

Proposed Residential Development at Headford Road, Ballinfoyle, Co. Galway



Screening for Appropriate Assessment

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Tait Business Centre, Dominic Street, Limerick City, Ireland.
t. +353 61 313519, f. +353 61 414315
e. info@ecofact.ie
w. www.ecofact.ie



SUMMARY

The proposed development comprises a residential development at a site on Headford Road in the Ballinfoyle area at the northern outskirts of Galway City, Co. Galway. The proposed development consists of a 3-storey apartment building and three 4-bed houses along with amenity green area, carparks and other ancillary site works. This report assesses whether the proposed development is likely to have a significant effect on the Natura 2000 site network.

The proposed development does not lie within the boundary of any Natura 2000 site. The site is located c. 200m from the Lough Corrib SAC and c. 2.3km north of the Galway Bay Complex SAC and the Inner Galway Bay SPA. No direct impacts were identified due to the separation from the site and the Natura 2000 network. Using the Source-pathway-receptor model, one pathway for significant indirect and cumulative impacts was identified via the Galway WwTP, which discharges directly into the Galway Bay Complex SAC and the Inner Galway Bay SPA. Another pathway is identified regarding surface water run-off and groundwater impacts, affecting the Lough Corrib SAC which is c. 220m north-west, and the following habitats: Semi-natural dry grasslands and scrubland facies on calcareous substrates, *Molinia* meadows and Limestone pavement.

There is potential that foul water treatment could result in significant impacts. The proposed development will require a connection to the Galway WwTP, which discharges into the SAC and SPA, providing a pathway for operational phase impacts. There is some uncertainty surrounding the effectiveness of treatment for the plant. Nonetheless, even without uncertainty, this does provide a potential pathway for impacts on water quality relating to foul water treatment. A full assessment and detailed examination of the Galway WwTP, expected discharge from the site, and calculations, is required. This cannot be carried out at the pre-assessment Screening stage.

The receptors for this potential significant effect have been identified as Mudflats and sandflats not covered by seawater at low tide, Large shallow inlets and bays, Reefs, Atlantic salt meadows, Mediterranean salt meadows, Otters and Harbour seal (Galway Bay Complex SAC), and the bird species and Wetland and Waterbirds habitat (Inner Galway Bay SPA).

DoEHLG (2010) notes that if effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). In *Kelly –v- An Bord Pleanála* 2013/802 High Court Judgement Ruling it is stated that the *‘possibility of there being a significant effect on the site will generate the need for an appropriate assessment for the purposes of Article 6(3)’*. As demonstrated in case C-323/17 *People Over Wind* and *Peter Sweetman v Coillte*, mitigation measures are not to be taken into account at the screening stage of Appropriate Assessment. This includes for mitigation by a third party, which in this case would be foul water treatment by the Mutton Island plant. Mitigation is also required for the construction phase.

It is recommended that as part of further assessment that a full ecology survey be completed. During the site visit there were large numbers of Hares recorded on the site along with evidence of breeding activity. There is also the scrub on the site which should be surveyed for the presence of mammals.

Taking the above into account, the proposed development site at Headford Road, Co. Galway therefore requires an Appropriate Assessment (NIS).



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1. INTRODUCTION

The proposed development comprises a residential development at a site on Headford Road in the Ballinfoyle area at the northern outskirts of Galway City, Co. Galway. The proposed development comprises a 3-storey apartment building and three 4-bed houses along with amenity green area, car-parks and other ancillary site works. The current report provides a Screening for Appropriate Assessment for the proposed development.

The Natura 2000 network is a network of nature protection areas across the European Union, comprising of Special Areas of Conservation which are designated under the EU Habitats Directive and Special Protection Areas which are designated under the EU Birds Directive. This report assesses whether the proposed residential development on Headford Road is likely to have a significant effect on the Natura 2000 site network. Effects upon the conservation objectives and qualifying interests (including habitats and species) within the affected designated areas are considered.

The purpose of the Screening for Appropriate Assessment is to identify any such Natura 2000 sites in the locality of proposed plans / projects that are likely to be significantly impacted by the proposed plan / project and / or require mitigation to prevent such impacts. If the proposed plan is found by the Screening to be likely to significantly affect any Natura 2000 site, it will then be subject to a further stage of Appropriate Assessment whereby a Natura Impact Statement is prepared.

Appropriate Assessment is required under Article 6 of the Habitats Directive (92/43/EEC), in instances where a plan or project may give rise to significant effects upon a Natura 2000 site. Natura 2000 sites are those identified as sites of European Community importance designated under the Habitats Directive (1992) or the Birds Directive (2009). The current document meets this requirement by providing a Screening Assessment of the development and follows the guidance for screening published by the Department of the Environment, Heritage and Local Government (DoEHLG 2010) *'Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities'*.

According to DoEHLG (2010), screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the EU Habitats Directive:

- (1) Whether a plan or project is directly connected to or necessary for the management of the site, and;
- (2) Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

Screening is a pre-assessment procedure which considers whether an assessment (i.e. appropriate assessment) is required or not. A project or plan may only pass at the Screening stage if there is no reasonable scientific doubt remaining as to the absence of impacts on the Natura 2000 network. The current screening therefore sets out to determine whether the proposed project, alone or in combination with other plans and projects, is likely to have significant effects on any Qualifying Interests of the Natura 2000 sites within the study area. If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). When assessing the significance of potential effects, DoEHLG (2010) recommends that *"a precautionary approach is fundamental and, in cases of uncertainty, it should be assumed the effects could be significant"*.



1.1 Legislative context

Part XAB of the 2000 Act and SI. No 477 of 2011 transpose into Irish law, Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive) and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). These Directives require Ireland to establish protected sites as part of a European wide network of sites (known in Ireland as European sites) for habitats and species that are of international importance for conservation. In Ireland, European sites include Special Areas of Conservation (SACs, including candidate SACs) and Special Protection Areas (SPAs)". Article 6, paragraphs 3 and 4 of the EC 'Habitats' Directive (1992) state that:

The 1997 Regulations were updated in 1998 by The European Communities (Natural Habitats) (Amendment) Regulations 1998 (S.I. No. 233/1998) to include Council Directive 97/62/EC which served to update Council Directive 92/43/EEC, adapting it to technical and scientific progress made in the intervening years.

The 1997 Regulations were again updated in 2005, by The European Communities (Natural Habitats) (Amendment) Regulations 2005 (S.I. No. 378/2005). This amendment served to consolidate the main nature conservation legislation enacted in Ireland, meaning The Wildlife Act 1976, The Wildlife (Amendment) Act 2000, The European Communities (Natural Habitats) Regulations 1997, The European Communities (Natural Habitats) (Amendment) Regulations 1998, and to draw direct reference upon Council Directive (2009/147/EC) on the conservation of wild birds – '*The Birds Directive*'.

The Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs) whereas the Habitats Directive does the same for habitats and other species groups with Special Areas of Conservation (SACs). It lists certain rare habitats (Annex I) and species (Annex II) whose conservation is of community interest. It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected areas throughout the European Community.

Article 6, paragraphs 3 and 4 of the Habitats Directive state that:

'6(3) Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.'

6(4) If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.'

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial



consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.'

In case C-323/17 People Over Wind and Peter Sweetman v Coillte, the Court of Justice of the European Union (CJEU) ruled that mitigation measures could not be taken into account when undertaking a screening for Appropriate Assessment (AA). If mitigation measures are required to reduce or avoid a significant adverse effect, then Appropriate Assessment is required.

1.2 Consultation

The following bodies provided information for this report, via publicly available sources:

- National Parks and Wildlife Service (NPWS);
- National Biodiversity Data Centre (NBDC);
- Environmental Protection Agency (EPA).

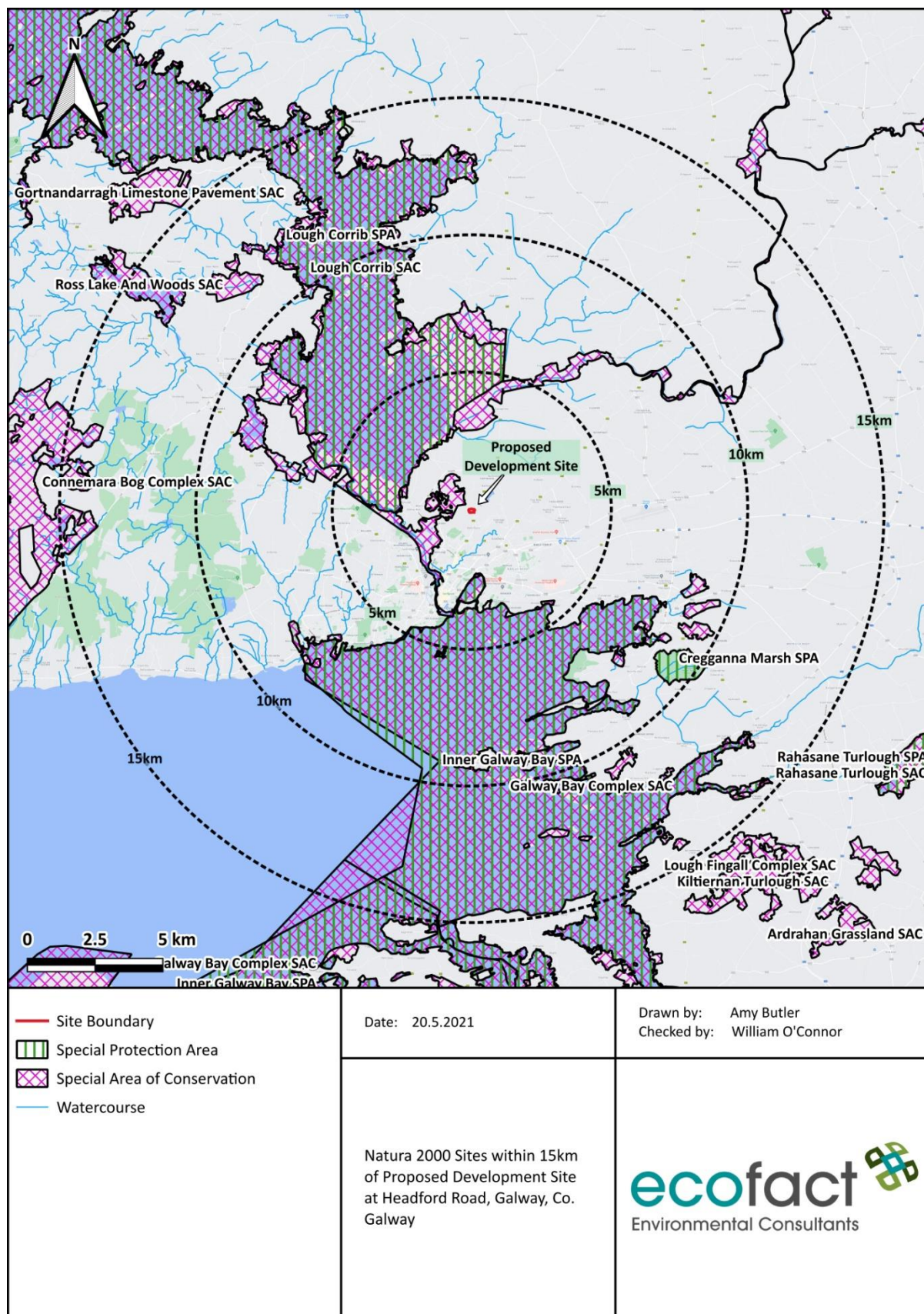


Figure 1 Natura 2000 Sites within 15km of proposed development at Headford Road, Galway, Co. Galway.



2. METHODOLOGY

2.1 Desk study

A desktop study was undertaken to identify the extent and scope of the potentially affected designated Natura 2000 sites within the current study area in relation to the development site. The desktop study identified the qualifying interests (species and habitats) relevant to the designated sites within the area.

Information sources reviewed as part of the current assessment included NPWS site synopses, as well as protected species data held on the NPWS/NBDC online databases. Scientific data on water quality and waterbodies relevant to the subject site was obtained from the websites of the EPA and catchments.ie. The conservation objectives documents as well as the conservation objectives supporting documents relevant to the Natura 2000 site affected were also reviewed on the NPWS website. A full bibliography of information sources reviewed is given in the reference section. Online aerial imagery was accessed to characterize the nature of proposed works locations near the Natura 2000 network.

2.2 Assessment Methodology

The European Commission Guidance Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC prescribes a staged process, as set out below, the need for each stage being dependent on the outcomes of the preceding stage.

1. Screening for Appropriate Assessment
2. Appropriate Assessment
3. Assessment of Alternative Solutions
4. Assessment where no alternative solutions exist and adverse impacts remain, i.e. the Imperative Reasons of Overriding Public Interest test, and compensatory measures

The current report is a Screening Report and therefore makes Stage One assessment only. According to DoEHLG (2010), screening can result in the following possible conclusions or outcomes:

AA is not required. Screening establishes that the plan or project is directly connected with or necessary to the nature conservation management of the site.

