Natura Impact Statement

Sligo Bio-energy Park

Doherty Environmental Consultants Ltd.

20th August 2021

Sligo Bio-energy Park

Finisklin, Sligo, Co. Sligo

Natura Impact Statement

Document Stage	Document Version	Prepared by
Final	1	Pat Doherty MSc, MCIEEM

Table of Contents

1.0 INTRODUCTION

Doherty Environmental Consultants (DEC) Ltd. has been commissioned by Carbon Sole Group Ltd. to prepare a Natura Impact Statement (NIS) for the proposed development of a bio-energy park (i.e. the project) at Finisklin, Sligo, Co. Sligo (see Figure 1.1 for the location of project site and Figure 1.2 for an aerial view of the project site).

In accordance with Article 6(3) of the Habitats Directive, as transposed into Irish law by Regulation 42(1) and Part 5 of the European Communities (Birds and Natural Habitats) Regulations 2011 – 2015 (i.e. the "Habitats Regulations") and Part XAB of the Planning and Development Act, 2000 (as amended) (i.e. the "Planning and Development Act"), a Screening Report for Appropriate Assessment (AA) was prepared to assess whether it could or could not be ruled out, on the basis of objective information, that the project, either individually or in combination with other plans or projects, was likely to have a significant effect on any European Sites. The Screening Report for Appropriate Assessment was prepared by DEC Ltd. on behalf of Carbon Sole Group Ltd. The Screening Report for Appropriate Assessment concluded, in view of best scientific knowledge and the conservation objectives of the European Sites occurring within the zone of influence of the project, that, in the absence of appropriate mitigation, it could not be ruled out at the screening stage that the project would not result in significant negative effects to two European sites, namely the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and the Cummeen Strand SPA (jointly referred to as the Cummeen Strand European Sites). The conclusion of the Screening Report was informed by a highly precautionary approach and adopted a worst-case scenario. Such an approach was adopted to ensure consistency with the extremely low threshold for triggering likely significant effects, as determined in both European and Irish case law and Section 177U of the Planning and Development Act. On the basis of that conclusion, it has been determined that AA is required in order to assess the implications of the project for those two European Sites. In accordance with Section 177T of the Planning and Development Act, a NIS of the project has been prepared in order to assist the competent authority, in this case Sligo County Council, in carrying out its Appropriate Assessment. This NIS provides an examination, analysis and evaluation of the likely impacts from the project, both individually and in combination with other plans and projects, in view of best scientific knowledge and the conservation objectives of the European Sites concerned. It also prescribes appropriate mitigation to ensure that the project will not adversely affect the integrity of those sites identified as being at risk of likely significant effects.

Finally, it provides complete, precise and definitive findings, which are capable of removing all reasonable scientific doubt as to the absence of adverse effects on the integrity of the European sites concerned.

1.1 SUMMARY OF SCREENING REPORT FOR APPROPRIATE ASSESSMENT

The Screening Report identified two European Sites as occurring within the zone of influence of the project. These are the Cummeen Bay European Sites.

Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC is designated as a SAC for its role in supporting a range of qualifying habitat and species. These features are as follows:

[1130] Estuaries

[1140] Tidal Mudflats and Sandflats

[2110] Embryonic Shifting Dunes

[2120] Marram Dunes (White Dunes)

[2130] Fixed Dunes (Grey Dunes)*

[5130] Juniper Scrub

[7220] Petrifying Springs*

[1014] Narrow-mouthed Whorl Snail (Vertigo angustior)

[1095] Sea Lamprey (Petromyzon marinus)

[1099] River Lamprey (Lampetra fluviatilis)

[1365] Common (Harbour) Seal (Phoca vitulina)

The Cummeen Strand SPA is designated for its role in supporting overwintering populations of waterbird species of national and international importance and wetland habitats. A total of 3 waterbird species are listed as special conservation interest bird species of this SPA. These are

Light-bellied Brent Goose;

Oystercatcher;

Redshank.

Wetlands and waterbirds are also listed as special conservation interest for the SPA.

The reason for identifying the SPA and the SAC within the zone of influence of the project and the potential for the project to result in likely significant effects was due to the presence of a hydrological pathways in the form of groundwater and surface water pathways linking the project site to these European Sites.

Construction works associated with the construction phase of the project and the potential for these works to mobile leachate associated with the former landfill site occurring at had surrounding the project site have been identified as a possible source of contamination. This contaminated water could in turn discharge to the Garravogue Estuary and the Sac and SPA. Surface water runoff will also be generated during the operation phase and the generation of contaminated surface water runoff during this phase of the project and its release to Sligo Estuary was identified as a potential impact during the screening.

Given that construction works will be required for the construction phase of the project, which will generate noise emissions, the screening exercise concluded that the potential for such noise emissions to disturb waterbird species should be further examined as part of an NIS.

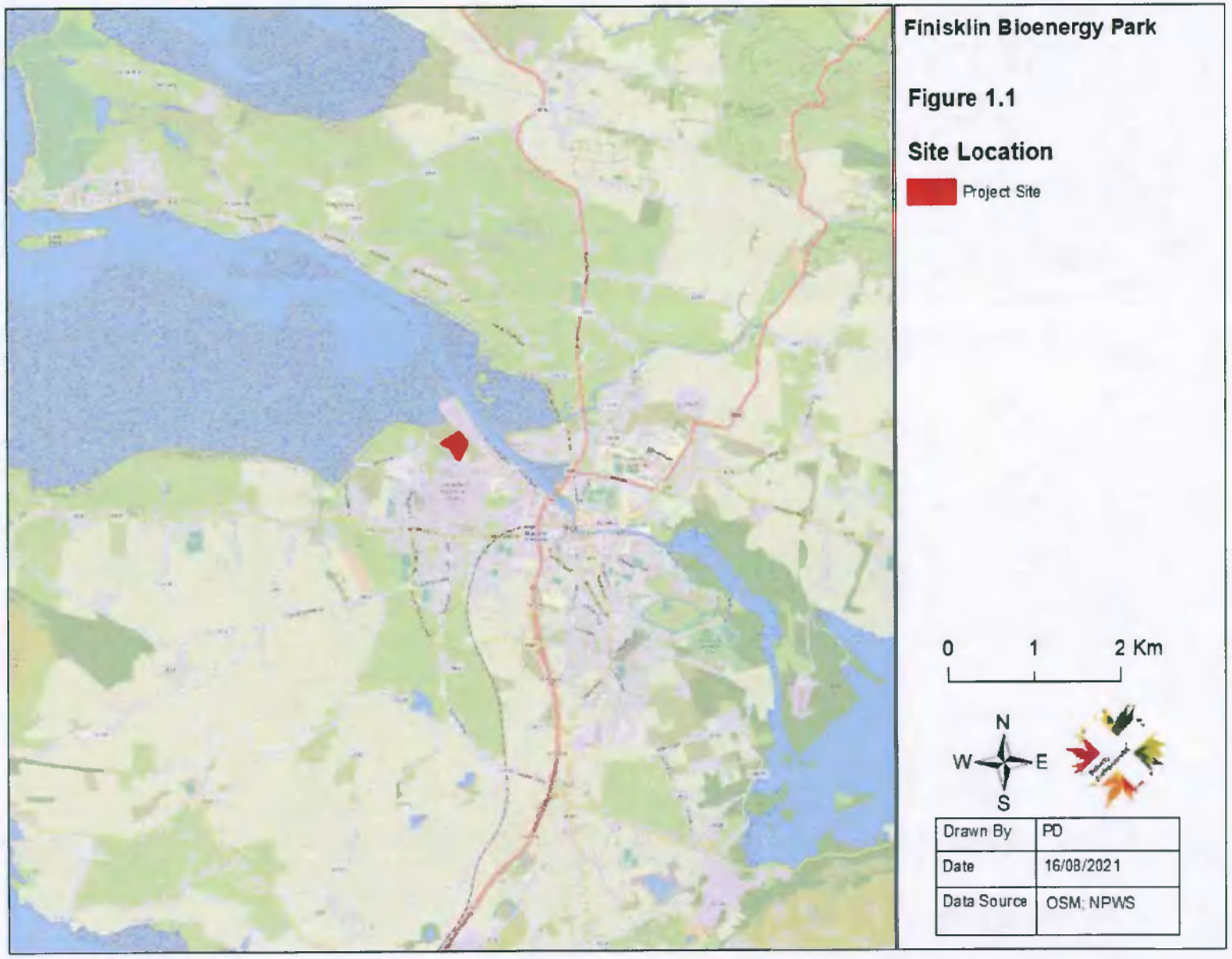
The operation phase will also result in the emission of potentially polluting substances to air and possible deposition of such substances in the estuary was identified as an element of the project that required further examination as part of an NIS.

