-1, BE 15-2, BE 15-6, BE 15-7 and BE 15-8, BE 15-9 of Cork County Development Plan 2022-2028.

The objective of this BMP is to minimise any potential negative impacts arising from the proposed Aglish Solar Farm, while increasing the habitat diversity. The enhancement of the land within the development boundary will increase the site's capability of supporting biodiversity.

This will be achieved by the following:

- Creating and maintaining a diverse species-rich grassland with a varied sward structure;
- Creating and maintaining native species-rich hedgerows;
- Increasing biodiversity at the site as a result of the habitat creation scheme; and
- Maximising the floral and faunal biodiversity of the created and retained habitats.

2 Proposed Landscaping and Biodiversity Measures

The following measures to achieve biodiversity net gain are laid out in the Landscape Mitigation Plan prepared by Macro Works (August 2024).

These existing and proposed habitats will be in place and managed for the duration of the proposed development (c.40 years).

2.1.1 Hedgerows

Approximately 22,285 linear meters of existing hedgerow will be enhanced as required by filling gaps throughout the site along with 1,194 linear meters of new hedgerow planting within the development boundary. These hedgerows will be planted with native Irish species from Irish stock and will provide enhancement of biodiversity corridors throughout the site. The hedgerows will be managed in accordance with the All-Ireland Pollinator Plan, which advises that hedgerow management is an essential part of encouraging biodiversity and maintaining pollinator populations. Hedgerows will be trimmed once every three years (outside of the bird breeding season), thus allowing plants to “grow-out” and flower which in turn will attract a rich population of native species, especially pollinators. These ecological corridors provide food sources, nesting sites and allow connectivity throughout the site for bird, bat and invertebrate species as well as small mammals.

Native Hedgerow species proposed for planting include Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Holly (*Ilex aquifolium*), Guelder Rose (*Viburnum opulus*), Hazel (*Corylus avellana*), Dog-rose (*Rosa canina*) and Spindle (*Euonymus europaeus*). Hawthorn will account for 60% of the hedgerow species suggested with Blackthorn and Holly accounting for 15%. The remaining species will make up 2.5% each.

2.2 Field Margins

Field margins will be managed in accordance with the Bride (EU Life Project).¹ The creation of a 2m field margin will provide a habitat for wildflowers, insects, birds and small mammals. The provision of thick vegetation and a wide field margin will be of benefit to ground nesting birds.

Creating a field margin simply involves locating the fence line a minimum of 2m from the base of the adjacent hedgerow. The area should be flailed or grazed every year between September 15th and February 28th to reduce the vegetation and prevent the hedgerow from encroaching onto the field margin.

This management regime, following best practice, will be adhered to and will ensure that the species within the field margin will thrive through natural regeneration.

2.3 Biodiversity Enhancement Zones

Solar panels will be excluded from areas within Parcels 3, 4 and 5 at the proposed site. These areas will be excluded from grazing and will be allowed to ‘grow out’ allowing species present in the existing seed bank grow² and, in time, allowing various stages of successional growth to occur, such as rough

¹ <https://www.thebrideproject.ie/wp-content/uploads/2020/04/BRIDE-Project-Farm-Habitat-Management-Guidelines.pdf>

² This is in line with recent opinion articles and recent research, for example: [Additional Expert Opinions » All-Ireland Pollinator Plan \(pollinators.ie\)](#) and [\(PDF\) Shades of green – “wildflowers” and biodiversity urban planting considerations \(researchgate.net\)](#), accessed 19/09/2024

grassland and scrub. These areas will provide habitat for small mammals, birds and foraging bats and will also provide space for the provision of artificial structures, as detailed below in Section 2.8.2.

Small parcels of scrub within Parcel 2 and woodland present in Parcels 1, 2, 3 4 will be fenced off from the footprint of the proposed solar farm and excluded from grazing. These areas will provide habitat for birds, bats and mammals.

2.4 Small Mammals

The site perimeter fencing is stock proof but has been designed to allow for permeability across the landscape for small mammals such as badger and hedgehog.

300mm x 300mm gaps will be included at the base of the security fence at 100m distances for mammal access.

2.5 Other Biodiversity Enhancement Commitments

This section details other biodiversity enhancement measures that are proposed for the Solar Farm, as provided in the Ecological Impact Assessment (EclA).

2.5.1 Grazing

The site may be grazed by sheep at a low stocking rate so that the grassland obtains structural diversity. However, grazing will be at the discretion of the landowner and the alternative is that the grass and vegetation between the rows of panels will be mowed using a small standard agricultural vehicle for such purposes. Mowing will only take place where necessary to allow access between the panel rows and to ensure grass does not grow to a height which may affect the efficiency of the solar panels.

2.5.2 Artificial Structures

Hibernacula

Hibernacula: log, rock and stone piles designed to create suitable conditions for reptiles and amphibians to hibernate³ will be provided in the biodiversity enhancement area located at the east of Parcel 4, which is adjacent to the Rathonoane watercourse. An example of a log pile for reptiles and amphibians is illustrated in Figure 2-2.



Figure 2-1: Example of log pile for reptiles and amphibians

³ For an example see [Log piles and rockeries \(froglife.org\)](http://froglife.org)

Habitat for Invertebrates

As recommended in the All-Ireland Pollinator Plan, additional invertebrate habitat can be provided by creating log piles (Figure 2-2), installing small bug or bee hotels⁴ or creating solitary bee nest sites (Figure 2-3). Log piles should consist of a mixture of hard wood and soft wood and left undisturbed to rot down. Log piles should be placed in both sunny and shady habitats to benefit the widest variety of invertebrates. Butterflies and solitary bees prefer sunny areas while stag beetles prefer shade. Log piles can also provide suitable conditions for reptiles, amphibians, lichens and fungi.



Figure 2-2: Examples of Solitary Bee Nesting Sites (Pollinators.ie)⁵

Habitat for invertebrates will be provided in the biodiversity enhancement areas within Parcel 3 and Parcel 4. The final invertebrate habitat type and location will be confirmed by the Project Ecologist prior to construction, based on a detailed review of the site at that time.

Bat Boxes

Bat boxes will increase opportunities for roosting bats within the proposed site. The boxes can be located on existing mature trees in treelines at the site boundary.

The Schwegler 1FF bat box is recommended, due to the open bottom design preventing the build-up of bat droppings⁶. It is recommended that 18. no bat boxes are mounted on existing mature trees at the boundary of Parcels 1, 2, 3 and 4 in consultation with the EcOW or a bat specialist.

Bird Boxes

In order to enhance the site for nesting birds, it is recommended that 15 no. bird boxes are placed throughout the site, as detailed below.

⁴ [Pollinator-Nesting-How-to-Guide-2022-WEB.pdf \(pollinators.ie\)](#)

⁵ [ActionSheet_Solitary-Bees-WEB-2.pdf \(pollinators.ie\)](#)

⁶ For an example of the 1FF please see: <https://www.nhbs.com/1ff-schwegler-bat-box-with-built-in-wooden-rear-panel>

Open-fronted boxes will provide enhanced nesting opportunities for species such as robins, pied wagtails and spotted flycatchers. Boxes with entrance holes (26mm and 32mm) are suitable for tits, wren and tree sparrows.

Bird boxes should be mounted so that they face between the south-east and north to avoid direct sunlight. They should be tilted forwards so that rain is directed away from the entrance.

It is recommended that ten 1B Schwegler nest boxes (five 32mm and five 26mm holes) and five 2H Schwegler robin boxes are installed⁷.

⁷ See <https://www.nhbs.com/1b-schwegler-nest-box>

Figure 2-3: Biodiversity Management Plan Parcel 1



LEGEND:

- Hedgerow Type 1
- Hedgerow Type 2
- Field marginal grass seeding
- Existing hedgerows
- Existing trees
- Advanced nursery stock
- Proposed fence
- Drain
- Site boundary

NOTES:

The function of the proposed mitigation planting is to support screening and to enhance biodiversity across the site. The new and bolstered sections of hedgerow vegetation, proposed woodland mix and wild grass verges will all reinforce the existing green infrastructure links and provide new ecological corridors within the site and throughout the wider landscape.

Mitigation screen planting shall consist of a mixture of native hedgerow species that are prevalent in the immediate area. Planting to consist of feathered whips (of various sizes) in staggered rows at a spacing of 600mm.

'Under-planting' to consist of a single row of whips to the development side of existing tree lines and hedgerows.

'Inter-planting' to consist of whips at 400mm centres to fill gaps in existing tree lines and hedgerows.

New sections of hedgerow to consist of a triple staggered row of whips and advanced nursery stock at 600mm spacing.

All native species will be planted as whips, with the primary and secondary structure species to be of a minimum height of 90cm and the other shrubs species to be of a minimum height of 60cm.

Proposed mitigation screen planting to be planted as per diagram LMP11-1.2 and maintained at a height of approximately 3-4m unless otherwise specified. Hedgerow type 1 to be planted as necessary for gap filling and bolstering.

Proposed mitigation to be planted in the first growing season prior to commencement of development. Hedgerows should reach full establishment (3-4 meters) within 2-3 years of planting.

Native grass seeding of local provenance to occupy any residual space between perimeter fence and nearest line of whip planting. Field margins to be managed in line with the BRDE project management techniques.

Species mix to be finalised in conjunction with the project ecologist.

*Advanced nursery stock to be provided as Crataegus monogyna (Hawthorn) at 6-10cm girth (c. 3m) bare root standard trees.

NATIVE HEDGEROW SPECIES:

| Botanical name | Common name | Size | % |
|---------------------------------|--------------|--|------|
| <i>Primary structure:</i> | | | |
| <i>Crataegus monogyna</i> | Hawthorn | 65-100cm / 6-10cm girth 3m br standard trees | 60% |
| <i>Secondary structure:</i> | | | |
| <i>Prunus spinosa</i> | Blackthorn | 60-120cm | 15% |
| <i>Ilex aquifolium</i> | Holly | 60-120cm | 15% |
| <i>Shrub species structure:</i> | | | |
| <i>Viburnum opulus</i> | Guelder Rose | 60-90cm | 2.6% |
| <i>Corylus avellana</i> | Hazel | 60-90cm | 2.5% |
| <i>Rosa canina</i> | Dog-rose | 60-90cm | 2.5% |
| <i>Eucrymus europaeus</i> | Spindle | 60-90cm | 2.5% |

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PROJECT:
 Aglish Solar Farm,
 County Cork

CLIENT:
 Aglish Solar Farm Limited

DRAWING:
 Landscape Mitigation Plan - Parcel 1

SCALE:
 1:1500

DATE: September 2024

DWN BY: RAH

CKD BY: CD

SHEET SIZE: A1 (landscape)

DWG No.: LD ACLSH-SLR 3.2

Figure 2-4: Biodiversity Management Parcel 2



Figure 2-5: Biodiversity Management Plan Parcel 3

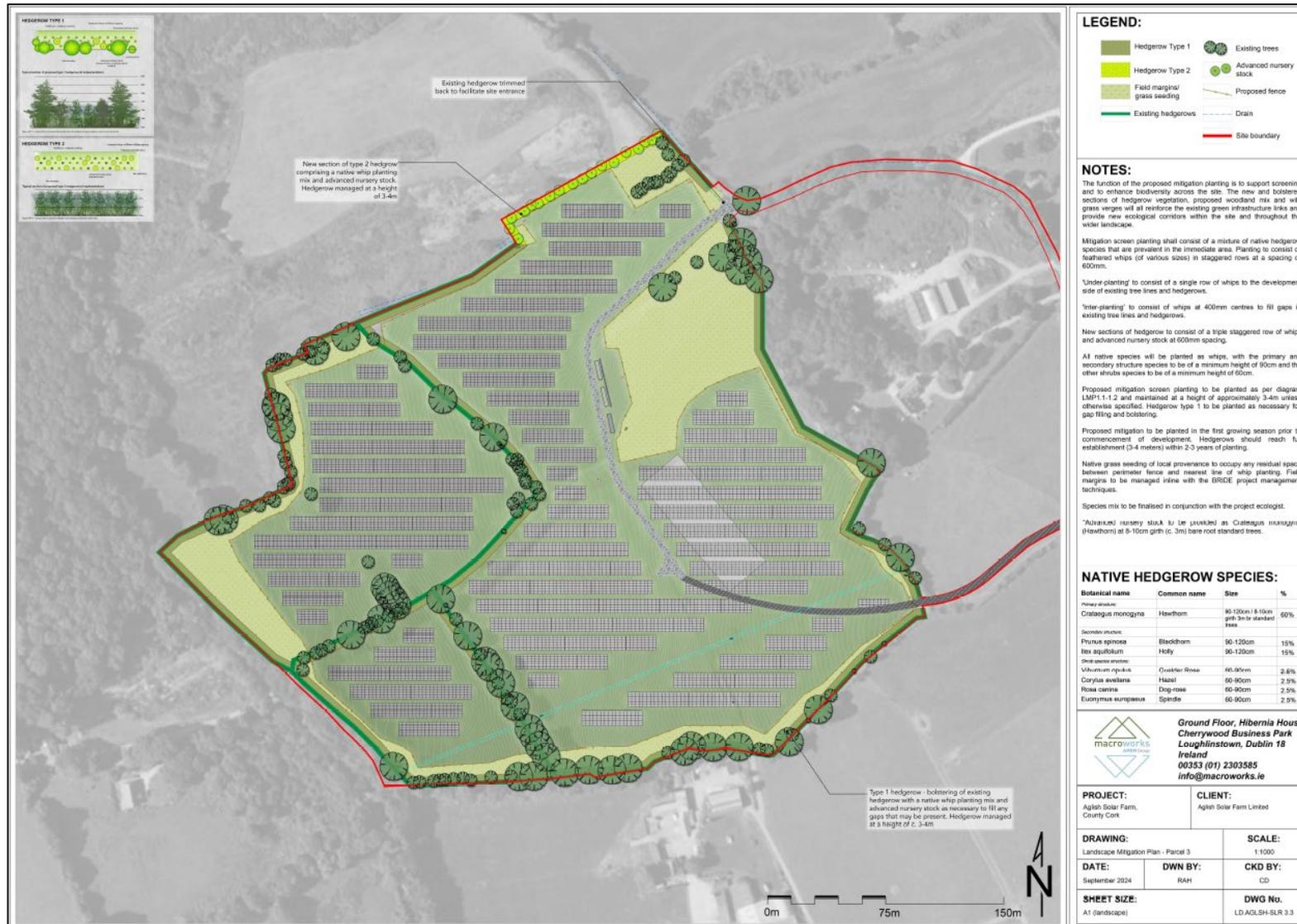


Figure 2-6: Biodiversity Management Plan Parcel 4

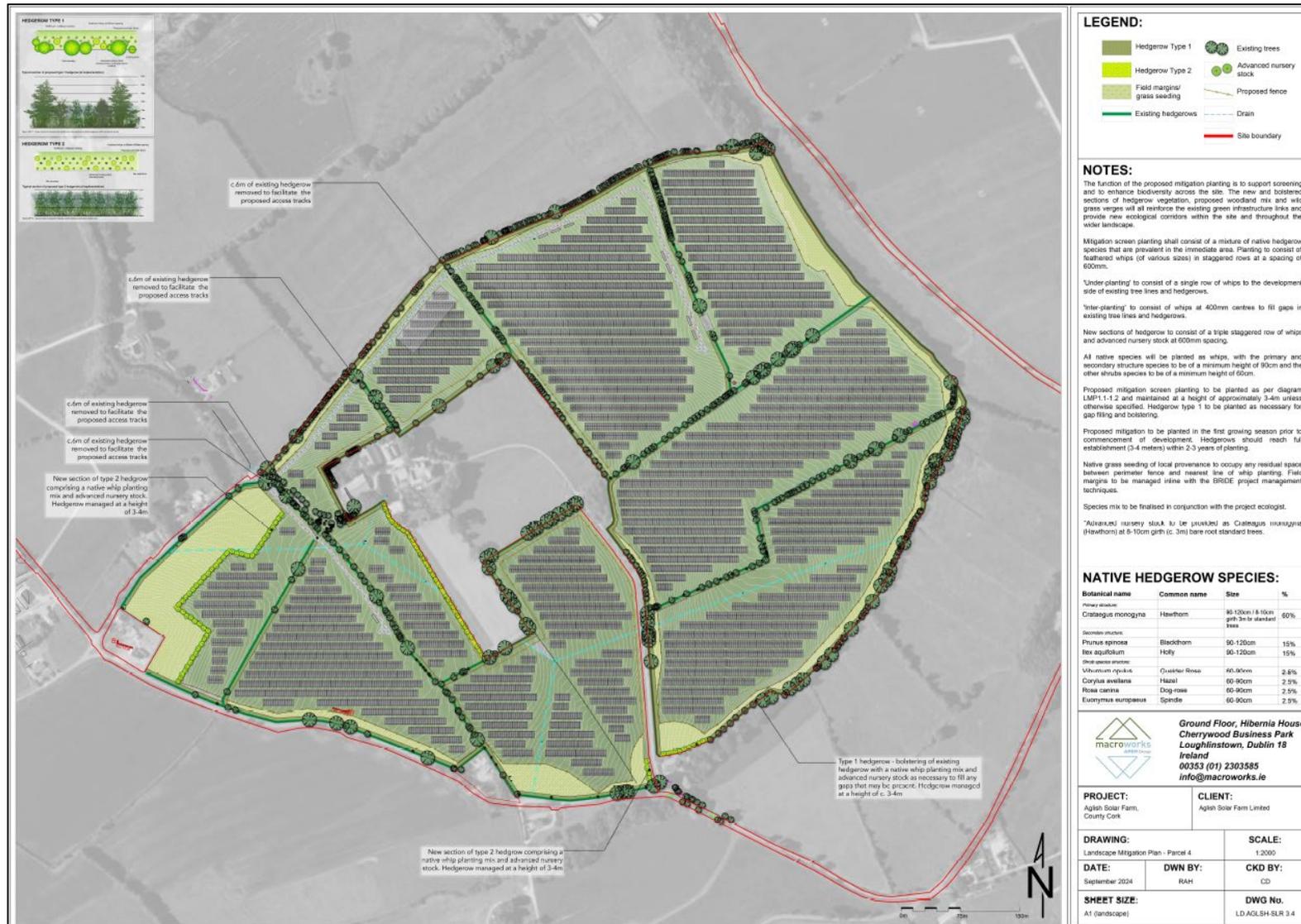


Figure 2-7: Biodiversity Management Plan Parcels 5 & 6



3 Monitoring

The monitoring commitments for the proposed landscaping and biodiversity measures are outlined in Table 3-1 below.