No potential for significant effects/AA is not required. Screening establishes that there is no potential for significant effects and the project or plan can proceed as proposed. However, no changes may be made after this as this will invalidate the findings of screening. Documentation of the AA screening process, including conclusions reached and how decisions were made, must be kept on file.

Significant effects are certain, likely or uncertain. The plan or project **must either proceed to Stage 2 (AA), or be rejected.** Rejection of a plan or project that is too potentially damaging and/or inappropriate ends the process and negates any need to proceed to Stage 2 (AA).

The safeguards set out in Article 6(3) and (4) of the Habitats Directive are triggered not by certainty but by the possibility of significant effects. Thus, in line with the precautionary principle, it is unacceptable



to fail to undertake an appropriate assessment on the basis that it is not certain that there are significant effects.

The approach to screening is likely to differ somewhat for plans and projects, depending on scale and on the likely effects. It is stated in DoEHLG (2010) that any Natura 2000 site within or adjacent to the proposed development area as well as any Natura 2000 sites within the likely zone of impact should be included for assessment. A distance of 15km is currently recommended by DoEHLG (2010) to loosely define the zone of impact in the case of plans but the distance could be much less than 15km, and in some cases less than 100m: this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects. In the case of the current project any Natura 2000 sites in close proximity and / or those with downstream hydrological connectivity have been considered.

When doing a screening it is ***merely necessary to determine that there may be such an effect.*** *'The threshold at the first stage of Article 6(3) is a very low one. It operates merely as a trigger, in order to determine whether an appropriate assessment must be undertaken on the implications of the plan or project for the conservation objectives of the site.'* (Finlay Geoghegan J. in Kelly -v- An Bord Pleanála 2013/802 JR). A significant effect is defined as “any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated, but excluding de minimis or inconsequential effects” (EHS, 2002; English Nature, 2004 & 2006; Scottish Natural Heritage, 2006). Where the potential for a significant impact is identified, or if there is any uncertainty regarding an impact, then an Appropriate Assessment must be completed to assess if this effect would cause an integrity level impact. At Appropriate Assessment (NIS) stage mitigation can also be specified to reduce or avoid this effect. A screening assessment cannot replace the requirement of Appropriate Assessment so if any potential impact on qualifying interests or their habitats is identified then Appropriate Assessment is required. Screening must be approached on a precautionary basis with the safeguards set out in Article 6(3) and (4) of the Habitats Directive triggered not by certainty - but by the possibility of significant effects.



3. DESCRIPTION OF PROJECT CHARACTERISTICS

The proposed development site is a vacant site in the Ballinfoyle area of the outskirts of Galway City. The site is located to the north of Galway City on the west side of Headford Road (N84) just over c. 3km north of Eyre Square in the center of the city. The subject site is c. 2.6km south-east of Lough Corrib. Ballindooly Lough is just over c. 0.5km northeast of the subject site. There is a quarry site c. 60m to the west side of the proposed development site. There is also a garage and machinery yard immediately to the south of the proposed development. An industrial complex including large premises / factories of companies including the Clada Group bottling plant and Western Beverages Limited is located on the opposite side (east) of the Headford Road to the proposed development. A number of residential dwellings exist along Headford Road to the north of the proposed development. The proposed development site is on an area of limestone bedrock near the surface, and is classed as an Extreme 'X' groundwater vulnerability area. The site is also over an area with a regionally important aquifer (karstified). The site consists of mainly Wet Grassland habitat (GS4) with some Scrub (WS1) sections, most likely used for livestock grazing.

The proposed development comprises the construction of a housing development (including excavation and levelling of existing sloped ground profile) with ancillary site services on a greenfield site on the Headford Road to the north of Galway City. The proposed development includes a 3-storey apartment building with 21 no. apartment units as well as 3no. dwelling houses. The houses will be detached 4-bedroom units with an adjacent hardstand area and a rear garden for each. There will be 2no. car-parking courts, a 12-space court to the west of the apartment building and a 20-space court to the south of the apartments and the east of the proposed dwelling houses. The proposed development also includes an amenity sports pitch / green area a bin store area, a pumping station, perimeter railings, walls, supplementary tree planting and planted terraces, a maintenance access route, property entrances from Headford Road and onsite vehicle and pedestrian roads / paths / surfaces.

An Engineering Report has been prepared by Galway City Council in May 2021 that outlines the civil and structural design of the project (Galway City Council, 2021). This Stage 1 Report outlines design standards for the Road Layout, Storm Water Management, Surface Water Design, Foul Drainage Design, Water Supply and Site Flood Risk. Regarding foul drainage, the site will be drained internally and will connect to a new pumping station which will be constructed on site. This will also include an underground concrete storage tank for storage of Dry Weather Flow for 24 hours for emergency purposes. The report also outlines that a pre-connection inquiry has been sent to Irish Water (Galway City Council, 2021). For surface water, it is proposed to manage, intercept, treat and contain all surface water within the site boundary via a soakaway. The soakaway will be located underneath the open space and be 5m from the boundary and other structures. Swales will be constructed adjacent to roads where suitable green space is available, including gullies along roads. Further details of the watermain connection, main entrance road and structural details of the proposed houses are provided in the Engineering Report (Galway City Council, 2021).

3.1 Galway WwTP

Due to the location of the site, it is considered likely that the proposed development will be connected to the Galway Wastewater Treatment Plant (WwTP) which is located on Mutton Island and discharges directly into both the Galway Bay Complex SAC and the Inner Galway Bay SPA. It appears that this WwTP was upgraded in 2017 to 170, 000 P.E. The most recent available Annual Environmental Report (AER) at the time of writing (20th September 2021) is from 2019, uploaded to the EPA website on the 4th of March 2021. This AER indicates that the discharge at this time was compliant and the annual



mean and maximum hydraulic loading is less than the peak Treatment Plant Capacity. The remaining capacity of the plant is given as 67,722 for 2019 and the AER notes that the capacity will not be exceeded in the next three years. The AER also notes upgrades planned at the plant to completed with many noted to be at the planning stage (Irish Water, 2019). An Taisce completed a report in August 2020 on the Mutton Island treatment plant (An Taisce, 2020). This report raises serious concerns over the regular release of raw sewage during high overflow events, backed by testing, coupled with restrictions on swimming in nearby beaches issued by the EPA for 'Poor' bathing water quality and therefore challenges that the current capacity of the Mutton Island plant has already been exceed, there is strong uncertainty regarding the adequacy of this plant (An Taisce, 2020).



Figure 2 Location of the proposed development site at Headford Road, Galway, Co. Galway.



4. IDENTIFICATION OF RELEVANT NATURA 2000 SITES

4.1 Rationale for Appropriate Assessment Screening

Article 6 assessments are required under the Habitats Directive (92/43/EEC), in instances where a plan or project may give rise to significant effects upon a Natura 2000 site. Natura 2000 sites are those identified as sites of European Community importance designated under the Habitats Directive (Special Areas of Conservation, here after referred to as SACs) or the Birds Directive (Special Protection Areas, here after referred to as SPAs).

Following the guidelines set out by DoEHLG (2010) Screening for Appropriate Assessment is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3); i.e. whether a plan or project can be excluded from Appropriate Assessment requirements because it is directly connected with or necessary to the management of the site; and the potential effects of a project or plan, either alone or in combination with other projects or plans, on a Natura 2000 site in view of its conservation objectives, and considering whether these effects will be significant.

According to DoEHLG (2010), screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the EU Habitats Directive:

- (1) Whether a plan or project is directly connected to or necessary for the management of the site, and;
- (2) Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

The proposed development at Headford Road does not comply with the first screening test (i.e. the proposed works are not directly connected to or necessary for the management of any Natura 2000 site). The current Screening Assessment therefore sets out to determine whether the development, alone or in combination with other plans and projects, is likely to have significant effects on the Natura 2000 sites within the study area.

4.2 Natura 2000 sites considered for the Proposed Development

The location of the proposed residential development at Headford Road in Co. Galway in the context of the Natura 2000 network is indicated in Figure 2. Special Areas of Conservation (SAC's) are sites of international importance because of the presence of habitats or species that are of European importance, listed on the EU Habitats Directive (1992). Special Protection Areas (SPA's) for birds are designated based on the presence of internationally significant populations of bird species, listed in Annex I of the EU Birds Directive (2009).

Special Areas of Conservation (SAC) and Special Protection Areas (SPAs) considered in the current screening are listed in Table 1. The closest Natura 2000 site to the proposed development is Lough Corrib SAC (000297). The SAC boundary is located c. 200m to the north-west of the proposed development site. Galway Bay Complex SAC (000268) and the Inner Galway Bay SPA (004031) are the next closest sites. Both of these sites are c. 2.3km south of the proposed development site at the closest point at Lough Atalia in Galway City. Also within the 5km radius of the proposed development is the Lough Corrib SPA (004042) which is located at the main Lough Corrib waterbody c. 2.4km north-west of the proposed development site. Creggana Marsh SPA (004142) is the only other Natura 2000 site within 10km of the proposed development. This SPA is c. 8.4km south-east of the proposed



development site. The Connemara Bog Complex SAC (002034) is also c. 13.7km west of the site and the Ross Lake and Woods SAC (001312) is also c. 12.9km north-west.

4.2.1 Lough Corrib SAC

Lough Corrib is situated to the north of Galway City and is the second largest lake in Ireland, with an area of approximately 18,240ha. The lake can be divided into two parts: a relatively shallow basin, underlain by Carboniferous limestone, in the south, and a larger, deeper basin, underlain by more acidic granite, schists, shales and sandstones to the north. This site is designated for the presence of a range of protected habitats and species and this SAC is located c. 200m north-west of the proposed development site.

4.2.1.1 Qualifying Habitats

This SAC is designated for the protection of the following qualifying habitats: Oligotrophic waters containing very few minerals; Oligotrophic to Mesotrophic Standing waters; Hard Water lakes; floating river vegetation; orchid-rich calcareous grassland; *Molinia* meadows; Raised bog (Active)*; Degraded raised bog; Rhynchosporion vegetation; *Cladium* fens; Petrifying springs; Alkaline fens; limestone pavement; Old oak woodlands and bog woodland.

The conservation objectives document for the SAC provided mapping data for some of the habitats designated within the site. Map 3 of the conservation objectives shows the extent of the lake habitats Oligotrophic to Mesotrophic standing waters and hard water lakes. This shows that the majority of Lough Corrib is designated for these habitats, c. 33km north-west of the site (NPWS, 2017)

Map 4 of the conservation objectives shows that the Active raised bog habitat in the SAC is located c. 4.1km north of the proposed development site at its closest point, as Aldergoole Bog (NPWS, 2017).

The conservation objectives Map 5 shows the extent of bog woodland and other active raised bog ecotopes, shown to be c. 5km north of the proposed development site (NPWS, 2017).

Map 6 of the conservation objectives shows that extent of Potential limestone pavements habitats, which may be located c. 220m north-west of the site at its closest point, including the semi-natural dry grassland habitats and *Molinia* meadows which may be associated with limestone pavement (NPWS, 2017).

Map 8 shows woodland habitats in the SAC, in particular the Old Sessile Oak Wood habitats which is c. 26.6km north-west of the proposed development site at its closest point (NPWS, 2017).

4.2.1.2 Qualifying Species

This SAC is designated for the protection of the following qualifying species: Freshwater Pearl Mussel *Margaritifera margaritifera*, White-clawed Crayfish *Austropotamobius pallipes*, Sea lamprey *Petromyzon marinus*, Brook lamprey *Lampetra planeri*, Salmon *Salmo salar*, Lesser Horseshoe bat *Rhinolophus hipposideros*, Otter *Lutra lutra*, Slender Naiad *Najas flexilis*, Slender Green Feather-moss *Hamatocaulis vernicosus*.



Map 9 of the conservation objectives shows the extent of Freshwater Pearl Mussel habitat in the SAC, which is confined to the Owenriff River upstream of Oughterard (NPWS, 2017). This is not located downstream of the site and is more than 20km from the site.

Map 10 shows the extent of Slender Green Feather Moss, shown to be c. 12.4km north of the proposed development site (NPWS, 2017). White-clawed Crayfish are also shown in Map 10, but there is no hydrological connection to this SAC and locations of this species.

Map 11 shows that potential foraging ground and extent of Lesser Horseshoe bats in the SAC is primarily to the north of the SAC at Coalpark, c. 30km from the site (NPWS, 2017).

Map 12 shows Otter commuting routes as the edges of Lough Corrib north of the site (NPWS, 2017). There is no downstream hydrological connection with the SAC. There is also therefore no connection between the site and habitats for Sea lamprey, Brook lamprey and Salmon in the SAC.

Map 13 shows the Slender Naiad species extent as the northern section of Lough Corrib, c. 7km north of the site at its closest point (NPWS, 2017). There is no downstream hydrological connection with the SAC.

