
Natura Impact Statement

Proposed Residential Development at
Far Finisklin, Co. Sligo

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NM Ecology Ltd - Consultant Ecologists

38 Maywood Avenue, Raheny, Dublin 5

Website: www.nmecology.com

Email: info@nmecology.com

Tel: 087-6839771

Executive Summary

This *Natura Impact Statement* has been prepared by NM Ecology Ltd on behalf of Sligo County Council (the applicant), as part of a planning application at Far Finisklin, Co. Sligo. The proposed development will involve the demolition of some buildings, the clearance of parts of the site, the renovation and conversion of a derelict structure (Rathellen House) and the construction of up to 63 residential units. The aim of this report is to identify and evaluate any potential impacts on Natura 2000 sites.

In accordance with their obligations under the *European Communities (Birds and Natural Habitats) Regulations 2011* (SI 477/2011), the planning authority (in this case An Bórd Pleanála) must assess whether the proposed development could have 'likely significant effects' on any Natura 2000 sites. This document provides supporting information to assist the authority with an Appropriate Assessment, including: details of Natura 2000 sites within the potential zone of impact, an appraisal of *source-pathway-receptor* relationships, an assessment of potential direct, indirect and in-combination impacts, and a mitigation strategy.

If a precautionary approach is adopted, it is possible that pollutants (suspended sediments, concrete / cement and hydrocarbons) generated during the construction of the proposed development could have an impact on aquatic habitats and fauna in the *Cummeen Strand / Drumcliff Bay* SAC and the *Cummeen Strand* SPA. In response, a range of mitigation measures will be implemented during the construction phase in order to avoid or minimise the risk that any pollutants could reach the SAC or SPA. Subject to the successful implementation of these measures, we conclude that the proposed development will not cause significant impacts on any Natura 2000 sites.

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1 Introduction

1.1 Background to Appropriate Assessment

Approximately 10% of the land area of Ireland is included in the European Network of Natura 2000 sites, which includes Special Protection Areas (SPAs) to protect important areas for birds, and Special Areas of Conservation (SACs) to protect habitats and non-avian fauna. Legislative protection for these sites is provided by the *European Council Birds Directive* (79/409/EEC) and *E.C. Habitats Directive* (92/43/EEC, as amended), which are transposed into Irish law by the *European Communities (Birds and Natural Habitats) Regulations 2011* (SI 477/2011).

In accordance with Article 42 of the national regulations, planning authorities must consider the potential impacts of any development on the integrity of the Natura 2000 network. The first stage of this process is a simple screening exercise to determine whether the development could potentially affect any Natura 2000 sites. If there is a viable risk of impact (adopting a precautionary approach), the development should proceed to the second stage of the process, which is known as ‘Appropriate Assessment’ (AA). In Section 3.1 of *Appropriate Assessment of Plans and Projects in Ireland*, the second stage of the AA process is described as follows:

“This stage considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a Natura 2000 site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. The proponent of the plan or project will be required to submit a Natura Impact Statement [...] to identify and characterise any possible implications for the site in view of the site’s conservation objectives, taking account of in-combination effects. This should provide information to enable the competent authority to carry out the appropriate assessment. If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must proceed to Stage 4, or the plan or project should be abandoned. The Appropriate Assessment is carried out by the competent authority, and is supported by the Natura Impact Statement.”

This document is a Natura Impact Statement, which provides supporting information to assist competent authorities with stages 1 and 2 of the Appropriate Assessment process. It includes the following sections: a description of the project, details of Natura 2000 sites within the zone of impact, an appraisal of potential pathways for indirect effects, an assessment of potential impacts, mitigation measures, and a conclusion.

1.2 Statement of authority

This report was written by Nick Marchant, the principal ecologist of NM Ecology Ltd. He has an MSc in Ecosystem Conservation and Landscape Management from NUI Galway and a BSc in Environmental Science from Queens University Belfast. He is a member of the Chartered Institute of Ecology and Environmental Management, and operates in accordance with their code of professional conduct.

He has fourteen years of professional experience, including eleven years as an ecological consultant, one year as a local authority biodiversity officer, and two years managing an NGO in Indonesia. He provides ecological assessments for developments throughout Ireland and Northern Ireland, including wind farms, infrastructural projects (roads, water pipelines, greenways, etc.), and a range of residential and commercial developments.