Table 3-1: Monitoring of Landscaping and Biodiversity Measures

| Monitoring Requirement | Timing | Responsibility |
|--------------------------------------|--|---|
| Planted Hedgerows | <p>60 months after the date of completion of all of the initial planting works</p> <p><u>Weeding</u> Throughout the aftercare period, all shrub planting areas will be weeded regularly. An area of 1m diameter will be kept clear around each planted tree to help ensure the early establishment. A minimum of 3-visits per growing season will be required to keep injurious weeds under control. The growth of herbaceous material between the weeded areas will be controlled by twice yearly strimming.</p> <p><u>Stakes, Trees, and Ties</u> All stakes and trees shall be maintained in firm positions within the ground and all ties securely fixed and adjusted to allow for the increase in stem girth.</p> <p><u>Replacements</u> Plants that fail to thrive will be removed and replaced with equivalent plants as soon as possible during the following planting season.</p> | Landscape Architect/ Project Ecologist |
| Field Margins | Check field margins for hedgerow encroachment and adjust management (outside of the breeding bird season 1st March to 31st August) as required. | Project Ecologist/EcOW |
| Biodiversity Enhancement Zone | <p>Check vegetation regrowth and maintain areas with amphibian hibernacula and invertebrate habitat in an appropriate condition, as guided by the Project Ecologist.</p> <p>Check for scrub encroachment and adjust management (outside of the breeding bird season 1st March to 31st August) as required.</p> | Project Ecologist/EcOW |
| Artificial Structures | <p>Bird Boxes: Check condition and use of boxes annually between September and February. Boxes to be maintained and replaced as required.</p> <p>Bat Boxes: Check condition and use of boxes annually in September to check summer usage. Boxes to be maintained and replaced as required.</p> <p>Amphibian Hibernacula and Invertebrate Habitat: Install on completion of the construction phase. Check condition and use of amphibian and invertebrates and maintain/ replace as required.</p> | Project Ecologist/EcOW |
| Small Mammal Gates | Check that the small mammal gates are free of obstructions such as scrub and heavy undergrowth and clear as appropriate. | Project Ecologist/EcOW |

4 Conclusion

The commitments provided for in this plan will enhance the local biodiversity and ensure that there is improved habitat connectivity throughout the development site. The landscaping proposals to plant new hedgerows at the site are an important component of the Biodiversity Management Plan and will provide a net gain of approximately 1,097m of new hedgerows and will, in time, provide habitats for a wide range of flora and fauna and a lasting biodiversity gain for the project. The existing hedgerows at the proposed site are currently variable in condition, structure and species richness. The enhancement of approximately 22,285m of hedgerows, which constitute critical corridors for wildlife, will improve the structure and species richness of the existing hedgerow network. The management of the hedgerows will be in accordance with the guidance within the All-Ireland Pollinator Plan. The provision of field margins and biodiversity enhancement areas will further enhance the floral diversity of field margins and provide habitat for invertebrates, small mammals and birds.

The proposed site is within a landscape that is considered to be of moderate to high suitability for foraging and commuting bats. The provision of bat boxes will increase the opportunities for roosting bats at the site. Care will also be taken to ensure that non-volant mammals can freely traverse the site. The provision of bird boxes will increase the opportunities for nesting birds at the site.

The provision of hibernacula will create suitable conditions for reptiles and amphibians to hibernate and the provision of log piles or solitary bee nest sites will provide habitat for a range of invertebrates.

The habitats to be maintained, enhanced and established at the proposed site individually offer shelter and a food source for a variety of wildlife. The mosaic of new habitats, combined with the existing hedgerows, ditches and watercourses, will support the existing wildlife within the proposed site. By offering a wider range of habitats that benefit local wildlife, they also have excellent potential to increase the biodiversity of the site. The grassland, hedgerows, and artificial structures such as log piles and solitary bee nest sites will also contribute towards the All-Ireland Pollinator Plan by providing new habitats that will support important pollinator species.

These measures together with the aftercare commitments will benefit local biodiversity and are in keeping with Objectives BE 15-1, BE 15-2, BE 15-6, BE 15-7 and BE 15-8, BE 15-9 of Cork County Development Plan 2022-2028.

Appendix D Relevant Policies and Objectives Cork County Development Plan 2022-2028

| Policy/ Objective |
|---|
| <p>It is an objective of the Council to:</p> <p>BE 15-1: Support and comply with national biodiversity protection policies</p> <ul style="list-style-type: none"> a) Support and comply with the objectives of the National Biodiversity Plan 2017-2021 (and any future National Biodiversity Plan which may be adopted during the period of this Plan) as appropriate, b) Implement the current County Biodiversity Action Plan and any future updated Plan; c) Support and comply with biodiversity policy set out in other national and regional policy documents as appropriate. |
| <p>BE 15-2: Protect sites, habitats and species</p> <ul style="list-style-type: none"> a) Protect all natural heritage sites which are designated or proposed for designation under European legislation, National legislation and International Agreements. Maintain and where possible enhance appropriate ecological linkages between these. This includes Special Areas of Conservation, Special Protection Areas, Marine Protected Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites. These sites are listed in Volume 2 of the Plan. b) Provide protection to species listed in the Flora Protection Order 2015, to Annexes of the Habitats and Birds Directives, and to animal species protected under the Wildlife Acts in accordance with relevant legal requirements. These species are listed in Volume 2 of the Plan. c) Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 of the Plan. d) Recognise the value of protecting geological heritage sites of local and national interest, as they become notified to the local authority, and protect them from inappropriate development e) Encourage, pursuant to Article 10 of the Habitats Directive, the protection and enhancement of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species. |
| <p>BE 15-6: Biodiversity and New Development</p> <p>Provide for the protection and enhancement of biodiversity in the development management process and when licensing or permitting other activities by:</p> <ul style="list-style-type: none"> a) Providing ongoing support and guidance to developers on incorporating biodiversity considerations into new development through preplanning communications and the Council's guidance document 'Biodiversity and the Planning Process – guidance for developments on the management of biodiversity issues during the planning process' and any updated versions of this advice; b) Encouraging the retention and integration of existing trees, hedgerows and other features of high natural value within new developments; c) Requiring the incorporation of primarily native tree and other plant species, particularly pollinator friendly species in the landscaping of new developments; d) Fulfilling Appropriate Assessment and Environmental Impact Assessment obligations and carrying out Ecological Impact Assessment in relation to development and activities, as appropriate; e) Ensuring that an appropriate level of assessment is completed in relation to wetland habitats subject to proposals which would involve drainage or reclamation. This includes lakes and ponds, watercourses, springs and swamps, marshes, heath, peatlands, some woodlands as well as some coastal and marine habitats; f) Ensuring that the implementation of appropriate mitigation (including habitat enhancement, new planting or other habitat creation initiatives) is incorporated into new development, where the implementation of such development would result in unavoidable impacts on biodiversity - supporting the principle of biodiversity net gain. |

BE 15-7: Control of Invasive Alien Species

Implement best practice to minimise the risk of spread of invasive alien species, on Council owned or managed land, and require the development and implementation of Invasive Alien Species Management Plans for new developments where required.

BE 15-8: Trees and Woodlands

- a) Protect trees the subject of Tree Preservation Orders.
- b) Make use of Tree Preservation Orders to protect important trees or groups of trees which may be at risk or any tree(s) that warrants an order given its important amenity or historic value.
- c) Encourage the provision of trees for urban shading and cooling in developments in urban environments and as an integral part of the public realm.
- d) Preserve and enhance the general level of tree cover in both town and country. Ensure that development proposals do not compromise important trees and include an appropriate level of new tree planting.
- e) Where appropriate, to protect mature trees/groups of mature trees and mature hedgerows that are not formally protected under Tree Preservation Orders

BE 15-9: Support for Communities and Other Stakeholders

Support community organisations and other stakeholders as follows:

- a. Implement the County Biodiversity Action Plan and any future updated Plan;
- b. Support the implementation of the All-Ireland Pollinator Plan.
- c. Where possible, support community led initiatives to protect biodiversity including the development of community led Biodiversity Action Plans and Pollinator Plans.
- d. Work with statutory agencies, educational institutes and other organisations to address the issues relating to the protection of biodiversity in the County where possible and as appropriate.

ET 13-14: Solar Farm Development

- a) In recognition of national targets and commitments to significantly increase renewable energy production, support will be given to solar farm projects at appropriate locations, where such development does not have a negative impact on the surrounding environment, landscape, historic buildings, or local amenities.
- b) Promote the development of solar energy infrastructure in the county, in particular for on-site energy use, including solar PV, solar thermal and seasonal storage technologies. Such projects will be considered subject to environmental safeguards and the protection of natural or built heritage features, biodiversity views and prospects.
- c) Require that new solar farm development proposals be assessed against the criteria listed in this Plan until such time as Section 28 Guidelines on Solar Farm Developments from the Department of Housing, Planning and Local Government are published to supersede same.
- d) Encourage the use of passive solar design principles for residential building(s) in line with relevant design criteria.
- e) Support and encourage the installation of solar collectors and panels for the production of heat or electricity in residential and commercial buildings, in line with relevant design criteria.
- f) All proposed solar developments locating in close proximity to any roads and airport infrastructure will undergo a full glint and glare assessment.
- g) Proposals for development of new solar developments and associated infrastructure including grid connections will be subject to ecological impact assessment and, where necessary Appropriate Assessment, with a view to ensuring the avoidance of negative impacts on designated sites, protected species and on-sites or locations of significant ecological value.

BI O27: Require the retention and appropriate management of hedgerows and to require infill or suitably sized transplanted planting where possible in order to ensure an uninterrupted green infrastructure network.

BI O31: Require the retention and appropriate management of hedgerows and to require infill or suitably sized transplanted planting where possible in order to ensure an uninterrupted green infrastructure network.

Appendix E Aquatic Ecological Impact Assessment

Aquatic Ecological Impact Assessment



Aglish Solar Farm Co. Cork, Ireland

Final Report - October 2024

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1 INTRODUCTION

This report contains the Ecological Impact Assessment (EclA) covering the aquatic ecology elements in relation to an application by Aglish Solar Farm Limited in the townlands of Aglish, Currahaly, Farnanes, Farran, Knockavullig, Knocknagoul, Knockshanawee, Loughleigh, Mahallagh, Nettleville Demesne, Rathonoane, Rooves Beg, Rooves More and Shandangan East in County Cork. The solar farm covers 165 hectares, inclusive of underground cabling connections on public roads and private lands.

Aglish Solar Farm (the 'Proposed Development') will be subject to a planning application to Cork County Council and will consist of solar photovoltaic panels on ground mounted frames and all associated ancillary development works. The solar farm comprises six distinct field parcels, which will be connected by means of 33kV underground interconnector cables (hereafter referred to as 33kV UGC Interconnectors). The interconnectors will be contained in solar farm access tracks within private lands and within the local public roads (L62031, L6203, R619, L6207, L22012 and L2204).

A 110kV substation (located in Land Parcel 6) will connect via 110kV underground cable and two new interface towers (located in Land Parcel 5) into the existing Inniscarra Macroom overhead line. Both the substation and Grid Connection Route (GCR) are considered 'Strategic Infrastructure Development' and will be the subject of a separate planning application to An Bord Pleanála. This impact assessment report has been prepared having regard to the 'Solar Farm' (solar array and interconnector elements) that is the subject of the current application and considers cumulative effects with the proposed 110kV substation and grid connection route.

The proposed Aglish Solar Farm is located within the EPA delineated river water bodies: Lee (Cork)_070 (RWB code: IE_SW_19L030500), Lee (Cork)_080 (RWB code: IE_SW_19L030600) and Bride (Lee)_040 (RWB code: IE_SW_19B041300). The watercourses that are the subject of this assessment are shown in **Figure 1-1**. There are seven (7 no.) HDD¹ watercourse crossings and four (4 no.) clear-span, dry deck crossings required for the proposed solar farm and interconnector network. **Figure 1-2** shows the land parcels and interconnectors referenced in this report.

¹ Including the underground grid connection which forms part of the Strategic Infrastructure Development (SID) application to an Bord Pleanála.



11Figure 1-1 Watercourses potentially affected by the Proposed Development (EPA Mapviewer)



12Figure 1-2 Proposed Land Parcels and Interconnector Sections - from Construction Method Statement (TS, 2024)

2 METHODOLOGY AND SOURCES OF INFORMATION

2.1 Legislation and Guidance

The ecological impact assessment was prepared having due regard to relevant legislation and guidance documents as follows:

EU Legislation

- European Union Directive 2011/92/EU (the 'EIA Directive') as amended by Directive 2014/52/EU.
- EU Habitats Directive - Council Directive 92/43/EEC (1992).
- EU Water Framework Directive (2000/60/EC) (WFD)

National Legislation

- The Wildlife Acts 1976 and 2000 (as amended) which provide for the protection and conservation of wild fauna and flora, specifically from injury, disturbance, and damage to breeding and resting sites.
- Part XAB of the Planning and Development Act, 2000 (S.I. 30/2000) as amended and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011) as amended that transpose the EU Habitats Directive into Irish law.
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) which give legal effect in Ireland to the WFD.

Guidance

- EPA (2022) Guidelines on the Information to be contained in Environmental Impact Statements.
- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine by the Chartered Institute of Ecology and Environmental Management.
- NRA (2009) Guidelines for assessment of ecological impacts of national road schemes, Revision 2.
- NRA (2003) Guidelines for assessment of ecological impacts of national road schemes, Revision 1.
- IFI (2016) Guidelines on protection of fisheries during construction works in and adjacent to waters. Inland Fisheries Ireland.

2.2 Study Approach

Watercourses potentially affected by the proposed solar array and grid connection routes were characterised by a combination of desk and field survey. Field survey methods were consistent with standard and published protocols. Desk-based review of existing information informed the aquatic baseline assessment.

With regards to aquatic survey and impact assessment, the downstream Zone of Influence (Zoi) was considered using expert judgement, taking into account existing watercourse morphology, size and flow types in terms of potential for downstream export of pollutants. There was no fixed distance applied for downstream Zoi because site-specific conditions will determine the potential for pollutant generation, their downstream transport, and any consequent effects. For this project, each watercourse was examined at a number of locations along their lengths between the solar farm land parcels and the Inniscarra Reservoir to allow for a comprehensive characterisation of aquatic ecological value.

2.3 Desk Study

A thorough desk-based search of available information was undertaken to assess potential presence/absence of protected aquatic species/habitats and identify key aquatic values and/or sensitivities. Online information, plus published and unpublished literature, from the following sources was utilised:

- Environmental Protection Agency (EPA) maps and data
- Water Framework Directive (WFD) maps and data (<https://www.catchments.ie/>)
- NPWS maps and data (<https://www.npws.ie/maps-and-data>)
- Geohive historical mapping (<https://www.geohive.ie/>)
- Geological Survey of Ireland (GSI) mapviewer
- National Biodiversity Data Centre (NBDC) maps and data
- Inland Fisheries Ireland (IFI) and WFD fish survey data

2.4 Field Studies

2.4.1 Survey Locations

Fieldwork was conducted on 28 June and 13 August 2024, focusing on potentially affected watercourses, their proposed crossing points (where applicable) and the downstream Zol. The aim of field studies was to fully characterise baseline conditions of instream habitats and identify key aquatic receptors. Focus was placed on fisheries and any protected aquatic species value of instream habitats. Assessment of ecological value was backed up by desk studies and, where necessary, the published scientific literature. Watercourses were photographed and site coordinates were taken using handheld GPS.

Table 2-12 Aglish Solar Farm – Aquatic Ecology Survey Locations

| EPA Waterbody name and code | EPA Watercourse / Lake Name | Site | Easting (ITM) | Northing (ITM) |
|------------------------------------|-----------------------------|--------------|---------------|----------------|
| Lee (Cork)_070 IE_SW_19L030500 | Kame | AG1 | 544085 | 571343 |
| | Kame | AG2 | 542572 | 571231 |
| | Cooldrum | AG3 | 542283 | 570300 |
| | Rathonoane | AG4 | 544662 | 569975 |
| | N/A (dry drain) | AG9 | 544215 | 572281 |
| Lee (Cork)_080 IE_SW_19L030600 | Nadrid | AG5 | 545554 | 569728 |
| | Nadrid | AG5a | 545829 | 569861 |
| | Aglish 19 | AG6 | 546750 | 569932 |
| | Nadrid | AG7 | 546655 | 570713 |
| IE_SW_19_138 (Lake waterbody) | Inniscarra Reservoir | AG8 | 544502 | 572354 |
| Bride (Lee)_040 IE_SW_19B041300 | *Un-named Drain | AG10 | 547764 | 569755 |
| | *Un-named Drain | AG11a | 548277 | 569748 |
| | *Un-named Stream | AG11b | 548281 | 569734 |
| | *Un-named Stream | AG12 | 548934 | 569503 |

** Note, for clarity, that un-named drains and stream of the Bride (Lee)_040 waterbody are termed ‘Farran stream’ and ‘Farran stream’ drains in this report. Parcels 5 and 6 are in this separate water catchment of the Lee system.*

Figure 2-1 (a) and (b) marks field survey locations. **Table 2-1** lists ITM (X, Y) co-ordinates of survey site locations.