4.2.2 Galway Bay Complex SAC

The Galway Bay Complex SAC is located on the west coast of Ireland, where the Burren karstic limestone fringes the southern sides and extends into the sublittoral. West of Galway city the bedrock geology is granite. The site is designated for a diverse range of marine, coastal and terrestrial habitats, making the area of high scientific importance. This SAC is located c. 2.3km south of the proposed development site, but is located at the discharge from the Mutton Island WwTP, to which the proposed development will be connected to for foul water treatment.

4.2.2.1 Qualifying Habitats

The proposed development is located c. 2.3km north of this SAC, and it is assumed the residential development will be connected to the Galway WwTP, located on Mutton Island and discharges directly into the Galway Bay Complex SAC.

Mudflats and sandflats not covered by sea water at low tide are mapped in the conservation objectives for the Galway Bay Complex SAC. Map 3 of the conservation objectives show that this habitat is present c. 2.3km south of the site and adjacent to Mutton Island (NPWS, 2013a).

Coastal lagoons are mapped in the conservation objectives, with the closest locations being Lough Atalia and Renmore Lough south of Galway City (NPWS, 2013a). Map 4 of the conservation objectives shows that this habitat is not located at the proposed development, at Mutton Island or the coast south of the site (NPWS, 2013a).

Large shallow inlets and bays in this SAC are illustrated in Map 5 of the conservation objectives and are shown to be present c. 2.3km south of the proposed development site (NPWS, 2013a). This habitat is also located south of Mutton Island, c. 800m from the WwTP discharge (NPWS, 2013a).

Reefs in this SAC are illustrated in Map 6 of the conservation objectives and are shown to be present c. 2.3km south of the proposed development site (NPWS, 2013a). They are also mapped surrounding Mutton Island, where the location of the Galway WwTP discharge is (NPWS, 2013a).



Perennial vegetation of stony banks are mapped in the conservation objectives for the Galway Bay Complex SAC. Map 8 of the conservation objectives show that this habitat is present c. 2.3km south of the site (NPWS, 2013a).

Salicornia mud habitats are mapped in the conservation objectives for the Galway Bay Complex SAC. Map 9 of the conservation objectives show that this habitat is not located in the vicinity of Mutton island or c. 2.3km south of the proposed development site (NPWS, 2013a). This habitat is located on Tawin island (NPWS, 2013a).

Atlantic salt meadows are illustrated in Map 9 of the conservation objectives and are shown to be present c. 2.3km south of the proposed development site (NPWS, 2013a). This habitat is not located at Mutton Island (NPWS, 2013a).

Mediterranean salt meadows are illustrated in Map 9 of the conservation objectives and are shown to be present c. 2.3km south of the proposed development site (NPWS, 2013a). This habitat is not located at Mutton Island (NPWS, 2013a).

Turloughs are mapped in the conservation objectives, with the closest location being Ballinacourty Turlough, west of Tawin Island (NPWS, 2013a). Map 10 of the conservation objectives shows that this habitat is not located downstream of the proposed development, at Mutton Island or the coast south of the site (NPWS, 2013a).

Juniper scrub habitats in the SAC are mapped in the conservation objectives, with the closest location being Rocklands Juniper Formation east of Galway City (NPWS, 2013a). Map 10 of the conservation objectives shows that this habitat is not located downstream of the proposed development, at Mutton Island or the coast south of the site (NPWS, 2013a).

Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) (*important orchid sites) are not mapped in the conservation objectives but it does note that the extent in the SAC is currently unknown (NPWS, 2013a). It further notes that this habitat is likely to be small and often in a mosaic with other habitats such as limestone pavement and scrub (NPWS, 2013a).

Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* habitat is not mapped in the conservation objectives but it does note that the extent in the SAC is currently unknown (NPWS, 2013a). It further notes that this habitat occurs in wetland in Oranmore, as well as in Ballindereen Lough, usually found in a mosaic of other habitats (NPWS, 2013a).

Alkaline fens habitat is not mapped in the conservation objectives but it does note that the extent in the SAC is currently unknown (NPWS, 2013a). It further notes that this habitat occurs in wetland in Oranmore, as well as in Ballindereen Lough, usually found in a mosaic of other habitats (NPWS, 2013a).

4.2.2.2 Qualifying Species

The Galway Bay Complex SAC is located on the west coast of Ireland, where the Burren karstic limestone fringes the southern sides and extends into the sublittoral. West of Galway city the bedrock geology is granite. The site is designated for the conservation of two protected species within the SAC.



Otter commuting habitat in the SAC is mapped in Map 11 of the conservation objectives, which shows commuting habitat c. 2.3km south of the proposed development and surrounding Mutton Island, where the Galway WwTP is located (NPWS, 2013a).

Harbour seal breeding, moulting and resting and general habitat is mapped in Map 12 of the conservation objectives for the SAC (NPWS, 2013a). This map shows that there is general habitat both c. 2.3km south of the proposed development and at Mutton Island, but no known breeding, resting or moulting sites are located here (NPWS, 2013a).

4.2.3 Inner Galway Bay SPA

4.2.3.1 Qualifying Habitats

The only habitat designated as part of the Inner Galway Bay SPA is the Wetland and waterbirds habitat that the bird species utilise. This habitat comprises the extent of wetlands habitats within the boundary of the SPA. Therefore, this habitat is present both at Mutton Island and c. 2.3km south of the proposed development site (NPWS, 2013b).

4.2.3.2 Qualifying Species

The bird species in the Inner Galway Bay SPA are protected using the ecological characteristics and distributions informed by the supporting documents for the SPA. These supporting documents examine waterbird distributions recorded during the 2009/10 waterbird survey programme, drawing also on data from NPWS monitoring programmes (e.g. benthic surveys) and the Irish Wetland Bird Survey (I-WeBS) (NPWS, 2013c).

Light-bellied Brent Goose are shown in the dot density diagrams for the 2009/10 waterbird surveys to both forage and roost in small numbers c. 2.3km south of the proposed development site and at Mutton Island, in the subtidal zones (NPWS, 2013c). During the winter the site regularly supports 1% or more of the biogeographical population of Light-bellied Brent Goose, with the mean peak number within the SPA during the baseline period (1995/96 – 1999/00) being 676 individuals (NPWS, 2013c).

Red-breasted Merganser are shown in the dot density diagrams for the 2009/10 waterbird surveys to both forage and roost in small numbers c. 2.3km south of the proposed development site and forage Mutton Island, in the subtidal zones (NPWS, 2013c). During the winter the site regularly supports 1% or more of the All-Ireland population of Red-breasted Merganser, with the mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) being 249 individuals (NPWS, 2013c).

Great Northern Diver are shown in the dot density diagrams for the 2009/10 waterbird surveys to forage in small numbers c. 4km south of the proposed development site and also forage at Mutton Island, in the subtidal zones (NPWS, 2013c). During the winter the site regularly supports 1% or more of the biogeographical population of Great Northern Diver, with the mean peak number within the SPA during the baseline period (1995/96 – 1999/00) being 94 individuals (NPWS, 2013c).

Cormorant are shown in the dot density diagrams for the 2009/10 waterbird surveys to both forage and roost c. 2.3km south of the proposed development site and Mutton Island, in the subtidal zones (NPWS, 2013c). During winter the site regularly supports 1% of more of the all-Ireland population of Cormorant, with the mean peak number within the SPA during the baseline period (1995/96 – 1999/00) being 266



individuals (NPWS, 2013c). In 2000, as part of the Seabird 2000 survey, 200 pairs of Cormorant (based on apparently occupied nests were estimated on Deer Island; exceeding the All-Ireland 1% threshold and making the site of national importance for this species (NPWS, 2013c).

Grey Heron are shown in the dot density diagrams for the 2009/10 waterbird surveys to forage in small numbers c. 2.3km south of the proposed development site and also forage at Mutton Island, in the subtidal zones (NPWS, 2013c). During the winter the site regularly supports 1% or more of the All-Ireland population of Grey Heron, with the mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) being 102 individuals (NPWS, 2013c).

Ringed Plover are shown in the dot density diagrams for the 2009/10 waterbird surveys to forage in c. 2.8km south of the proposed development site and also at Mutton Island, in the subtidal zones (NPWS, 2013c). During the winter the site regularly supports 1% or more of the All-Ireland population of Ringed Plover, with the mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) being 335 individuals (NPWS, 2013c).

Bar-tailed Godwit are shown in the dot density diagrams for the 2009/10 waterbird surveys to forage in c. 2.3km south of the proposed development site and also forage at Mutton Island, in the subtidal zones (NPWS, 2013c). During the winter the site regularly supports 1% or more of the All-Ireland population of Bar-tailed Godwit, with the mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) being 447 individuals (NPWS, 2013c).

Turnstone are shown in the dot density diagrams for the 2009/10 waterbird surveys to forage in c. 2.3km south of the proposed development site and also forage at Mutton Island, in the subtidal zones (NPWS, 2013c). During the winter the site regularly supports 1% or more of the All-Ireland population of Turnstone, with the mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) being 182 individuals (NPWS, 2013c).

Wigeon are shown in the dot density diagrams for the 2009/10 waterbird surveys to forage in c. 2.3km south of the proposed development site and also forage at Mutton Island, in the subtidal zones (NPWS, 2013c). For the baseline period surveys of the site (1995/96 – 1999/00) numbers of Wigeon recorded were of All-Ireland importance (NPWS, 2013c).

Teal are shown in the dot density diagrams for the 2009/10 waterbird surveys to forage in c. 2.3km south of the proposed development site and also forage at Mutton Island, in the subtidal zones (NPWS, 2013c). For the baseline period surveys of the site (1995/96 – 1999/00) numbers of Teal recorded were of All-Ireland importance (NPWS, 2013c).

Golden Plover are shown in the dot density diagrams for the 2009/10 waterbird surveys, but based on these surveys do not forage or roost either c. 2.3km south of the proposed development site or at Mutton Island. Instead, these birds are primarily found at Oranmore Bay and Tawin Island (NPWS, 2013c). For the baseline period surveys of the site (1995/96 – 1999/00) numbers of Golden Plover recorded were of All-Ireland importance (NPWS, 2013c).

Lapwing are shown in the dot density diagrams for the 2009/10 waterbird surveys to forage in small numbers c. 2.3km south of the proposed development site in the subtidal zones, but are primarily found in Oranmore Bay and Tawin island (NPWS, 2013c). For the baseline period surveys of the site (1995/96 – 1999/00) numbers of Lapwing recorded were of All-Ireland importance (NPWS, 2013c).



Dunlin are shown in the dot density diagrams for the 2009/10 waterbird surveys to forage in c. 2.3km south of the proposed development site and also forage at Mutton Island, in the subtidal zones (NPWS, 2013c). For the baseline period surveys of the site (1995/96 – 1999/00) numbers of Dunlin recorded were of All-Ireland importance (NPWS, 2013c).

Curlew are shown in the dot density diagrams for the 2009/10 waterbird surveys to forage in small numbers c. 2.7km south of the proposed development site and also forage at Mutton Island, in the subtidal zones (NPWS, 2013c). For the baseline period surveys of the site (1995/96 – 1999/00) numbers of Curlew recorded were of All-Ireland importance (NPWS, 2013c).

Redshank are shown in the dot density diagrams for the 2009/10 waterbird surveys to both forage and roost c. 2.3km south of the proposed development site and Mutton Island, in the subtidal zones (NPWS, 2013c). For the baseline period surveys of the site (1995/96 – 1999/00) numbers of Redshank recorded were of All-Ireland importance (NPWS, 2013c).

Black-headed Gull are shown in the dot density diagrams for the 2009/10 waterbird surveys to both forage and roost c. 2.3km south of the proposed development site and Mutton Island, in the subtidal zones (NPWS, 2013c). For the baseline period surveys of the site (1995/96 – 1999/00) numbers of Black-headed Gull recorded were of All-Ireland importance (NPWS, 2013c).

Common Gull are shown in the dot density diagrams for the 2009/10 waterbird surveys to both forage and roost c. 2.3km south of the proposed development site and Mutton Island, in the subtidal zones (NPWS, 2013c). For the baseline period surveys of the site (1995/96 – 1999/00) numbers of Common Gull recorded were of All-Ireland importance (NPWS, 2013c).

Black-throated Diver are not mapped as part of the dot density diagrams for the 2009/10 waterbird surveys (NPWS, 2013c). However, the conservation objectives supporting document does note that 36 individuals were recorded for the baseline data period (1995/96-1999/00) and the site average (2004/05-2008/09) was 14 individuals (NPWS, 2013c).

Sandwich Tern are not mapped as part of the dot density diagrams for the 2009/10 waterbird surveys (NPWS, 2013c). However, the conservation objectives supporting document does note that in 1995 as part of the All-Ireland Tern Survey, the breeding population of Inner Galway Bay was surveyed and 81 pairs were recorded, which exceeds the 1% threshold for this Annex I species (NPWS, 2013c).

Common Tern is not mapped as part of the dot density diagrams for the 2009/10 waterbird surveys (NPWS, 2013c). However, the conservation objectives supporting document does note that in 1995 as part of the All-Ireland Tern Survey, 98 pairs of Common Tern were recorded at Green Island in Ballyvaughan Bay in Co. Clare. The Seabird 2000 survey recorded 46 pairs on Mutton Island in Co. Galway in 2001, with both of these counts exceeding the 1% threshold for this Annex I species (NPWS, 2013c).