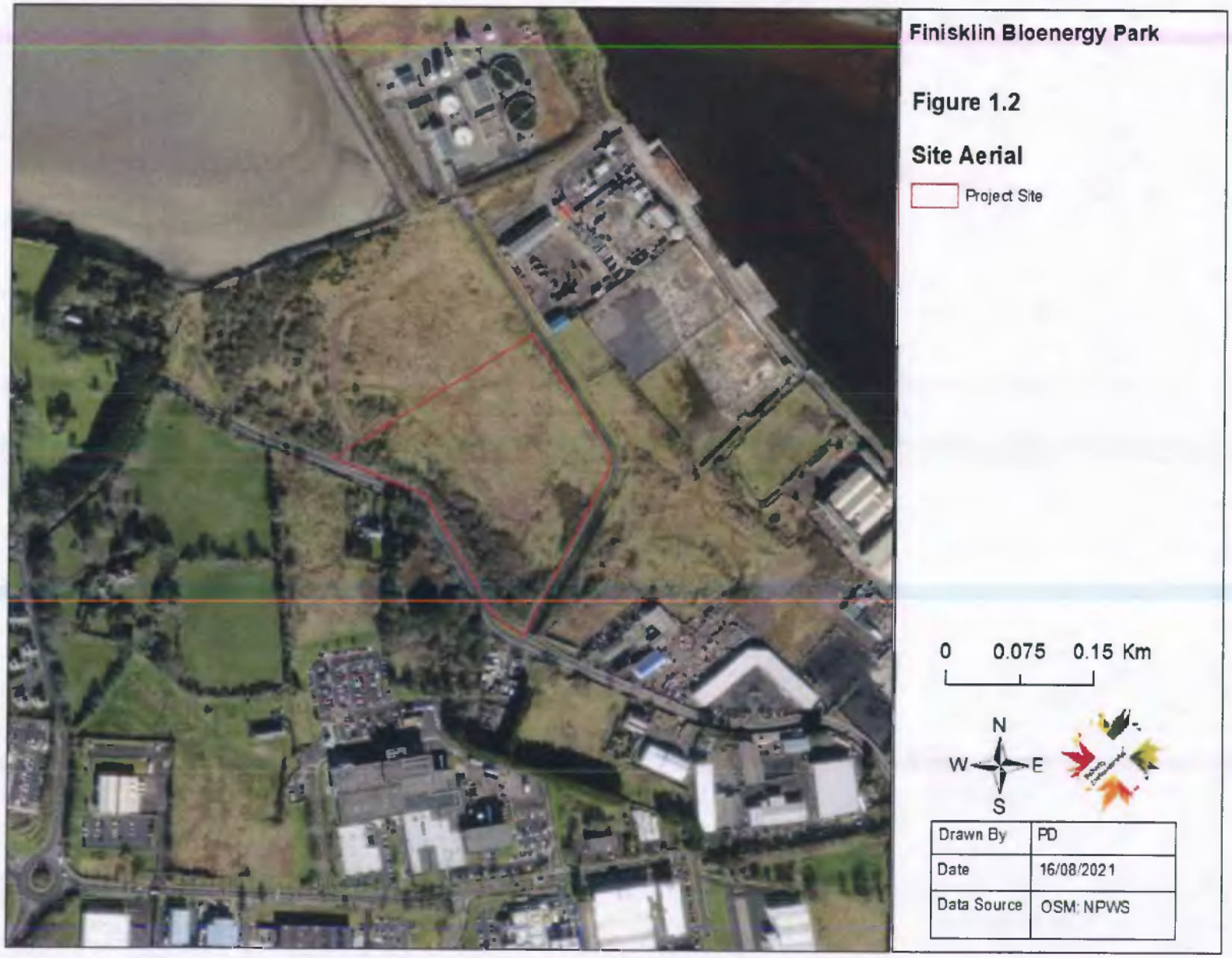
In summary based on the information provided in the Screening Report, the precautionary approach adopted during the consideration of impacts for the Screening Report and the

extremely low threshold required to trigger Stage 2 Appropriate Assessment, it was concluded that the potential for significant effects to the Cummeen Bay European Sites as a result of:

1. the potential discharge of contaminated waters during the construction and operation phase;
2. the emission of noise during the construction phase; and
3. the emission of ash to air during the operation phase could not be ruled out.

As such the Screening Report concluded that a NIS was required to evaluate further the potential for these impacts to result in significant adverse effects to the Cummeen Strand European Sites and where necessary prescribe mitigation measures to avoid such adverse effects.


Finisklin Bioenergy Park
Figure 1.1
Site Location
Project Site
0
1
2 Km
N
W
E
S
Drawn By
PD
Date
16/08/2021
Data Source
OSM; NPWS


Finisklin Bioenergy Park
Figure 1.2
Site Aerial
Project Site
0 0.075 0.15 Km
N
W
E
S
Drawn By PD
Date 16/08/2021
Data Source OSM: NPWS

1.2 GUIDANCE

This NIS has been undertaken in accordance with National and European guidance documents: Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities (DEHLG 2010) and *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites – Methodological Guidance of the Provisions of Article 6(3) and (4) of the Habitats directive 92/43/EEC.* The following guidance documents were also of relevance during this the preparation of this NIS:

- A guide for competent authorities. Environment and Heritage Service, Sept 2002. Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (2010). DEHLG.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological Guidance of the Provisions of Article 6(3) and (4) of the Habitats Directive 92/42/EED. European Commission (2001).
- Managing Natura 2000 Sites – The provisions of Article 6 of the Habitats directive 92/43/EEC. European commission (2018).

The information provided in this NIS is also guided by European and Irish case law guiding the approach to Stage 2 Appropriate Assessment. In particular it is noted that the consideration of impacts provided in Section 4 this NIS has been undertaken in the absence of any regard to construction phase best practice measures and operation phase design measures that aim to safeguard the receiving environment and the Cummeen Bay European Sites from potential adverse impacts.

1.2.1 Background to Habitats Directive Article 6 Assessments

The EC (2001) guidelines outline the stages involved in undertaking an assessment of a project under Article 6(3) and 6(4) of the Habitats Directive. The assessment process comprises the four stages outlined below. Stage 1 to 3 form part of the Article 6(3) process, while Stage 4 forms part of the Article 6(4) process. This NIS presents the findings of an examination, analysis and evaluation of the project to inform a Stage 2 Appropriate Assessment of the project.

- Stage 1 – Screening: This stage defines the proposed plan, establishes whether the proposed plan is necessary for the conservation management of the European Site and assesses the likelihood of the plan to have a significant effect, alone or in combination with other plans or projects, upon a European Site.

- Stage 2 – Appropriate Assessment: If a plan or project is likely to have a significant affect an Appropriate Assessment must be undertaken. In this stage the impact of the plan or project to the Conservation Objectives of the European Site is assessed. The outcome of this assessment will establish whether the plan will have an adverse effect upon the integrity of the European Site.

- Stage 3 – Assessment of Alternative Solutions: If it is concluded that, subsequent to the implementation of mitigation measures, a plan has an adverse impact upon the integrity of a European Site it must be objectively concluded that no alternative solutions exist before the plan can proceed.

- Stage 4 – Where no alternative solutions exist and where adverse impacts remain but imperative reasons of overriding public interest (IROPI) exist for the implementation of a plan or project an assessment of compensatory measures that will effectively offset the damage to the European Site will be necessary.

1.2.1.1 Stage 2: Appropriate Assessment

The EC Guidance Assessment Criteria for a Stage Two Appropriate Assessment seeks the following information:

1. A description of the elements of the project that are likely to give rise to significant effects to European Sites;

2. The Setting out of the Conservation Objectives of the Site;

3. A description of how the project will affect key species and key habitats;

4. A description of how the integrity of the site (determined by structure and function and conservation objectives) is likely to be affected by the project (e.g. loss of habitat, disturbance, disruption, chemical changes, hydrological changes etc.);

5. A description of the mitigation measures that are to be introduced to avoid, reduce or remedy the adverse effects on the integrity of European Sites.

This NIS addresses each of these items, but prior to doing so the following sections provide a description of the project; a description of the lands at and surrounding the footprint of the project site; and a brief description of the Cummeen Bay European Sites.

2.0 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

The planning application comprises a number of separate but interrelated bioenergy production elements within the site plan which are set out below. Bioenergy is a low-carbon renewable energy that can be used to replace carbon intensive fossil fuels. The proposed development will use forestry residues from harvest in the form of wood chips, approximately 66,000 tonnes of dried biomass woodchip per annum will generate approximately 32MW of Green Energy per year. The flexibility in the design incorporates the use of the green biogas produced in the gasification plants to be converted in the different process operations to produce Clean Green Advanced Biofuels/Biomethane, Electricity & Heat for district heating, to meet local needs, replacing fossil fuels.

2.2 DEFINITION OF BIOENERGY

Bioenergy is broadly defined by the European Commission (EC) and the European Environmental Agency (EEA) as: "a wide range of products and by-products from forestry and agriculture as well as municipal and industrial waste streams. It thus includes trees, arable crops, algae and other plants, agricultural and forest residues, effluents, sewage sludge, manure, industrial by-products and the organic fraction of municipal solid waste. After a conversion process, the biomass can be used as a fuel to provide heat, electricity or as transport fuel,

depending on the conversion technology and the type of primary biomass" (EC, 2005; EEA, 2007).[1]

The project proposals will utilise forestry and agricultural waste such as woodchip, straw, and energy crops.

The Finisklin bioenergy park proposal will include the following renewable production envelopes to meet the local energy demands with renewable alternatives to aid in the decarbonisation of Sligo Town and Environs:

- Biomass processing and storage area envelope
- Gasification and Methanation for production of advanced biofuels, envelope
- Gasification CHP Plant for production of electricity & heating, envelope
- Battery storage for electricity, envelope
- Thermal Energy recovery & storage for district heating distribution, envelope

[1] 5 Intelligent Energy Europe (2010) 'Long list of relevant cases in integrated bioenergy planning' Available via:

https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/make-it-be_best_practices_en.pdf

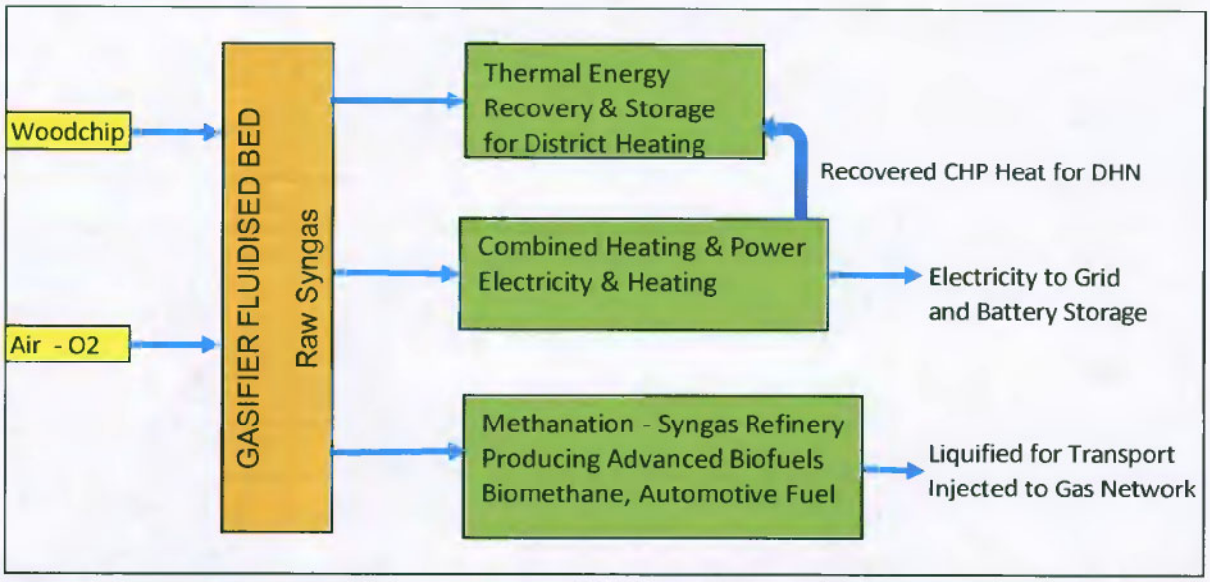


Figure 2.1: ***Process Overview Biomass Gasification and Conversion of the Syngas to Renewable Energy***