1.3 Methods

This report has been prepared with reference to the following guidelines:

- *Appropriate Assessment of Plans and Projects in Ireland* (Department of the Environment, Heritage and Local Government, 2009)
- *OPR Practice Note PN01: Appropriate Assessment Screening for Development Management* (Office of the Planning Regulator 2021)
- *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4), E.C., 2002.*
- *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal* (CIEEM 2018)

Supporting data was collected from the following sources:

- Plans and specifications for the proposed development
- A *Winter Bird Survey Report* carried out by MKO Planning and Environmental Consultants between January and March 2021
- A *Hydrological Assessment Report* for the Site, prepared by RPS Group in 2021
- Qualifying interests / conservation objectives of Natura 2000 sites from www.npws.ie
- Bedrock, soil, subsoil, surface water and ground water maps from the Geological Survey of Ireland webmapping service, the National Biodiversity Data Centre, and the Environmental Protection Agency web viewer
- The *Sligo County Development Plan 2017 - 2023*, the *Sligo & Environs Local Area Plan 2010-2016* (which has been extended, pending an update), and details of permitted or proposed developments from the local authority's online planning records

Desktop data from internet resources was accessed between January and August 2021, and site inspections were carried out on 1st June 2021 and 21st January 2022.

1.4 Consultation

A request for consultation was made to the National Parks and Wildlife Service (via the Development Applications Unit) on 11th December 2020, and a response was received on 4th February 2021. The following was noted in relation to Appropriate Assessment:

“The Department would like to highlight the potential for impacts to designated Natura 2000 sites, which should be included in the assessments which include, but not limited to, for example, Cummeen Strand/Drumcliff Bay (Sligo Bay) Special Area of Conservation (SAC [site code 000627], Cummeen Strand Special Protection Area [site code 004035], directly adjacent (approximately 90 metres) to the study area for this project and Drumcliff Bay Special Protection Area [site code 004013] and Ballysadare Bay Special Protection Area [site code 004129].

The following considerations are recommended in order to assess whether the proposed project will be likely to have a significant effect, either individually or in combination with other plans or projects on the Natura site/s.

The Department recommends that the screening for AA should include all the associated operations of the proposed development site, for example, construction and operational phases to identify whether any of these phases of the project are likely to have a significant effect on the integrity of a European site. Noting, the Groundwater vulnerability for the development site and area is listed as ‘High’ on GSI.ie; hydrogeological investigations may be required both inside and outside the development site to establish if there is connectivity with Natura 2000 sites and their Qualifying Interest (QI) habitats; and Special Conservation Interest (SCI) habitats.

Similarly, surveys of QI and SCI species may be required both inside and outside the development site to identify, for example, feeding areas for SCI species (and/or QI species as relevant) outside the Natura 2000 site or flight lines between European sites and any associated impacts from the proposed project.”

2 Description of the Project

2.1 Environmental setting

Site location and surroundings

The proposed development site (hereafter referred to as the Site) is located in the townland of Far Finisklin, which is on the south-western outskirts of Sligo Town. It currently contains a derelict building and associated outbuildings, as well as fields of grassland surrounded by mature treelines and hedgerows (Figure 1).

The northern boundary of the Site is formed by Far Finisklin Road, the western boundary by Sea Road, the southern boundary by an An Post Delivery Centre, and the eastern boundary by open pasture land. Most land to the north and west of the Site is in agricultural usage, but most land to the south and east consists of industrial facilities and housing estates.

Geology and soils

The Site is underlain by limestone and shale (described as ‘dark fine limestone & calcareous shale’ on the GSI website). The bedrock is a locally-important aquifer. Subsoils are metamorphic till, and soils are a coarse loamy drift with limestones (Mullabane series).

Existing land elevations within the Site range from 6.0 m OD to 9.5 m OD (Malin), with a gentle slope from the south (high point) to the north (low point). In the Hydrological Assessment Report for the Site (RPS Group, 2021), it is noted that *“Storm runoff from the Site currently infiltrates to the ground, and any excess runoff drains northward and eventually discharges into Sligo Estuary as overland flow.”*

Hydrology

There are no rivers or streams within or adjacent to the Site. There is a drainage ditch on the northern boundary of the Site, which drains north-east towards the coast, and is culverted under Far Finisklin Road.