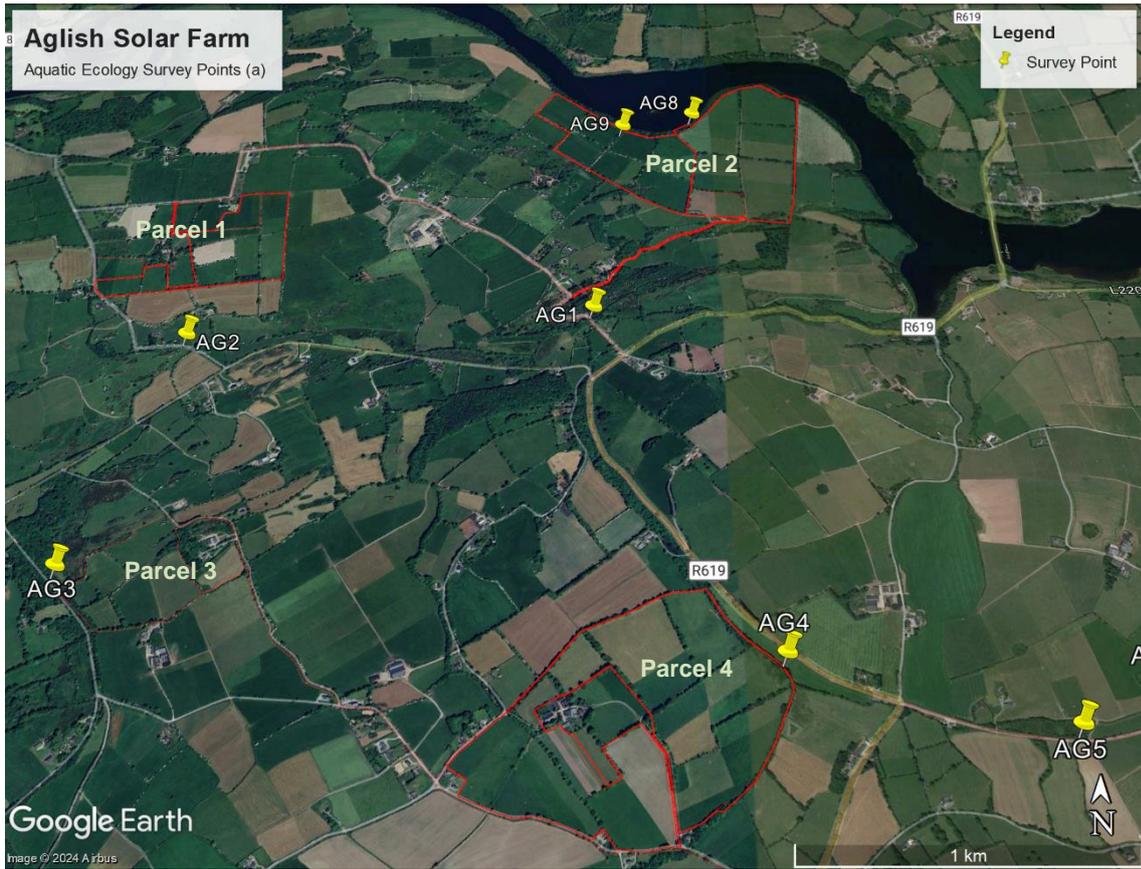


Figure 2-121 (a) (b) Aquatic Ecology survey points Aglish Solar Farm and Interconnectors (Google Earth imagery)

2.4.2 Field Survey Methods

Biological Water Quality

In Ireland, biological water quality is assessed using the Q-value metric. This system is based on field sampling and observations, which evaluates habitat quality and macroinvertebrate diversity and abundance to interpret ecological status as set out in **Table 2-2**. Water Framework Directive (WFD) ecological status is assigned based on the Q-value rating which is the biological quality element that determines status under the WFD. The objective of the WFD is to protect, enhance and restore all surface waters to at least good status by 2027. All surface waters must be maintained or restored to, at least, 'good' ecological status (Q4) and 'high' status waters must not suffer deterioration.

Table 2-2 Biological Water Quality and Status - Q-value system

| Biotic Index | EQR | Quality Status | WFD Ecological Status |
|--------------|-----|---------------------|-----------------------|
| Q5 | 1.0 | Unpolluted | High |
| Q4-5 | 0.9 | Unpolluted | High |
| Q4 | 0.8 | Unpolluted | Good |
| Q3-4 | 0.7 | Slightly Polluted | Moderate |
| Q3 | 0.6 | Moderately Polluted | Poor |
| Q2-3 | 0.5 | Moderately Polluted | Poor |
| Q2 | 0.4 | Seriously Polluted | Bad |
| Q1-2 | 0.3 | Seriously Polluted | Bad |

Potentially affected watercourses were also sampled during field studies of 28 June and 13 August 2024 in accordance with EPA protocols to determine Q-value and water quality implications. This involved taking a 2-minute, travelling kick-sample in a fast flowing (riffle) area of each watercourse using a long-handled sampling net (250 mm width, mesh size 0.25mm). Stone washing was employed to ensure "clinging" species, e.g. leeches and gastropods, were adequately collected. Relative abundance and sensitivity of aquatic organisms to pollution were then assessed at the bankside using the Q-rating system. The EPA operate a national system of river monitoring which provides Q-value data for classification of ecological status on a three-yearly cycle. Available EPA data for the study area was reviewed. Q-values assist in characterising water and habitat quality for the purposes of EclA as water quality is a primary determinant of habitat quality for aquatic organisms.

Fisheries Habitat Assessment

A field-based fisheries habitat assessment was undertaken, recording and evaluating hydromorphology including the principle in-channel and bank-side habitats (e.g., substrates, flow types, instream vegetation, sedimentation), and the suitability as potential spawning, nursery, holding and residential sites for fish (salmonids, lampreys and European eel). The survey was based on expert judgement arising from many years of experience and observations (e.g., during electrofishing sampling), backed up by evidence from the scientific literature as to the suitability of channel morphology in relation to fisheries habitat.

In the case of salmonid habitat, the method of Salmonid Life Cycle Unit Score (LCU) (O'Connor & Kennedy 2002, Loughs Agency 2008) was used. This involved assigning a score equating to "Excellent", "Good", "Fair", "Poor" or "None" for each life cycle unit (Spawning, Nursery, Holding) as shown in **Table 2-3**. These scores were then totalled to provide an overall salmonid habitat score. Scores are presented in the Excel Field Log spreadsheet. The overall salmonid habitat assessment

was also qualified using expert judgement, based on years of experience in electrofishing of watercourses.

Table 2-3 Salmonid Life Cycle Unit Score and Expert Judgement Qualification

| Habitat quality | Life Cycle Unit Habitat score | Total score (3 x LCU) | Expert Judgement Qualification |
|-----------------|-------------------------------|-----------------------|--|
| Excellent | 1 | 3 to 5 | Watercourse is ideal habitat for the species owing to high quality and diversity of habitats (flow types, substrate types, bed profiles, riparian habitat) that support relevant salmonid life stages |
| Good | 2 | 6 to 8 | Likely and certain that the watercourse supports the species owing to good quality of habitat conditions |
| Fair | 3 | 9 to 11 | Possible that the stream section could support the species but it there is sub-optimal diversity of flow, bed profile, substrate diversity and/or instream water quality and physical conditions |
| Poor | 4 | 12 | Possible, but unlikely, that the stream could support the species owing to impaired habitat conditions such as drainage, lack of flow, bed profile and substrate diversity and/or instream water quality and physical conditions |
| None | ~ | ~ | No possibility that the watercourse could support the species in question in the relevant life stage owing to completely unsuitable habitat and conditions |

General Habitat Descriptions

Survey sites were visually assessed recording bankside and in-channel habitats and their suitability for aquatic fauna, including substrate and flow types, depth and width, shading, surrounding land-use and general morphological character. The latter were assessed, generally based on principles of the River Hydromorphology Assessment Technique (RHAT) (NIEA, 2014) whereby “departure from naturalness” is evaluated in terms of habitat quality for aquatic fauna.

2.5 Ecological Valuation of Watercourses

The criteria used for assessment of ecological value of watercourses are adapted from ²NRA Ecological Impact Guidelines (NRA, 2003, 2009) involving careful consideration of fisheries value, water quality and consideration of contextual information for the resource at a geographic level. The evaluation criteria used to classify sites is shown in **Table 2-4**. This is based on NRA (2003) guidelines, with slight modifications based on NRA (2009) to set out criteria that classify aquatic habitat value within the study area. The 2009 NRA guidelines were used minimally, as they mainly do not reference aquatic habitats or fisheries. Only criteria with direct relevance to aquatic habitats and fisheries within the study area have been retained in this table. EPA biological monitoring data and field-based study results were assessed in the context of national trends, guidelines, regulations and criteria of both the EU Habitats Directive (92/43/EEC) and Water Framework Directive (WFD) (2000/60/EC), as appropriate. In the absence of any standards or guidelines, the scientific literature was consulted for direction.

² NRA = National Roads Authority, now Transport Infrastructure Ireland (TII)

Table 2-4 Ecological evaluation criteria (Adapted from NRA, 2003 and 2009)

| Relevant Criteria | Category |
|--|----------|
| International Importance: <ul style="list-style-type: none"> ▪ Sites designated (or qualifying for designation) as an SAC. ▪ Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988). ▪ Major salmonid (salmon, trout, or char) lake fisheries. | A |
| National Importance: <ul style="list-style-type: none"> ▪ Sites or waters designated or proposed as an NHA or Statutory Nature Reserve or National Park. ▪ Undesignated sites containing significant numbers of resident or regularly occurring populations of Annex II species under the EU habitats directive. ▪ Resident or regularly occurring populations (assessed to be important at the national level) of species protected under the Wildlife Acts; and/or; species listed on a Red Data list. ▪ Major trout fishery rivers. ▪ Waterbodies with major amenity fisheries value. ▪ Commercially important coarse fisheries. | B |
| County Importance: <ul style="list-style-type: none"> ▪ Small water bodies with known salmonid populations or with good potential salmonid habitat, ▪ Undesignated sites containing any resident or regularly occurring populations of Annex II species under the EU Habitats Directive. ▪ Large water bodies with some coarse fisheries value. ▪ Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level. | C |
| Local Importance (Higher Value): <ul style="list-style-type: none"> ▪ Small water bodies with some coarse fisheries value or some potential salmonid habitat. ▪ Any waterbody with unpolluted water (Q-value rating 4-5, Q5) | D |
| Local Importance (Lower value): <ul style="list-style-type: none"> • Water bodies with no current fisheries value and no significant potential fisheries value. | E |

2.6 Impact Assessment

Potential direct, indirect and cumulative impact significance associated with the proposal were assessed in accordance with criteria set out in EPA Guidelines (EPA, 2022). Guidance was also sought from CIEEM (2018) and NRA (2009). The magnitude, extent, timing and duration of potential impacts have been considered, as well as their likelihood of occurring (CIEEM, 2018). Impact types, levels of significance and duration are described according to the terminology of EPA (2022) as set out in **Table 2-5 and 2-6**. To assist with assigning impact significance, criteria set out in **Appendix 1** were used, which determines effects in relation to the ecological quality category of the watercourse in question. Special consideration was given to the prediction of how proposed measures may affect protected aquatic species and their habitats.

Table 2-5 Ecological Impact Significance Criteria (from EPA, 2022)

| Impact Significance | Criteria |
|---------------------|--|
| Neutral | No impact |
| Imperceptible | An impact capable of measurement but without noticeable consequences |
| Not significant | An impact which causes noticeable changes in the character of environment but without significant consequences |

| Impact Significance | Criteria |
|---------------------|--|
| Slight impacts | An impact which causes noticeable changes in the character of the environment without affecting its sensitivities |
| Moderate impacts | An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends |
| Significant impacts | An impact which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment |
| Very Significant | An impact which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment |
| Profound impacts | An impact which obliterates sensitive characteristics |

Table 2-6 Ecological Impact Duration Criteria (from EPA, 2022)

| Impact Duration | Criteria |
|----------------------|---|
| Momentary Effects | Effects lasting from seconds to minutes |
| Brief Effects | Effects lasting less than a day |
| Temporary Effects | Effects lasting less than a year |
| Short-term Effects | Effects lasting one to seven years |
| Medium-term Effects | Effects lasting seven to fifteen years |
| Long-term Effects | Effects lasting fifteen to sixty years |
| Permanent Effects | Effects lasting over sixty years |
| Reversible Effects | Effects from which spontaneous recovery is possible within a reasonable timescale or which may be counteracted by mitigation. |
| Irreversible Effects | Effects from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. |

2.7 Statement of Competence

Lauren Williams BSc PGDip MCIEEM carried out aquatic baseline studies and impact assessment for this project. She is a qualified freshwater ecologist with over 20yrs professional consultancy experience working in New Zealand (2yrs) and in Ireland (past 18yrs). Lauren holds a BSc in Zoology (University of Otago, NZ); a Certificate in Environmental Law (Open Polytechnic of NZ) and a Post Graduate Diploma in Environmental Monitoring Assessment and Engineering with Distinction from Trinity College Dublin. She is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Lauren specialises in water quality assessment, monitoring, aquatic ecological impact assessment and protected aquatic species and habitat surveys; regularly undertaking specialised aquatic field studies and preparing EclA reports and EIAR chapters, plus Appropriate Assessment reporting (AA Screening/NIS) in relation to a wide range of large infrastructural developments. She carries out aquatic sampling, monitoring and reporting as part of national river monitoring programmes and is a nationally recognised aquatic protected species surveyor (freshwater pearl mussel and white-clawed crayfish).

3 EXISTING ENVIRONMENT

3.1 Designated Conservation Areas

There are no designated Natura 2000 sites directly affected by the Aglish Solar Farm proposal. The Gearagh SAC (Site Code 000108) is located 17km upstream (hydrologically) of the Kame River confluence with Inniscarra Reservoir and will not be affected by the proposed development.

Indirectly, by way of a distant hydrological connectivity, the boundary of Cork Harbour SPA (Site Code 004030) is 29.5km downstream of the Nadrid Stream confluence with Inniscarra Reservoir. The boundary of Great Island Channel SAC (Site Code 001058) is a further 4.9km downstream, i.e., a total of 34.4km downstream of the Nadrid Stream confluence with Inniscarra Reservoir. The following aquatic habitats are qualifying interests:

- **Great Island Channel SAC:** Mudflats and sandflats not covered by seawater at low tide [1140] and Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) [1330]
- **Cork Harbour SPA:** Wetlands [A999]

Please read the AA Screening Report that accompanies this application for the full examination of effects on European sites.

3.2 River Lee Catchment

3.2.1 Overview

The River Lee rises in the Shehy Mountains near Gouganebarra, Co. Cork. It flows eastwards through Ballygeary, Lough Allua and the Gearagh, from which point the two hydroelectric dams form Carrigadrohid and Inniscarra Reservoirs in succession. Below Inniscarra Dam, the lower River Lee flows towards Cork City, entering the sea at Cork Harbour. The dams were commissioned between 1952 and 1957, flooding the Lee valley, completely altering catchment hydromorphology and introducing barriers to fish migration into the upper Lee system.

Land Parcels 1 to 4 are currently agricultural fields that drain via agricultural drains to small tributary streams (Kame, Cooldrum, Rathonoane) which ultimately enter via the Kame River at the south bank of the Inniscarra Reservoir just south of Coachford. Land Parcels 5 and 6 drain in an easterly direction along a field boundary drain which forms into a gully stream that flows via Farran Cross and southwards to meet the River Bride at Bride Bridge. The solar farm site is underlain by purple mudstone and sandstone (GSI mapviewer).

3.2.2 Fisheries Data Review

Salmon were prolific throughout the Lee catchment up until the early 1950s with annual runs of 15,000 fish reported at that time. However, a total collapse of Lee salmon stocks occurred within 5 years of the commissioning of Carrigadrohid and Inniscarra dams in the 1950s (ESB, 2023). A significant proportion of the Lee catchment (69%) is now located upstream of Inniscarra Dam and is inaccessible to migrating fish. Currently only an estimated average of 500 salmon each year (TEGOS, 2024) manage to pass the dams via Borland McDonald fish-lock lifts and reach the upper Lee.

Salmon stocks of the upper Lee system are managed by the presence of fish lifts on the dams, in combination with hatchery rearing and release of smolts by ESB fisheries staff (ESB 2014, 2022). For a few weeks each year, ESB staff trap and retain returned hatchery reared fish (marked as smolts using adipose fin-clipping) as breeding stock for their hatchery at Carrigadrohid. Between 50,000 and 70,000 hatchery-reared smolts are released upstream and downstream of the dams each year, but these have a very low marine survival rate (c. 1.5%) and only relatively small numbers of hatchery-reared and wild salmon return annually to Inniscarra. ESB carried out electrofishing surveys in 1993, 2001, 2003, 2005 and 2009 at sites upstream and downstream of the two dams, which showed satisfactory densities of naturally spawned juvenile salmon occurred at all sites sampled below

Inniscarra, whereas only isolated populations were found above the stations (largely as a result of restocking efforts) (ESB, 2023).

Inland Fisheries Ireland (IFI) have two WFD fish river monitoring sites on the system: one at Inchinossig Bridge near Ballingearry in the upper Lee and one at Lee Fields, downstream of Leemount Bridge on the lower Lee. Electrofishing surveys were conducted in 2010 and 2013 at both sites (Kelly et al., 2010, 2014).

At Lee Fields (Lower River Lee) a total of eight fish species were recorded in 2010, with lamprey being most common, followed by eels, three-spined stickleback, salmon, stone loach, gudgeon, brown trout and minnow. In 2013, twelve species were recorded at this site, with minnow being most common, followed by salmon, three-spined stickleback, European eel, gudgeon, stone loach, brown trout, perch, lamprey sp., pike, bream and roach. During each sampling effort, two age classes of salmon were present (0+, 1+) and three age classes of brown trout (1+, 2+, 3+).

At Inchinossig Bridge (Upper River Lee), nine fish species were captured in 2010, with minnow being the most abundant species, followed by brown trout, three-spined stickleback, lamprey, roach, gudgeon, eels, pike and stone loach. In 2013, a total of five species were recorded at the Inchinossig site. Brown trout were the most common species, followed by minnow, lamprey sp., roach and three-spined stickleback. Four age classes of brown trout (0+, 1+, 2+ and 3+) were present in 2010 and five age classes (0+, 1+, 2+, 3+ and 4+) were present in 2013. Young-of-the-year trout (0+) were the most commonly recorded (>75% of total trout numbers) during each sampling effort. The data demonstrates that the upper Lee is an important trout recruitment habitat, but absence of salmon from the record at the upper Lee site (Inchinossig) demonstrates the negative effect of the downstream dams. Using the Fish Classification Scheme 2 (FCS2) tool, both the Inchinossig and Lee Fields sites are currently assigned 'Moderate' ecological status for their fish communities based on 2013 surveys.

The theoretical salmon Conservation Limit (CL)³ set for the upper River Lee by the SSCS⁴ is currently 2,789 fish. In 2023, the upper Lee average salmon count (based on most recent five-year fish count data) was 512, representing a deficit of -2,277 fish and meaning only 18% of (a very modest) CL was achieved (TEGOS, 2024). The Lower Lee has a theoretical salmon CL of 1896 fish, of which a 918 fish surplus was estimated for 2024, meaning the tributaries and main channel of the Lower Lee (below Inniscarra Dam) currently exceed the salmon CL by 48% (TEGOS, 2022). Clearly the presence of the dams has a profoundly negative effect on salmon stocks and also affects other anadromous fish species (sea trout, river and sea lampreys) of the Lee system, preventing natural inward migration past Inniscarra Dam.

Inniscarra Reservoir has a surface area of 488ha and a maximum depth of 34.7m. It is designated as a mixed coarse fishery and is popular with anglers. The reservoir has been surveyed by Inland Fisheries Ireland on four occasions (2005, 2008, 2015 and 2019) using a variety of survey netting techniques. Fish species captured in 2005 - 2019 surveys included brown trout, salmon, roach, bream, roach x bream hybrids, rudd, perch, pike, gudgeon, carp and eel. The most recent survey in September 2019 captured a total of eight fish species and one hybrid. No salmon were recorded. Perch and roach were dominant in 2019 in terms of abundance (catch per unit effort). Perch had the highest overall biomass but other "species" such as roach x bream hybrids, bream, brown trout and roach also recorded high biomass (Corcoran et al., 2020).

3.2.3 Biological Water Quality

3.2.3.1 EPA Q-value Data

The EPA don't monitor the small streams draining the proposed solar farm development site. **Table 3-1** shows recently available (2020-2023) river Q-value results from relevant, nearest downstream, EPA

³ Scientifically derived sustainable stock level, i.e., the number of returning salmon that would be required to maintain the carrying capacity of the system based on its accessible area of fluvial habitat.