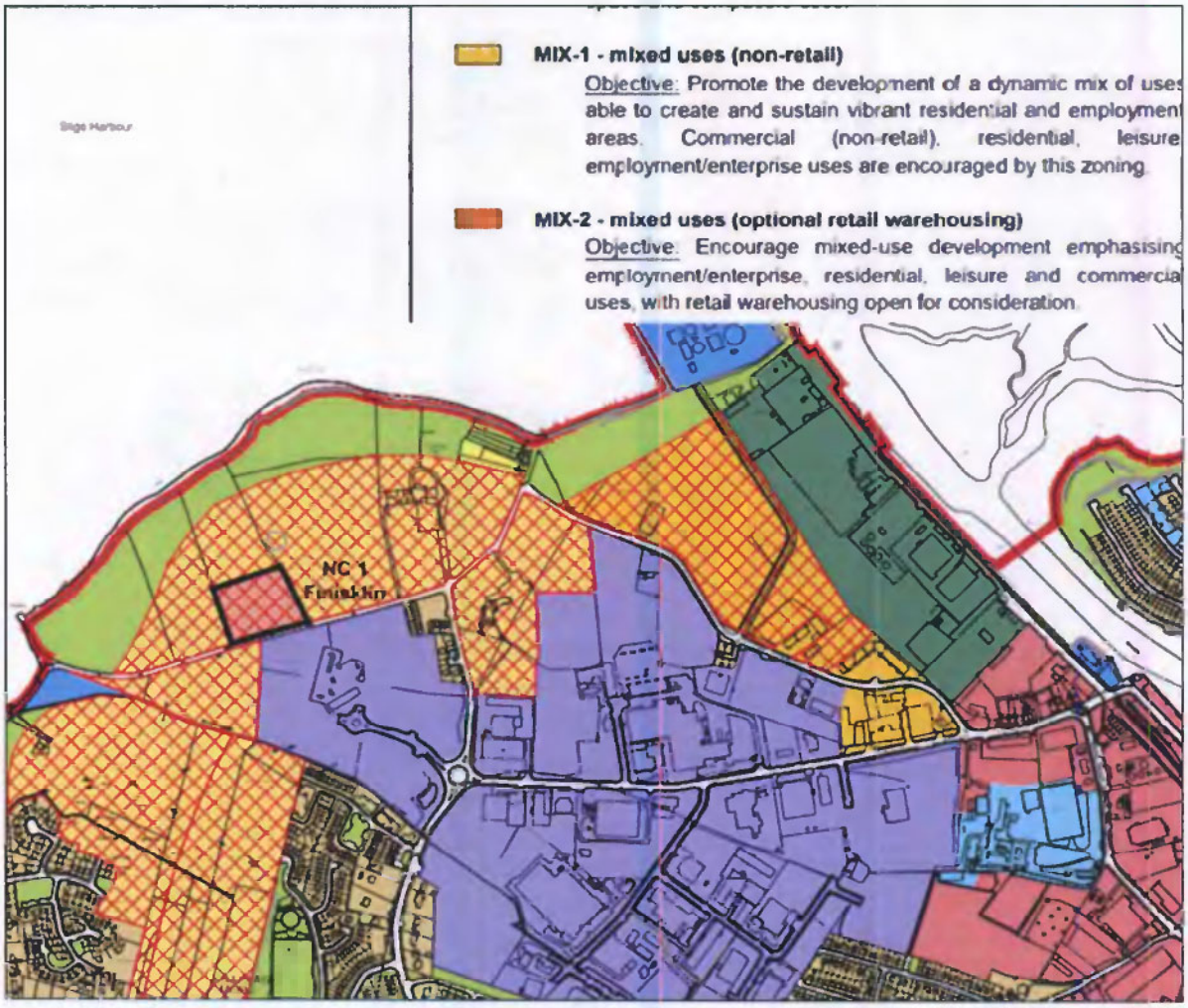


Figure 2.2: ***Extract from The Sligo and Environs Development Plan 2010-2016***

Description of the Site Plot Envelopes

Table 2.1 Development Envelopes	Description of Development
1.Biomass processing and storage area	The Biomass Processing Area includes a weigh bridge, delivery staging area, low temperature dryer and dried biomass storage. This process utilises 66,000 dry tonnes per annum which will generate 32MW of Green Energy per year.
2.Gasification and Methanation for production of advanced biofuels	20MW Gasification and Methanation Plant which produces 13MW of advanced biofuel as Renewable Natural Gas (RNG) for injection into

Table 2.1 Development Envelopes	Description of Development
	Gas Networks or Liquid Natural Gas (LNG) for transport off-site, and 7MW of heat for district heating per hour.
3.Gasification CHP Plant for production of electricity & heating	15MW CHP Gasification Plant which will produce 5MW electricity and 7MW of heat for district heating per hour.
4.Thermal Energy recovery & storage for district heating distribution	The thermal plant consists of a building size of 74sqm that houses the heat exchangers and heat pumps. External to the building is a hot water storage vessel. From this thermal plant and equipment, hot water will be distributed to a District Heating Network (DHN). The District Heating Network (DHN) routes have been designed and the heat loads of Sligo mapped showing >128,000 MWth demand, primarily met using fossil fuels such as kerosene, natural gas, and light fuel oil. Letters of Access to the industrial estates with the largest concentration of energy demand adjacent to the site accounts for approximately 50% of the towns heat load based on a small number of industrial and commercial clients. Based on the linear concentration of heat use and district heating network route design, 1st phase of the Sligo DHN would deliver fossil fuel heat displacement of over 13,000 tonnes of CO2 reductions per annum.
5. Battery storage for electricity, envelope	The proposal also includes 20 MW of battery energy storage facility which will help meet peak power demand consumption in Sligo Town. The proposed location for the battery storage is to the east of the site. The battery storage facility

Table 2.1 Development Envelopes	Description of Development
	comprises rechargeable battery units contained in containers approximately 12.2m long x 2.4m wide x 2.9m high. The 6 containers are laid out in a row, oriented east to south with a substation located to the south of the containers.

2.3 CONSTRUCTION PHASE WORKS

2.3.1 Proposed Construction Schedule

The construction phase of the Proposed Development will begin with site preparation works and will be complete when the plant is operational, connected to the national grid, commissioned, and when all wastes have been removed from the site. For this development, it is envisaged that the construction phase will last approximately 15 months. The fundamental steps that will be followed in carrying out in the construction period include the following:

- Construct a temporary site contractor's compound.
- Install the proposed 1.2m diameter culvert to divert the existing stream
- Strip the required topsoil and vegetation from the site.
- Store the excavated material in a designated area for re-use or removal following completion of construction of compound.
- Construct site access roads using appropriate imported material. Site storm drainage and associated petrol interceptors and attenuation tanks will be constructed simultaneously. Excavated soil material from the track will be re-used around the new hardstanding areas and will be re-seeded immediately on formation to stabilise them and avoid erosion.
- Excavated soil material will be stockpiled for site re-instatement.
- Construct foundation pads and install all drainage and ducting throughout the site
- Construct all steel frame and blockwork buildings.
- Install electrical and mechanical equipment within the bioenergy park.

- Install final road finishes, footpaths, lighting and landscaping.
- If unwanted stockpiled materials remain, remove off-site to an appropriate, licensed, location.
- Carry out additional works such as tidying up of site and demobilisation of site compounds etc;
- Grid connection and commissioning of the bioenergy plant.

2.3.2 Construction & Environmental Management Plan

A Construction and Environmental Management ("CEMP") plan will be finalised in agreement with the planning authority and implemented for the project. A preliminary CEMP has been prepared as part of the planning application documentation and is provided under separate cover.

2.3.3 Construction Compound & Temporary Works Area

A temporary construction compound will be developed upon commencement of the construction phase. The proposed construction compound will be situated within the project site, close to the site entrance. The compound will be approximately 15 m by 30 m and approximately 0.28 m in excavated depth [126 m^3]. The compound will be used as a secure storage area for construction materials and will also contain a number of temporary, prefabricated site accommodation units for staff welfare facilities. These units will be used for an office facility, a meeting room, a toilet facility, and a canteen area.

An area within the compound will also be used for the storage of fuel and oils and this will be suitably bunded and the bund will be lined with an impermeable membrane in order to prevent any contamination of the surrounding soils, vegetation and water table. Alternatively, double skinned protection containers / equipment will be used along with drip trays, and such details will be included in the CEMP.

During the construction phase, water will be supplied by water bowser. The maximum wastewater production will be the same as the maximum water consumption. The project will include an enclosed wastewater management system at the temporary compound capable of handling the demand during the construction phase when as many as up to 20 people will be

working on site at peak. A holding tank is proposed for wastewater management which will be emptied by tanker as often as is necessary and transported to an EPA licenced wastewater facility for treatment. Alternatively, port-a-loos will be used. Bottled drinking water will be brought to site on a daily basis.