The closest watercourse is the Knappagh Stream, which is located approx. 250 m south-west of the proposed development. It flows north-west and meets the coast approx. 750 m downstream. However, considering its distance from the Site, and that the Site slopes toward the north, there is not considered to be any connection to this stream.

The main surface water feature of the surrounding area is the transitional waters of the Garvogue Estuary / Cummeen Strand Bay, which are located approx. 200 m north of the Site at the closest point.

Under the Water Framework Directive status assessments 2013 – 2018, the transitional waters of the Garvogue Estuary / Cummeen Strand are of Moderate status, the offshore coastal waters of Good status, and the Knappagh Stream is not monitored.



Figure 1. Site and immediate surroundings



Figure 2. Proposed layout, shown by the red line (rotated 90°). New dwellings are shown in black, and landscaped areas in green and yellow

2.2 Description of the proposed development

The proposed development will involve the demolition of some derelict outbuildings, and the clearance of much of the remainder of the site. An existing structure (known as Rathellen House) and an associated outbuilding will be renovated and converted into 6 no. residential units. 57 no. new residential units will be constructed in the remainder of the site, comprising a mixture of 2 – 5 bedroom houses and 1 - 2 bedroom duplex apartments. In total, this will comprise 63 no. residential units.

The primary access point will be from Sea Road, and it will lead to paved internal roads and on-street parking spaces. A cycle path will run along the western and northern sides of the Site. Part of Sea Road will be re-aligned to accommodate public transport. Existing mature trees in the north of the Site will be retained and incorporated into a large area of public open space. New residences will have private gardens.

Foul water will be discharged to a local authority foul sewer on Sea Road and conveyed to the Sligo Waste Water Treatment Works. Surface water runoff from roofs and paved surfaces will be discharged to an underground infiltration tank in the north of the site, with smaller soakaways to the rear of dwellings. Rainwater on green areas will percolate to ground.

2.3 Other nearby developments (potential in-combination effects)

The Site is located in a suburban setting on the south-western outskirts of Sligo Town. In the *Sligo Environs Development Plan 2010 - 2016* (which has been extended), it is zoned as a low / medium density residential area, and a strategic land reserve. The surrounding area is under moderate development pressure, particularly to the south and east.

Live and recently-approved planning applications in the vicinity of the Site were reviewed on the online planning records of Sligo County Council. The following were identified:

- Planning reference 2182: Permission granted in 2021 for a building extension and the alteration of waste facilities at a manufacturing facility to the east of the Site;
- 18100: Permission granted in 2018 for a minor expansion of works at a pharmaceutical facility approx. 10 m south-west of the Site;
- 18458: Permission granted in 2019 for a cold-storage facility and reconfiguration of parking facilities approx. 600 m south-east of the Site;
- 1577: Permission granted in 2015 for the continuation of work and retention of buildings at a scrap metal yard approx. 400m north-east of the Site;
- 17243: Permission granted in 2017 for an expansion of operations at a hazardous waste treatment facility located approx. 750 m east of the Site.

Screening for Appropriate Assessment was carried out by Sligo County Council for each of these developments, as reported in the Planners' Reports on the online planning records. When each development was considered *in isolation*, it was concluded that there was no risk of significant

impacts on Natura 2000 sites. However, the potential impacts of multiple concurrent developments *in combination* will be considered in Section 4.3 of this document.

It is expected that these developments will have been completed by the time the proposed development commences, but it is possible that some may be constructed at the same time.