Table 1 Designated Natura 2000 Sites and associated Qualifying Interests within 15km of the proposed development at Headford Road, Ballinfoyle, Galway City, Co. Galway.

Natura 2000 Site	Qualifying Interests	Distance (km)
Lough Corrib SAC (000297)	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]	c. 200m north-west
	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]	
	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]	
	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]	
	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]	
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]	
	Active raised bogs [7110]	
	Degraded raised bogs still capable of natural regeneration [7120]	
	Depressions on peat substrates of the Rhynchosporion [7150]	
	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae [7210]	
	Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220]	
	Alkaline fens [7230]	
	Limestone pavements [8240]	
	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	
	Bog woodland [91D0]	
	<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	
	<i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]	
	<i>Petromyzon marinus</i> (Sea Lamprey) [1095]	
	<i>Lampetra planeri</i> (Brook Lamprey) [1096]	
	<i>Salmo salar</i> (Salmon) [1106]	
	<i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]	
	<i>Lutra lutra</i> (Otter) [1355]	
	<i>Najas flexilis</i> (Slender Naiad) [1833]	
	<i>Hamatocaulis vernicosus</i> (Slender Green Feather-moss) [6216]	
Galway Bay Complex SAC (000268)	Mudflats and sandflats not covered by seawater at low tide [1140]	c. 2.3km south; at Mutton Island WwTP discharge
	Coastal lagoons [1150]	
	Large shallow inlets and bays [1160]	
	Reefs [1170]	
	Perennial vegetation of stony banks [1220]	
	Salicornia and other annuals colonising mud and sand [1310]	
	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330]	
	Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]	
	Turloughs [3180]	
	Juniperus communis formations on heaths or calcareous grasslands [5130]	
	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]	
	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae [7210]	
	Alkaline fens [7230]	
	Limestone pavements [8240]	
	<i>Lutra lutra</i> (Otter) [1355]	
	<i>Phoca vitulina</i> (Harbour Seal) [1365]	
	Black-throated Diver (<i>Gavia arctica</i>) [A002]	



Natura 2000 Site	Qualifying Interests	Distance (km)
Inner Galway Bay SPA (004031)	Great Northern Diver (<i>Gavia immer</i>) [A003]	c. 2.3km south; at Mutton Island WwTP discharge
	Cormorant (<i>Phalacrocorax carbo</i>) [A017]	
	Grey Heron (<i>Ardea cinerea</i>) [A028]	
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]	
	Wigeon (<i>Anas penelope</i>) [A050]	
	Teal (<i>Anas crecca</i>) [A052]	
	Red-breasted Merganser (<i>Mergus serrator</i>) [A069]	
	Ringed Plover (<i>Charadrius hiaticula</i>) [A137]	
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]	
	Lapwing (<i>Vanellus vanellus</i>) [A142]	
	Dunlin (<i>Calidris alpina</i>) [A149]	
	Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]	
	Curlew (<i>Numenius arquata</i>) [A160]	
	Redshank (<i>Tringa totanus</i>) [A162]	
	Turnstone (<i>Arenaria interpres</i>) [A169]	
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]	
	Common Gull (<i>Larus canus</i>) [A182]	
	Sandwich Tern (<i>Sterna sandvicensis</i>) [A191]	
	Common Tern (<i>Sterna hirundo</i>) [A193]	
	Wetland and Waterbirds [A999]	
Lough Corrib SPA (004042)	Gadwall (<i>Anas strepera</i>) [A051]	c. 2.4km west
	Shoveler (<i>Anas clypeata</i>) [A056]	
	Pochard (<i>Aythya ferina</i>) [A059]	
	Tufted Duck (<i>Aythya fuligula</i>) [A061]	
	Common Scoter (<i>Melanitta nigra</i>) [A065]	
	Hen Harrier (<i>Circus cyaneus</i>) [A082]	
	Coot (<i>Fulica atra</i>) [A125]	
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]	
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]	
	Common Gull (<i>Larus canus</i>) [A182]	
	Common Tern (<i>Sterna hirundo</i>) [A193]	
	Arctic Tern (<i>Sterna paradisaea</i>) [A194]	
	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]	
	Wetland and Waterbirds [A999]	
Creggana Marsh SPA (004142)	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]	c. 8.4km south-east
Ross Lake and Woods SAC (001312)	Lesser Horseshoe bat <i>Rhinolophus hipposideros</i> [1303]	c. 12.9km north-west
	Hard Oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]	
Connemara Bog complex SAC (002034)	Coastal lagoons [1150]	c. 13.7km west
	Reefs [1170]	
	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]	
	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]	
	Natural dystrophic lakes and ponds [3160]	
	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]	
	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]	



Natura 2000 Site	Qualifying Interests	Distance (km)
	European dry heaths [4030]	
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]	
	Blanket bogs (* if active bog) [7130]	
	Transition mires and quaking bogs [7140]	
	Depressions on peat substrates of the Rhynchosporion [7150]	
	Alkaline fens [7230]	
	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	
	<i>Euphydrias aurinia</i> (Marsh Fritillary) [1065]	
	<i>Salmo salar</i> (Salmon) [1106]	
	<i>Lutra lutra</i> (Otter) [1355]	
	<i>Najas flexilis</i> (Slender Naiad) [1833]	



5. ASSESSMENT OF EFFECTS

Table 2 below outlines the locations of the Qualifying Interests of Natura 2000 Sites within 15km of the proposed development, as well as potential pathways for impacts.

Table 2 Designated Natura 2000 Sites within 15km of the proposed works, the potential location of Q.I.s in relation to the proposed works, potential pathways for impacts and potential impacts arising from the proposed works.

Natura 2000 Site	Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
Lough Corrib SAC (000297)	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletea uniflorae</i>) [3110]	c. 33km north-west of the proposed development site in Lough Corrib, according to conservation objectives map 3 (NPWS, 2017)	No	No – no potential pathway for impacts – no downstream hydrological connection with this habitat in the SAC (c. 950m from the nearest watercourse)
	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]	c. 16km north-west of the proposed development site in Lough Corrib, according to conservation objectives map 3 (NPWS, 2017)	No	
	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]	c. 2.5km north-west of the proposed development site in Lough Corrib, according to conservation objectives map 3 (NPWS, 2017)	No	
	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]	Not mapped in the conservation objectives but present in rivers in the SAC (NPWS, 2017).	No	
	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]	Not mapped in the conservation objectives, but is associated with limestone pavement, so could be present c. 220m from the site (NPWS, 2017).	Yes	Yes – due to close proximity to the site boundary, as well as groundwater vulnerability status and presence of limestone bedrock at the site (GSI online maps) – potential for surface water and groundwater impacts
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>) [6410]	Full extent unknown, not present at the site (NPWS, 2017)	Yes	
	Active raised bogs [7110]	The nearest occurrence is Aldergoole Bog c. 4.1km north of the proposed development at its closest point (Map 4 – NPWS, 2017)	No	No – no potential pathway for impacts – no downstream hydrological connection with this habitat in the SAC (c. 950m from the nearest watercourse)



Natura Site	2000	Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
		Degraded raised bogs still capable of natural regeneration [7120]	Map 4 of the conservation objectives shows bogs habitats, could be present c. 5km north of the site (NPWS, 2017).	No	
		Depressions on peat substrates of the Rhynchosporion [7150]	Only present on active raised bogs, which are mapped in Map 4 of the conservation objectives, could be present c. 5km north of the site (NPWS, 2017)	No	
		Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae [7210]	Full extent unknown and not present at the site (NPWS, 2017).	No	
		Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220]	Full extent unknown but associated with Lough Corrib, closest c. 2km north-west of the site (NPWS, 2017)	No	
		Alkaline fens [7230]	Full extent unknown, can be present in limestone pavement habitats, which are mapped in Map 7 of the conservation objectives to be c. 220m north-west of the site (NPWS, 2017).	No	
		Limestone pavements [8240]	c. 220m north-west of the proposed development at its closest point (Map 7 – NPWS, 2017)	Yes	Yes – due to close proximity to the site boundary, as well as groundwater vulnerability status and presence of limestone bedrock at the site (GSI online maps) – potential for surface water and groundwater impacts
		Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	c. 26.6km north-west of the proposed development at its closest point (Map 8 – NPWS, 2017)	No	No – no potential pathway for impacts – terrestrial habitat with no connection with the proposed development site
		Bog woodland [91D0]	c. 4.9km north of the proposed development at its closest point (Map 8 – NPWS, 2017)	No	
		<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	In the Owenriff River further upstream / north in the Lough	No	No – no potential pathway for impacts – no downstream



Natura Site	2000	Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
			Corrib catchment and more than 20km from the proposed development site (Map 9 – NPWS, 2017)		hydrological connection with this species in the SAC
		<i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]	Map 10 of the conservation objectives shows this species is present in the River Clare north of the site (NPWS, 2017).	No	No – no potential pathway for impacts – no downstream hydrological connection with this species in the SAC (c. 950m from the nearest watercourse)
		<i>Petromyzon marinus</i> (Sea Lamprey) [1095]	Full extent unknown but present in rivers in the SAC (NPWS, 2017).	No	
		<i>Lampetra planeri</i> (Brook Lamprey) [1096]	Full extent unknown but present in rivers in the SAC (NPWS, 2017).	No	
		<i>Salmo salar</i> (Salmon) [1106]	Full extent unknown but present in rivers in the SAC (NPWS, 2017).	No	
		<i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]	Potential foraging grounds and extent mapped in Map 11 of the conservation objectives, c. 30km from the site (NPWS, 2017).	No	No – no potential pathway for impacts – significant separation from this species extent in the SAC
		<i>Lutra lutra</i> (Otter) [1355]	Map 12 of the conservation objectives shows foraging commuting areas around Lough Corrib. c. 2km north-west of the site (NPWS, 2017).	No	No – no potential pathway for impacts – no downstream hydrological connection with this species in the SAC (c. 950m from the nearest watercourse)
		<i>Najas flexilis</i> (Slender Naiad) [1833]	Map 13 of the conservation objectives shows this species extent c. 7km north of the site in Lough Corrib at its closest point (NPWS, 2017).	No	No – no potential pathway for impacts – no downstream hydrological connection with this species in the SAC (c. 950m from the nearest watercourse)
		<i>Hamatocaulis vernicosus</i> (Slender Green Feather-moss) [6216]	c. 12.4km north of the proposed development at its closest point (Map 10 – NPWS, 2017)	No	No – no potential pathway for impacts – terrestrial species with no connection with the proposed development site
		Mudflats and sandflats not covered by seawater at low tide [1140]	c. 2.3km south of the site and adjacent to Mutton Island where	Yes	Yes – potential pathway for effects – via the Galway WwTP



Natura Site	2000	Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
Galway Bay Complex (000268)	SAC		Galway WwTP located – according to Map 3 of the conservation objectives (NPWS, 2013a).		at Mutton Island which discharges directly into the SAC
		Coastal lagoons [1150]	Located at Lough Atalia and Renmore lough south of Galway City – not downstream or in the vicinity of the proposed development or Mutton island – according to conservation objectives Map 4 (NPWS, 2013a).	No	No – no potential pathway for impacts – no downstream hydrological connection with this habitat in the SAC
		Large shallow inlets and bays [1160]	c. 2.3km south of the site and c. 800m south of Mutton island where Galway WwTP located – according to Map 5 of the conservation objectives (NPWS, 2013a).	Yes	Yes – potential pathway for effects – via the Galway WwTP at Mutton Island which discharges directly into the SAC
		Reefs [1170]	c. 2.3km south of the site and at Mutton Island where Galway WwTP located – according to Map 6 of the conservation objectives (NPWS, 2013a).	Yes	
		Perennial vegetation of stony banks [1220]	c. 2.3km south of the site – according to Map 8 of the conservation objectives (NPWS, 2013a).	No	No – no potential pathway for impacts – terrestrial habitat with no connection with the proposed development site
		Salicornia and other annuals colonising mud and sand [1310]	Located on Taiwin Island – not downstream or in the vicinity of the proposed development or Mutton island – according to conservation objectives Map 9 (NPWS, 2013a).	No	No – no potential pathway for impacts – no downstream hydrological connection with this habitat in the SAC
		Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]	c. 2.3km south of the site – according to Map 9 of the conservation objectives, but not at Mutton island (NPWS, 2013a).	Yes	Yes – potential pathway for effects – via the Galway WwTP at Mutton Island which discharges directly into the SAC