⁴ Standing Scientific Committee on Salmon.

stations on the River Lee and River Bride. Ecological status is determined by the Q-rating according to Table 2-2, above. The River Lee is currently 'good' ecological status (Q4) based on monitoring at two stations below Inniscarra Dam, downstream of the proposed solar farm development lands. The River Bride is currently rated at 'Moderate' ecological status (Q3-4) just downstream of the drain confluence arising from the Farran Stream. During EPA sampling of 2023, the Bride improved with distance downstream, meriting 'good' status (Q4) by the time it reaches Kilumney and continued at 'good' ecological status all the way through Grange and Ovens to the Lee confluence. The Lee and the lower Bride are currently compliant with the WFD objective of good status.

Table 3-1 Rivers Lee and Bride - EPA Q-value data and WFD Status

| EPA Code (RS) | River | Station Name | Q-value 2020 | Q-value 2023 | WFD Ecological Status (2016-2021) |
|---------------|-------|-------------------------|--------------|--------------|-----------------------------------|
| 19L030600 | Lee | Inishcarra Br | Q4 | Q4 | Good |
| 19L030700 | Lee | Leemount Br | Q4 | Q4 | Good |
| 19B041200 | Bride | Bride Br | ~ | Q3-4 | Moderate |
| 19B041200 | Bride | Kilcrea Br | Q3-4 | ~ | Moderate |
| 19B041400 | Bride | Br at Kilumney | ~ | Q4 | Good |
| 19B041400 | Bride | Ovens Br | ~ | Q4 | Good |
| 19B041400 | Bride | Br u/s Lee R confluence | Q4 | Q4 | Good |

3.2.3.2 Field Study Q-value Data

Appendix 2 contains macroinvertebrate species lists and abundance data which underpin the assigned Q-values summarised in **Table 3-2**. Sites are assigned 'representative' status as they are not formal status classifications reported to Europe. The Q-value ratings use published EPA methods and protocols (Toner *et al*, 2005) which equate to WFD status according to Table 2-2, above.

Table 3-2 Q-value Summary Data for Field Survey Sites

| EPA Waterbody name and code | EPA Watercourse / Lake Name | Site | 2024 Q-value | Q-value - Representative Ecological Status |
|------------------------------------|-----------------------------|-------|--------------|--|
| Lee (Cork)_070 IE_SW_19L030500 | Kame | AG1 | Q4-5 | High |
| | Kame | AG2 | *Q3 | *Poor |
| | Cooldrum | AG3 | Q4 | Good |
| | Rathonoane | AG4 | Q3-4 | Moderate |
| | N/A (dry drain) | AG9 | N/A (dry) | N/A (dry) |
| Lee (Cork)_080 IE_SW_19L030600 | Nadrid | AG5 | N/A | N/A |
| | Nadrid | AG5a | Q4 | Good |
| | Aglish 19 | AG6 | *Q3 | *Poor |
| | Nadrid | AG7 | Q4 | Good |
| IE_SW_19_138 (Lake waterbody) | Inniscarra Reservoir | AG8 | N/A (lake) | N/A |
| Bride (Lee)_040 IE_SW_19B041300 | Un-named Drain | AG10 | N/A | N/A |
| | Un-named Drain | AG11a | *Q3 | *Poor |
| | Un-named Stream | AG11b | N/A (dry) | N/A (dry) |
| | Un-named Stream | AG12 | Q3-4 | Moderate |

* Indicates a tentative Q-rating owing to very low flows (possibility of the stream being ephemeral) which naturally affects the diversity of benthic macroinvertebrates present. Water quality may be better than that indicated by the impoverished benthic community which is more influenced by flow conditions than water quality in these cases.

The Kame River, by the time it reaches Inniscarra Reservoir is unpolluted with a benthic macroinvertebrate community that reflects high ecological status and therefore capable of supporting salmonids. The Nadrid system is also unpolluted and reflective of good ecological status. The smaller tributaries were at such low flow that Q-values were less reliable indicators of water quality (likely ephemeral watercourses) but judging by the record of high and good ecological status at the larger downstream sites in each sub-catchment, water quality is reasonably good throughout. The only exception to this was the Rathonoane (AG4, moderate status), which had a disturbed benthic community including some good quality indicator species and some species indicative of a localised source of fine particulate organic matter, commonly associated with for example, farmyard discharges. The Kame River was still representative of 'high' status (Q4-5) downstream of the Rathanoane confluence.

3.2.4 Water Framework Directive

Current EPA assigned waterbody status (2016-2021) for relevant receiving waterbodies is listed in **Table 3-1** and illustrated on the map in **Appendix 3**.

Table 3-1 EPA Waterbody Status, Risk and Pressures

| EPA Waterbody name and code | EPA Watercourse / Lake Name | Aglish Solar Farm Sites | EPA assigned Waterbody Status (2016-2021) | EPA Identified Risk / Issue / Pressures |
|------------------------------------|-----------------------------|---------------------------------|---|--|
| Lee (Cork)_070 IE_SW_19L030500 | Kame | AG1, AG2 | Good | Not at risk |
| | Cooldrum | AG3 | | |
| | Rathonoane | AG4 | | |
| Lee (Cork)_080 IE_SW_19L030600 | Nadrid | AG5, AG5a, AG 7 | Good | Not at risk |
| | Aglish 19 | AG6 | | |
| IE_SW_19_138 (Lake waterbody) | Inniscarra Reservoir | AG8 | Good | Not at risk |
| Bride (Lee)_040 IE_SW_19B041300 | Un-named Drain/stream | AG10, AG11a, AG11b, AG12 | Moderate | At risk: Nutrients / Domestic Wastewater |

Note that Inniscarra Reservoir (Lake Water Body code: IE_SW_19_138) is classified as a heavily modified waterbody (HMWB) for the purpose of power generation and abstraction for drinking water (EPA, 2023, 2024). For the purposes of WFD monitoring and reporting HMWBs have a different environmental objective which recognises that physical habitat conditions have been modified for the specified use. In the case of Inniscarra, Good Ecological Status cannot be achieved because the dam introduces a recognised migration barrier which impacts on fish status. HMWBs must still achieve good ecological condition for all the other status elements not affected by the physical modification (i.e., the dam), such as nutrients, specific pollutants, priority substances and any other biological quality elements. Inniscarra is monitored for macrophytes, phytoplankton, chlorophyll, nutrient (ammonia, total phosphorus) and general supporting physicochemical conditions, achieving 'good' status for all parameters during the 2016-2021 WFD reporting cycle (EPA Data).

3.2.5 Aquatic Habitat Descriptions

The following habitat descriptions should be read in conjunction with macroinvertebrate sampling and Q-value results shown in **Appendix 2**. Site locations are shown in Section 2.4.1, above.

3.2.5.1 Watercourses flowing to Inniscarra Reservoir

Kame: Site AG1 [ITM (X, Y) 544085, 571343]

The Kame River at this location is a good quality trout stream with quite natural hydromorphology (bank-width 3.6m, wet-width 2.4m, depth 12cm in riffles). The survey location is the main receiving water for drainage from Parcels 1, 2, 3 and 4, and was just downstream of the proposed HDD crossing of Interconnector 2 (Parcels 1 and 2 to Parcel 6). Instream habitat comprised riffle/run over cobble (20%), gravel (70%) and coarse sand (10%). There was a riparian corridor of native woodland on both banks dominated by alder, ash and hawthorn with ivy, ferns and bramble. Instream vegetation was sparse bryophyte (*Fontinalis antipyretica*, *Ambelstegium riparium*) and occasional emergent *Oenanthe crocata*. The habitat forms good salmonid (brown trout) spawning and nursery habitat, but there was very little, if any brook lamprey nursery potential locally as there were no silt deposits. Salmonid LCU Score = 7 (Good). Kick-sampling showed a good quality macroinvertebrate community, meriting Q4-5 (potential 'high' status) with good representation of sensitive mayflies (*Ecdyonurus* spp., *Rithrogenia semicolorata*) and stoneflies (*Isoperla* sp., *Siphonoperla* sp.). Trout are present and the stream in these lower reaches could also support salmon spawning and nursery, although salmon are largely prevented from accessing because of the migration barrier formed by Inniscarra Dam, downstream. Very few salmon migrate through the fish-lift on the dam.



Image 1A: Site AG1 view upstream (28 June 2024)



Image 1B: Site AG1 view upstream (28 June 2024)

Kame: Site AG2 [ITM (X, Y) 542572, 571231]

This site is on a small branch of the upper Kame River and is the receiving stream for drainage from Parcel 1. It was at low flow on 28 June 2024 (bank-width 1.8m, wet-width 0.8m, depth 3cm in riffles) which depresses its salmonid value Salmonid LCU Score = 11 (Fair to Poor). Trout may spawn here during winter under higher flows, with fry dropping back to the larger channel downstream during the nursery period. The channel has been historically drained alongside the local road but has recovered natural instream habitat of riffle/run, step/pool over substrates of bedrock (5%), cobble (20%), gravel (70%) with some coarse sand and interstitial silt. There is a riparian corridor of native hedgerow dominated by hawthorn, willow, hazel, ivy, ferns and bramble. Kick-sampling merited Q3 (potential 'poor' status) with a low diversity macroinvertebrate community, but the habitat was not suitable for q-sampling, being at such low flow. The habitat is generally suboptimal for trout and is of little value to brook lamprey through lack of silt deposits for nursery.



Image 2A: Site AG2 view upstream of riffle under low flow conditions (28 June 2024)



Image 2B: Site AG2 view upstream of shallow glide/pool under low flow conditions (28 June 2024)

Cooldrum: Site AG3 [ITM (X, Y) 542283, 570300]

Cooldrum Stream is an upper tributary of the Kame River. It is the receiving stream for drainage from Parcel 3. At Site AG3 it is a moderate gradient, gully stream aligned next to the local road. It has recovered reasonably natural hydromorphology (bank-width 2.2m, wet-width 2.4m, depth 12cm in riffles). Instream habitat comprises riffle/run over bedrock (5%), cobble (20%), gravel (70%) and coarse sand (10%). There is a riparian corridor of native woodland on both banks dominated by mature alder, oak and ash with some sycamore (Image 3A). Instream vegetation was very sparse bryophyte (*Brachythecium* spp.) on exposed cobbles. There were patches of trout spawning gravel and good trout nursery habitat, although flows clearly reduce in summer and fish may drop down to localised pools. Salmonid LCU Score = 9 (Fair). There is no brook lamprey nursery potential. Kick-sampling showed a good quality macroinvertebrate community, meriting Q4 (potential 'good' status) with representation Group B cased caddis, sensitive mayflies (*Rithrogenia semicolorata*) and stoneflies (*Isoperla* sp.). The proposed development land slopes down to the stream, with a woodland riparian buffer between agricultural land and the channel. There is a small 'wetland' area (ITM 542321, 570271) within this woodland buffer (Image 3B) which has been avoided by the project design and will be retained in its natural state.



Image 3A: Site AG3 view upstream (28 June 2024)



Image 3B: Wetland area within riparian woodland – drainage pathway from Parcel 3 (28 June 2024)

Rathonoane: Site AG4 [ITM (X, Y) 485626, 598396]

Rathonoane Stream is a tributary of the Kame River which confluences just upstream of Site AG1. It is the receiving water for drainage from Parcel 4. The upper reaches of the stream will be crossed by HDD carrying Interconnector 4. It also receives a small proportion of drainage from the R619 public road that carries Interconnector 2 (From Parcels 1 and 2 to Parcel 6). The stream has been

historically dredged forming part of the field boundary hedgerow. Channel wet width was 1.9m with a bank width of 2.6m, mean depth 10cm (riffle-run). Habitat comprised mainly riffle/run with occasional small pools over substrates of cobble (20%), gravel/pebble (70%) and sand (10%) with fine silt accumulations in slacks. There is a vertical bedrock cascade at ITM 544685, 569938 which would certainly be a at least a partial fish migration barrier (Image 4B). Juvenile trout were observed both upstream and downstream of this barrier, so there is a distinct trout population surviving upstream of the waterfall.



Image 5A: Site AG4, view downstream (28 June 2024)



Image 5B: Bedrock cascade upstream of Site AG4.

A kick sample merited Q3-4, “slightly polluted”, indicative of ‘moderate’ status. There was low diversity and abundance of sensitive macroinvertebrate fauna (*Ecdyonurus*, *Isoperla*), with an abundance of worms and black fly larvae (Simuliidae), indicative of a level of particulate organic enrichment in the upstream catchment. Overall, the stream is suitable for trout spawning and nursery but had clearly been drained in the recent past and habitat was overly not optimal for salmonids because of impaired hydromorphology and water quality. Salmonid LCU Score = 8 (Good). The true right bank had been cleared of vegetation in the recent past and was covered in disturbed tall-herb and grasses, mainly nettle. The left bank supports a mature hedgerow of oak, alder, ash with bramble, ferns and ivy providing shade to the stream. Emergent *Helosciadium nodiflorum* and the aquatic moss *Amblestegium riparium* were common, with patches of pollution tolerant filamentous green algae, *Vaucheria*.

Nadrid: Site AG5 [ITM (X, Y) 545554, 569728] and **Site AG5a** ITM (X, Y) 545829, 569861]



Image 5A: Site AG5, view upstream of drain-like channel which was virtually dry (28 June 2024)



Image 5B: Site AG5a – 300m downstream of AG5, where the stream had an increased volume

The upper Nadrid Stream would be crossed by interconnector cabling using HDD at Site AG5. At that point it is a very minor watercourse with trickle flow, piped under the road. Image 5A shows the stream about 30m downstream of the road, where it is dredged to form a field boundary drain. There is no fisheries value at that point in the catchment. Site AG5a was located c.300m downstream of Site

AG5 where the stream emerges from a road culvert and the volume had increased (Image 5B). In the absence of downstream barriers, trout could occur in this part of the catchment. Salmonid LCU Score = 11 (Fair to Poor). A kick-sample was taken at AG5a, meriting Q4, 'unpolluted' (potential 'good' ecological status). Sensitive mayflies and stoneflies were present (*Ecdyonurus*, *Isoperla*).

Aglish 19: Site AG6 [ITM (X, Y) 546750, 569932]

The Aglish 19 is a very small tributary of the Nadrid Stream. It follows a steep gully down to meet the main channel. Interconnector cabling would cross the channel by HDD at the local road at Site AG6. The stream had very low flow (wet width 40cm, bank-width 1.2m, depth 2cm) forming shallow riffle/run over substrates of embedded gravel and pebble with some coarse sand (Image 6A). A patch of woodland dominated by hawthorn, willow and sycamore surrounds the stream upstream of the road, leading to a willow enclosed gully downstream. A narrow stone culvert conveys the stream beneath the road and there is a considerable overburden into which cabling could be set (Image 6B). Trout are very unlikely to be present at this point in the catchment owing to very low flow Salmonid LCU Score = 12 (Poor to None). A kick-sample merited Q3 ('poor' ecological status), revealing a disturbed faunal assemblage with some signs of organic enrichment (e.g., Simuliidae, worms). The Q-value is tentative owing to very low flow.



Image 6A: Site AG6, view upstream from culvert (28 June 2024)



Image 6B: Existing road culvert at AG6 (28 June 2024)

Nadrid: Site AG7 [ITM (X, Y) 546655, 570713]



Image 7A: Site AG7 – view through culvert (28 June 2024)



Image 7B: Site AG7, view upstream showing concrete bed and banks (28 June 2024)

The lower end of the Nadrid Stream was surveyed at Site AG7 where it is set deep in a gully and crossed by a stone arch culvert (Image 7B). The whole channel was highly modified at this point, with concrete bed and banks (Image 7A). Water seeps below the concrete bed at points in the channel,

leaving the streambed dry. The series of steps and weirs are being undermined by the subterranean flow, leaving fish passage barriers. This structure is a partial or complete fish migration barrier. The habitat should be trout spawning and nursery because biological water quality was 'good' status (Q4), but the instream modifications likely preclude trout locally. Salmonid LCU Score = 11 (Poor).

Inniscarra: Site AG8 [ITM (X, Y) 544502, 572354] and **Site AG9** [ITM (X, Y) 544215, 572281]

Site AG8 is on the southern shoreline of Inniscarra Reservoir on the northern boundary of Parcel 2. There is a steep scarp of woodland between the proposed development fields and the lake, which provides a wide, well-vegetated buffer. A 3m band of fringing reeds (*Phalaris arundinacea*) occur at the lake edge (Image 8). The lake shore substrates are a combination of muddy silt and rounded gravel, overlain with silt and detritus. A pond-net weed sweep showed an abundance of pollution / silt tolerant water sowbug (*Asellus aquaticus*), tubificid worms with a few Limnephilid cased caddisflies.



Image 8: Site AG8 Inniscarra Reservoir, view upstream showing woodland scarp and fringing shoreline (28 June 2024)



Image 9: Site AG9 – dry field boundary depression sloping in the direction of Kame River.

The proposed development lands themselves are generally flat or sloping away southwards, draining back towards the Kame River. There are no preferential flow paths evident from the existing agricultural lands to Inniscarra Reservoir. The lands are 'high and dry' with any surface depressions that could convey surface water being dry during field survey, and all sloping back towards the Kame River (Image 9). The entire northern boundary was walked, and it is concluded with a high degree of confidence that there is no potential for surface water runoff directly from Parcel 2 northwards into Inniscarra Reservoir.

3.2.5.2 Watercourses flowing towards Farran / River Bride

Site AG10 [ITM (X, Y) 547764, 569755]

Site AG10 is at the northwestern corner of Parcel 6 adjacent to the L2204 local road. There is no watercourse at this location. A field boundary drain following the south side of the road was present at this point with stagnant standing water of 60cm depth which was infiltrating to ground (Image 10A). The corner of the field was a small wetland area covered in Fool's watercress (*Helosciandium nodiflorum*) and Meadowsweet (*Filipendula ulmaria*) (Image 10B). The drain has no fisheries significance and no downstream hydrological connectivity, at least during dry summer conditions.



Image 10A: Site AG10 – stagnant drain at HDD crossing point with Fool’s watercress and standing water sinking to ground (13 August 2024)



Image 10B: Site AG10 – view ‘upstream’ over HDD crossing point showing wetland area where standing water sinks to ground (13 August 2024)

Site AG11a [(X, Y) 548277, 569748] and AG11b [(X, Y) 548281, 569734]

Two existing field entrances enter north and south of the L2204, into Parcels 5 and 6, respectively. These are both culverted. The drain north of the road had trickle flow in August 2024. The drain south of the road was completely dry and does not have characteristics of even being an ephemeral watercourse. The culvert into Parcel 5 (Site AG11a, Image 11A) is an embedded concrete pipe (approximately 600mm) that carries a small watercourse with a wet-width of 0.70m and depth of 3cm. The drain at AG11a has been straightened and deepened with a high ditch (2m) on the along the road / field interface. Substrates were a combination of gravel and silt. Abundant growths of *H. nodiflorum* caused flows to stagnate in patches. OSI historical mapping shows the watercourse is spring fed, rising from emergences located about 900m upstream of the AG11a culvert. The macroinvertebrate community was poor and indicated the watercourse is ephemeral. The channel has no fisheries significance, especially considering there is an impassable barrier downstream (see Site AG12, below). The culvert into Parcel 6 (Site AG11b, Image 11B) is a plastic land drain pipe and was completely dry, with dry field boundary drains upstream and downstream. This channel has no fisheries significance at all.