2.3.4 Construction Traffic

As with any construction development project, the transport of materials onto the site will give rise to increased traffic. It is considered that the proximity of the site to primary road network (the primary access road to the site) will reduce the degree of traffic impact that would otherwise be associated with third class or minor roads.

- The traffic movements to be expected will involve:
- Vehicles bringing concrete (for foundations) to the site;
- Vehicles bringing building materials and electrical materials / components to the site; and
- Private vehicles of those employed on site for the construction phase.

The largest number of traffic movements will be with the delivery of concrete to the site for construction of the buildings. In order to assist with logistics for delivery, the selection of final delivery times and routes will be subject to detailed consultation with the Planning Authority. The site has good accessibility with close proximity to a regional route.

2.3.5 Waste Generated during Construction

The wastes likely to be generated during the construction phase will include the following:

- Excavated material from the access track and foundations. The material will be stored in a designated area defined in the CEMP to minimise environmental impact and will be used on-site for hardstanding and trackside berms;
- Cut-offs from building material. This material will be taken off-site for re-use, recycling, or taken to a licensed landfill facility;

- Domestic type waste by contractors. This material will be collected on-site, stored in an enclosed skip, and disposed of at a licensed landfill facility.

2.3.6 Disposal of Excavated Material

Where necessary, excavated soil material will be stored, out of the path of trafficking machinery. Where top-soils are stored in spoil storage areas, the contractor will see that the topsoil layer is not mixed with sub-soils. This will facilitate adequate site reinstatement and ensure re-vegetation of the land occurs as quickly as possible.

The maximum gradient of spoil heaps in the spoil storage areas will be 35 degrees to ensure safe storage of materials and reduce the overall erosion potential at the site. The top of the soil mound will to be profiled gently to facilitate surface water runoff, prevent ponding and saturation of the soil. All stockpiling will be temporary and specific site locations for stockpiling will be determined by the appointed site engineer / EM. Details of stockpiling will form part of a Construction Management Plan for the development.

2.3.7 Construction and Management of Site Drainage

A drainage system will be constructed which causes minimal disturbance to the current hydrological regime and which minimises suspended sediment generation. As part of the works on site the existing drainage ditch flowing through the site will be culverted and realigned/diverted. In the absence of a properly designed drainage scheme, the Proposed Development has the potential to impact site hydrology, surface water hydrology and to a lesser extent, aquatic ecology during the construction and operation phases. The construction of a suitable drainage system and other mitigation measures are required to protect against suspended solid loading and pollution of headwater drainage during the construction stage of the project.

2.3.8 Construction Reinstatement

Following completion of construction, all plant and machinery will be removed from site. The temporary compound and other temporary work areas needed for the construction period such as blade laydown areas, will be reinstated using the original spoil material removed and stockpiled close to the location from where it was excavated. All rubbish and waste/excess materials will be removed from site to an appropriate licenced facility from where it will be

reused/recycled, where possible, or disposed of accordingly. The on-site installed drainage network will be periodically monitored to see that it is operating to its stated design purpose.

2.3.9 Construction Supervision and Monitoring

The construction activities will be monitored by a Site Engineer / Environmental Manager ("EM"). The EM will oversee all activities and monitor for issues such as ground instability, water ingress into excavations etc. and will have stop work authority if, for example, there is the possibility of silt / pollution runoff to watercourses or soils.

The EM will be employed from the commencement of construction until construction work is complete, and they will monitor the working corridor and review of pollution control measures and working practices during construction, having an input into site remediation. The report will also conduct daily monitoring of excavations during the construction phase. If high levels of seepage inflow occur, excavation work should immediately be stopped, and a geotechnical assessment undertaken.

An inspection and maintenance plan will be developed for the planned site drainage prior to commencement of construction. Regular inspections of the installed drainage system will be undertaken, especially after heavy rainfall events, to check blockages and see that there is no build-up of standing water in any part of the system. Excess build-up of silt at check dams, attenuation/settlement ponds or any other drainage feature will be removed.

A Construction and Environmental Management Plan 'CEMP' will be undertaken by the developer during the detail design phase. The CEMP will set out the minimum environmental standards or measures to be applied. This will be developed in detail once the Contractor has been appointed. This will set out the proposed site organisation, sequencing of works, methodologies, mitigation measures (including these outlined above) and monitoring measures.

The local road network near the site used to transport construction materials will be monitored during construction so that any damage caused by construction traffic associated with the proposed Development can be identified and repaired as soon as possible to avoid issues for other road users. It is envisaged that ready mixed concrete and rock will be sourced from local quarries.

3.0 BASELINE DESCRIPTIONS

3.1 DESCRIPTION OF THE SITE LOCATION

The project site is characterised by recolonising bare ground habitat that has colonised the surface of a former landfill site. The landfill site was operational from 1958 to 1994. There was no associated landfill infrastructure installed at the site, such as a landfill liner, leachate collection system or gas collection system. Land was reclaimed from the estuary by depositing waste material directly on top of the tidal mudflats and sandflats of the Garravogue Estuary and progressively filling into the estuary parallel to the shore. An Environmental Report detailing the results of a conceptual risk model was published in 2012 (Malone O'Regan, 2012) and this found that the former landfill site represents a high risk site, with potential for the migration of leachate from the former landfill site to surface waters and the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and the Cummeen Strand SPA adjacent to the landfill site.

Non-breeding season field surveys were completed at the project site during October and November 2020 and February and March 2021. Surveys were previously completed in 2012 during the 2011/2012 non-breeding season (BES, 2012). The vegetation occurring in the project site are representative of ruderal species, with a mixture of ruderal grassland and herb species and scrub species colonising the surface of the project site. the dominant scrub species occurring in the site are Salix species such as Salix cinerea, Salix aurita and Salix caprea. Ulex europeaus is frequent throughout the site. Stands of Juncus effusus also occur throughout the site. Depressions in the surface occur to the south of the project site and in these water is held and pooled and has lend to the development of stands of Typha latifolia and Phragmites australis.

The 2020/2021 non-breeding season surveys were completed during a rising tide so that the site was surveyed at high tide when wetland bird species are most likely to occupy terrestrial habitats. During the four non-breeding season surveys no special conservation interest bird species or waterbird species of the SPA were identified as relying on the terrestrial habitats within the project site. The 2012 surveys also recorded a similar finding with no special conservation interest bird species or waterbirds of the SPA recorded within the former landfill site during those surveys (BES, 2012).

The former landfill site to the north of the site boundary stretches further north to the coastline. A buffer distance of approximately 170m separates the project site from the coast to the

northwest. An area of coastal defence in the form of rock armour forms the boundary between the former landfill area and the coastal habitats of Cummeen Bay. The lower strip of rock armour is inundated by the ride and is dominated by brown fucoid algae. Green algae in the form of Entermorpha species occur on rock armour habitat. Intertidal sediments representative of mudflat habitat occur at the base of the rock armour and stretch seaward from the coastline. The sediments are uniform and are representative of the marine community type "Intertidal fine sand with Peringia ulvae and Pygospio elegans community complex".

The boundary of the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and Cummeen Strand SPA commences at the base of the rock armour that bounds the boundary of the former landfill site.

3.2 DESCRIPTION OF THE CUMMEEN STRAND/DRUMCLIFF BAY (SLIGO BAY) SAC

This large coastal site extends from Cullamore in the north-west to Killaspug in the south-west, and from Sligo town in the south-east to Drumcliff village in the northeast. It encompasses two large, shallow bays, Drumcliff Bay and Sligo Harbour, and both Ardboline and Horse Island. Sand dunes and sand hills at Rosses Point, Killaspug, Yellow Strand and Coney Island are included, as are grasslands at Ballintemple and Ballygilgan (Lissadell), along with a variety of other habitats such as woodland, saltmarsh, sandy beaches, boulder beaches, shingle, fen, freshwater marshes, rocky sea cliffs and lakes. The site is largely underlain by Carboniferous limestone, but acidic rocks are also found on the Rosses Point peninsula. At Serpent Rock in the north-western section of the site the most complete section of the northwestern Carboniferous strata is exposed. Here are found an excellent series of fossilised corals which, in some strata, stand out from the rock matrix.

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):

[1130] Estuaries

[1140] Tidal Mudflats and Sandflats

[2110] Embryonic Shifting Dunes

[2120] Marram Dunes (White Dunes)

[2130] Fixed Dunes (Grey Dunes)*

[5130] Juniper Scrub

[7220] Petrifying Springs*

[1014] Narrow-mouthed Whorl Snail (Vertigo angustior)

[1095] Sea Lamprey (Petromyzon marinus)

[1099] River Lamprey (Lampetra fluviatilis)

[1365] Common (Harbour) Seal (Phoca vitulina)