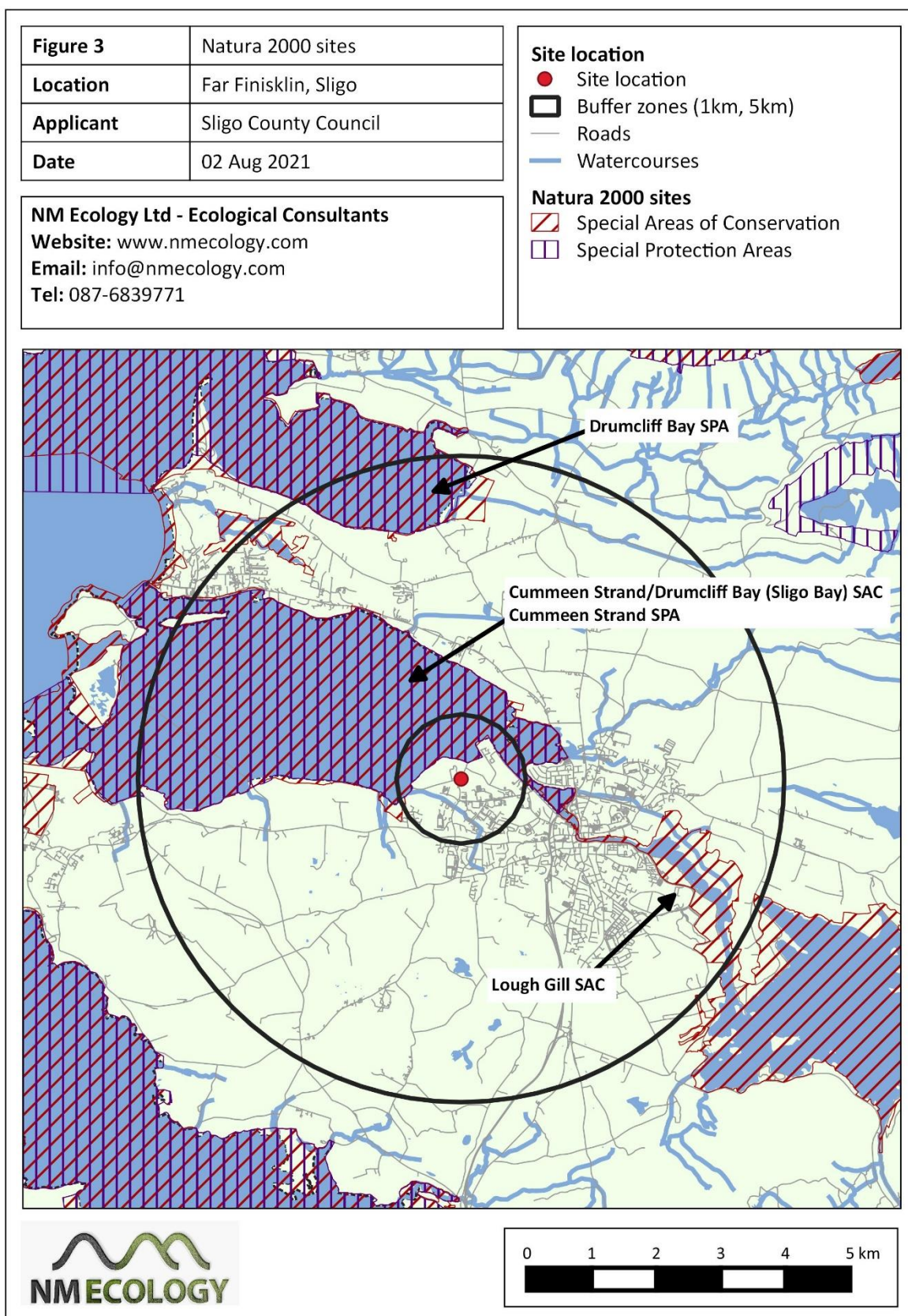
3 Description of Natura 2000 sites

3.1 Identification of Natura 2000 sites within the zone of influence

The Site is not located within or adjacent to any Natura 2000 sites. Potential indirect impacts were considered within a zone of influence of 5km, and along associated watercourses. The *Ballysadare Bay* SPA was added following consultation with the National Parks and Wildlife Service (Section 1.4). Details of these Natura 2000 sites are provided in Table 1, and their locations are shown in Figure 3.

Table 1: Natura 2000 sites of relevance to the Site

Site name	Distance	Qualifying Interests
Cummeen Strand / Drumcliff Bay SAC (site code 627)	0.1 km north	<p>Annex I Habitats: estuaries; mudflats and sandflats; embryonic shifting dunes; shifting dunes with <i>Ammophila arenaria</i>; fixed coastal dunes with herbaceous vegetation; <i>Juniperus communis</i> formations on heaths or calcareous grasslands; petrifying springs with tufa formation (Cratoneurion)</p> <p>Annex II Species: narrow-mouthed whorl snail, sea lamprey, river lamprey, common seal</p>
Cummeen Strand SPA (4035)	0.1 km north	<p>Habitats: coastal wetlands</p> <p>Special conservation interests: wintering populations of light-bellied brent goose, oystercatcher and redshank</p>
Lough Gill SAC (1976)	1.9 km east	<p>Annex I Habitats: natural eutrophic lakes; old sessile oak woods; alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i></p> <p>Annex II Species: white-clawed crayfish, sea lamprey, brook lamprey, river lamprey, Atlantic salmon, otter</p>
Drumcliff Bay SPA (4013)	3.8 km north	<p>Habitats: coastal wetlands</p> <p>Special conservation interests: wintering populations of sanderling and bar-tailed godwit</p>
Ballysadare Bay SPA (4129)	6.0 km south-west	<p>Habitats: coastal wetlands</p> <p>Special conservation interests: wintering populations of light-bellied brent goose, grey plover, dunlin, bar-tailed godwit and redshank</p>