Image 11A: Site AG11a - view downstream into existing culvert entrance (13 August 2024)



Image 11B: Site AG11b - view downstream of small plastic pipe culvert that outfall to a completely dry field boundary drain (13 August 2024)

“Farran Stream”: Site AG12 [ITM (X, Y) 548934, 569503]

Site AG12 (termed “Farran Stream” but not marked on OSI 1:50000 or EPA watercourse mapping) is located 700m downstream of the proposed crossing points at AG11a and AG11b. At this point,

drainage from the upstream catchment area forms a gully stream that flows 850m (moderately steep) down towards Farran Crossroads then under the N22 road and on to the River Bride confluence a further 930m downstream. The channel at AG12 is set within a swathe of roadside woodland, with a 3m bank width and a 1.2m wet width (3cm depth) during sampling. The setting was reasonably “natural” with substrates comprising mainly gravel with interstitial silt and patches of exposed bedrock and cobble. Broadleaf tree cover was mainly sycamore, hawthorn and ash. The stream passes through several culverted sections, one of which was a long, skewed pipe immediately upstream of Site AG12, which is completely impassable to fish (even if they could reach this part of the catchment). The stream has some potential trout spawning and nursery habitat at Site AG12 (when flows increase in winter), but fish could not migrate any further upstream from this point because of the impassable culvert. It would be expected that trout are present within the channel between this point and the River Bride confluence, but the proposed solar farm lands are 700m upstream of any possible trout recruitment habitat.



Image 12A: Site AG12 – view upstream showing reasonably ‘natural’ instream morphology (13 August 2024)



Image 12B: Site AG12 – view downstream showing gully stream with (13 August 2024)

3.3 Notes on Hydrological Connectivity

- As relevant to the impact assessment the following is noted in terms of hydrological connectivity:
- Land Parcels 1, 2, 3 and 4 all ultimately drain to the Kame River and enter Inniscarra Reservoir just upstream of Rooves Bridge (R619) a distance of 10km upstream of the dam.
- Although Parcel 2 borders Inniscarra Reservoir, there is no direct hydrological connectivity directly between Parcel 2 and the reservoir because there is gently south-sloping topography meaning Parcel 2 drains to the Kame River. There is a broad, mature woodland scarp (40m wide) separating Parcel 2 and the reservoir and there were no direct preferential flow paths down the scarp from the proposed development land.
- The Nadrid Stream system is only relevant to the assessment because of two (2 no.) proposed HDD stream crossings (no instream works). None of the solar farm land parcels drain to this sub-catchment.
- Land Parcels 5 and 6 are very high in a sub-catchment of the River Bride, connected by small field boundary drains to the ephemeral “Farran stream” (unmarked on OSI Discovery or EPA watercourse mapping) which ultimately joins the River Bride 2.5km downstream of Parcels 5 and 6. The River Bride then meets the River Lee 10.5km downstream at Ballincollig West.
- The proposed solar farm development lands are generally, gently rolling-to-flat with minor field boundary drains (inactive during summer) between the proposed land parcels and EPA delineated watercourses.

3.4 Summary of Aquatic Receptor Sensitivity

Table 3-4 provides a summary of ecological value of watercourses potentially affected by the development and sets out the species and habitats of ecological interest that occur or are likely to occur in the Zone of Influence of the proposed development.

Table 3-4 Summary of Aquatic Ecological Value and Importance

| Sub-catchment | Summary | Ecological Valuation |
|---|---|--|
| Kame River | The Kame main channel in its lower reaches has good water quality (Q4-5, 'high status) and good trout spawning and nursery habitat with reasonably natural hydromorphology. Its tributaries (Cooldrum and Rathonoane) comprise fair to good trout spawning and nursery habitats, although water quality is slightly impaired in the Rathonoane. | C – County Importance in the lower reach at HDD crossing point |
| Nadrid Stream (including Aglish 19 tributary) | Small system with some potential salmonid habitat in the lower reaches (although impaired by partial fish migration barriers), but no salmonid potential at the proposed upper sub-catchment HDD crossing locations. | E – Local Importance (Lower Value) in upper reaches crossed by the Interconnector |
| Inniscarra Reservoir | Large water body with good water quality, a well-known coarse fishery and high amenity value (angling, rowing, swimming) | C – County Importance |
| Drains upstream of "Farran Stream" (Sites AG10, AG11a, AG11b) | Small, (spring fed) ephemeral (or dry) channels with no salmonid potential adjacent to Parcels 5 and 6. | E – Local Importance (Lower Value) |
| Farran Stream (Site AG12) | Small stream with some poor to fair potential trout habitat commencing 700m downstream of Parcels 5 and 6. Highly modified by culverts / barriers along it's length to the River Bride, hence low connectivity with Bride in terms of fish passage. | D – Local Importance (Lower Value) |

4 POTENTIAL IMPACTS

4.1 Relevant characteristics of the proposal

4.1.1 Aglish Solar Farm

The proposed solar farm development (array plus interconnectors) covers 160 hectares on lands to the south of Inniscarra Reservoir, Co. Cork. Operational access will be via 7 no. entrances from the L62031, L6203, L11012, L6398 and L1104 local roads. The operational lifespan of the solar farm will be 40 years. Construction work will span 24 months (including the installation of the substation and grid connection route that are subject to separate application but are included, cumulatively, in this assessment). Solar farm construction in each land parcel will take 3-5 months with activities overlapping for individual land parcels.

The solar farm will consist of solar panels on ground mounted frames, 23 no. single storey electrical inverter/transformer stations, 6 no. single storey spare parts containers, 3 no. Ring Main Units, 7 no. weather stations, underground electrical ducting and cabling within the development site, private lands and within the L62031, L6203, R619, L6207, L11012 and L1104 public roads to connect solar farm field parcels, security fencing, CCTV, access tracks, 4 no. stream/drain deck crossings, 6 no. horizontal directional drill (HDD) crossings (under watercourses/drains/public road), temporary construction compounds, landscaping and all associated ancillary development and drainage works.

The Construction and Environmental Management Plan (CEMP) was consulted for this assessment as was the Construction Method Statement (CMS) prepared by Terra Solar (TS, 2024). The CEMP describes the proposed solar farm infrastructure, installations, work schedule and environmental protection measures. The CMS covers the electrical infrastructure construction, including interconnector cabling, grid connection route cabling and the 110kV substation. Protective measures were built into the CMS and CEMP and overall project design that avoids or limits the potential sources of construction related pollutants (sediment, concrete, hydrocarbons) and helps prevent export of pollutants into drains and/or watercourses from the construction areas.

The civil works for the panels involves a simple ground-mounted system, avoiding undue ground disturbance. The installation works within the flat to gently sloping existing site topography. There are no major excavations required for panel installation. A total of 8,235 linear metres of access track will be installed across the land parcels (1,933m will be refurbished existing track and 391m of temporary access track, meaning 5,911 m of new access track). Finished internal access tracks will be 4.5m wide and of compacted gravel. The design specifies a buffer zone of no less than 10m between solar farm elements and any drains or watercourses to reduce potential for pollutant losses during the construction and operation phases.

Apart from the potential indirect effects on aquatic habitats arising from the above general construction works, the following features of the solar farm and interconnector portion of the project are relevant to the aquatic ecology assessment:

- 1 no. HDD cable crossing of the Kame River for Interconnector 2.
- 1 no. HDD cable crossing of the upper Rathonoane Stream for Interconnector 4.
- 2 no. HDD cable crossings of the upper Nadrid Stream system for Interconnector 2.
- 2 no. HDD cable crossings of the upper "Farran Stream" drains - Interconnectors 2 and 5.
- 2 no. dry-deck (clear span) crossings of the minor, upper "Farran Stream" drains forming site entrances from L2204 local road to Parcels 5 and 6.
- 1 no. dry-deck (clear span) crossing of a minor (ephemeral) drain in Parcel 1.
- 1 no. dry-deck (clear span) crossing of a minor (ephemeral) drain in Parcel 4.

4.1.2 Aglish 110kV Substation and Grid Connection Route

The 110kV sub-station is not part of the subject application, but the design for the sub-station, interface towers and Grid Connection Route (GCR) are included with information for the current

application for the purpose of cumulative assessment of all project elements. Of relevance to the aquatic ecology assessment, the proposed sub-station will comprise:

- 1 no. on-site electrical substation and ancillary buildings with a footprint of 1.2ha plus a permanent 4.5m wide access track of c.320m length from the L2204 local road to the substation.
- No foul water discharges to surface waters - site messroom, washroom and toilet waste will be retained on site and tanked out periodically using a licenced waste management contractor.
- The substation and GCR are set on gently sloping topography where surface flows are collected by the upper "Farran Stream" field drains, which have no fisheries significance.

The sub-station, interface towers and GCR will take approx. 24 months to construct and will commence up to 6 months prior to the main solar farm construction period. The main soil stripping works for the substation in Parcel 6 therefore occur well before the main solar farm construction period in the "Farran stream" water catchment (Parcels 5 and 6).

The GCR underground cable will run from the proposed 110kV substation within Land Parcel 6, to connect to Inniscarra Macroom overhead line via 2 no. new Interface Towers in Parcel 5. This involves an additional HDD cable crossing of the upper "Farran Stream" drains. The Interface Towers are located 210m north of the upper "Farran Stream" drain (represented by Site AG11a). Protective measures are built into the CMS and CEMP to prevent waterborne export of sediment and other pollutants into watercourses from the substation and GCR construction areas.

4.2 Potential Effects of Aglish Solar Farm

4.2.1 Construction Phase Effects

Impacts resulting from civil engineering works near watercourses are primarily related to three sources of potential water borne pollutant loss, which are: suspended sediment, concrete and hydrocarbons.

Potential Effect and Impact Significance in relation to Suspended Sediment Loss

The principal source of potentially negative impact on aquatic receptors arises from the escape of excessive amounts of suspended sediment during the construction phase. Sediment export could occur as a result of earthworks and erosion of soil stockpiles and excavated areas relating to, e.g., access tracks, site compounds and underground cable installation (trenching, HDD crossings). Machinery traversing lands during PV panel piling, mounting and installation, may generate suspended solids. On the latter point, it is noted that the land parcels are generally 'high and dry' with very little in the way of soft ground prone to disturbance. In addition, low load bearing machines will be used to traverse ground, and only minimal soil disturbance is expected for this element of construction.

Installation of new access tracks involves linear construction within green fields on generally flat land which is easier to manage in terms of run-off controls (e.g., with temporary check dams, silt fencing) compared to, for example, broad-scale excavations or full field ploughing, the latter of which is ordinarily practiced widely in the catchment. Over-the-edge drainage to vegetated ground will occur from permeable (compacted gravel) access tracks with the existing onsite drainage features (field perimeter drains) and infiltration patterns remaining unchanged.

Escaped solids (if this did occur) can settle in watercourses; smothering of plants and macroinvertebrates, causing fish to abandon the area at least in the short-term. At worst, such sedimentation could occur over trout spawning beds, which mainly relates to the Kame River and its trout bearing tributaries (Cooldrum and Rathonoane). This could (depending on the amounts and the timing) result in reduced recruitment of young fish from affected reaches as a result of localised egg and fry mortalities. Elevated concentrations of suspended solids and resulting turbidity within the water column can also potentially damage the gills, physiology and behaviour of fish (e.g., respiration,

migration) and/or benthic macroinvertebrates (e.g., respiration, drift responses). Similar to salmonids, brook lamprey also depend on clean gravels for spawning, although very little lamprey spawning or nursery habitat was identified in the Kame or Nadrid system. Lamprey nursery areas are less likely to be significantly adversely affected by small amounts of instream sedimentation, since juveniles (ammocoetes) inhabit areas of silt deposition during their nursery stage. The upper “Farran Stream” drains have no fisheries significance, and any escaped solids would likely settle out within a short distance of their source especially given the weed choked, low flow nature of the small channels.

The indicative work timeline set out in Figure 2 of the CEMP showing an overall construction period covering a total of 24 months. Substation enabling works in Parcels 5 and 6 occur in Months 1 to 4 and include the main soil stripping for this element. Solar farm construction commences in Month 7, with the first 2 months involving the excavation and construction of access tracks, including the installation of dry deck crossings over minor field drains in Parcels 1 and 4. This means there is a gap of 3 months between the two main periods of soil stripping, i.e., associated with initial works in Parcels 5 and 6, followed by access track installation in Parcels 1 to 4. By the time solar farm access tracks are excavated and panels are installed, the substation site will be substantially advanced in the civil works period and any stripped soil will have been re-used (settled and reseeded) or safely stockpiled with silt control measures in place for later reinstatement. It is important to note that the substation, interface towers and GCR are located in Parcels 5 and 6 (“Farran stream” catchment draining towards the River Bride) which is an entirely separate water catchment to land parcels 1, 2, 3 and 4 which are in the Kame catchment (draining towards Inniscarra Reservoir).

In the absence of controls, suspended solids linked to the main periods of soil excavation and spoil redistribution (access tracks, interconnector cabling) could reach the Kame River and its more minor, but trout bearing tributaries (Cooldrum, Rathonoane) via field drains from Parcels 1, 2, 3 and 4. Parcels 5 and 6 drain via minor drains connected to the headwaters of the “Farran Stream” that eventually flows to the River Bride. Potential sediment losses cannot be quantified in absolute terms for a project such as this, but the source areas can be managed and controlled to minimise potential for generation of suspended solids and/or their transport pathways in overland run-off. Placed in context, the proposed excavation activity occurs over three separate water sub-catchments and is less of a risk in terms of potential sediment export to either Inniscarra Reservoir or the River Bride compared to entire field ploughing, which routinely occurs in agricultural settings in the absence of dedicated controls. Furthermore, the impoundment caused by Inniscarra Dam means that in the unlikely event that solids did escape, they will settle out and cause no perceptible increase in suspended solids (over and above entire catchment levels) within the salmonid habitats of the River Lee downstream of the dam.

Given the phasing and the level of environmental measures proposed during construction, the risk of uncontrolled sediment loss is considered low. However, in line with requirements of the Habitats Directive whereby mitigations cannot be considered, if appropriate construction strategy and environmental controls were not employed, there is potential for **localised, short-term moderate-to-significant negative reversible** effects (in the absence of mitigation) on water quality (temporarily elevated turbidity), and trout habitats (short-term sedimentation effects) of the Kame River and its trout bearing tributaries (Cooldrum and Rathonoane). It is noted that this impact significance rating takes a worst-case scenario where all the main soil stripping activity for access tracks occurred at the same time on Parcels 1, 2, 3 and 4, which is **unlikely** to occur as there will be shared resources that mean access track installation will be staggered between land parcels.

There is potential for **localised, short-term moderately negative reversible** effects (in the absence of mitigation) on water quality (temporarily elevated turbidity) of the upper “Farran stream” drains, but there are no fish habitats for at least 700m downstream of Parcels 5 and 6, and hence there are no likely significant effects on fisheries habitat or fish populations that may occur from a point 700m downstream.

Potential Effect and Impact Significance in relation to Cement Loss

Relatively small amounts of liquid cement usage will be required during the solar farm construction phase, e.g., transformer plinths. There will be no on-site batching of concrete and no-washing out of concrete batch delivery trucks on-site. Interconnector joint bays utilise precast concrete units. Proposed dry-deck crossings over drains will involve pre-cast concrete and will not require bulk wet-

cement pouring. Owing to its highly alkaline and corrosive nature, cement is potentially toxic to instream fauna and can cause fish and invertebrate kills downstream. All of these possibilities will be avoided using the best practice in construction site layout and construction management as set out in the CEMP and the overall risk is very low. Concrete usage during the solar farm construction period will have **no likely significant negative effects** on aquatic receptors as there are limited sources of concrete contamination and very distant pathways to any sensitive aquatic habitats in relation to each of the 6 no. land parcels.

Potential Effect and Impact Significance in relation to Hydrocarbon Loss

Hydrocarbon spills and leakages can result in oil slicks and tainting of fish, or (if large enough) fish and invertebrate kills. They can be very detrimental to salmonid eggs and young fry in spawning areas. Hydrocarbons can reach drains and watercourses as a result of spills and leakage from poorly secured or non-bunded fuel storage areas; spills during re-fuelling; leaks from on-site vehicles, plant and equipment. Loss of hydrocarbons during the construction phase can be avoided and prevented by best practice in terms of site layout including fuel storage and best practice construction management, and these issues have been addressed in the CEMP and CMS, which include the necessary environmental control measures.

It is considered that the main area of risk for hydrocarbon contamination for the Aglish Solar Farm construction are at HDD launch and reception areas where there is potential for machinery to leak or spill hydraulic fluid or fuels that may reach watercourses. To a much lesser extent the temporary site compounds in Parcels 5 and 6 are quite near the upper "Farran stream" drains, which could act as conduits to potential fisheries habitat 700m downstream, although this is very unlikely to occur when the CEMP is implemented, as will be binding on the contractor. Temporary compounds in Parcels 1, 2, 3 and 4 are distant from watercourses with any fisheries significance and it is very unlikely owing to the long pathways (comprising ephemeral, vegetated drains), that any source of contamination would have effects on aquatic receptors. If there was no mitigation in the area of hydrocarbon usage and water quality protection, the effects could at worst be **localised, temporary, significant reversible negative** at the HDD crossing of the Kame River at Site AG1 (Interconnector 2). Effects at the Nadrid (AG5), Aglish 19 (AG6) and "Farran stream" drains (AG10, AG11a) would be less significant as the watercourses have lower sensitivity (no significant fisheries habitats).

Potential Effect and Impact Significance in relation to HDD stream/drain crossings

There are no instream works involved but HDD involves civil works near the watercourse or drain, with risk of contaminants entering. The main potential contaminant source during HDD is the drilling fluid, which is a "mud" or "slurry" comprised of water and additives, usually bentonite clay. As such, the drilling fluid is potentially a source of fine suspended solids that could adversely impact downstream aquatic receptors if there was an accidentally frack-out of HDD fluid. Whilst this fluid can give rise to high suspended solids concentrations, it is not toxic. In the absence of dedicated environmental controls potential exists for accidental frack-out or spillage of drilling fluids which could occur as part of a leak from the launch/reception pits or as a frack-out burst through river substrates. If excessive quantities of drill fluid (mud slurry) escaped to watercourses, fisheries, and macroinvertebrate habitat could be significantly negatively affected locally in the short-term by turbidity and sedimentation effects.