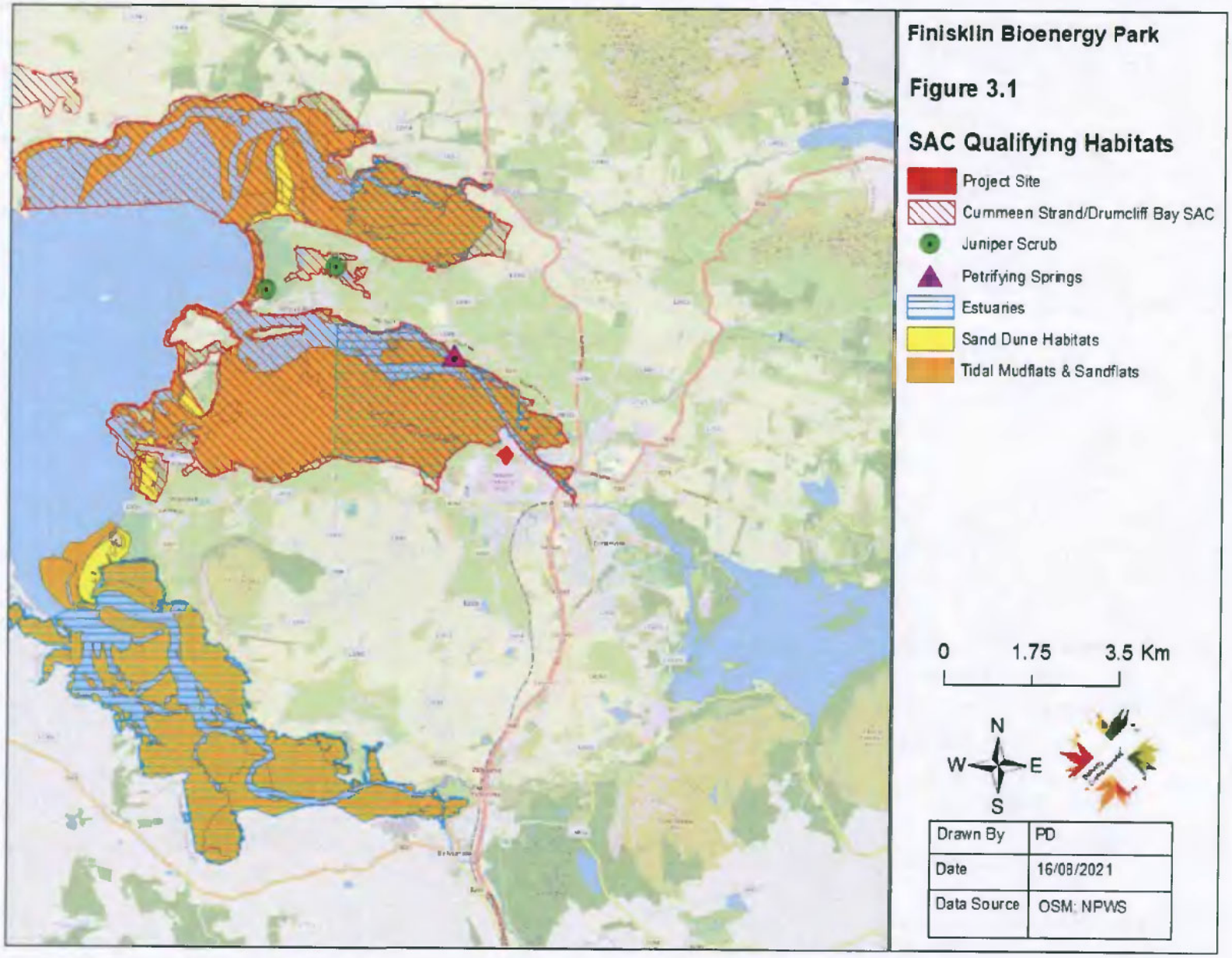
The dominant habitats of the SAC and occurring in the vicinity of the project site are estuaries and intertidal sand and mud flats. At low tide extensive areas of intertidal flats are exposed in both of these sheltered estuarine bays. The intertidal flats support a diverse macrofauna, with invertebrate species such as lugworm (Arenicola marina), common cockle (Cerastoderma edule), sand mason worm (Lanice conchilega), Baltic tellin (Macoma balthica), spire shell (Hydrobia ulvae) and common mussel (Mytilus edulis) being frequent. Of particular note is the presence of the eelgrasses Zostera noltii and Z. angustifolia beds in both bays. Areas of saltmarsh fringe both bays in places.

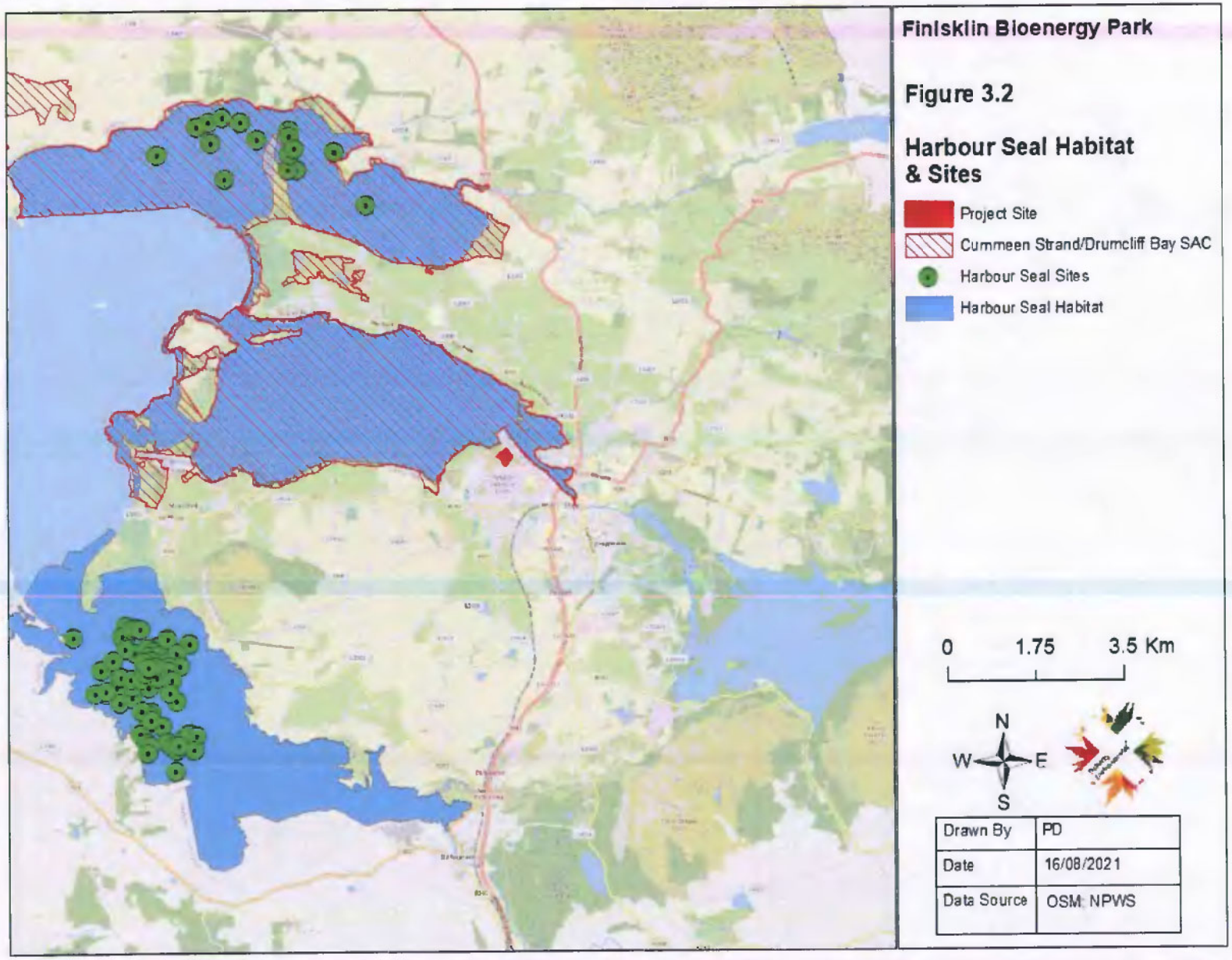
Other habitats supported by the SAC such as dune habitats (approximately 6km to the west), juniper scrub (approximately 5km to the northwest), and petrifying springs (approximately 2km to the northwest) are located at a remote distance from the project site.

The location of the qualifying habitats of the SAC with respect to the project site are shown on **Figure 3.1.**

Sea Lamprey and River Lamprey have been recorded in the Garavogue River, and River Lamprey are also known from further upstream in the tributaries of Lough Gill. Vertigo angustior is known to occur at sand dune habitats at Killaspugbrone, near Sligo airport approximately 6km to the west of the project site.

The coastal habitats bounding the former landfill site and approximately 170m to the west of the project site have been identified by the NPWs as suitable common harbour seal habitat, however no haul out or moulting sites are located within this area of the SAC. **Figure 3.2** shows the locations within the SAC where common harbour seals are located.


Finisklin Bioenergy Park
Figure 3.1
SAC Qualifying Habitats
Project Site
Cummeen Strand/Drumcliff Bay SAC
Juniper Scrub
Petrifying Springs
Estuaries
Sand Dune Habitats
Tidal Mudflats & Sandflats
0
1.75
3.5 Km
N
W
E
S
Drawn By
PD
Date
16/08/2021
Data Source
OSM: NPWS


Finisklin Bioenergy Park
Figure 3.2
Harbour Seal Habitat & Sites
Project Site
Cummeen Strand/Drumcliff Bay SAC
Harbour Seal Sites
Harbour Seal Habitat
0
1.75
3.5 Km
N
W
E
S
Drawn By
PD
Date
16/08/2021
Data Source
OSM, NPWS

3.2.1 Qualifying features of interest within the Zone of influence of the Project

Given the separation distance between the project site and the dune habitats, juniper scrub and petrifying spring habitats and the absence of any pathways between the project site and these habitats they are not considered to occur within the zone of influence of the project.

In addition given the distance between the project site and the habitats known to support Vertigo angustior and the absence of any pathway connecting the project site to this habitat, this qualifying species is not considered to occur within the zone of influence of the project.

The estuary and tidal mudflats and sandflats qualifying habitats are located in close proximity to and downstream of the project site and as such are considered to occur within the zone of influence of the project.

The Garravogue Estuary adjacent to the project provides suitable habitat for lamprey species and as such these qualifying species are considered to occur within the zone of influence of the project.

While no harbour seal sites are located in the Garravogue Estuary section of the SAC, this area of the SAC has been identified as suitable habitat for this qualifying species and as such it is considered to occur within the zone of influence of the project.

The remainder of this Natura Impact Statement with respect to the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC will concentrate on examining the potential for the project to adversely impact the qualifying features of interest of the SAC that have been identified as occurring within the zone of influence of the project.