Natura Site	2000	Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
		Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]	c. 2.3km south of the site – according to Map 9 of the conservation objectives, but not at Mutton island (NPWS, 2013a).	Yes	
		Turloughs [3180]	Located west of Tawin Island at Ballinacourty Lough (closest example) – not located downstream of proposed development or at Mutton island (NPWS, 2013a)	No	No – no potential pathway for impacts – no downstream hydrological connection with this habitat in the SAC
		Juniperus communis formations on heaths or calcareous grasslands [5130]	Located at Rocklands Juniper formations east of Galway city (closest example) – not located downstream of proposed development or at Mutton island (NPWS, 2013a)	No	No – no potential pathway for impacts – terrestrial habitat with no connection with the proposed development site
		Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]	Extent unknown – terrestrial habitat – SAC boundary c. 2.3km south of the site at its closest point (NPWS, 2013a).	No	
		Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210]	Extent unknown – present in wetlands at Oranmore and Ballindereen lough - terrestrial habitat – SAC boundary c. 2.3km south of the site at its closest point (NPWS, 2013a).	No	No – no potential pathway for impacts – no downstream hydrological connection with this habitat in the SAC
		Alkaline fens [7230]	Extent unknown – present in wetlands at Oranmore and Ballindereen lough - terrestrial habitat – SAC boundary c. 2.3km south of the site at its closest point (NPWS, 2013a).	No	
		Limestone pavements [8240]	Extent unknown – terrestrial habitat – SAC boundary c. 2.3km south of the site at its closest point (NPWS, 2013a).	No	No – no potential pathway for impacts – terrestrial habitat with no connection with the proposed development site
		<i>Lutra lutra</i> (Otter) [1355]	Commuting buffer in Map 11 of the conservation objectives	Yes	Yes – potential pathway for effects – via the Galway WwTP



Natura Site	2000	Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
			includes the area of the coast c. 2.3km south of the site and at Mutton island (NPWS, 2013a).		at Mutton Island which discharges directly into the SPA
		<i>Phoca vitulina</i> (Harbour Seal) [1365]	Map 12 of the conservation objectives shows general habitat c. 2.3km south of the site and at Mutton island but no known breeding, resting or moulting sites located here (NPWS, 2013a).	Yes	
Inner Galway Bay SAC (004031)		Black-throated Diver (<i>Gavia arctica</i>) [A002]	Not mapped in dot density diagrams – so precautionary principle could use the SPA extent c. 2.3km south of the site and at Mutton island (NPWS, 2013a).	Yes	Yes – potential pathway for effects – via the Galway WwTP at Mutton Island which discharges directly into the SPA
		Great Northern Diver (<i>Gavia immer</i>) [A003]	Forage in small numbers c. 4km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Cormorant (<i>Phalacrocorax carbo</i>) [A017]	Forage and roost c. 2.7km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Grey Heron (<i>Ardea cinerea</i>) [A028]	Forage in small numbers c. 2.3km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]	Forage and roost in small numbers c. 3.8km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10	Yes	



Natura Site	2000	Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
			waterbird surveys (NPWS, 2013c).		
		Wigeon (<i>Anas penelope</i>) [A050]	Forage in small numbers c. 2.3km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Teal (<i>Anas crecca</i>) [A052]	Forage c. 2.3km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Red-breasted Merganser (<i>Mergus serrator</i>) [A069]	Forage and roost in small numbers c. 2.3km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Ringed Plover (<i>Charadrius hiaticula</i>) [A137]	Forage c. 3.8km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Golden Plover (<i>Pluvialis apricaria</i>) [A140]	Does not forage in the extent of the SPA c. 2.3km south of the proposed development or at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c). However, do roost at Oranmore Bay and forage and roost at Taiwin Island south of Mutton Island (NPWS, 2013c).	Yes	
		Lapwing (<i>Vanellus vanellus</i>) [A142]	Forage and roost c. 2.3km south of the proposed development but primarily found at Oranmore	Yes	



Natura Site	2000	Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
			bay and Tawin island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).		
		Dunlin (<i>Calidris alpina</i>) [A149]	Forage c. 3.5km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]	Forage c. 3.8km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Curlew (<i>Numenius arquata</i>) [A160]	Forage in small numbers c. 2.7km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Redshank (<i>Tringa totanus</i>) [A162]	Forage and roost c.2.3km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Turnstone (<i>Arenaria interpres</i>) [A169]	Forage c. 2.4km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]	Forage and roost c. 2.3km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	



Natura Site	2000	Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
		Common Gull (<i>Larus canus</i>) [A182]	Forage and roost c.2.3km south of the proposed development and at Mutton island, according to dot density diagrams for 2009/10 waterbird surveys (NPWS, 2013c).	Yes	
		Sandwich Tern (<i>Sterna sandvicensis</i>) [A191]	Not mapped in dot density diagrams – so precautionary principle could use the SPA extent c. 2.3km south of the site and at Mutton island (NPWS, 2013c).	Yes	
		Common Tern (<i>Sterna hirundo</i>) [A193]	Not mapped in dot density diagrams – so precautionary principle could use the SPA extent c. 2.3km south of the site and at Mutton island (NPWS, 2013a).	Yes	
		Wetland and Waterbirds [A999]	Located at SPA extent c 2.3km south of the site and at Mutton island (NPWS, 2013a).	Yes	
Lough Corrib SPA (004042)		Gadwall (<i>Anas strepera</i>) [A051]	c. 2.6km west of the proposed development at its closest point	No	No – no potential pathway for impacts – significant separation from the proposed development site - no downstream hydrological connection with this species in the SPA
		Shoveler (<i>Anas clypeata</i>) [A056]	c. 2.6km west of the proposed development at its closest point	No	
		Pochard (<i>Aythya ferina</i>) [A059]	c. 2.6km west of the proposed development at its closest point	No	
		Tufted Duck (<i>Aythya fuligula</i>) [A061]	c. 2.6km west of the proposed development at its closest point	No	
		Common Scoter (<i>Melanitta nigra</i>) [A065]	c. 2.6km west of the proposed development at its closest point	No	
		Hen Harrier (<i>Circus cyaneus</i>) [A082]	c. 2.6km west of the proposed development at its closest point	No	
		Coot (<i>Fulica atra</i>) [A125]	c. 2.6km west of the proposed development at its closest point	No	
		Golden Plover (<i>Pluvialis apricaria</i>) [A140]	c. 2.6km west of the proposed development at its closest point	No	
		Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]	c. 2.6km west of the proposed development at its closest point	No	



Natura Site	2000	Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
		Common Gull (<i>Larus canus</i>) [A182]	c. 2.6km west of the proposed development at its closest point	No	
		Common Tern (<i>Sterna hirundo</i>) [A193]	c. 2.6km west of the proposed development at its closest point	No	
		Arctic Tern (<i>Sterna paradisaea</i>) [A194]	c. 2.6km west of the proposed development at its closest point	No	
		Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]	c. 2.6km west of the proposed development at its closest point	No	
		Wetland and Waterbirds [A999]	c. 2.6km west of the proposed development at its closest point	No	
Creggana Marsh SPA (004142)		Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]	c. 8.4km south-east of the proposed development at its closest point	No	No – no potential pathway for impacts – significant separation from the proposed development site - no downstream hydrological connection with the habitat used by this species in the SPA
Ross Lake and Woods SAC (001312)		Lesser Horseshoe bat <i>Rhinolophus hipposideros</i> [1303]	c. 12.9km north of the proposed development at its closest point	No	No – no potential pathway for impacts – terrestrial species with no connection with the proposed development site – significant separation
		Hard Oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]	c. 12.9km north of the proposed development at its closest point, not located downstream	No	No – no potential pathway for impacts – significant separation from the proposed development site - no downstream hydrological connection with this habitat in the SAC
Connemara Bog complex SAC (002034)		Coastal lagoons [1150]	c. 13.6km west of the proposed development at its closest point	No	No – no potential pathway for impacts – significant separation from the proposed development site - no downstream hydrological connection with this habitat in the SAC
		Reefs [1170]	c. 13.6km west of the proposed development at its closest point	No	
		Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]	c. 13.6km west of the proposed development at its closest point	No	
		Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]	c. 13.6km west of the proposed development at its closest point	No	
		Natural dystrophic lakes and ponds [3160]	c. 13.6km west of the proposed development at its closest point	No	



Natura Site	2000 Qualifying Interests	Location in relation to Proposed Development	Potential pathway for Impacts (Yes/No)	Potential for Significant Impact
	Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]	c. 13.6km west of the proposed development at its closest point	No	
	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]	c. 13.6km west of the proposed development at its closest point	No	
	European dry heaths [4030]	c. 13.6km west of the proposed development at its closest point	No	
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>) [6410]	c. 13.6km west of the proposed development at its closest point	No	No – no potential pathway for impacts – terrestrial habitat with no connection with the proposed development site – significant separation
	Blanket bogs (* if active bog) [7130]	c. 13.6km west of the proposed development at its closest point	No	
	Transition mires and quaking bogs [7140]	c. 13.6km west of the proposed development at its closest point	No	
	Depressions on peat substrates of the Rhynchosporion [7150]	c. 13.6km west of the proposed development at its closest point	No	No – no potential pathway for impacts – significant separation from the proposed development site - no downstream hydrological connection with this habitat in the SAC
	Alkaline fens [7230]	c. 13.6km west of the proposed development at its closest point	No	
	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	c. 13.6km west of the proposed development at its closest point	No	
	<i>Euphydryas aurinia</i> (Marsh Fritillary) [1065]	c. 13.6km west of the proposed development at its closest point	No	No – no potential pathway for impacts – terrestrial species with no connection with the proposed development site – significant separation
	<i>Salmo salar</i> (Salmon) [1106]	c. 13.6km west of the proposed development at its closest point	No	
	<i>Lutra lutra</i> (Otter) [1355]	c. 13.6km west of the proposed development at its closest point	No	
	<i>Najas flexilis</i> (Slender Naiad) [1833]	c. 13.6km west of the proposed development at its closest point	No	No – no potential pathway for impacts – significant separation from the proposed development site - no downstream hydrological connection with this species in the SAC



5.1 Assessment of potential direct impacts affecting Natura 2000 sites

5.1.1 *Lough Corrib SAC*

5.1.1.1 Construction Phase

The proposed development site is located c. 220m south-east of this site and is outside of the Natura 2000 network. None of the qualifying interests of the SAC are expected to occur on the proposed development site. There is therefore no potential for direct construction phase impacts to arise which could affect the conservation objectives of the SAC or the Natura 2000 network.

5.1.1.2 Operational Phase

The proposed development site is located c. 220m south-east of this site and is outside of the Natura 2000 network. None of the qualifying interests of the SAC are expected to occur on the proposed development site. There is therefore no potential for direct construction phase impacts to arise which could affect the conservation objectives of the SAC or the Natura 2000 network.

5.1.2 *Galway Bay Complex SAC*

5.1.2.1 Construction Phase

The proposed development site is located c. 2.3km north of this SAC and outside the Natura 2000 network. None of the qualifying interests of the SAC occur on the proposed development site. There is therefore no potential for direct construction phase impacts to arise which could affect the conservation objectives of the SAC or the Natura 2000 network.

5.1.2.2 Operational Phase

The proposed development site is located c. 2.3km north of this SAC and outside the Natura 2000 network. None of the qualifying interests of the SAC occur on the proposed development site. There is therefore no potential for direct operational phase impacts to arise which could affect the conservation objectives of the SAC or the Natura 2000 network.

5.1.3 *Inner Galway Bay SPA*

5.1.3.1 Construction Phase

The proposed development site is located c. 2.3km north of this SPA and outside the Natura 2000 network. None of the qualifying interests of the SPA occur on the proposed development site. There is therefore no potential for direct construction phase impacts to arise which could affect the conservation objectives of the SAC or the Natura 2000 network.

5.1.3.2 Operational Phase



The proposed development site is located c. 2.3km north of this SPA and outside the Natura 2000 network. None of the qualifying interests of the SPA occur on the proposed development site. There is therefore no potential for direct operational phase impacts to arise which could affect the conservation objectives of the SAC or the Natura 2000 network.

5.2 Assessment of potential indirect impacts affecting Natura 2000 sites

Indirect (or secondary) impacts are defined as effects that are “caused by and result from the activity although they are later in time or further removed in distance, but still reasonably foreseeable” (Bowers-Marriott, 1997).

5.2.1 Lough Corrib SAC

5.2.1.1 Construction Phase

Using the Source-Pathway-Receptor model, there is a potential pathway for significant effects on the Lough Corrib SAC during the construction phase of the development.

Although the proposed development site is separated from the SAC by c. 220m, there is potential for Annex I habitats to be present at the SAC boundary. There is therefore potential for surface water run-off impacts as well as potential groundwater pollution impacts to arise. There is uncertainty surrounding the magnitude of these potential impacts. Additionally, groundwater at the site is classified ‘X’ which is Extremely Vulnerable. Bedrock at the site is also classified as Limestone. There is therefore a potential pathway for significant impacts. At the Screening stage of Appropriate Assessment, it is merely necessary to determine that there may be such an effect, as per case 2013/802 JR Kelly -v- An Bord Pleanála. This could affect the Semi-natural dry grasslands and scrubland facies on calcareous substrates, Molinia meadows and Limestone pavements habitats which may be present c. 220m from the site boundary.