3.2 Conservation objectives

The standard conservation objective for all SACs and SPAs in Ireland is “*to maintain or restore the favourable conservation condition of the qualifying interests for which the SAC / SPA has been selected*”. In addition, the Department of Housing, Local Government and Heritage has produced detailed conservation objectives for the Natura 2000 sites listed in Table 1. They can be viewed on the website of the National Parks and Wildlife Service (<http://www.npws.ie/protected-sites>), but are not reproduced here in the interests of brevity.

3.3 Potential pathways for indirect impacts

Indirect impacts can occur if there is a viable pathway between the source (the Site) and the receptor (the habitats and species for which a Natura 2000 site has been designated). The most common pathway for impacts is surface water, e.g. if a pollutant is washed into a river and carried downstream into a Natura 2000 site. Other potential pathways are groundwater, air (e.g. airborne dust or sound waves), or land (e.g. flow of liquids, vibration). The zone of effect for hydrological impacts can be several kilometres, but for air and land it is rarely more than one hundred metres. An appraisal of potential pathways for impacts on Natura 2000 sites is provided below.

The *Cummeen Strand / Drumcliff Bay* SAC and the *Cummeen Strand* SPA are located approx. 200 m north of the Site. The SAC has been designated for the protection of estuarine / tidal habitats, including sand dunes, juniper heaths / grasslands and petrifying springs. The SPA has been designated for the protection of over-wintering migrant populations of brent geese, oystercatchers, redshank and other coastal bird species. No rivers or streams directly link the Site with the SAC / SPA, but it is noted in the Hydrological Assessment Report for the Site (RPS Group 2021) that “*excess runoff [from the Site] drains northward and eventually discharges into Sligo Estuary as overland flow*”. There may also be surface water pathways to coastal waters via the drainage ditch in the north of the Site, or via other drains along adjoining roads. Considering that the bedrock is a locally-important aquifer and that the underlying soils are relatively free-draining, it is also possible that there could be a groundwater pathway to coastal waters. Air is not considered a feasible pathway, because windborne dust is unlikely to reach the coast in detectable concentrations.

The *Lough Gill* SAC is located approx. 1.9 km east of the Site, and includes both the lake and the freshwater section of the Garvogue River. The SAC has been designated for the protection of the lake, associated woodlands, and a number of aquatic species. There is no surface water pathway between the Site and this SAC, because the SAC is upstream on the Garvogue River. Pathways via groundwater, land or air can be ruled out due to the distances involved.

The *Drumcliff Bay* SPA is located approx. 3.8 km north of the Site. It has been designated for the protection of over-wintering migrant populations of sanderling, bar-tailed godwit and other

coastal bird species. There is no surface water pathway between the Site and the SPA, as the SPA is located in a separate bay. Considering the distances involved, pathways via groundwater, land and air can be ruled out.

The *Ballysadare Bay* SPA is located approx. 6 km south-west of the Site. It has been designated for the protection of over-wintering migrant populations of brent geese, grey plover, dunlin, bar-tailed godwit, redshank and other coastal bird species. As above, there is no surface water pathway between the Site and the SPA, as the SPA is located in a separate bay. Considering the distances involved, pathways via groundwater, land and air can be ruled out.

In summary, potential pathways via surface water and groundwater were identified between the Site and two Natura 2000 sites: the *Cummeen Strand / Drumcliff Bay* SAC and the *Cummeen Strand* SPA. Potential impacts on these sites will be considered in Section 4 below.