3.3 CUMMEEN STRAND SPA

Cummeen Strand is a large shallow bay stretching from Sligo Town westwards to Coney Island. It is one of three estuarine bays within Sligo Bay and is situated between Drumcliff Bay to the north and Ballysadare Bay to the south. The Garavogue River flows into the bay and forms a permanent channel. At low tide, extensive sand and mud flats are exposed. These support a diverse macro-invertebrate fauna which provides the main food supply for the wintering waterfowl. Invertebrate species such as Lugworm (Arenicola marina), Ragworm (Hediste

diversicolor), Cockles (Cerastoderma edule), Sand Mason (Lanice conchilega), Baltic Tellin (Macoma balthica), Spire Shell (Hydrobia ulvae) and Mussels (Mytilus edulis) are frequent. Of particular note is the presence of eelgrass (Zostera noltii and Z. angustifolia) beds, which provide a valuable food stock for herbivorous wildfowl. The estuarine and intertidal flat habitats are of conservation significance and are listed on Annex I of the E.U. Habitats Directive. Areas of salt marsh fringe the bay in places and provide roosting sites for birds during the high tide periods. Sand dunes occur at Killaspug Point and Coney Island, with a shingle spit at Standalone Point near Sligo Town. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species:

Light-bellied Brent Goose;

Oystercatcher;

Redshank; and

Wetlands and waterbirds

The E.U. Birds Directive pays particular attention to wetlands, and as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cummeen Strand supports important concentrations of wintering waterfowl, including an internationally important Light-bellied Brent Goose flock (223) and nationally important populations of Oystercatcher (680) and Redshank (408). Other species occurring include Shelduck (86), Wigeon (149), Teal (54), Mallard (145), Redbreasted Merganser (15), Golden Plover (428), Lapwing (695), Knot (165), Sanderling (14), Dunlin (539), Bar-tailed Godwit (85), Curlew (430), Greenshank (13) and Turnstone (62) - all figures are mean peak counts for 4 of the 5 winters between 1995/96 and 1999/2000. Whooper Swan (7) also uses the site, though not regularly. Cummeen Strand SPA is of high ornithological importance with one species, Lightbellied Brent Goose, occurring in numbers of international importance. In addition, the site supports nationally important populations of a further two species. The regular presence of Golden Plover and Bar-tailed Godwit is of particular note as these species are listed on Annex I of the E.U. Birds Directive. The site is also important as a component of the much larger Sligo Bay complex. Cummeen Strand is a Ramsar Convention site.

The section of the SPA adjacent to the former landfill site and to the north west of the project site supports a number of bird roosts. Figure 3.3 shows the locations of wetland bird roosts occurring at this section of the SPA.

3.4 DOCUMENTED THREATS & PRESSURES

The most recent examination of threats and pressures to mudflat habitats such as those supported by the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC have been documented by the NPWS in their Article 17 report (NPWS, 2019a). these threats and pressure are ranked as medium to high and are as follows:

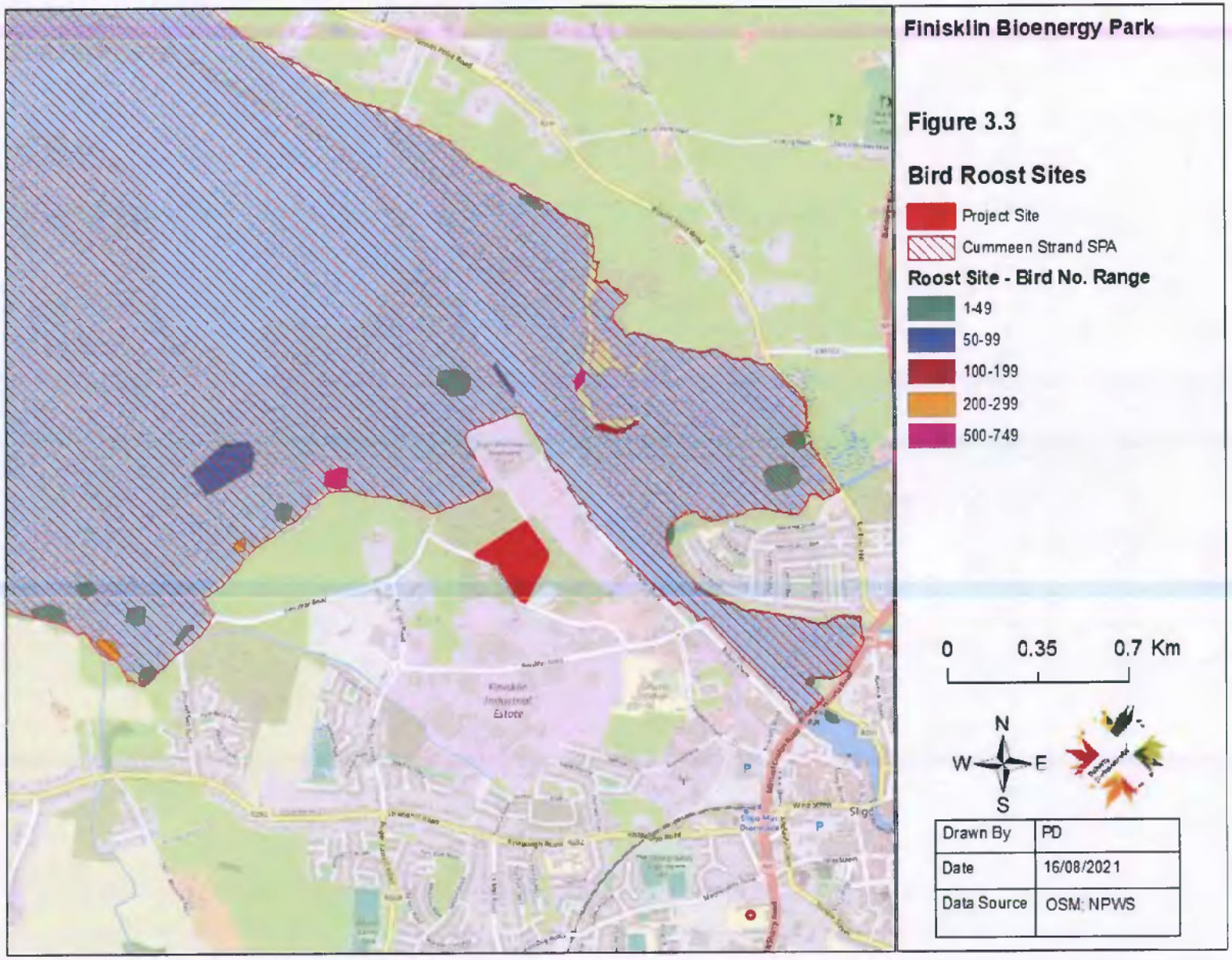
F20 Residential or recreational activities and structures generating marine pollution (excl. marine macro- and micro- particular pollution (High pressure/threat)

A28 Agricultural activities generation marine pollution (High pressure/threat)

G16 Marine aquaculture generating marine pollution (High pressure/threat)

The current project will not result in activities that are representative of these pressures/threats.

With regard to Cummeen Strand SPA the most recent Natura 2000 Data Return Form for this SPA (dated October 2020) lists the medium to high level threats and pressures that are affecting the SPA. These are as follows:


Finisklin Bioenergy Park
Figure 3.3
Bird Roost Sites
Project Site
Cummeen Strand SPA
Roost Site - Bird No. Range
1-49
50-99
100-199
200-299
500-749
0
0.35
0.7 Km
N
W
E
S
Drawn By
PD
Date
16/08/2021
Data Source
OSM; NPWS

E01 Urbanised areas, human habitation (medium impact)

D03.02 Shipping lanes (high impact)

D01.02 Roads motorways (medium impact)

E02 Industrial or commercial areas (high impact)

F01 Marine and Freshwater Aquaculture (high impact)

J02.01.02 Reclamation of land from sea, estuary or marsh (high impact)

Of the above threats and pressures, the project and the activities associated with it fall under the threat pressure described as industrial or commercial areas. The pathways with which industrial or commercial areas impact this SPA is not expanded on in the Natura 2000 Data Form but it is considered that these threats/pressures relate to potential emissions to the wetland habitats of the SPA in the form of potential air or water emissions and the potential for disturbance to special conservation interest bird species of the SPA from noise or visual sources.

3.5 CONSERVATION OBJECTIVES

Site-specific Conservation Objectives for the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and the Cummeen Strand SPA have been published by the NPWS (NPWS, 2013a & b). The overall Conservation Objectives for the special conservation interest bird species of the SPA is to maintain the favourable conservation status of bird species for which the SPA is designated. The favourable conservation status of bird species will be achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis

Favourable conservation status of wetland habitats is achieved when:

- its natural range, and area it covers within that range, are stable or increasing
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and;
- the conservation status of its typical species is favourable.

The site-specific Conservation Objectives for the Cummeen Strand SPA aim to define the favourable conservation status its special conservation interest bird species. The site-specific Conservation Objectives for these species occurring within the sphere of influence of the project are outlined in Table 3.1 below.

Table 3.1: Site-Specific Conservation Objectives for Cummeen Strand SPA Special Conservation Interest Species

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by special conservation interest bird species other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document.

The site-specific Conservation Objectives for the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC aim to define the favourable conservation status its qualifying features of interest. The site-specific Conservation Objectives for the qualifying features of interest of the SAC

occurring within the zone of influence of the project (see Section 3.2.1 above) are outlined in Table 3.2 below.

Table 3.2: Site Specific Conservation Objectives for the mudflat and estuarine qualifying habitat and the Common harbour Seal of the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC

Attribute	Measure	Target
Estuaries & Mudflats		
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution	Hectares	Maintain the extent of the Zostera-dominated community and the Mytilidae-dominated community complex, subject to natural processes
Community structure: Zostera density	Shoots/m²	Conserve the high quality of the Zostera-dominated community, subject to natural processes
Community structure: Mytilus edulis density	Individuals/m²	Conserve the high quality of the Mytilidae-dominated community complex, subject to natural processes
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal fine sand with Peringia ulvae and Pygospio elegans community complex; Estuarine mixed sediment to sandy mud with Hediste diversicolor and oligochaetes community complex; Fine sand with Angulus spp. and Nephtys spp. community complex; Sand to mixed sediment with amphipods community; Intertidal reef community. For tidal mudflats and sandflats also conserve: Fine sand with crustaceans and Scololepis (Scololepis) squamata

		community complex; Fine sand with Angulus spp. and Nephtys spp. community complex.
Common Harbour Seal		
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition.
Moulting behaviour	Moult haul-out sites	Conserve the moult haulout sites in a natural condition.
Resting behaviour	Resting haul-out sites	Conserve the resting haulout sites in a natural condition
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site
Lamprey Species		
Distribution: extent of anadromy	% of estuary accessible	No barriers for migratory life stages of lamprey moving from freshwater to marine habitats and vice versa

3.6 GARRAVOGUE WATER QUALITY

The Garravogue estuary is classed as a transitional waterbody. The latest results of monitoring reported by the EPA for the 2018 to 2020 period has resulted in this waterbody being classified at Unpolluted status.