The risk of this occurring from a well-managed HDD site is very low but - although unlikely to occur - in the absence of robust emergency procedures for a frack out / spillage incident the effects could be **localised short term significant reversible negative** in relation to trout habitats of the Rathonoane Stream (Site AG4) and trout habitats and high status macroinvertebrate of Kame River (Site AG2).

Effects of a frack out or accidental spillage of drilling fluid on the small tributaries of the upper Nadrid Stream system (Sites AG5 and AG6) would be **temporary slightly negative locally and reversible** because these are minor channels with no fisheries significance near downstream.

Effects of a frack out or accidental spillage of drilling fluid on the upper "Farran Stream" drain at Site AG10 would be **temporary slightly negative locally and reversible** only if there was elevated water table at the time as there may be export to the flowing drain on the opposite side of the road, although there is no fisheries significance near downstream. The drain was not hydrological connected during

dry summer months, in which case the effect of HDD spillage or frack out would be imperceptible negative and localised related to minor effects in relation to common macroinvertebrates in the stagnant drain.

It is noted that engineering and environmental control measures for prevention of leakage or spillage of drilling fluid from drilling pits or containers, plus an emergency frack-out plan have been set out in Section 8.15 of the CEMP.

Potential Effect and Impact Significance in relation to dry-deck stream/drain crossings

Dry-deck construction does not require any instream works. Pre-cast bearing slabs are brought to site on which a reinforced concrete deck is placed to bridge the channel. Access track approaches to each side of the dry deck are potential sources and pathways for suspended solids generation and entrainment to the stream. The proposed dry decks in Parcels 1 and 4 cross minor, ephemeral field drains that have no fisheries habitat and low ecological significance. The laying of dry decks and approach tracks will cause **temporary imperceptible negative reversible** effects locally related to slight disturbance with downstream effects being neutral.

The installation of the proposed dry deck from the L2204 road into Parcel 6 will have a **neutral** effect, as the drain will be either dry (as it was in summer 2024) or conveying a small amount of surface water (if the water table is elevated following rain). It has no fisheries or aquatic ecological significance. Placement of the dry deck would require removal of the existing small plastic pipe culvert, which would equally have no significant effects. The pipe and channel could be excavated and lifted while the drain is dry with no ecological effect. Even if there was a small amount of water in the drain the effect of removal and replacement would not be significant.

Potential Effects of Invasive Alien Species

Construction works, especially those involving earthworks and importation of materials, carry potential for introduction and/or transfer of invasive alien plant species. These can have very significant negative effects on riparian corridors if transferred either within the site or brought onsite. It is noted there will be no importation or movement of topsoil, with any reinstatement works carried out within the individual land parcels using soil stripped from access tracks for example. There is not expected to be any significant negative effects on riparian corridors and instream fauna. Section 8.2 of the CEMP contains the approach to the Invasive Alien Species (IAS) Management Plan to prevent any transference of IAS within the development lands.

Potential Construction Phase Effects on European Sites

In respect of the separation distance to the nearest downstream European sites (29.5km and 34.4km as set out in Section 3.1, above), plus the relatively limited scale of activity separated into 6 no. land parcels across 3 no. water sub-catchments, and temporary to (at worst) short-term nature of the construction phase activity, it is considered that there is no potential for likely significant effects on wetland habitat of Cork Harbour SPA nor on the marine qualifying interest habitats of Great Island Channel SAC.

4.2.2 Operation Phase Effects

Hydrology and Water Quality

The proposed solar arrays are on generally flat-to-gently-rolling topography and will continue to be drained by existing on-site (in-active) field drains which flow towards the receiving watercourses. The Drainage Report prepared for this project demonstrates that the frequency of discharge rates shall be the equivalent of greenfield conditions, with no alteration to natural flow patterns and hence no significant change to the hydrological regime of the lands in question. It is envisaged that either mowing or low intensity sheep grazing will be the principal means of managing grass growth levels on the site during operation, meaning the site will continue to be vegetated. This is consistent with best practice measures contained within the UK BRE Planning Guidelines for the development of ground mounted solar PV systems. Because of the proposed management, run-off rates will not differ

significantly from existing green-field rates and the potential for erosion linked to concentrated run-off from panels is therefore considered low (Cook & McCuen, 2013).

There will be no additional soil disturbance during the 40-year operation phase, meaning a negligible release of sediment to the watercourses associated with the proposed development. The sediment export rates will likely be similar or less compared to the current situation because there will be no ploughing/reseeding of fields (as would otherwise be common agricultural practice over a 40-year time scale). The development includes a 10m set-back at a minimum from all watercourses and drains. These buffers, which are currently grassed, will be enhanced through management as tussocky grassland with perennial grasses and wildflowers. The proposal also includes 1194 linear metres of new hedgerow planting and bolstering of 22,285 linear metres of existing hedgerow, some of which is in riparian zones. Once established, these setbacks and plantings will enhance filtering function and on-site nutrient and sediment attenuation, helping to protect receiving watercourses. Panels will be cleaned with pure water (no chemical additives).

Given there are no significant sources of contaminants from the operational panel array, nor their maintenance, and no further soil disturbance, there is virtually no risk of contaminated run-off having any significant impact on watercourses during operation. On the whole, the effect over the 40-year lifespan of the project is considered to be **long-term positive** on water quality and aquatic receptors as there will be an overall reduction in intensity of agricultural activity on the land parcels, i.e., a net reduction over 40-years in commonly associated agriculture emissions to surface waters.

Polarised Light Pollution

With reference to the potential impact of solar panels on the behaviour of aquatic insects, it is first important to note that the proposed site boundary is located a minimum of ~40m distant from Inniscarra Reservoir, and at that nearest point (in Land Parcel 2), there is a tall, mature riparian woodland covering the entire zone between the site boundary and the lake.

Most of the aquatic insects with aerial life-stages that are important sources of food to fish (e.g., mayflies, stoneflies, caddisflies) are delicate as adults and are poor fliers. When they emerge from the water, they rest on nearby riparian vegetation for a short terrestrial phase in which they complete egg-laying and die (O'Grady, 2006). These groups of insects therefore have life cycles primarily localized to the natal river and the near-river corridor. Water beetles are better fliers and can be attracted to shiny objects that look like open water (e.g., car windscreens, windows). Some water beetles have the ability to fly as adults (at least some distance from the riverbank where they pupate) but their primary dispersal method is through drift in the waterbody.

A limited number of recent studies have reported on the possible effect of solar panel arrays on groups of flying aquatic insects in terms of being attracted away from natural water bodies to lay their eggs on solar panels, which mimic the horizontal polarization of water-reflected light (Fritz, 2020; Black & Robertson, 2020; Lovich & Ennen, 2011; Kriska *et al.*, 2008). The potential attractiveness of PV panels has been demonstrated for species of mayfly (Ephemeroptera), caddisfly (Trichoptera), non-biting midge (Chironomidae) and blackfly (Simuliidae) (Black & Robertson, 2020). Of these groups, all were recorded in nearby streams during sampling. It is important to note that laying of eggs (oviposition) on surfaces that mimic PV panels has been observed for mayfly by Fritz (2020), but not specifically reported for other groups. It is also notable, for context, that common surfaces such as black asphalt (roads), cars and windows can act as alternative sources of polarising light pollution, not just PV panels. There were no studies located in the literature search that showed *preferential* attractiveness to alternative polarising light surfaces over water surfaces. Kriska *et al.* (2020) report that flying stages of aquatic insects tend to rise only a short distance from the water surface, where dark silhouettes of trees and bushes on the riverbank form markers which can keep emerging swarms together. In addition, they observed that caddis flies, for example, usually move away from the emergence sites only at distances from which they can still see the horizontally polarized water-reflected light. Their study concentrated on tall glass-fronted buildings near large rivers, where aquatic insects would also have obvious visual contact with alternative polarising light (glass) surfaces. Given the elevation of Parcel 2 above the reservoir and that fact that the high scarp is cloaked in tall, mature woodland, it is reasonable to deduce that there will be limited potential for aquatic insects emerging from the reservoir to be attracted to the alternative polarising surfaces of the solar array. The effect of potential polarised light pollution on local aquatic invertebrate communities is considered **neutral** for

the invertebrate communities of the Inniscarra Reservoir and its small tributaries that are the subject of this assessment.

Potential Operational Phase Effects on European Sites

In respect of the separation distance to the nearest downstream European sites (29.5km and 34.4km as set out in Section 3.1, above), plus the fact there are no anticipated emissions to surface water that could affect aquatic receptors either locally or further afield there is no potential for likely significant effects on wetland habitat of Cork Harbour SPA nor on the marine qualifying interest habitats of Great Island Channel SAC.

4.2.3 Decommissioning Phase Effects

Refer to the Decommissioning and Restoration Plan accompanying this application. At the end of the 40 year lifespan of the solar farm there are two options: **Option 1:** Extending the operational lifetime of the solar farm, subject to either a new planning permission or amendment planning permission); or **Option 2:** Decommissioning the solar farm and ensuring its lands are restored to an agreed baseline.

Potential impacts associated with Option 2 decommissioning will be similar to those identified for the construction phase, but the anticipated level of soil disturbance will be less during the decommissioning phase compared to the construction phase.

After ensuring the solar panels are disconnected from the electrical network, the panels can be individually removed from their frame. The panels can be reused depending on their age and condition. If they are not fit for reuse, they will be disposed of to a suitably licenced waste facility. The mounting system is connected to the ground via a small driven pile system. These driven steel piles will be removed with a rig. These will not be reused so they will be taken off site for recycling. Storage containers will be available should the panels be reused or disposal containers if they are to be transported to a waste facility.

Underground 33kV interconnector cables and ducting will be removed as part of the decommission, and trenches will be reinstated and reseeded immediately. Access tracks will be required to remain for the decommissioning period and will then be top soiled over and reseeded. Alternatively, if the landowner wishes to retain track as they have a beneficial farming purpose, these may be retained. Hardcore plinths will be broken up and removed from site for appropriate recycling. The land will then be filled and re-seeded for full reinstatement.

Environmental protection measures for decommissioning would be the same as during construction, with measures relating to surface water management that increase on-site attenuation and prevent excessive sediment loss from the land parcels via field drains. The effects on aquatic receptors, if any, will be **temporary, slight negative reversible** locally and not significant.

4.2.4 Do Nothing Scenario

If the project does not go ahead there will be no potential construction, operation or decommissioning phase effects on water quality and aquatic ecology related to sediment and/or hydrocarbon / concrete loss during the solar farm development. Agriculture will continue, with its emissions and effects relating to nutrient and sediment wash out to surface water.

4.3 Potential Effects of Aglish 110kV Substation and Grid Connection Route

4.3.1 Construction Phase Effects

The main issue during construction of the substation is related to potential for suspended solids entrainment to the upper "Farran stream" drains during the main period of soil stripping for site preparation, access track and to a lesser extent, cable trenching. The main substation footprint excavation period occurs early in the 6 months prior to any solar farm construction activity. Stripped topsoil will be stockpiled with the use of silt containment measures (silt fences) and will be used in

general landscaping reinstatement (spread, rolled and reseeded) around the substation and access track.

A short stretch of trenching is required to carry the grid connection cabling c.400m between the proposed substation and interconnector towers. This occurs within private, currently agricultural land and involves an HDD crossing beneath the local road (L2204) and the upper "Farran Stream" drains. There is no direct impact on the drains, but trenching can give rise to potential for sediment export locally. Lean mix will line the first 600mm of trenches along the route, which, by its nature, is contained and has a low risk of potential escape to nearby drains. It is noted that only short lengths of trench will be open at any one time (100m maximum), with backfill and reinstatement occurring immediately. Plant and machinery involved in the trenching are small and mobile and will not be refuelled within 50m of a watercourse or drain. These activities can be adequately managed using best construction practise in line with the CEMP. The limited source areas at any one time, separation distance and the gently sloping topography are such that the potential for water-borne sediment to reach the drains is very low.

Interface towers will require excavations and the use of bulk liquid concrete to secure footings. There is a 210m separation distance between the tower construction areas and the upper "Farran stream" drain (represented by Site AG11a). The nature of the works is such that liquid concrete (for foundations) will be contained within the ground excavations with no escape pathway to the drains. The likelihood of any significant impacts arising from this aspect of the construction is considered extremely low, with no effects on aquatic receptors anticipated.

The upper Farran stream drain adjacent to the proposed substation site in Parcel 6 (Site AG11b) is not a flowing watercourse. It is an ephemeral field boundary drain that was dry in summer of 2024. It appears to seep to ground, with no obvious hydrological connectivity to the trickling drain on the north side of the L2204 road (Site AG11a). For this reason, the Parcel 6 drain parallel to the local road forms an effective interceptor ditch between the substation site and connectivity to the downstream "Farran stream". There is no fisheries or ecological sensitivity for 700m downstream of the substation access track entrance. Whilst sediment entrainment during the earthworks phase cannot be ruled out, it is considered that the combination of considerable separation distance, environmental controls and low-gradient topography means that sediment entrainment is unlikely to occur but if it did would result in imperceptible, or at worst localised **temporary slight negative reversible** effects on a low quality macroinvertebrate community in the AG11a drain, with no likely significant effects on potential fisheries habitat 700m downstream in the "Farran stream" nor further afield to the River Bride.

4.3.2 Operational Phase Effects

Once the substation is complete, there will be no emissions that could potentially be deleterious to locally important (lower value) aquatic ecological values of "Farran stream" and its upper drains. Once installed and land reinstated, underground cables have no operational impacts on aquatic ecology. Any required maintenance of cables could be expected to involve intervention at joint bays, with no watercourse interaction and no deleterious substances released. There are no significant aquatic ecological operational impacts predicted with regard to the grid connection.

4.3.3 Decommissioning Phase Effects

The 110kV substation, interface towers and underground grid connection cabling will become the property of ESB Networks once the project is energised and will therefore remain on-site following the decommissioning of the solar farm as per the connection agreement with ESB Networks. This infrastructure will have a future long-term use as part of the national electricity transmission system.

4.4 Potential Cumulative Effects

4.4.1 Within Project Cumulative Effects

The 110kV substation, interface towers and GCR are located in Parcels 5 and 6 ("Farran stream" catchment draining towards the River Bride in the Bride (Lee)_040 river waterbody) which is an entirely separate water catchment to solar farm Parcels 1, 2, 3 and 4 which are in the Kame

catchment (draining towards Inniscarra Reservoir in the Lee (Cork)_070 river waterbody). The potential, therefore, for cumulative effects of Aglish Solar Farm with the 110 kV Substation and GCR only arises in relation to works in Parcels 5 and 6.

In this regard, it is first important to note that the upper "Farran stream" drains that run along field boundaries parallel to the L2204 local road in Parcels 5 and 6 are very minor channels with no fisheries significance. This is illustrated in **Figure 4-1**.

- The drain between the field and L2204 road and Parcel 6 is ephemeral and seeps to ground with no indication of a permanent watercourse of any type.
- The drain between the field and L2204 road and Parcel 5 is also ephemeral but is spring fed so has a trickle flow in drier months. It has been excavated (dredged) and was choked with macrophytes.
- There is no potential fisheries habitat for at least 700m downstream of Parcels 5 and 6. Even at that point in the "Farran stream" system (not marked on OSI 1:50000 or EPA watermaps), habitat is sub-optimal for fish and it is a further 1.7km to the main channel of the River Bride.

The main substation footprint excavation period occurs early in the 6 months prior to any solar farm construction activity. In total 95% of excavated material will be removed from site. Only the stripped topsoil will be stockpiled with the use of silt containment measures (covers, silt fences) and will be used in general landscaping reinstatement (spread, rolled and reseeded) around the substation and access track. There is thus no significant stockpiling of excavated material that could become a source of sediment runoff. By the time the main period of solar farm installation occurs, the substation site will be covered with geotextile and Clause 804 stone, compacted and rolled. This forms a solid, permeable surface through which rainfall will infiltrate, with a low risk of run-off to the nearby field drain. This phased approach, along with measures set out in the CEMP and CMS to control sediment wash-out potential (silt fencing, drainage management) reduces the possibility of cumulative sediment loss effects to the downstream "Farran stream". The likelihood of cumulative excessive suspended solids export is low given the site topography, the existing drainage patterns, and the low aquatic ecological sensitivity in the reasonable downstream zone of influence.

However, if specific mitigation measures were not used to avoid and prevent sediment wash out during both the substation / GCR and the solar farm construction, there may be **cumulative short-term, moderate negative reversible** effects on water quality (turbidity) with some localized sedimentation in the drains, which will have no likely significant effects on fish or fisheries habitats as the drains themselves are of low ecological value, but may cause a slight drop in recruitment success if uncontrolled sediment wash out reached the relatively poor trout habitat 700m downstream.

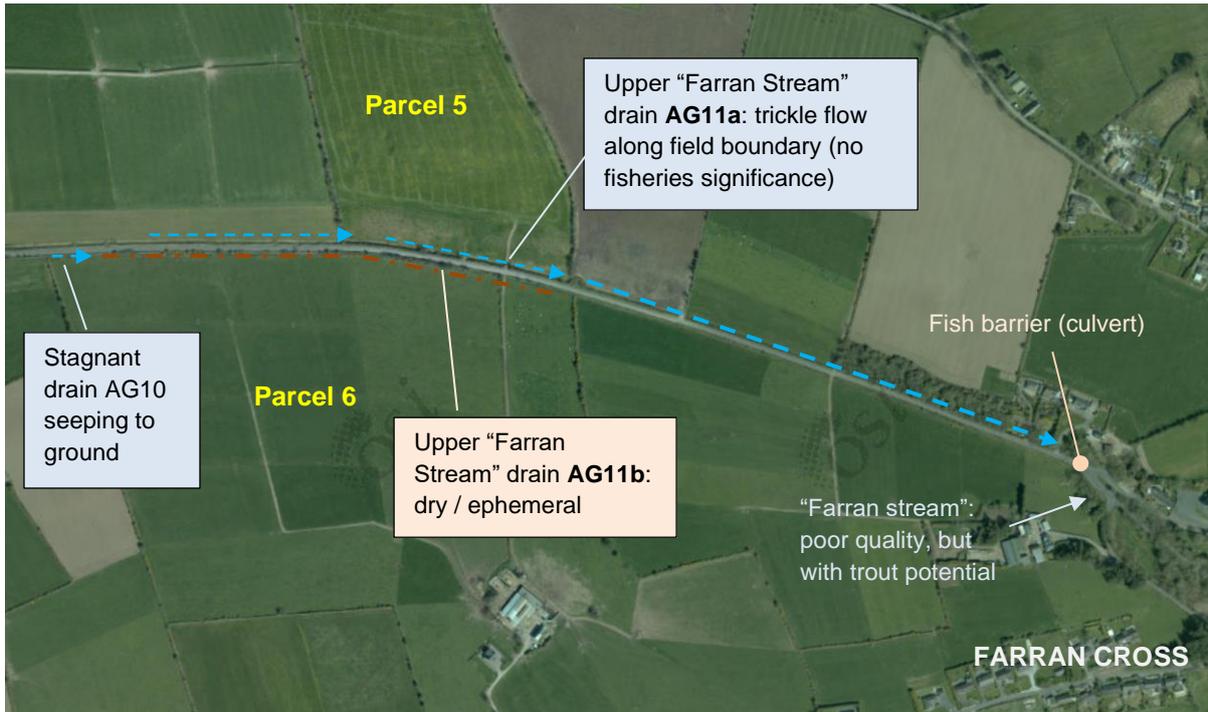


Figure 4-1 Illustration of upper “Farran stream” drains in relation to Parcels 5 and 6

4.4.2 Wider Cumulative Effects

With respect to projects identified by review of Cork County Council and An Bord Pleanála (ABP) for the cumulative assessment (see Section 2.2.9 of the EIA Screening), **Table 4-1** examines the potential for cumulative effects on aquatic ecological receptors.