The source of potential effects is construction phase surface water run-off can result in adverse impacts on water quality and may arise from spillage of fuels such as hydrocarbons, or increased suspended solids releases during excavations or site clearance. Excavations and digging of foundations for the proposed development could result in groundwater contamination and adverse impacts on the quality of groundwater, considering the current classification of the site being ‘extremely vulnerable’ for groundwater.

The safeguards set out in Article 6(3) and (4) of the Habitats Directive are triggered not by certainty but by the possibility of significant effects. A screening assessment cannot replace the requirement of Appropriate Assessment so if any potential impact on qualifying interests or their habitats is identified then Appropriate Assessment is required. As demonstrated in case C-323/17 People Over Wind and Peter Sweetman v Coillte, mitigation measures are not to be taken into account at the screening stage of Appropriate Assessment.

5.2.1.2 Operational Phase

There is no potential for significant operational phase impacts to arise affecting the Lough Corrib SAC. The Engineering Report for the proposed development outlines that surface water management for the operational phase will consist of a soakaway located underneath open spaces (Galway City Council, 2021). It is expected that this soakaway system is likely to be sufficient to successfully treat surface



water during the operational phase that would result in no significant adverse effects on the Lough Corrib SAC. Due to the distance of the site from the SAC boundary, and the site is separated from the SAC with hedgerows and scrub in between, as well as the soakaway system proposed, no potential for significant impacts during the operational phase are identified.

5.2.2 Galway Bay Complex SAC

5.2.2.1 Construction Phase

The proposed development site is located c. 2.3km north of this SAC and there are no drains or watercourses on the site with connectivity to the SAC. There is therefore no potential pathway for construction phase impacts to arise that could affect the qualifying interests of the SAC due to distance, separation and a lack of connectivity.

5.2.2.2 Operational Phase

Using the Source-Pathway-Receptor model, there is a potential pathway for significant effects on the Galway Bay Complex SAC during the operational phase of the development.

It is likely due to the location of the site that this will require a connection to the Galway Wastewater Treatment Plant, located on Mutton Island, which discharges directly into Galway Bay within the SAC boundary. There is some uncertainty surrounding treatment at the plant, as described in section 3.1. DoEHLG (2010) notes that if effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Nonetheless even without uncertainty, this does provide a potential pathway for operational phase impacts on water quality relating to foul water treatment. At the Screening stage of Appropriate Assessment, it is merely necessary to determine that there may be such an effect, as per case 2013/802 JR Kelly -v- An Bord Pleanála. This could affect the following qualifying interests of the site: Mudflats and sandflats not covered by seawater at low tide; Large shallow inlets and bays; Reefs; Atlantic salt meadows; Mediterranean salt meadows; Otters and Harbour seal.

The source of potential significant effects is foul water production from the proposed development, the pathway is via the treatment plant Galway WwTP which discharges into the Galway Bay Complex SAC, and the receptors are the QIs of the SAC that are sensitive to water quality impacts outlined above.

The safeguards set out in Article 6(3) and (4) of the Habitats Directive are triggered not by certainty but by the possibility of significant effects. A screening assessment cannot replace the requirement of Appropriate Assessment so if any potential impact on qualifying interests or their habitats is identified then Appropriate Assessment is required. As demonstrated in case C-323/17 People Over Wind and Peter Sweetman v Coillte, mitigation measures are not to be taken into account at the screening stage of Appropriate Assessment. This includes for mitigation by a third party, which in this case would be foul water treatment by the Mutton Island plant. A full assessment and detailed examination of the Galway WwTP, expected discharge from the site, and calculations, is required. This cannot be carried out at the pre-assessment Screening stage.

5.2.3 Inner Galway Bay SPA

5.2.3.1 Construction Phase



The proposed development site is located c. 2.3km north of this SPA and there are no drains or watercourses on the site with hydrological connectivity to this SPA. There is therefore no potential pathway for construction phase impacts to arise that could affect the qualifying interests of the SPA due to distance, separation and a lack of connectivity.

5.2.3.2 Operational Phase

Using the Source-Pathway-Receptor model, there is a potential pathway for significant effects on the Inner Galway Bay SPA during the operational phase of the proposed development.

It is likely that the proposed development will be connected to the Galway Wastewater Treatment Plant, located on Mutton Island, which discharges directly into Galway Bay within the SPA boundary. As described in detail above in section 3.1, there is some uncertainty regarding treatment at the Galway WwTP. DoEHLG (2010) notes that if effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Nonetheless even without uncertainty, this does provide a potential pathway for operational phase impacts on water quality relating to foul water treatment. At the Screening stage of Appropriate Assessment, it is merely necessary to determine that there may be such an effect, as per case 2013/802 JR Kelly -v- An Bord Pleanála. This could affect the bird species of the SPA as well as the Wetland and Waterbirds habitat that they utilise. A full assessment and detailed examination of the Galway WwTP, expected discharge from the site, and calculations, is required. This cannot be carried out at the pre-assessment Screening stage.

5.3. Assessment of potential cumulative impacts affecting the Natura 2000 site

Cumulative impacts or effects are changes in the environment that result from numerous human-induced, small-scale alterations. Cumulative impacts can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects (Bowers-Marriott, 1997).

5.3.1 Lough Corrib SAC

The standard data Natura 2000 form for the Lough Corrib SAC lists the threats and pressures currently having an impact on this protected site. The following are listed as having a high impact on the site: diffuse pollution to surface waters due to household sewage and waste, agricultural intensification, other human intrusions and disturbances, mechanical removal of peat and invasive non-native species (NPWS, 2020). The following are listed as having a medium impact on the SAC: fertilisation, infilling of ditches, dykes, ponds, pools, marshes or pits, forest planting on open ground, dispersed habitation, other human induced changes in hydraulic conditions, removal of hedges and copses or scrub, roads paths and railroads, piers / tourist harbours or recreational piers, continuous urbanisation and abandonment of pastoral systems and lack of grazing (NPWS, 2020).

The potential for cumulative impacts arising from the proposed development concern in-combination effects on water quality. There are existing background pressures on water quality, both surface and groundwater, and diffuse pollution to surface waters is specifically listed as having a high impact on the SAC. As described in section 5.2.1.1, there is the potential for construction phase impacts to arise affecting surface and groundwater which may act in combination with existing pressures in the area. At



the Screening stage of Appropriate Assessment, it is merely necessary to determine that there may be such an effect, as per case 2013/802 JR Kelly -v- An Bord Pleanála. Mitigation is required and cannot be provided at the Screening stage.

5.3.2 Galway Bay Complex SAC

The standard data Natura 2000 form for the Galway Bay Complex SAC lists the threats and pressures currently having an impact on this protected site. The following are listed as having a high impact: diffuse pollution to surface waters due to agricultural and forestry activities; shipping lanes, ports, marine constructions; industrial ports; diffuse pollution to surface waters due to household sewage and waste waters and sea defence or coast protection works, tidal barrages (NPWS, 2019). The following are listed as having a medium impact: Sand and gravel extraction; non intensive sheep grazing; Hunting, fishing or collecting activities not referred to above; reclamation of land from sea, estuary or marsh; agricultural intensification; removal of beach materials; pipe lines; non intensive cattle grazing; invasive species and Marine and Freshwater Aquaculture (NPWS, 2019).

The potential for cumulative impacts arising from the proposed development concern in-combination effects on water quality. There are existing background pressures on water quality in the area, and pollution to surface waters in particular is already listed as having a high impact on the SAC (NPWS, 2019). As described in section 5.2.2.2, there is the potential for impacts relating to foul water treatment and the Galway WwTP. The proposed development could therefore cumulatively add to loading on the plant, which in turn could increase the potential for water quality impacts from the discharge in Galway Bay. At the Screening stage of Appropriate Assessment, it is merely necessary to determine that there may be such an effect, as per case 2013/802 JR Kelly -v- An Bord Pleanála. A full assessment and detailed examination of the Galway WwTP, expected discharge from the site, and calculations, is required. This cannot be carried out at the pre-assessment Screening stage.

5.3.3 Inner Galway Bay SPA

The standard data Natura 2000 form for the Inner Galway Bay SPA lists the threats and pressures currently having an impact on this protected site. The following are listed as having a high impact: Discharges; Urbanised areas, human habitation and reclamation of land from sea, estuary or marsh (NPWS, 2018). The following are listed as having a medium impact: roads, motorways; Leisure fishing; Fertilisation; Industrial or commercial areas; nautical sports; Dykes, embankments, artificial beaches, general and walking, horse-riding and non-motorised vehicles (NPWS, 2018).

The proposed development does have a potential to act in-combination with existing background pressures on water quality, so cumulative impacts on the Inner Galway Bay SPA would be similar as those described above in section 5.3.2. Discharges are specifically listed as having a high impact on the SPA (NPWS, 2018). There remains uncertainty surrounding cumulative impacts on water quality and as in DoEHLG (2010), if uncertainty remains regarding a potential impact, then Appropriate Assessment (Natura Impact Statement) is required. A full assessment and detailed examination of the Galway WwTP, expected discharge from the site, and calculations, is required. This cannot be carried out at the pre-assessment Screening stage.



6. SCREENING STATEMENT WITH CONCLUSIONS

According to the guidance published by the DoEHLG (2010), Screening for Appropriate Assessment can either identify that an Appropriate Assessment is not required, where a project / proposal is directly related to the management of the site; or that there is no potential for significant effects affecting the Natura 2000 network; or that significant effects are certain, likely or uncertain (i.e., the project must either proceed to Stage 2 (AA) or be rejected).

Using the Source-Pathway-Receptor model, a potential pathway for significant effects have been identified. One pathway for potential significant effects has been identified via the Galway WwTP, which discharges directly into the Galway Bay Complex SAC and the Inner Galway Bay SPA. This pathway has the potential to result in significant impacts from foul water treatment. The receptors for this potential significant effect have been identified as Mudflats and sandflats not covered by seawater at low tide, Large shallow inlets and bays, Reefs, Atlantic salt meadows, Mediterranean salt meadows, Otters and Harbour seal (Galway Bay Complex SAC), and the bird species and Wetland and Waterbirds habitat (Inner Galway Bay SPA). Another pathway is identified regarding surface water run-off and groundwater impacts, affecting the Lough Corrib SAC which is c. 220m north-west, and the following habitats: Semi-natural dry grasslands and scrubland facies on calcareous substrates, Molinia meadows and Limestone pavement.

DoEHLG (2010) notes that if effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). The safeguards set out in Article 6(3) and (4) of the Habitats Directive are triggered not by certainty but by the possibility of significant effects. A screening assessment cannot replace the requirement of Appropriate Assessment so if any potential impact on qualifying interests or their habitats is identified then Appropriate Assessment is required. Mitigation is also required to ensure no significant impacts occur - as demonstrated in case C-323/17 People Over Wind and Peter Sweetman v Coillte, mitigation measures are not be taken into account at the screening stage of Appropriate Assessment. This includes for mitigation by a third party, which in this case would be foul water treatment by the Mutton Island plant. A full assessment and detailed examination of the Galway WwTP, expected discharge from the site, and calculations, is required. This cannot be carried out at the pre-assessment Screening stage.

A potential pathway for significant effects has been identified, and uncertainty remains. Furthermore, mitigation is also required, as well as further assessment of the Galway WwTP. It is also recommended that a full ecology survey be completed. During the site visit there were large numbers of Hares recorded on the site along with evidence of breeding activity. There is also scrub on the site which should be surveyed for the presence of mammals. Taking the above into account, the proposed development site at Headford Road, Co. Galway therefore requires an Appropriate Assessment (NIS).



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PLATES



Plate 1 Proposed Development site at Headford Rd, Galway.



Plate 2 Site use is primarily agricultural, but hares are noted to breed on the site.



APPENDIX 1 NPWS Site Synopses

SITE NAME: Lough Corrib SAC

SITE CODE: 000297

Lough Corrib is situated to the north of Galway city and is the second largest lake in Ireland, with an area of approximately 18,240 ha (the entire site is 20,556 ha). The lake can be divided into two parts: a relatively shallow basin, underlain by Carboniferous limestone, in the south, and a larger, deeper basin, underlain by more acidic granite, schists, shales and sandstones to the north. The surrounding lands to the south and east are mostly pastoral farmland, while bog and heath predominate to the west and north. A number of rivers are included within the cSAC as they are important for Atlantic Salmon. These rivers include the Clare, Grange, Abbert, Sinking, Dalgan and Black to the east, as well as the Cong, Bealanabrack, Failmore, Cornamona, Drimneen and Owenriff to the west. In addition to the rivers and lake basin, adjoining areas of conservation interest, including raised bog, woodland, grassland and limestone pavement, have been incorporated into the site.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [3110] Oligotrophic Waters containing very few minerals; [3130] Oligotrophic to Mesotrophic Standing Waters; [3140] Hard Water Lakes; [3260] Floating River Vegetation; [6210] Orchid-rich Calcareous Grassland* ; [6410] Molinia Meadows; [7110] Raised Bog (Active)*; [7120] Degraded Raised Bog; [7150] Rhynchosporion Vegetation [7210] Cladium Fens*; [7220] Petrifying Springs*; [7230] Alkaline Fens; [8240] Limestone Pavement*; [91A0] Old Oak Woodlands; [91D0] Bog Woodland*; [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*); [1092] White-clawed Crayfish (*Austropotamobius pallipes*); [1095] Sea Lamprey (*Petromyzon marinus*); [1096] Brook Lamprey (*Lampetra planeri*); [1106] Atlantic Salmon (*Salmo salar*); [1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*); [1355] Otter (*Lutra lutra*); [1393] Slender Green Feather-moss (*Drepanocladus vernicosus*) and [1833] Slender Naiad (*Najas flexilis*).