3.4 Suitability for SPA bird species

The *Cummeen Strand* SPA, *Drumcliff Bay* SPA and *Ballysadare Bay* SPA support a range of over-wintering bird species. The main habitats of these birds are the coastal mudflats and sandflats of each bay, but some species also fly inland to feed in terrestrial habitats, including brent geese that feed on grass, and waders (e.g. curlew) that feed on soil invertebrates. These bird species are relatively large and require some time to take flight, so they usually avoid areas with high levels of human disturbance, and are particularly wary of dogs. Therefore, the inland sites with highest levels of SPA bird activity are typically large, open and have relatively low levels of human activity. In this context, the Site is considered to have low suitability for such species because it contains a large number of mature trees that obstruct fields of view.

A series of site-specific bird surveys were carried out by MKO Planning and Environmental Consultants between January and March 2021, in order to determine whether or not the Site was used by SPA bird species. Six surveys were carried out in total, each of which comprised a Vantage Point survey, as well as a Transect Survey to search for goose droppings. No brent geese were observed during any of the surveys, and no goose droppings were found during transect surveys. An oystercatcher was observed in flight during one of the surveys, but it did not land at the Site. None of the other qualifying interests of nearby SPAs were recorded.

Therefore, we conclude that the Site is of no importance for the qualifying interests of the *Cummeen Strand* SPA, the *Drumcliff Bay* SPA or any other SPAs. A full outline of methods and results is provided in the *Winter Bird Survey Report 2021* that accompanies this application.

3.5 Conclusion of Stage 1: Screening Statement

In Section 3.2.5 of *Appropriate Assessment of Plans and Projects in Ireland* (NPWS 2010), it is stated that the first stage of the AA process can have three possible conclusions:

1. AA is not required

Screening, followed by consultation and agreement with the NPWS, establishes that the plan or project is directly connected with or necessary to the nature conservation management of the site

2. 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.

3. Significant effects are certain, likely or uncertain

The plan or project must either proceed to Stage 2 (AA), or be rejected.

Having considered the particulars of the proposed development, we conclude that this application meets the third conclusion, because significant effects on the *Cummeen Strand / Drumcliff Bay* SAC and the *Cummeen Strand* SPA cannot be ruled out. However, it is noted that the potential surface water and groundwater pathways are quite tenuous, and they are being considered only under the precautionary principle. Potential impacts are considered in further detail in Section 4, and mitigation measures are outlined in Section 5.

4 Assessment of potential impacts

4.1 Direct impacts

The Site is not located within or adjacent to any Natura 2000 sites, so there is no risk of habitat loss, fragmentation or any other direct impacts.

4.2 Indirect impacts

Potential changes in water quality (construction phase)

The construction of the proposed development will involve a range of activities, including the clearance of vegetation, demolition of derelict structures, earthworks, and the construction of new buildings and roads. These activities have potential to generate pollutants, including:

- Concrete and cement, which are composed of highly alkaline, corrosive fine sediments that are very harmful for aquatic fauna
- Suspended silt or other sediments, which can reduce water quality, harm aquatic fauna, and/or alter the flow of watercourses

- Hydrocarbons (oil, petrol, diesel, etc), solvents and other chemicals, which can be toxic to aquatic fauna

As the bedrock and soils underlying the Site appear to be relatively well-drained, it is expected that most rainfall on the Site percolates to ground. If any pollutants percolated to ground in this manner, it is possible that they could be carried 200 m north via groundwater to reach the *Cummeen Strand / Drumcliff Bay* SAC and the *Cummeen Strand* SPA. In addition, during periods of high rainfall it is possible that runoff may flow 200 m north over land or via fieldside / roadside drainage channels to the *Cummeen Strand / Drumcliff Bay* SAC and the *Cummeen Strand* SPA.

A hypothetical impact assessment of potential pollution incidents is difficult, because any potential impacts would vary depending on the type of pollutant, its quantity, the rate at which it would be released, and the time of year. Minor pollution incidents would be diluted by other surface water or groundwater sources, reducing their concentration to negligible levels before they could affect any of the qualifying interests of the SAC or SPA. Only a very large pollution event (e.g. a significant fuel spill, or a prolonged release of suspended sediments) could potentially cause a significant effect on the SAC or SPA.

Consequently, in accordance with the precautionary principle, we conclude that there is a risk that a pollution incident during the construction of the proposed development could reach the *Cummeen Strand / Drumcliff Bay* SAC and the *Cummeen Strand* SPA in sufficient quantities to have a significant impact on the qualifying interests of one or both sites.