4.0 CONSIDERATION OF POTENTIAL IMPACTS TO EUROPEAN SITES

4.1 SURFACE WATER RUNOFF

The potential impacts that may arise as a result of surface water runoff relate to the discharge of contaminated surface water from the project site during the construction phase and operation phase to the Garravogue Estuary. The discharge of any contaminated surface water from the project site to the estuary, via surface water or groundwater drainage ditch pathway that drains

from the project site to the estuary will, in the absence of suitable safeguards, have the potential to result in pollution in the estuary in the vicinity of the drainage ditch outfall. As noted in Section 3 above the project site which occupies a portion of a former landfill site has been identified as a high risk site (Malone O'Regan, 2012). The emission of leachate from the project site to the Garravogue Estuary particularly during excavations associated with the construction phase of the project will pose a risk to the water quality of the estuary and the marine communities supported by the tidal mudflats and sandflats and estuarine habitats occurring within the Garravogue Estuary to the north and west of the project site.

4.2 NOISE EMISSIONS

The potential impacts of construction activities to waterbirds relates to the displacement of birds as a result of disturbance. Given the findings of onsite surveys during the 2020/2021 non-breeding season and the findings of previous surveys during the 2011/2012 non-breeding season (Boyne Estuary SPA, 2012) it has been found that the project site is not relied upon special conservation interest bird species or waterbirds of the Cummeen Strand SPA. Therefore the potential impact of noise emissions to the Cummeen Strand SPA and its special conservation interest bird species relates to disturbance outside the project site and within the SPA.

Numerous studies have been undertaken to investigate the effect of construction disturbance to wetland bird species. A study of waders roosting within 150 to 200m of the Mutton Island Wastewater Treatment Plant in Galway found that most species had either increased or remained relatively stable during the construction phase of this facility (Nairn, 2005). The construction works for this facility involved blasting with sound waves in the range of 150dB to 160dB measured at 250m from the source. Nairn (2005) noted no visual response to this blasting by any wetland birds at this distance, and that they continued to forage throughout the blasting operation.

In contrast Burton (2002) found that construction activities at Cardiff Bay resulted in significant disturbance to a range of wetland bird species, with reductions in the densities of Oystercatcher, Dunlin and Redshank reported on adjacent mudflats. However the construction activities associated with this study at Cardiff Bay are not analogous to the current proposed project: the Cardiff Bay development comprised a number of major infrastructural development projects at a number of locations throughout the Bay. Dwyer (2010) examined the effects of the

construction phase of the Firth of Forth bridge crossing on wetland bird species and found that only Cormorant and Redshank were significantly disturbed at their roost sites.

Following their review of waterbird sensitivities to construction impacts Cutts, Phelps & Bourdon (2009) noted that in order to avoid impacts to birds' ambient construction noise levels at the receptor location should be restricted to below 70dB(A). They stated that waterbirds will habituate to regular noise below this level.

To aid in the consideration of the potential construction disturbance effects to waterbirds, Cutts *et al*. (2013) developed the Waterbird Disturbance Mitigation Toolkit. The distance for noise disturbance to wetland bird species from construction works is considered to be limited to a 300m distance from the source of the noise (Cutts et al. 2013). Disturbance effects up to a 300m distance are associated with high noise levels, circa 120 dB(A) at source. During the construction phase of the project a variety of items of plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators. There will be vehicular movements to and from the site that will make use of the existing adjoining roads. Due to the nature of the activities undertaken on a large construction site, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels.

The plant and machinery to be operated during the construction phase is outlined in Table 4.2. The typical noise levels associated with each of these items of plant and machinery and the distance at which acceptable dose levels are attained from the source are provided in Table 4.2. The typical noise levels of the plant and machinery to be used for the construction phase is sourced from the British Standard BS 5228 – 1: 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Noise. The calculation of the disturbance distance (i.e. the distance between the source and the acceptable dose level) is based on the noise disturbance calculation table provided by Cutts et al. (2013) and reproduced as Table 4.2 below.

Table 4.1: Noise Disturbance Calculation Table (Source: Cutts et al. 2013)

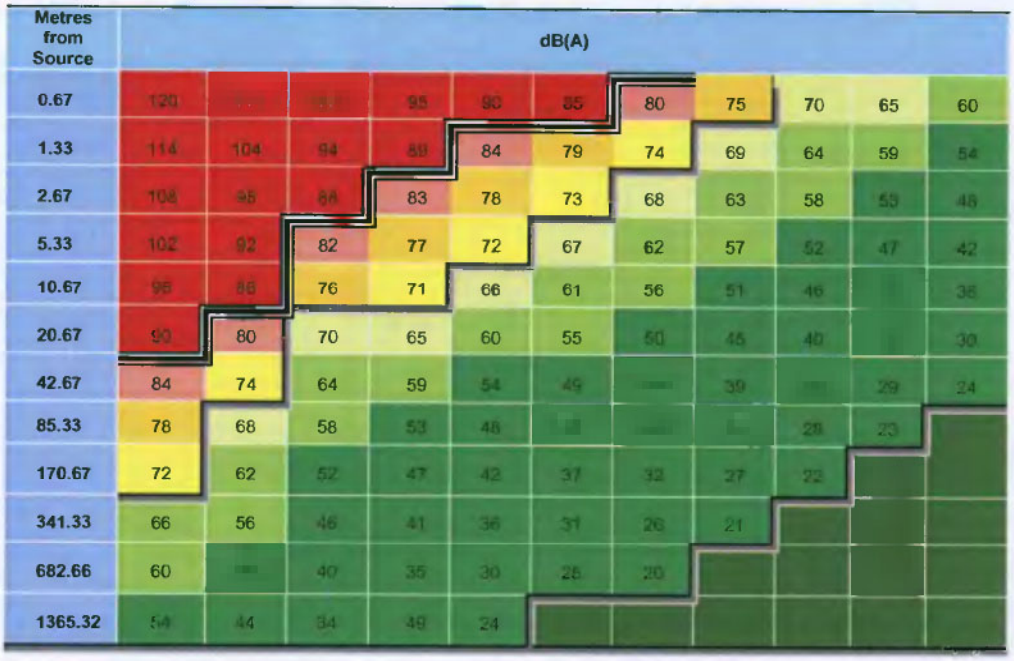


Table 4.2: Typical Noise Levels generated by Project Plant and Machinery and Distance to Acceptable Dose Levels for Wetland Bird Species

Phase	Plant Item (Ref: BS 5228)	Plant Noise Level at 10m Distance1 (dB LAeq)	Generic Distance (m) to Acceptable Dose Level from Source
Site Preparation	Tracked excavator (C3.92)	76	c. 10m
	Dumper (C3.100)	74	c. 10m
Foundation Laying	Compressor (C6.19)	72	c. 5m
	Poker Vibrator (C6.40)	73	c. 5m
	Cement Mixers (C6.6)	71	c. 5m

Steel Erection	Crane (C7.120)	76	c. 10m
	Lorry (C7.121)	70	c. 5m
General Construction	Compressor (C7.70)	70	c. 5m
	Diesel Hoist (C7.97)	73	c. 5m
	Pneumatic Circular Saw (C.79)	75	c. 10m
	Generator (C7.51)	72	c. 5m

The noise disturbance calculation table provided in Table 4.2 above indicates that the noise generated during the construction phase will be within acceptable dose levels for wetland bird species within circa 10mm of the source of construction. Based on a potential disturbance zone of 10m surrounding the project site and given that the nearest known potential foraging habitat is located approximately 170m to the west of the project site and that the nearest known roost site (see Figure 4.2) is located approximately 450m to the east of the project site, there will be no potential for the construction phase of the project to disturb wetland birds at these locations. Therefore noise generated during the construction phase is not predicted to have the potential to undermine the conservation status of wetland bird species and the conservation objectives for the special conservation interest bird species of the Cummeen Strand SPA.

Furthermore, it is noted that mitigation measures will be implemented during the construction phase to further reduce noise levels generated during this phase of the project. These measures are outlined in Section 7 below.

4.3 AIR EMISSIONS

The two main identified sources of atmospheric emissions are the syngas flare and the exhaust gases from the engines. Table 4.3 relates to the emission concentrations values through the flues associated with the CHP units and flare on the proposed site, based on the emission limits of

each source type gases from the syngas flare will be discharged by means of a stack, the height of which will be calculated in such a way as to safeguard human health and the environment.

Table 4.3: Emission Concentrations

Pollutant	CHP Engines Emission Concentration Values (mg/Nm3)	Syngas Flare Emission Concentration Values (mg/Nm3)	CHP Engine (x3) (3.02 Nm3/s)	Syngas Flare (4.97 Nm3/s)
Oxides of Nitrogen (NOx)	100	200	0.51	0.99
Carbon Monoxide	250	250	1.27	1.24
Sulphur Dioxide (SO2)	10	100	0.05	0.50
Total Particulates	10	10	0.05	0.05

Over the above emissions those relevant to impacts to vegetation and habitats relate to nutrients (i.e. oxides of nitrogen). An assessment of the impact of the NOx emissions to air has been completed as part of the project (Irwin Carr Consulting, 2021). An Aermod Dispersion Model was used to examine the potential impact of NOx emissions to the Annex 1 habitats/wetland habitats of the csdband the Cummeen Strand SPA. The United Nations Ecoonomic Commission for Europe (UNECE) critical load values for nutrient nitrogen deposition were used as the threshold, where any predicted emissions that exceed the threshold are considered to have the potential to result in significant adverse effects to habitats. The air dispersion model analysis found that all of the predicted ground level concentrations for NOx will be significantly below the UNECE critical load value. The potential for the project emissions to combine with other emissions to air to result in cumulative adverse effects to the Cummeen Bay European Sites was also assessed as part of the air quality assessment and air dispersion model. This cumulative assessment found that, even when considering a worst-case scenario, the maximum process

contribution at Cummeen Bay European Sites is 0.5% of the air quality standard, which is representative of an insignificant cumulative effect.