Table 4-1 Cumulative Effects with Identified developments

| Ref. Number and Status | Distance from Subject Site | Description | Cumulative Effect on Aquatic Ecology |
|---|----------------------------|--|---|
| ABP. 319810 (Appeal Ongoing, Decision Due – 30/09/2024) | c. 1km | 45 no. dwelling units and all associated ancillary development works. | The site is at Coachford, within a separate water sub-catchment to the Aglish solar farm. It is hydrologically connected to the Iniscarra Reservoir but will be connected to the public sewer for the operation phase. If construction phases coincided some cumulative waterborne pollutant losses could occur to the reservoir. However, with mitigations in place to avoid and prevent waterborne pollutant loss during construction of the proposed Aglish solar farm development, there are no significant cumulative effects on aquatic ecological receptors predicted. |
| ABP. 313728 (Granted Permission – 21/08/2023) | c. 2.9km | The alteration of the permitted No.62 detached house type B (under planning permission 19/06613) to 2no. semi-detached 3-bedroom Type F houses on an extended site area and including 5no. new detached 4bedroom dwelling composed of; 2no. Type B and 3No. Type C, together with associated site development works. | The site is at Cloughduv, within a separate water sub-catchment to the Aglish solar farm. It is hydrologically connected to the River Bride but will be connected to the public sewer for the operation phase. If construction phases coincided some cumulative waterborne pollutant losses could occur to the River Bride. However, with mitigations in place to avoid and prevent waterborne pollutant loss during construction of the proposed Aglish solar farm development, there are no significant cumulative effects on aquatic ecological receptors predicted. |

| | | | |
|--|------------------|---|--|
| <p>PL. 22/4909 (Granted Permission – 15/06/2022)</p> | <p>c. 6.6km</p> | <p>Modification to the solar farm permitted under planning reg no. 15/6625 and extended under 21/4505. The modifications consist of changes to the dimensions of the permitted photovoltaic panels, replacement of the 2 transformer stations with 1 smaller transformer station and 1 smaller storage unit, changes to the design of the delivery station and associated layout changes. All modifications are within the boundary of the permitted development.</p> | <p>No significant cumulative effects predicted with proposed Aglish solar farm development as these are minor changes with no significant sources of waterborne pollutant loss.</p> |
| <p>ABP. 310214 Granted Permission – 18/01/2022)</p> | <p>c. 1km</p> | <p>Development of a small-scale quarry for rock extraction.</p> | <p>Located 4km west of Coachford, in a separate water sub-catchment, this application concerned an extension of an existing quarry, with natural (mainly infiltration) drainage to Iniscarra Reservoir. The permitted development includes site-specific mitigation measures to address potential impacts on water and ABP considered that significant adverse impacts on water (and hence aquatic receptors of Iniscarra Reservoir) would not arise from the proposed development. There are hence no cumulative effects on aquatic receptors predicted in combination with the construction phase of the Aglish solar development.</p> |
| <p>ABP. 309891 (Granted Permission – 23/09/2021)</p> | <p>C. 2.18km</p> | <p>Extension of existing quarry excavation area (06/13499 and PL04.226347).</p> | <p>Located between Cloughdub and Crookstown on the Brouen River tributary of the River Bride, confluencing 5km upstream of the “Farran Stream” tributary. The quarry is subject to ongoing dewatering for which it has a discharge licence and monitoring requirements to ensure water quality compliance. Water pumped out of the quarry passes through a water attenuation/settlement system prior to discharge to the Brouen River for removal of suspended sediments as well as an oil interceptor at the existing discharge point. Noting that only Parcels 5 and 6 eventually drain to the River Bride, with mitigations in place to avoid and prevent waterborne pollutant loss during construction of the proposed Aglish solar farm development in Parcels 5 and 6, no significant cumulative effects on aquatic ecological receptors of the River Bride are predicted with this development.</p> |
| <p>PL. 20/4916 (Extension of Duration Granted – 1/07/2020)</p> | <p>c. 3.6km</p> | <p>A solar PV panel array consisting of up to 5400sqm of solar panels on ground mounted steel frames, electricity control room, power inverter unit, underground cable ducts, temporary laydown area, boundary security fence, site entrance, CCTV and all associated site works. Extension of Duration of permission granted under Planning Reference 14/06644 and (ABP 04.244539).</p> | <p>This small development site drains via a small field boundary drain that is a tributary of Carrigadrohid Reservoir, confluencing approximately 10km upstream of the (proposed Aglish solar development) Kame River confluence with Iniscarra Reservoir. Given the separation distance and the fact that Carrigadrohid Dam intercepts flow, there is not considered to be reasonable potential for cumulative effects on aquatic receptors in combination with the construction phase of the proposed Aglish solar development even if both developments occurred concurrently.</p> |

Other principal catchment activities with potential cumulative effects on aquatic receptors include ongoing agricultural activities (nutrient and sediment runoff) and rural housing with associated infrastructure (e.g., septic tanks, domestic wastewater). These aspects are a continuously evolving background and have no additional in-combination effects with respect to the potential temporary-to-short term effects predicted during construction of the proposed solar farm, substation and grid connection route.

During the operational phase, there is potential for an overall positive impact on aquatic ecology owing to a net reduction in the regular agricultural activities on the solar farm lands which can affect water quality. For example, across the 160ha solar farm site there will be no broad scale ploughing/reseeding of fields; no herbicides to be used in the solar farm management, plus the introduction of swathes of unfertilized species rich grassland buffers.

5 MITIGATION

5.1 Aglish Solar Farm

The CEMP and CMS set out best practise methods and specific measures in relation to the solar farm (plus interconnectors), substation, interface towers and GCR covering the construction / operation and decommissioning phases. Contractors will be obliged to adopt the CEMP and the CMS as their own and adhere to its contents, updated to include any requirements conditioned in the planning permission. In this regard, the CEMP, the CMS and any additional specific measures in Section 5 of this chapter will be used by the appointed contractor to prepare the updated final CEMP and CMS prior to the commencement of any onsite works.

It is important that IFI (Macroom) are notified well in advance of the construction commencement in relation to the 7 no. HDD crossings⁵ of small streams / drains to confirm that timing restrictions do not apply and to provide them with a copy of the HDD construction method statement and emergency frack-out plan (taken from the CEMP).

Sections 5.1.1, 5.1.2, 5.1.3 and 5.1.4, below, detail construction, operation, decommissioning phase and cumulative impact mitigation in relation to aquatic receptors.

5.1.1 Construction Phase Mitigation

| Objective | Measure | Details of Mitigation |
|--|-------------------------------------|--|
| Water quality and Aquatic habitat protection | Temporary Works Drainage Management | <p>During excavation and construction of access tracks and associated over the edge drainage: on tracks that run directly downhill towards watercourses and field boundary drains, there must be a series of temporary gravel check-dams, as necessary, installed along the parallel drainage flow path in order to attenuate and slow run-off velocities during the construction phase. These must remain in place until such time as the track surfaces have bedded in and over-the-edge drainage pathways have revegetated. Temporary check dams may be removed following revegetation of over these over the edge drainage pathways, except on the slightly higher gradient downslopes of Parcel 5 and Parcel 4 where intermittent check-dams must be maintained through the operation phase on over the edge drainage flow paths that run directly downhill.</p> <p>During soil excavation associated with temporary site compound area construction there must be temporary silt fencing installed on the downslope leading to any minor field drain or watercourse.</p> |

⁵ Including the underground grid connection which forms part of the Strategic Infrastructure Development (SID) application to an Bord Pleanála.

| Objective | Measure | Details of Mitigation |
|---|--|--|
| | | Any existing preferential over-land flow paths or field drains between the access tracks or temporary compound areas sites must be bunded or have temporary check dams installed prior to works commencing to prevent escapement of suspended solids to downstream drains / streams. |
| Water quality and Aquatic habitat protection HDD crossings | IFI Consultation | IFI must be contacted and consulted prior to HDD works commencing. A copy of the CMS relating to the HDD methods and the emergency frack-out response (within the CEMP) must be provided. |
| Water quality and Aquatic habitat protection – HDD crossings | Timing of HDD Crossing Works | The HDD crossings are not likely to be subject to timing restrictions that apply to the closed fisheries season, so long as suitable mitigation measures in place in event of a frack-out. However, the timing of these works must be agreed with IFI well in advance of their commencement. |
| Water quality and Aquatic habitat protection – HDD crossings | Best Practice during HDD Construction | <p>There must be no discharge of suspended solids or any other deleterious matter to watercourses during the HDD work. Any silt contaminated water from the works area (launch/reception pits) must be treated prior to discharge. The Contractor shall employ best practice settling systems to ensure maximum removal of suspended solids prior to discharge of any surface water or groundwater from excavations to receiving waterbodies. This may include treatment via settlement tanks. There must be no direct pumping of silt/sediment laden water from the works to the active watercourse at any time.</p> <p>Any preferential over-land flow paths or drains between the launch and reception pit sites must be bunded or have temporary check dams installed prior to works commencing to prevent any escaped drilling fluid from reaching the stream.</p> |
| Water quality and Aquatic habitat protection – HDD crossings | Emergency Procedure for HDD Frack-out | <p>The emergency response procedure for accidental frack-out (burst of drilling fluid from drilled ground) is included in the CEMP. This must be adhered to by the contractor. A tool-box talk must be delivered by the Site Environmental Manager (SEM) to all plant operators/ on-site personnel to ensure the emergency procedure is understood, and all necessary equipment and materials to deal with escaped fluids must be on hand and ready for use.</p> <p>The aim of the emergency response is to immediately cease drilling and withdraw fluids from the bore to reduce sources of suspended solids, and / or contain and treat any frack-out / spillage of fluid to land before it reaches the watercourse. If large quantities of drilling fluid escape to a flowing watercourse, IFI must be notified on the pollution hotline. This applies primarily at the crossing of the Kame River (Site AG1) where there is good fisheries habitat.</p> |
| Water quality and Aquatic habitat protection – Dry-deck crossings | Best Practice during dry-deck Construction | <p>Access track approaches to each side of the dry deck will be managed to avoid and prevent run-off of waterborne sediment during the installation of the dry deck.</p> <p>In advance of the stream crossing works, a staked silt fence shall be installed at a distance of 2-3m from the channel on both banks. The approaching track excavations should be stopped at this distance back from the channel, hence retaining a vegetated buffer strip between the access track approach and the channel until such time as the dry deck is lifted into place.</p> <p>Silt fencing shall be retained on the downslope between the dry deck plinth and the channel until such time as the access track has bedded in and the access track drainage flow paths have revegetated.</p> <p>The flow paths alongside the access tracks approaching stream crossing dry-decks in parcels 1, 4, 5 and 6 shall have a temporary gravel check-dam installed for the construction phase to slow velocity and attenuate flow prior to reaching the channel. These check-dams will be</p> |

| Objective | Measure | Details of Mitigation |
|--|--|---|
| | | removed once the over-the edge flow paths that meet the drains are fully revegetated. |
| Prevention of spread of pathogens and invasive species | Biosecurity Measures | Transfer of invasive plant species between sites within catchments and to other catchments must be prevented. An invasive species management plan must identify specific locations of invasive plants, (e.g., Himalayan balsam, Japanese Knotweed) at watercourse crossings and along any cable trenching routes. The final Construction Method Statement shall set out methods for management and prevention of invasive species transfer. |
| Prevention and control of sediment loss | Best Management Practice – Cable Trenching | <p>All trenching works shall be undertaken using a cut and fill procedure to ensure that only short sections of the trench ($\leq 100\text{m}$) are open at any time as set out in the CEMP.</p> <p>Any run-off water which gathers in an excavated trench must be collected and treated appropriately using Best Practice methods (e.g., silt bags, settlement systems) before being discharged. There will be no discharge of silt contaminated pump-out water to on-site drains or watercourses.</p> <p>Spoil heaps are unlikely to accumulate because trenches will be immediately back filled following ducting installation. Any freshly excavated spoil must be retained in an area over 10m away from any drain or watercourse until such time as the trench is refilled. The spoil heap must be located on either a well vegetated area surrounded by silt fencing or with the use of containment measures (geotextile mat or bag) and covered to reduce potential for sediment export. A ready supply of these materials must be always onsite to deal with such eventualities.</p> <p>Where ancillary onsite drains are crossed with underground ducting, the release of sediment over baseline conditions will be prevented by the use of silt traps, check dams and/or bunds (including the use of staked down geotextile wrapped haybales) in dry or stagnant drains. These will be put in place on either side of the dry drain crossing location in advance of construction works.</p> |
| Prevention and control of sediment loss | Best Management Practice – Soil storage | Soil stripped in the construction of access tracks and temporary compound areas may be stored temporarily for reuse in reinstatement. Such material will be stored not less than 10m from any on-site drain and must be tamped down, reseeded with grass and allowed to revegetate for the duration of the construction phase. The stockpiles will be surrounded by staked-down silt fencing. |
| Prevention and control of sediment loss | Best Management Practice – Soil spreading | Stripped soil that is used for site infill, must be tamped down and immediately rolled and reseeded with an appropriate grass seed mix to establish vegetative cover and reduce potential solids washout. The use of hydroseeding is encouraged to quickly establish vegetation cover. Any localised agricultural drains should have temporary bunds (e.g., earthen or stake + geotextile) installed to prevent waterborne sediment run-off until such time as the areas have revegetated. |
| Avoid Hydrocarbon Loss | Best Management Practice - Hydrocarbons | <p>No storage of hydrocarbons or any polluting chemicals can occur within 50m of watercourses or surface water features. Any diesel or fuel oils stored on site will be banded to 110% of the capacity of the storage tank. Design and installation of fuel tanks to be in accordance with best practice guidelines and oil storage guidelines. Drip trays and spill kits must be kept available on site.</p> <p>Temporary parking and refuelling areas must be designated within the construction compound. These areas will be at least 50m away from watercourses and drains.</p> |
| Overseeing of environmental controls | Monitoring during Construction | A suitably qualified Environmental Clerk of Works (ECOW) will be employed to oversee the construction phase, including any advance works period, to ensure compliance with methods, mitigation measures and monitoring set out in the CMS / CEMP and Section 5 of this document. The ECOW will be present during key parts of the |

| Objective | Measure | Details of Mitigation |
|-----------|---------|--|
| | | construction phase, i.e., HDD crossing and dry deck crossings to protect water quality and avoid potential impacts on aquatic receptors. See Section 6 for details of the ECoW role and responsibilities. |

5.1.2 Operational Phase Mitigation

| Objective | Measure | Details of Mitigation |
|--|------------------------|---|
| Water quality and Aquatic habitat protection | Buffer zone management | To ensure the continued functioning of buffer zones alongside on-site drains and streams, the riparian vegetation should be protected by exclusion of continual grazing. The biodiversity enhancement proposals for the site detail the maintenance of uncropped tussocky grassland establishment along these stream / drain buffers. The appropriate way to manage these as buffer zones is to exclude uncontrolled grazing. The zones can be occasionally grazed and/or mowed to encourage a rich and diverse sward which enhances the filtering and attenuation function. |
| Water quality and Aquatic habitat protection | Drainage Maintenance | Access tracks will be embedded in with over-the-edge drainage to vegetated ground. The access tracks and any parallel, vegetated flow paths will be subject to routine maintenance and repair, as required, to ensure no obvious erosion and sediment washout is occurring. Over the course of the operation phase, observations shall be made during regular site visits. If there are any obvious erosion hot-spots on preferential flow paths from access tracks, then necessary surface repairs will be carried out as soon as practicable, with additional check-dams installed (and allowed to revegetate) into the preferential drainage flow path, where required to increase attenuation and slow run-off velocity locally. |

5.1.3 Decommissioning Phase Mitigation

| Objective | Measure | Details of Mitigation |
|--|--|---|
| Water quality and Aquatic habitat protection | Waterborne pollutant runoff measures as set out in Section 5.1.1 (above) | Environmental protection measures for decommissioning would be the same as during construction, with measures relating to surface water management that increase on-site attenuation and prevent excessive sediment loss and other pollutant losses from the land parcels via surface flow or field drains. |
| Overseeing of environmental controls | Monitoring during Decommissioning | It would be envisaged that a suitably qualified Environmental Clerk of Works (ECoW) will be employed to oversee the decommissioning works (in accordance with the approved decommissioning plan) to ensure compliance with methods and mitigations that match those used in the construction phase that will avoid and prevent water quality pollution and aquatic habitat impacts. |

5.1.4 Cumulative Impact Mitigation

| Objective | Measure | Details of Mitigation |
|--|--------------------------------|---|
| Minimize in-combination effects of sediment loss | Phasing of works | The overall project phasing as set out in Fig. 2 Section 2.1 of the CEMP along with rigorous implementation and maintenance of construction phase best practise and specific mitigation measures set out in the CMS and OCEMP and this document will reduce potential for cumulative impact arising from the construction of Aglish Solar Farm and the (future proposed) Grid Connection Route and 110kV Substation. |
| Overseeing of environmental controls | Monitoring during Construction | A suitably qualified Environmental Clerk of Works (ECoW) will be employed to oversee the construction phase, including any advance works period, to ensure compliance with methods, mitigation measures and monitoring set out in the CEMP and Section 5 of this document. The ECoW will be present during key parts of the construction phase, i.e., dry deck installations, HDD stream crossings, to protect water quality and avoid potential impacts on aquatic receptors. See Section 6 for details of the ECoW role and responsibilities. |

5.2 Aglish 110kV Substation and GCR

The substation, interface towers and the GCR are located in Parcels 5 and 6, with only minor drainage channels distantly connecting to the River Bride (Lee). The GCR is relatively short and involves no direct watercourse interactions, with just one HDD crossing under minor, upper “Farran stream” drains. The substation proposal also involves no direct watercourse interaction.