The shallow, lime-rich waters of the southern basin of Lough Corrib support one of the most extensive beds of stoneworts (Charophytes) in Ireland, with species such as *Chara aspera*, *C. hispida*, *C. delicatula*, *C. contraria* and *C. desmacantha* mixed with submerged pondweeds (*Potamogeton perfoliatus*, *P. gramineus* and *P. lucens*), Shoreweed (*Littorella uniflora*) and Water Lobelia (*Lobelia dortmanna*). These *Chara* beds are an important source of food for waterfowl. In contrast, the northern basin contains more oligotrophic and acidic waters, without *Chara* species, but with Shoreweed, Water Lobelia, Pipewort (*Eriocaulon aquaticum*), Quillwort (*Isoetes lacustris*), Alternate Water-milfoil (*Myriophyllum alternifolium*) and Slender Naiad (*Najas flexilis*). The last-named is listed under the Flora (Protection) Order, 2015, and is an Annex II species under the E.U. Habitats Directive.

Large areas of reedswamp vegetation, dominated by varying mixtures of Common Reed (*Phragmites australis*) and Common Club-rush (*Scirpus lacustris*), occur around the margins of the lake. Reedswamp usually grades into species-rich marsh vegetation characterised by Slender Sedge (*Carex lasiocarpa*), Water Mint (*Mentha aquatica*), Water Horsetail (*Equisetum fluviatile*) and Bogbean (*Menyanthes trifoliata*). Of particular note are the extensive beds of Great Fen-sedge (*Cladium mariscus*) that have developed over the marly peat deposits in sheltered bays, particularly in the south-east corner of the lake. Alkaline fen vegetation is more widespread around the lake margins and includes, amongst the typically diverse range of plants, the Slender Cottongrass (*Eriophorum gracile*), a species protected under the Flora (Protection) Order, 2015. Wet meadows dominated by Purple Moor-grass (*Molinia caerulea*) occur in seasonally flooded areas close to the lake shore. These support species such as Sharp-flowered Rush (*Juncus acutiflorus*), Jointed Rush (*J. articulatus*), Carnation



Sedge (*Carex panicea*), Devil's-bit Scabious (*Succisa pratensis*), Creeping Bent (*Agrostis stolonifera*) and Tormentil (*Potentilla erecta*), amongst others.

This large site contains four discrete raised bog areas and is selected for active raised bog, degraded raised bog, Rhynchosporion and bog woodland. Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, *Sphagnum* lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The Rhynchosporion habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (*R. fusca*), and at least some of the following associated species, Bog Asphodel (*Narthecium ossifragum*), sundews (*Drosera* spp.), Deergrass (*Scirpus cespitosus*) and Carnation Sedge.

At Addergoole, on the eastern shores of Lough Corrib, there is an important area of western raised bog. This bog area is one of the most westerly, relatively intact raised bogs in the country. There are also other substantial areas of raised bog along various tributaries of the Corrib in east Co. Galway, namely Slieve Bog, Lough Tee Bog and Killaclogher bog. The active parts of these bogs mostly correspond to the wettest areas, where there are well-developed surface features with hummocks, lawns and pools. It is in such areas that Rhynchosporion vegetation is best represented. The dominant species is the aquatic bog moss *Sphagnum cuspidatum*, which is usually accompanied by Bogbean, White Beak-sedge, Bog Asphodel, Common Cottongrass (*Eriophorum angustifolium*), Bog Sedge (*Carex limosa*) and Great Sundew (*Drosera anglica*). Brown Beak-sedge, a locally rare plant of wet bog pools, has been recorded from a number of the bog areas within the site. At Addergoole a substantial bog lake or soak occurs and this is infilling with large rafts of Rhynchosporion vegetation at present. This area is associated with an important area of wet bog woodland dominated by Downy Birch (*Betula pubescens*). The largest part of the uncut high bog comprises degraded raised bog. Degraded bog is dominated by a raised bog flora which tends to be rather species-poor because of disturbance and/or drying-out. The most conspicuous vascular plant species are usually Carnation Sedge, Heather (*Calluna vulgaris*), Cottongrasses, Cross-leaved Heath (*Erica tetralix*), Bog Asphodel and Deergrass. Bog-rosemary (*Andromeda polifolia*) and Cranberry (*Vaccinium oxycoccos*), two species indicative of raised bog habitat, are frequent on both degraded and active areas of raised bog. *Sphagnum* cover is generally low within degraded areas due to a combination of drying-out and frequent burning.

Limestone pavement occurs along much of the shoreline in the lower Corrib basin, and supports a rich and diverse flora, including Herb-Robert (*Geranium robertianum*), Bloody Crane's-bill (*G. sanguineum*), Carlina Thistle (*Carlina vulgaris*), Spring Gentian (*Gentiana verna*), Wild Thyme (*Thymus praecox*), Rustyback (*Ceterach officinarum*), Wood Sage (*Teucrium scorodonia*), Slender St. John's-wort (*Hypericum pulchrum*), Quaking-grass (*Briza media*) and Blue Moor-grass (*Sesleria albicans*). Areas of Hazel (*Corylus avellana*) scrub occur in association with exposed limestone pavement and these include species such as Hawthorn (*Crataegus monogyna*), Buckthorn (*Rhamnus catharticus*), Spindle (*Euonymus europaeus*), with occasional Juniper (*Juniperus communis*). Three Red Data Book species are also found in association with limestone scrub - Alder Buckthorn (*Frangula alnus*), Shrubby Cinquefoil (*Potentilla fruticosa*) and Wood Bitter-vetch (*Vicia orobus*), the latter is also protected under the Flora (Protection) Order, 2015.

Open areas of orchid-rich calcareous grassland are also found in association with the limestone exposures. These can support a typically rich vegetation, including many orchids such as Pyramidal Orchid (*Anacamptis pyramidalis*), Common Spotted-orchid (*Dactylorhiza fuchsii*), Early-purple Orchid



(*Orchis mascula*), Frog Orchid (*Coeloglossum viride*), Fragrant Orchid (*Gymnadenia conopsea*), Marsh Helleborine (*Epipactis palustris*), Greater Butterfly-orchid (*Platanthera chlorantha*) and Irish Lady's-tresses (*Spiranthes romanzoffiana*). The latter is protected under the Flora (Protection) Order, 2015.

The Hill of Doon, located in the north-western corner of the lake, is a fine example of a Sessile Oak (*Quercus petraea*) woodland. The understorey is dominated by Sessile Oak, Holly (*Ilex aquifolium*) and occasional Juniper. There are occasional Yew (*Taxus baccata*) and Ash (*Fraxinus excelsior*), and a well-developed ground layer dominated by Bilberry (*Vaccinium myrtillus*), Hard Fern (*Blechnum spicant*) and Wood Rush (*Luzula sylvatica*). Woodland also occurs on some of the islands in the lake.

A number of the rivers in the site support submerged and floating vegetation of the *Ranunculus fluitantis* and *Callitriche-Batrachion*, including mosses. For example, in the River Corrib species such as Shining Pondweed (*Potamogeton lucens*), Perfoliate Pondweed (*Potamogeton perfoliatus*), Small Pondweed (*P. berchtoldii*), Yellow Water-lily (*Nuphar lutea*), White Water-lily (*Nymphaea alba*) and stoneworts (*Chara* spp.) occur.

The rare and Annex II-listed Slender Green Feather-moss (*Drepanocladus [Hamatocaulis] vernicosus*) is found at the fen at Gortachalla, north-east of Moycullen. Here it is widespread around the margins, and this constitutes a large and significant population in the national context. A very large population of another rare moss, *Pseudocalliergon trifarium*, is also found in this area.

The lake is rated as an internationally important site for waterfowl. Counts from 1984 to 1987 revealed a mean annual peak total of 19,994 birds. In the past a maximum peak of 38,281 birds was recorded. The lake supports internationally important numbers of Pochard (average peak 8,600) and nationally important numbers of the following species: Coot (average peak 6,756), Mute Swan (average peak 176), Tufted Duck (average peak 1,317), Cormorant (average peak 110) and Greenland White-fronted Goose (average peak 83). The latter species is listed on Annex I of the E.U. Birds Directive. The Coot population is the largest in the country and populations of Tufted Duck and Pochard are second only to Lough Neagh. Breeding pairs of Common Scoter on the lake number 30-41 (1995 data), as well as breeding populations of Arctic Tern and Common Tern. Other bird species of note recorded from or close to the lake recently include Hen Harrier, Whooper Swan, Golden Plover and Kingfisher. All of these species are listed on Annex I of the E.U. Birds Directive.

Otter and Irish Hare have been recorded regularly within this site. Both of these species are listed in the Red Data Book and are legally protected by the Wildlife Act, 1976. Otter is also listed on Annex II of the E.U. Habitats Directive. Lough Corrib is considered one of the best sites in the country for Otter, due to the sheer size of the lake and associated rivers and streams, and also the generally high quality of the habitats. Atlantic Salmon (*Salmo salar*) use the lake and rivers as spawning grounds. Although this species is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II of the E.U. Habitats Directive. Lough Corrib is also a well-known fishing lake with a very good Trout (*Salmo trutta*) fishery. The lake has a population of Sea Lamprey (*Petromyzon marinus*), a scarce, though probably under-recorded species listed on Annex II of the E.U. Habitats Directive. Brook Lamprey (*Lampetra planeri*), also listed on Annex II, are also known from a number of areas within the site.

A population of Freshwater Pearl Mussel (*Margaritifera margaritifera*), a species listed on Annex II of the E.U. Habitats Directive, occurs within the site. White-clawed Crayfish (*Austropotamobius pallipes*), also listed on Annex II, is well distributed throughout Lough Corrib and its in-flowing rivers over



limestone. A summer roost of Lesser Horseshoe Bat, another Annex II species, occurs within the site - approximately 100 animals were recorded here in 1999.

The main threats to the quality of this site are from water polluting activities resulting from intensification of agricultural activities on the eastern side of the lake, uncontrolled discharge of sewage which is causing localised eutrophication of the lake, and housing and boating development, which is causing the loss of native lakeshore vegetation. The raised bog habitats are susceptible to further degradation and drying out due to drainage and peat cutting and, on occasions, burning. Peat cutting threatens Addergoole Bog and already a substantial area of it has been cut away. Fishing and shooting occur in and around the lake. Introduction of exotic crayfish species or the crayfish fungal plague (*Aphanomyces astaci*) could have a serious impact on the native crayfish population. The bat roost is susceptible to disturbance or development.

Despite these ongoing issues, however, Lough Corrib is one the best examples of a large lacustrine catchment system in Ireland, with a range of habitats and species still well represented. These include 15 habitats which are listed on Annex I of the E.U. Habitats Directive, six of which are priority habitats, and nine species which are listed on Annex II. The lake is also internationally important for birds and is designated as a Special Protection Area.

SITE NAME: Galway Bay Complex SAC

SITE CODE: 000268

Situated on the west coast of Ireland, this site comprises the inner, shallow part of a large bay which is partially sheltered by the Aran Islands. The Burren karstic limestone fringes the southern sides and extends into the sublittoral. West of Galway city the bedrock geology is granite. There are numerous shallow and intertidal inlets on the eastern and southern sides, notably Muckinish, Aughinish and Kinvarra Bays. A number of small islands composed of glacial deposits are located along the eastern side. These include Eddy Island, Deer Island and Tawin Island. A diverse range of marine, coastal and terrestrial habitats, including several listed on Annex I of the E.U. Habitats Directive, occur within the site, making the area of high scientific importance.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [1140] Tidal Mudflats and Sandflats; [1150] Coastal Lagoons*; [1160] Large Shallow Inlets and Bays; [1170] Reefs; [1220] Perennial Vegetation of Stony Banks; [1230] Vegetated sea cliffs of the Atlantic and Baltic coasts; [1310] *Salicornia* Mud; [1330] Atlantic Salt Meadows; [1410] Mediterranean Salt Meadows; [3180] Turloughs*; [5130] Juniper Scrub; [6210] Orchid-rich Calcareous Grassland*; [7210] *Cladium* Fens*; [7230] Alkaline Fens; [8240] Limestone Pavement*; [1355] Otter (*Lutra lutra*); [1365] Common (Harbour) Seal (*Phoca vitulina*).