Potential changes in water quality (operational phase)

Foul water will be discharged to a local authority foul sewer on Sea Road and conveyed to the Sligo Waste Water Treatment Works (WWTW). The WWTW is located approx. 650m north-east of the Site, and discharges treated effluent to the Garvogue Estuary / Cummeen Strand. The plant has a population equivalent of 50,000, and incorporates primary, secondary and tertiary treatment, including nutrient removal. The latest Annual Environmental Report on the EPA Wastewater Licensing Search website is from 2017, and it was reported that the WWTW was operating within its organic and hydraulic capacity at the time. It would have sufficient capacity to accommodate the proposed development. The WWTW was not compliant with the Emissions Limit Values for total phosphate, but was compliant for all other parameters. It is the responsibility of Irish Water to ensure that the WWTW is operating within its ELV limits, and that the treated effluent does not have an impact on surface water quality at the discharge point.

Surface water runoff from roofs and paved surfaces will be discharged to an underground infiltration tank in the north of the site, with smaller soakaways to the rear of dwellings. Rainwater on green areas will percolate to ground. Rainwater is considered to be free of pollutants, so it will not lead to negative impacts on receiving waters.

Consequently, it is concluded that foul water and surface water discharges during the operation of the development will not cause significant impacts on any designated sites.

Displacement of overwintering birds (construction and operational phases)

None of the qualifying interests of any nearby SPAs were recorded within the Site in early 2021 (Section 3.4). It is considered to have low suitability for brent geese and other species because fields of view are obstructed by trees. Therefore, there is no risk that any SPA bird species could be displaced from the Site.

Disturbance of overwintering birds (construction phase)

The construction of the proposed development will cause noise / vibration (loud or repetitive sounds) and visual disturbance (e.g. rapid or large-scale movements), which may cause birds to exhibit avoidance behaviour. Occasional sources of intense disturbance (e.g. a loud noise) could cause flocks of birds to take flight, which would deplete their energy reserves. Persistent sources of disturbance (e.g. piling or rock-breaking) could displace birds from feeding areas or roosting sites, which could increase competition for resources in undisturbed areas, and may cause them to move to other sites elsewhere in the bay.

However, considering that the Site is located approx. 200 m from the coast, that it is screened from the coast by woodland, hedgerows and/or scrub, and that there is a level of background human activity in the area (e.g. Sligo Harbour), there is a negligible risk that disturbance could lead to significant effects on the qualifying interests of any SPAs.

4.3 Potential in-combination effects

Some consented developments in the surrounding area are listed in Section 2.3. It is expected that these developments will have been completed by the time the proposed development commences, but it is possible that some may be constructed at the same time. When each development was screened for Appropriate Assessment by Sligo County Council *in isolation*, it was concluded that there was no risk of significant impacts on Natura 2000 sites.

If the proposed development was constructed at the same time as one or more of the developments above, it is possible that they could cause in-combination effects on water quality in the Garvogue Estuary / Cummeen Strand Bay, and thus cause negative effects on the *Cummeen Strand / Drumcliff Bay* SAC and the *Cummeen Strand* SPA. It is very difficult to estimate the magnitude of potential in-combination effects, because it would be influenced by a number of unknown variables, e.g. how many developments were constructed concurrently, and the quantities of pollutants produced by each development. However, in accordance with the precautionary principle, it is theoretically possible that they could cause significant negative in-combination effects on Natura 2000 sites.

5 Proposed mitigation measures

5.1 Pollution-prevention measures (construction phase)

The following mitigation measures have been designed to avoid or minimise any negative impacts on water quality in the Garvogue Estuary / Cummeen Strand Bay by preventing fine sediments, concrete / cement, hydrocarbons or any other pollutants from reaching nearby drainage ditches or groundwater. This applies both to potential impacts from the proposed development in isolation, and when considered in combination with other concurrent developments nearby. All are standard pollution control measures that are regularly used on construction sites in Ireland, and confidence in their success is high. They have been developed with reference to the following guidelines:

- *Guidelines on protection of fisheries during construction works in and adjacent to waters* (Inland Fisheries Ireland, 2016)
- *Pollution prevention guidelines: PPG5 - works and maintenance in or near water* (UK Environment Alliance, 2007)

Ecological Clerk of Works

The ecological mitigation strategy for the proposed development will require specialist expertise, so the construction contractor will engage an Ecological Clerk of Works (ECoW) to assist with the interpretation and implementation of these measures. The ECoW will not have a permanent presence on Site, but will carry out inspections on a regular basis (e.g. every two weeks) or as required by the contractor.