Contractors will be obliged to adopt the OCEMP and the CMS as their own and adhere to its contents, updated to include any requirements conditioned in the planning permission. In this regard, the CEMP, the CMS and any additional specific measures in Section 5 of this chapter will be used by the appointed contractor to prepare the updated final CEMP and CMS prior to the commencement of any onsite works. **Sections 5.2.1 and 5.2.3** detail construction phase and cumulative impact mitigation in relation to aquatic receptors for the 110kV Substation and GCR.

5.2.1 Construction Phase Mitigation

| Objective | Measure | Details of Mitigation |
|--------------------------|-------------------------------------|---|
| Control of sediment loss | Temporary Works Drainage Management | <p>During excavation and construction of the substation and GCR access tracks and associated over the edge drainage - there must be a series of temporary gravel check-dams (or similar, e.g., staked geotextile), as necessary, installed along the drainage flow paths to slow run-off velocities and attenuate flows. These must remain in place until such time as the track surfaces have bedded in and vegetation has re-established alongside tracks. Temporary check dams may be removed when over the edge drainage areas have revegetated, but on higher gradient downslopes permanent gravel check-dams must be retained and allowed to revegetate to prevent scouring of flow paths during operation.</p> <p>During soil excavation associated with the substation foundation, access tracks and/or temporary site compound area construction there must be temporary silt fencing installed on the downslope at the edge of the agricultural / roadside drain (AG 11a and AG11b) in Parcels 5 and 6.</p> <p>Any existing preferential over-land flow paths or drains between the access tracks, substation site and/or temporary compound sites in</p> |

| Objective | Measure | Details of Mitigation |
|--------------------------|---|--|
| | | Parcels 5 and 6 must be bunded or have temporary check dams installed prior to works commencing to prevent any escaped suspended solids from reaching the drain. |
| Control of sediment loss | Best Management Practice – Sediment (GCR Cable Trenching) | <p>All trenching works shall be undertaken using a cut and fill procedure to ensure that only short sections of the trench are open at any time (maximum 100m at any one time).</p> <p>Any water which gathers in the trench must be collected and treated appropriately on or off site before being disposed of in accordance with conditions set out by the relevant authorities. It will not be discharged directly to the upper “Farran stream” drains.</p> <p>Spoil heaps are unlikely to accumulate because trenches will be immediately back filled following ducting installation. Freshly excavated spoil must be retained in an area over 5m away from any drain or watercourse until such time as the trench is refilled. The spoil heap must be located on either a well vegetated area surrounded by silt fencing or with the use of containment measures (geotextile mat or bag) and covered to reduce potential for sediment export. A ready supply of these materials must be always onsite to deal with these eventualities.</p> <p>Where ancillary drains are crossed with underground ducting, the release of sediment over baseline conditions will be prevented by the use of silt traps, check dams and/or bunds. These will be put in place in advance of construction works.</p> |
| Control of sediment loss | Best Management Practice – Sediment (Cable Trenching) | Such material will be spread at not less than 10m from any on-site drain and must be reseeded with an appropriate grass seed mix and rolled immediately to establish vegetative cover and reduce potential solids washout. Any surplus spoil must be removed from the site and disposed of in accordance with conditions set out by relevant authorities. |
| Avoid Hydrocarbon Loss | Best Management Practice - Hydrocarbons | <p>Temporary parking and refuelling areas must be designated within a designated area along the grid connection construction route. These areas will be at least 50m away from watercourses and drains. Design and installation of fuel tanks to be in accordance with best practice guidelines and oil storage guidelines. Drip trays and spill kits must be kept available on site.</p> <p>No storage of hydrocarbons or any polluting chemicals can occur within 50m of watercourses or surface water features. Any diesel or fuel oils stored on site will be bunded to 110% of the capacity of the storage tank.</p> |

5.2.2 Operational Phase Mitigation

None required.

5.2.3 Cumulative Impact Mitigation

| Objective | Measure | Details of Mitigation |
|--|------------------|--|
| Minimize in-combination effects of sediment loss | Phasing of works | <p>Phasing of construction works will occur as set out in Fig. 2, Section 2.1 of the CEMP. This sets out a clear separation of the main periods of soil stripping in relation to aspects of the sub-station, the GCR and the solar farm construction.</p> <p>The rigorous implementation and maintenance of construction phase best practise and specific mitigation measures set out in the CMS, CEMP and this document will reduce potential for cumulative impact</p> |

| Objective | Measure | Details of Mitigation |
|--------------------------------------|--------------------------------|--|
| | | arising from potential simultaneous construction of Aglish Solar Farm, Substation and Grid Connection works. |
| Overseeing of environmental controls | Monitoring during Construction | A suitably qualified Environmental Clerk of Works (ECoW) will be employed to oversee the substation and GCR construction phase, including any advance works period, to ensure compliance with methods, mitigation measures and monitoring set out in the CEMP and Section 5 of this document. The ECoW will be present during key parts of the construction phase, i.e., dry deck installations, HDD drain crossing, to protect water quality and avoid potential impacts on aquatic receptors. See Section 6 for details of the ECoW role and responsibilities. |

6 MONITORING

6.1 Roles and Responsibilities

The main contractor will engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in construction to fulfil the role of Environmental Clerk of Works (ECoW) to ensure that methodologies and mitigation are followed throughout construction to avoid negatively impacting on the receiving aquatic environment.

The ECoW will be based on site, overseeing the implementation of pollution mitigation measures, compliance with any environmental planning conditions, monitoring and reporting on environmental aspects of the development. Regulation and ongoing maintenance of the mitigation measures will be the responsibility of the contractor, as directed by regular observations made by the ECoW to ensure water quality protection measures are being adhered to. Should the ECoW observe that erosion and sediment control measures are not functioning properly, they shall have the authority to stop works until such measures have been implemented properly in accordance with the CEMP and the CMS.

6.2 Visual Monitoring

Twice daily visual checks of HDD construction site area, particularly launch and reception site areas will be conducted by the ECoW to ensure all standard sediment control and emergency spillage / frack-out measures are in place.

The ECoW shall ensure pre-installation of silt fencing along the watercourses subject to dry deck crossings on either bank in relation to the access track approaches. Given the channels are very minor, twice weekly visual checks of each dry deck crossing works area will be conducted by the ECoW to ensure all sediment control and water quality protection measures are in place until such time as the structures have been installed and surrounding vegetation has re-established.

7 RESIDUAL EFFECTS

7.1 Aglish Solar Farm

During construction, with all measures and mitigations implemented and monitored in accordance with the CEMP, the CMS and Section 5 of this report, the effects on Inniscarra Reservoir and its small tributaries (Cooldrum, Rathonoane, Nadrid and Aglish 19) will be limited to, at worst, temporary, localised, slightly negative disturbance perhaps affecting the diversity and abundance of macroinvertebrate communities locally, but the effect will be **not significant**. Following a brief disturbance to localised, low-quality aquatic macroinvertebrate communities of the “Farran stream” drains adjacent to Parcels 5 and 6 (associated with dry deck installation and solar farm construction, there are no likely significant residual effects on the Bride (Lee)_040 water catchment or downstream

fisheries habitat. Key mitigations are in relation to sediment / pollutant runoff controls and overall phasing of works in relation to the concurrent substation and GCR construction in Parcels 5 and 6.

During the operational phase, the change of land use away from the existing level of agricultural use to a lower intensity land use with associated continuous vegetative cover and management of drain riparian areas as wild tussocky grassland buffer zones will mean that, compared to the baseline situation, operational effects will be at worst **imperceptible** and may even be **slightly positive** in terms of improved water quality and hence aquatic habitat improvement.

7.2 Aglish 110kV Substation and Grid Connection Route

During construction, with all measures and mitigations implemented and monitored in accordance with the CEMP, the CMS and Section 5 of this report, the effects on the “Farran stream” drains and the poor quality habitat downstream will be limited to, at worst, temporary, localised, slightly negative disturbance perhaps affecting the diversity and abundance of macroinvertebrate communities locally, but the effect will be **not significant**. The separation distance of the substation and the GCR from the downstream River Bride or the reach of the “Farran stream” with fisheries significance (700m downstream) means there will be no likely significant effects on fisheries value in the Bride (Lee)_040 water catchment. Given the overall phasing of the elements, the cumulative impact risk with the solar farm construction is also low at the outset. With all measures and mitigations implemented and monitored in accordance with the CEMP and Section 5 of this report, the cumulative impact on aquatic receptors of the River Bride will be not significant in relation to the 110kV substation and GCR in combination with the solar farm elements.

7.3 European Sites

In respect of the separation distance to the nearest downstream European sites, i.e., 29.5km (hydrologically) to Cork Harbour SPA and 34.4km (hydrologically) to Great Island Channel SAC, even in the absence of specific mitigations and certainly with the implementation of all environmental controls and mitigations to avoid and prevent localised effects on aquatic receptors (as set out in this document), there would be no perceptible effect on qualifying interest wetland habitat of Cork Harbour SPA, nor the marine qualifying interest habitats of Great Island Channel SAC. The AA Screening Report accompanying this application sets out the full assessment of effects on European sites.

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APPENDIX 1 Impact Magnitude Criteria

Ecological Impact Assessment criteria for impact magnitude (derived from NRA, 2009)

| Impact Magnitude | Internationally important (A sites) | Nationally important (B sites) | High value, locally important (C sites) | Moderate value, locally important (D sites) | Low value, locally important (E sites) |
|-------------------------------|---|---|--|--|---|
| Profound negative | Any permanent impacts | Permanent impacts on a large part of a site | | | |
| Significant negative | Temporary impacts on a large part of a site | Permanent impacts on a small part of a site | Permanent impacts on a large part of a site | | |
| Moderate Negative | Temporary impacts on a small part of a site | Temporary impacts on a large part of a site | Permanent impacts on a small part of a site | Permanent impacts on a small part of a site | Permanent impact on a site if part of a designated site |
| Slight Negative | | Temporary impacts on a small part of a site | Temporary impacts on a large part of a site | Permanent impacts on a small part of a site | Permanent impacts on a large part of a site |
| Imperceptible Negative | | | Temporary impacts on a small part of the site | Temporary impacts on a small part of the site | Permanent impacts on a small part of a site |
| Neutral | No impacts | No impacts | No impacts | No impacts | No impacts |
| Slight Positive | | | | Permanent beneficial impacts on a small part of a site | Permanent beneficial impacts on a large part of a site |

APPENDIX 2 Q-value Macroinvertebrate Taxa

| SITE | | AG1 | AG2 | AG3 | AG4 | AG5a | AG6 | AG7 | AG11a | AG12 |
|----------------------------------|---|-----------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|---------------------------|----------------|-----------------------|------------------|
| Stream | | Kame (lower) | Kame (upper) | Cooldrum | Rathonoane | Nadrid | Aglish 19 | Nadrid | "Farran stream" drain | "Farran stream" |
| Sample Date | | 28/07/2024 | 28/07/2024 | 28/07/2024 | 28/07/2024 | 28/07/2024 | 28/07/2024 | 28/07/2024 | 13/08/2024 | 13/08/2024 |
| Wet-width (m) | | 2.40 | 0.80 | 0.90 | 1.90 | 0.90 | 0.40 | 1.8 | 0.75 | 1.90 |
| Depth (cm) | | 12cm | 5cm | 8cm | 10cm | 2cm | 2cm | 10cm | 1cm | 3cm |
| Flow type | | Riffle/run | Trickle, riffle/run | Riffle/run | Riffle/run | Riffle/run | Trickle riffle/run | Riffle/run | Trickle, riffle/run | Riffle/run /pool |
| Substrate | | Cobble, gravel, coarse sand | Bedrock, Cobble, gravel | Bedrock, Cobble, gravel | Cobble, gravel, coarse sand | Embedded cobble, gravel | gravel, coarse sand, silt | Cobble, pebble | Gravel, silt | Bedrock, gravel |
| Easting ITM | | 544085 | 542572 | 542283 | 544662 | 545829 | 546750 | 546655 | 548277 | 548934 |
| Northing ITM | | 571343 | 571231 | 570300 | 569975 | 569861 | 569932 | 570713 | 569748 | 569503 |
| Taxa | | | | | | | | | | |
| MAYFLIES (Ephemeroptera) | | | | | | | | | | |
| <i>Ecdyonurus</i> | A | 5 | | | 1 | 3 | | 2 | | |
| <i>Rhithrogenia</i> | A | 100+ | | 4 | 5 | | | | | 10 |
| <i>Seratella ignita</i> | C | 3 | | | | 2 | | 5 | | |
| Baetidae | C | 100+ | 25 | 15 | 60 | 100+ | 50 | 50 | 5 | 21 |
| STONEFLIES (Plecoptera) | | | | | | | | | | |
| <i>Siphonoperla</i> | A | 7 | | | | | | 10 | | |
| <i>Isoperla grammatica</i> | A | 8 | | 2 | 3 | 4 | | | | |
| <i>Leuctra</i> | B | | | | 2 | | | 3 | | |
| CADDISFLIES (Trichoptera) | | | | | | | | | | |
| <i>Odontocerum albicorne</i> | B | 2 | | 7 | | | | | | |
| <i>Sericostoma personatum</i> | B | | | 5 | | | | | | |
| Polycentropidae | C | | 1 | | | | | 2 | 1 | |
| Limnephilidae | C | | 2 | 3 | | | | | | |
| Philopotomidae | C | | | 75 | | | 8 | | | 10 |
| Hydropsychidae | C | 3 | | 21 | | | | | | |
| Rhyacophilidae | C | 5 | | 5 | 12 | 4 | 4 | | | 2 |

| SITE | | AG1 | AG2 | AG3 | AG4 | AG5a | AG6 | AG7 | AG11a | AG12 |
|--------------------------------|---|--------------|--------------|-----------|-------------|-----------|------------|-----------|-----------------------|-----------------|
| Stream | | Kame (lower) | Kame (upper) | Cooldrum | Rathonoane | Nadrid | Aglish 19 | Nadrid | "Farran stream" drain | "Farran stream" |
| TRUE FLIES (Diptera) | | | | | | | | | | |
| <i>Dicranota</i> spp. | C | 3 | 2 | 5 | | 5 | | | 3 | 3 |
| Chironomidae | C | 25 | | | 50 | | | | 5 | |
| Tipulidae | C | | | | | | 3 | 1 | | |
| Simuliidae | C | 10 | 3 | 5 | 200+ | 7 | 8 | 10 | | 5 |
| BEETLES (Coleoptera) | | | | | | | | | | |
| Elmidae | C | 5 | | | 10 | 6 | | | | 3 |
| F/W SHRIMPS (Crustacea) | | | | | | | | | | |
| <i>Gammarus</i> sp. | C | 15 | 100+ | 25 | 40 | 35 | 45 | 15 | 100+ | 15 |
| <i>Asellus</i> sp. | D | | 2 | | | | | | | |
| SNAILS (Mollusca) | | | | | | | | | | |
| <i>Ancylus</i> sp. | C | | | 3 | | 4 | | | | |
| <i>Potamopyrgus jenkinsii</i> | C | | | 12 | | | | | | |
| LEECHES (Hirudinea) | | | | | | | | | | |
| <i>Glossophonia complanata</i> | D | | | | | 1 | 3 | | | |
| WORMS (Annelida) | | | | | | | | | | |
| Tubificidae | E | | | | 25 | 40 | 5 | 3 | 2 | |
| Q Value | | Q4-5 | *Q3 | Q4 | Q3-4 | Q4 | *Q3 | Q4 | *Q3 | Q3-4 |
| Potential Status | | High | *Poor | Good | Moderate | Good | *Poor | Good | *Poor | Moderate |

APPENDIX 3 Water Framework Directive Status Map

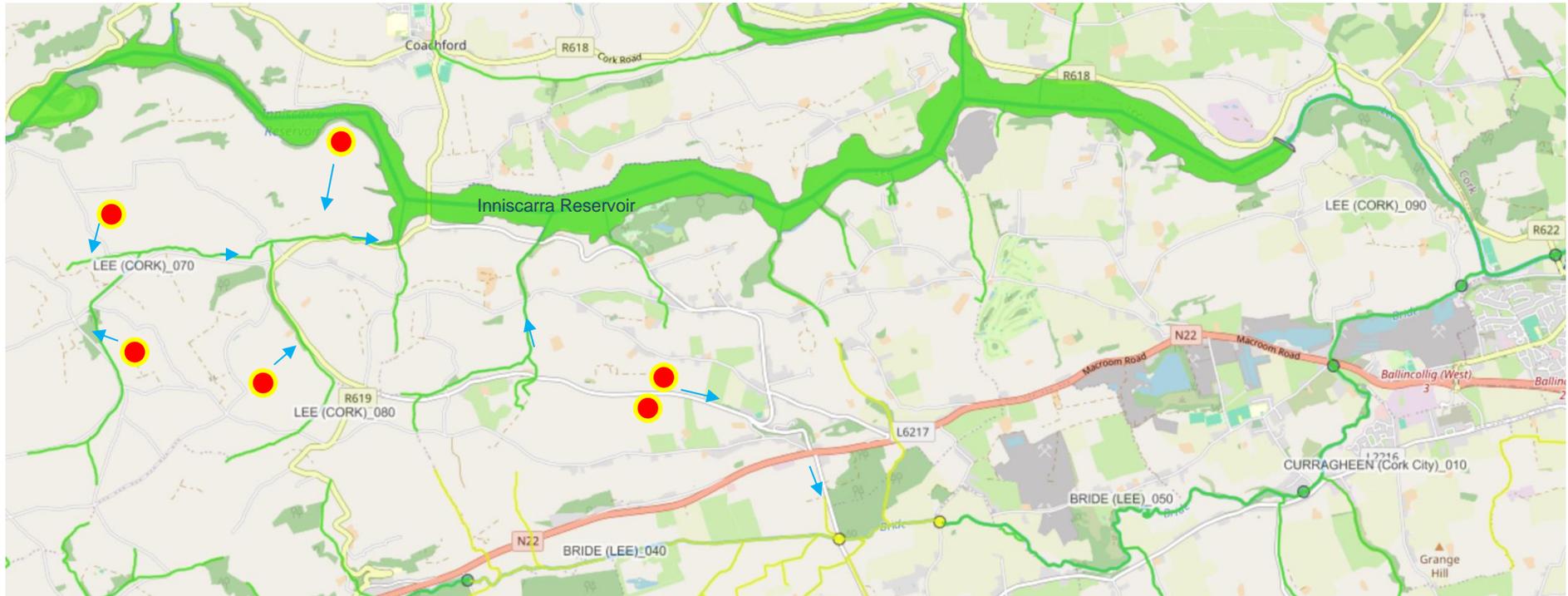


Figure A3: Aglish Solar Farm land parcels and general water flow direction with EPA watercourses and WFD status (Green = Good status; Yellow = Moderate status)