Galway Bay South holds a very high number of littoral communities (12). They range from rocky terraces, to sandy beaches with rock or sand dunes behind. The intertidal sediments of Galway Bay support good examples of communities that are moderately exposed to wave action. A well-defined talitrid amphipod zone in the upper shore gives way to an intertidal, mid shore zone with sparse epifauna or infauna. On the lower, flat part of the shore, the tubes of the deposit-feeding terebellid worm, *Janicea conchilega*, are common on the surface. Nereid and cirratulid polychaete worms (*Hediste diversicolor*, *Arenicola marina*), small crustaceans and bivalves (*Angulus tenuis*, *Cerastoderma edule* and *Macoma balthica*) are present. The area has the country's only recorded example of the littoral community characterized by *Fucus serratus* with sponges, ascidians and red seaweeds on tide-swept lower



eulittoral mixed substrata. This community has very high species richness (85 species), as do the sublittoral fringe communities on the Finavarra reef (88 species). The rare Purple Sea Urchin *Paracentrotus lividus* and the foliose red alga *Phyllophora sicula* are present at Finavarra, whereas the red alga *Rhodomenia delicatula* and the rare brown alga, *Ascophyllum nodosum* var. *mackii*, occur in Kinvarra and Muckinish Bays. Sublittorally, the area has a number of distinctive and important communities. Of particular note is that Ireland's only reported piddock (bivalve mollusc) bed thrives in the shallows of Aughinish Bay. The rare sponge, *Mycale contarenii*, is also found here. There is further interest in an extensive maerl bed of *Phymatolithon calcareum* which occurs in the strong tidal currents of Muckinish Bay. There is also maerl off Finavarra Point and in Kinvarra Bay (*Lithothamnion corallioides*, *Lithophyllum dentatum* and *Lithophyllum fasciculatum*). An oyster bed in Kinvarra Bay and seagrass (*Zostera* spp.) beds off Finavarra Point are also important features. Other significant habitats which occur include secondary maerl beds and communities strongly influenced by tidal streams.

Saltmarshes are frequent within this extensive coastal site, with both E.U. Habitats Directive types, 'Atlantic Salt Meadow' and 'Mediterranean Salt Meadow' well represented. Most of the saltmarshes are classified as the bay type, with the substrate being mud or mud/sand. There is one lagoon type and one estuary type. Lagoon saltmarshes are the rarest type found in Ireland. The best examples of saltmarsh are located in inner Galway bay, east of a line running between Galway city and Kinvarra. In this area the coastline is highly indented, thus providing the sheltered conditions necessary for extensive saltmarsh development. Common saltmarsh species include Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvygrass (*Cochlearia officinalis*), Lax-flowered Sea-lavender (*Limonium humile*), Common Saltmarsh-grass (*Puccinellia maritima*), Saltmarsh Rush (*Juncus gerardi*) and Sea Rush (*Juncus maritimus*). On the lower levels of the saltmarshes and within pans there occurs Glasswort (*Salicornia europaea* agg.). A noteworthy feature of the saltmarsh habitat within this site is the presence of dwarfed brown seaweeds in the vegetation. These are also known as "turf fucoids" and typical species include *Fucus* spp., *Ascophyllum nodosum* and *Pelvetia canaliculata*. A number of locally rare vascular plant species also grow in saltmarsh areas within the site. These include Reflexed Saltmarsh-grass (*Puccinellia distans*) and Sea-purslane (*Halimione portulacoides*), which are both relatively rare in the western half of the country.

Shingle and stony beaches can be found throughout the site, with the best examples along the more exposed shores to the south and west of Galway city and to the north and east of Finavarra, Co. Clare. In general, these shingle shorelines are sparsely vegetated and frequently occur interspersed with areas of sandy beach and/or bedrock shore. The associated flora is dominated by plant species of frequently disturbed maritime habitats. To the south and west of Galway city, typical plants include Curled Dock (*Rumex crispus*), Common Couch (*Elymus repens*), Sea Sandwort (*Honkenya peploides*), Sea Beet (*Beta vulgaris* subsp. *maritima*), Sea Mayweed (*Matricaria maritima*), Silverweed (*Potentilla anserina*) and Oraches (*Atriplex* spp.). Two rare plant species are associated with the habitat: Henbane (*Hyoscyamus niger*), a threatened species listed in the Irish Red Data Book, grows on shingle beach to the south of Lough Atalia; there are also old records for the threatened plant species Sea-kale (*Crambe maritima*).

Soft coastal cliffs reaching heights in excess of 10m occur at Rusheen. These support coastal grassland with very sparse vegetation cover. Species recorded include Sea Plantain (*Plantago maritima*), Creeping Bent (*Agrostis stolonifera*), False Oat-grass (*Arrhenatherum elatius*), Cock's Foot (*Dactylis glomerata*), Red Fescue, Common Bird's-foot-trefoil (*Lotus corniculatus*), and the lichens *Ramalina* sp. and *Xanthoria parietina*. They are considered highly representative of the rarer soft type of sea cliffs in Ireland.



An excellent range of lagoons of different types, sizes and salinities occurs within the site. This habitat is given priority status on Annex I of the E.U. Habitats Directive. One unusual type of lagoon, karstic rock lagoon, is particularly well represented. This type of lagoon is common on the Aran Islands, but on mainland Ireland, all but one are confined to this site. Additionally, the best example of all karstic lagoons in the country, Lough Murree, is found at this site. The flora of the habitat is rich and diverse, reflecting the range of salinities in the different lagoons. It is typically brackish, with two species of Tasselweed (*Ruppia* spp.), two Red Data charophytes *Chara canescens* and *Lamprothamnion papulosum*, and *Chaetomorpha linum*, an alga (all lagoonal specialists). The fauna of the lagoon is also rich, diverse and lagoonal. At least 10 lagoonal specialist species were recorded in 1996 and 1998 from the combined habitat of all the lagoons, which is one of the highest number for any lagoonal habitat in the country. Many of the species appear to be rare. The lagoons within this site are excellent examples of the habitat type and of high conservation importance.

Other terrestrial habitats within this site which are of conservation importance include Great Fen-sedge (*Cladium mariscus*)-dominated fen and Black Bog-rush (*Schoenus nigricans*)-dominated alkaline fen at Oranmore, a turlough of moderate size at Ballinacourty, limestone pavement at Ballyconry, Gleninagh North and Newquay, dry calcareous grassland with orchids (best examples occurring west of Salthill), Juniper (*Juniperus communis*) scrub formations at Oranmore, wet grassland and an area of deciduous woodland at Barna. The orchid-rich grassland occurs on a series of small drumlin hills found to the west of Galway City, and is largely confined to the sides of the hills. Calcicole species such as Kidney Vetch (*Anthyllis vulneraria*), Harebell (*Campanula rotundifolia*), Spring Gentian (*Gentiana verna*), Common Spotted-orchid (*Dactylorhiza fuchsii*), Lesser Twayblade (*Listera ovata*), Pyramidal Orchid (*Anacamptis pyramidalis*), Yellow-wort (*Blackstonia perfoliata*) and Greater Knapweed (*Centaurea scabiosa*) are found here, among others. Juniper is also found in this area.

Areas of alkaline and *Cladium* fen as best represented near Oranmore, and species such as Great Fen-sedge, Common Reed (*Phragmites australis*), Purple Moor-grass (*Molinia caerulea*), Bogbean (*Menyanthes trifoliata*) and Long-stalked Yellow-sedge (*Carex lepidocarpa*) are found along with the usually dominant, Black Bog-rush. The turlough at Ballinacourty floods to about 25 ha in winter, and has vegetation with a typical zonation. Wetland species such as Amphibious Bistort (*Polygonum amphibium*), Common Marsh-bedstraw (*Galium palustre*) and Marsh Cinquefoil (*Potentilla palustris*) are found near the swallow-hole, with species of wet grassland close to the flood limit (e.g. Silverweed, *Potentilla anserina*, Water Mint, *Mentha aquatica* and Creeping Bent, *Agrostis stolonifera*). Sedges (*Carex* spp.) dominate in between.

Inner Galway Bay provides extensive good quality habitat for Common Seal (maximum count of 317 in the all-Ireland survey of 2003). This species is listed on Annex II of the E.U. Habitats Directive. The seals use a range of haul-out sites distributed through the bay - these include inner Oranmore Bay, Rabbit Island, St. Brendan's Island, Tawin Island, Kinvarra Bay, Aughinish Bay and Ballyvaughan. The site provides optimum habitat for Otter, also an Annex II-listed species.

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Fishing and aquaculture are the main commercial activities within the site. A concern is that sewage effluent and detritus of the aquaculture industry could be deleterious to benthic communities. Reef and



sediment communities are vulnerable to disturbance or compaction from tractors accessing oyster trestles. The *Paracentrotus lividus* populations have been shown to be vulnerable to over-fishing. Extraction of maerl in Galway Bay is a threat. Owing to the proximity of Galway city, shoreline and terrestrial habitats are under pressure from urban expansion and recreational activities. Eutrophication is probably affecting some of the lagoons and is a continued threat. Drainage is a general threat to the turlough and fen habitats. Bird populations may be disturbed by aquaculture activities.

This large coastal site is of immense conservation importance, with many habitats listed on Annex I of the E.U. Habitats Directive, four of which have priority status (lagoon, Cladium fen, turlough and orchid-rich calcareous grassland). The examples of shallow bays, reefs, lagoons and saltmarshes found within this site are amongst the best in the country. The site supports an important Common Seal colony and a breeding Otter population (Annex II species), and six regular Annex I E.U. Birds Directive species. The site also has four Red Data Book plant species, plus a host of rare or scarce marine and lagoonal animal and plant species.

SITE NAME: Inner Galway Bay SPA

SITE CODE: 004031

Inner Galway Bay SPA is a very large, marine-dominated site situated on the west coast of Ireland. The inner bay is protected from exposure to Atlantic swells by the Aran Islands and Black Head. Subsidiary bays and inlets (e.g. Poul-na-clough, Aughinish and Kinvarra Bays) add texture to the patterns of water movement and sediment deposition, which lends variety to the marine habitats and communities. The terraced Carboniferous (Viséan) limestone platform of the Burren sweeps down to the shore and into the sublittoral. The long shoreline is noted for its diversity, and comprises complex mixtures of bedrock shore, shingle beach, sandy beach and fringing salt marshes. Intertidal sand and mud flats occur around much of the shoreline, with the largest areas being found on the sheltered eastern coast between Oranmore Bay and Kinvarra Bay. A number of small islands and rocky islets in the Bay are included within the site.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Black-throated Diver, Great Northern Diver, Cormorant, Grey Heron, Light-bellied Brent Goose, Wigeon, Teal, Red-breasted Merganser, Ringed Plover, Golden Plover, Lapwing, Dunlin, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Black-headed Gull, Common Gull, Sandwich Tern and Common Tern. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Inner Galway Bay supports an excellent diversity of wintering wetland birds, with divers, grebes, cormorants, dabbling duck, sea duck and waders all well represented. There are internationally important wintering populations of Great Northern Diver (88) and Light-Bellied Brent Goose (676) and nationally important wintering populations of an additional sixteen species i.e. Black-throated Diver (36), Cormorant (266), Grey Heron (102), Wigeon (1,168), Teal (700), Red-breasted Merganser (249), Ringed Plover (335), Golden Plover (2,030), Lapwing (3,969), Dunlin (2,155), Bar-tailed Godwit (447), Curlew (697), Redshank (505), Turnstone (182), Black-headed Gull (1,941) and Common Gull (1,066) - all figures given are five year mean peaks for the seasons 1995/96 to 1999/2000. Of note is that the populations of Red-breasted Merganser and Ringed Plover represent 6.8% and 2.3% of the respective all-Ireland totals. Other species which occur in notable numbers include Little Grebe (35), Long-tailed Duck (21), Scaup (44) and Herring Gull (216). In addition, the following species also use the site: Great Crested Grebe (16), Mallard (200), Common Scoter (87), Oystercatcher (576), Grey Plover (60), Black-



tailed Godwit (46), Mute Swan (150) and Great Black-backed Gull (129). The site provides both feeding and roost sites for most of the species. Little Egret, a species which has recently colonised Ireland, also occurs at this site.

The site has several important populations of breeding birds, most notably colonies of Sandwich Tern (81 pairs in 1995) and Common Tern (98 pairs in 1995 on Green Island and 46 pairs in 2001 on Mutton Island). A large Cormorant colony occurs on Deer Island - this had 200 pairs in 1985 and 300 pairs in 1989.

Inner Galway Bay SPA is of high ornithological importance with two wintering species having populations of international importance and a further sixteen wintering species having populations of national importance. The breeding colonies of Sandwich Tern, Common Tern and Cormorant are also of national importance. Also of note is that six of the regularly occurring species are listed on Annex I of the E.U. Birds Directive, i.e. Black-throated Diver, Great Northern Diver, Golden Plover, Bar-tailed Godwit, Sandwich Tern and Common Tern. Inner Galway Bay is a Ramsar Convention site and part of the Inner Galway Bay SPA is a Wildfowl Sanctuary.