Notwithstanding the above, the implementation and monitoring of all mitigation measures will ultimately be the responsibility of the construction contractor.

Concrete and cement

These products are highly toxic to fauna, particularly fish and other aquatic / marine species. It is expected that some pouring and/or mixing of concrete or cement will be required during construction works, so the following measures will be implemented in order to retain all cement-based materials within the boundaries of the Site:

- Concrete pouring / mixing will only take place in dry weather conditions. It will be suspended if high-intensity local rainfall events are forecast (e.g. >10 mm/hr, >25 mm in a 24 hour period or high winds)
- If any on-site mixing of concrete is required, it will only be carried out in the south of the Site, i.e. as far as possible from the coast. If any cement-based products will be stored on-site, they will be kept in a sheltered area in the south of the Site, and will be covered (e.g. with a thick plastic membrane) in order to prevent spread by wind

- Ready-mix lorries and larger plant will not be cleaned on-site; they will be taken to an appropriate off-site facility with capacity to capture and treat contaminated wash waters
- If any on-site cleaning of tools or concrete-batching plant is required, it will take place in the south of the Site. Wash waters will be discharged to an on-site soakaway area located as far as possible from the coast.

Suspended sediments

The term 'suspended sediments' refers to any silt, mud or other fine sediment that becomes dissolved in water. Water can be contaminated by suspended sediments (SS) from open earthworks and excavations (either from rainfall or groundwater seepage), from rainfall on soil/sediment stockpiles, or from the tyres / tracks of construction vehicles. In order to retain all contaminated waters within the boundary of the Site, the following measures will be implemented:

- Excavation works will be suspended if high intensity local rainfall events are forecast (e.g. >10 mm/hr, >25 mm in a 24 hour period, or high winds).
- If any excavations need to be dewatered, the SS-contaminated water will be retained and treated within the boundary of the Site. It will be collected and pumped into a settlement tank / pond (or similar feature), left undisturbed until sediments have settled, and then discharged via a buffered outflow to a soakaway in the south of the Site (i.e. as far as possible from the northern drainage ditch)
- Stockpiles of mud, sand or other fine sediments will be stored in the south of the Site, i.e. as far as possible from the northern drainage ditch. Stockpiles will be levelled and compacted, and will be covered with thick plastic membranes in order to limit wind/rainwater erosion
- Dust suppression measures will be implemented, as outlined in Section 8 of the IFI guidelines.

Hydrocarbons and chemicals

Hydrocarbons (oil, petrol, diesel, etc) and solvents are toxic to fauna. These chemicals can enter surface water or groundwater if they are accidentally spilled (e.g. during re-fuelling of machinery), or from leaking containers. In order to retain such materials within the boundaries of the Site, the following measures will be applied throughout the construction works:

- Any fuel, oil or chemical containers will be kept in the south of the Site, i.e. as far as possible from the coast. These pollutants are hazardous and must be stored in a designated bunded area that has sufficient capacity to retain any spills
- All machinery should be protected from vandalism and unauthorised interference, and will be turned off and securely locked overnight
- If any on-site re-fuelling is required, it will take place in the south of the Site in a bunded / impermeable area. Immobile plant will be refuelled over drip-trays

- While in operation, diesel pumps, generators or other similar equipment will be placed on drip trays to catch any leaks
- A spill kit will be kept on-site. If any spills occur, appropriate measures will be taken to intercept hydrocarbons or chemicals on-site before they can leave the Site

6 Conclusion

The proposed mitigation measures have been selected to prevent pollutants reaching the Garvogue Estuary / Cummeen Strand Bay in sufficient quantities to cause significant impacts on habitats or species in the *Cummeen Strand / Drumcliff Bay* SAC and the *Cummeen Strand* SPA. The site foreman will be responsible and liable for the implementation and monitoring of the proposed mitigation measures. An Ecological Clerk of Works will assist with the interpretation and implementation of measures.

These measures will substantially reduce the likelihood and magnitude of pollution events to negligible levels, thus preventing a significant negative impact upon the conservation status of the qualifying interests (aquatic fauna and habitats) of the *Cummeen Strand / Drumcliff Bay* SAC and the *Cummeen Strand* SPA, or any other Natura 2000 sites. As a result, we conclude that the proposed development will not cause any significant negative impacts upon the integrity of any Natura 2000 sites.

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