It is further noted that the air quality assessment concluded that the predicted long-term levels of all pollutant parameters listed in Table 4.4 above will be significantly less than the appropriate limit levels for each parameter and as such will not result in perturbations to air quality.

As such the project will not have the potential to result in the emission of nutrients or any other pollutant that have the potential to result in significant adverse effects to the Annex 1 habitats/wetland habitats of the Cummeen Bay European Sites.

4.4 IN-COMBINATION EFFECTS

An examination was made of all planning applications on the Sligo County Council Planning Map Viewer showing neighbouring developments are shown in Table 4.4.

Table 4.4: List of Recent Planning Applications

Planning Ref	Description of Development	Decision Date
16/123	erection of a single storey 45.5m2 extension to an existing office building, including an office and a toilet at Coldchon, Deepwater Quay, Sligo.	20/06/2016
15/77	development consisting of (1) continued usage of metal scrap yard granted planning permission under PL 04/70139 (Local Authority reference) and PL 77.211132 (An Bord Pleanala reference) (2) continued usage of existing on-site depollution building (area 168m2) granted planning permission under PL 05/70166, PL 11/70032 and PL 77.239495 (An Bord Pleanala reference), (3) continued usage of existing on-site dismantling building (area 730.4m2), granted planning permission under PL 05/70166, PL 11/70032 and PL 77.239495 (An Bord Pleanala reference); (4) permission for retention of change of use of part of existing building from office	10/08/2015

Planning Ref	Description of Development	Decision Date
	accommodation (formerly granted planning permission under PL 11/70032) to an extension of the dismantling building (area 148.1m2); (5) retention of office and associated accommodation in the form of portacabins (total area 86.0m2) and (6) permission for installation of new petrol interceptor with associated services and carrying out of all ancillary site works. Deepwater Quay, Finisklin.	
17/243	Development consisting of an increase in the amount ste accepted annually from 25,000 tonnes to 50,000 ; the acceptance of commercial and domestic non- lous wastes; the acceptance of household hazardous at the civic amenity area and commercial hazardous in the transfer building; the provision of additional receptacles in the civic amenity area and 3 no. secure lous waste storage containers in the south-eastern yard xisting Materials Recovery Facility. The development equire the review of the Industrial Emissions Licence d by the Environmental Protection Agency. vater Quay, Finisklin.	16/09/2017

In this context, there are no relevant projects in the area which could cause significant in-combination effects with the project to result in significant adverse effects to European Sites.

The potential for the project to result in negative impacts to the SAC and SPA as a result of surface water discharges has been examined in Section 4.1 above. The Malone O'Regan Environmental Report (2012) identified potential sources of contamination to the Garravogue Estuary that include waste formerly deposited beyond the landfill boundary, the former practice of discharging untreated sewage, diffuse agricultural and point source emissions from surrounding industrial and residential properties. There is potential for the project to combine with these sources of contamination to result in significant adverse impacts to the Garravogue Estuary and the qualifying features of interest of the Cummeen Strand European Sites.

5.0 A DESCRIPTION AND EVALUATION OF MITIGATION MEASURE

Section 4 above has provided an examination of the elements that were identified during the screening of the project as requiring further consideration. Targeted mitigation measures that will eliminate the potential for the project to discharge contaminated surface water from the project site to the Garravogue Estuary are detailed in this section.

5.1 CONSTRUCTION & ENVIRONMENT MANAGEMENT PLAN (CEMP)

An outline CEMP has been prepared for the project and all measures outlined in the CEMP will be implemented in full during the construction phase.

5.2 ENVIRONMENTAL REPORT RECOMMENDATIONS

Malone O'Regan (2012) prepared an Environmental Report for the landfill site and outlined a series of recommendations. One recommendation pertains to any future development within the landfill site and states

"If any development of the former landfill is considered in the future, a more detailed landfill gas assessment will be required, including revising the risk assessment in this report in order to address any potential landfill gas risks to future onsite occupier and also to evaluate the impact that any onsite development would have on offsite receptors. A further assessment of soil quality should also take place."

The Environmental Report also concluded that the groundwater body and the surface water seeps from the former landfill site clearly show evidence of intrusion largely influenced by its proximity to the tidal waters of the Garravogue Estuary. Other sources of contaminants in addition to the former landfill were also identified and include the waste located beyond the landfill boundary, the former practice of discharging untreated sewage, diffuse agricultural and point source emissions from surrounding industrial and residential properties.

In order for the construction phase to proceed in the absence of releasing contaminants from the project site the Garravogue Estuary and combining with these other sources of pollution a detailed construction phase method statement for the excavation of the site and containment of

surface water and groundwaters generated at the project site and the elimination of the migration of polluted waters from the project site to the Garravogue Estuary will be required.

5.3 CONSTRUCTION PHASE MEASURES TO PROTECT SURFACE WATER

The following measures will be implemented during the construction phase of the project to minimise the potential for surface water contamination:

- The civil engineering contractor engaged to construct the proposed development will provide a method statement for all earthworks. This statement will be reviewed by suitably qualified and competent persons and will include the mitigation measures outlined in this report.
- Prior to the commencement of any earthworks, the work corridor will be pegged and machinery will be restricted to movement within a specified working corridor to avoid soil contamination and compaction over the greater site area.
- o bedrock will be removed from the site, any rock removed from the foundation excavations will be reused on site.
- Bedrock, if encountered will be exposed for a short-term period only during the construction phase prior to foundation pouring.
- The underlying bedrock at the proposed location is close to the surface. To ensure the aquifer is protected during the proposed development works the bedrock at the proposed development site will be sealed or lined by laying a proprietary geosynthetic clay liner where infrastructure is to be provided directly on top of bedrock or where the thickness of the sub-formation overburden is less than 0.6m.
- Drainage and associated pollution control measures should be implemented on site before the main body of construction activity commences. Where possible drainage control should be installed during seasonally dry ground conditions.
- On site re-fuelling of machinery at the Proposed Development Site will be carried out within a specific designated area. All site machinery will also carry fuel absorbent material and pads in the event of any accidental spillages. There shall not be any refuelling within a 20m buffer of the main land drain on site. Measures such as drip trays and fuel absorbent mats will be used during all refuelling operations.
- Fuels stored at the Proposed Development Site will be minimised. Any storage areas will be bunded appropriately for the fuel storage volume for the time period of the construction.

- Any groundwater seepage / ingress that may be encountered in the weathered bedrock / mineral subsoil should be intercepted by an interceptor drain and diverted to the constructed drainage system for pollution control attenuation prior to discharge.

- All construction plant will be regularly inspected for leaks and fitness for purpose.

- An emergency plan for the construction phase to deal with accidental spillages will be drafted and contained within an Environmental Management Plan developed for the construction phase of the project. Spill kits will be available to deal with accidental spillages at the Proposed Development Site.

- Temporary storage of any spoil or other similar loose material that could potentially be washed out by rain will be located in areas where release of suspended solids into the land drain is not possible.

- Silt fences will be placed down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to the land drain of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water run-off. Inspection and maintenance of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the construction phase.

- Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters.

- The works programme will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast. Using the safe threshold rainfall values detailed following will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high intensity rainfall event. Works will be suspended if forecasting suggests any of the following is likely to occur: - >10 mm/hr (i.e. high intensity local rainfall events); - >25 mm in any 24 hour period (heavy frontal rainfall lasting most of the day); or, - >half the monthly average rainfall in any 7 days duration. Prior to works being suspended the following control measures should be completed: Secure all open excavations; Provide temporary or emergency drainage to prevent back-up of surface run-off; and Avoid working during heavy rainfall and a suitable duration after heavy events to ensure drainage systems are not overloaded.

5.4 CONSTRUCTION PHASE MEASURES TO MINIMISE NOISE EMISSIONS

The construction phase will generate noise during the operation of machinery. It is noted that the noise generated during the construction phase is not predicted (even in the absence of mitigation measures) to result in disturbance to wetland bird species of the Cummeen Strand SPA. Nevertheless, noise mitigation measures will be implemented to further minimise potential impact of construction phase noise to surrounding commercial and residential receptors. These measures are outlined below.

The scheme contractor will be obliged to give due regard to BS5228, which offers detailed guidance on the control of noise from construction activities. In particular, it is proposed that various practices be adopted during construction, including:

- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Establishing channels of communication between the contractor/developer, local authority and residents.
- Appointing a site representative responsible for matters relating to noise.
- Ensuring all site access roads are kept as even as possible so as to mitigate the potential for vibration from lorries.
- Monitoring typical levels of noise during critical periods at sensitive locations.

Furthermore, it is necessary for the following additional practicable noise control measures to be employed as follows:

- Selection of plant with low inherent potential for generation of noise.
- Siting of noisy plant as far away from sensitive properties as permitted by site constraints.

5.5 OPERATION PHASE

5.5.1 Measures to Protect Surface Water Quality

The operation phase mitigation measures to be implemented for the project that are of relevance to this NIS and the Sligo Estuary relate to those measure that will manage surface water runoff.

5.5.1.1 *Surface water Drainage Design*

The surface water drainage for the entire development will be designed using Causeway Flow Drainage Design Software in accordance with the Recommendations for Site Development Works for Housing Areas and also the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS). The surface water drainage design will be designed to cater for surface water from hard surfaces of the proposed development including roadways, footpaths, and the proposed buildings.

5.5.1.2 *Site Drainage*

As noted above, the surface water drainage for the entire development will be designed using Causeway Flow Drainage Design Software. The hydraulic pipe design prevents flood risk in the surface water pipes for a 30-minute 30-year return period design winter storm event satisfying recommendations for sustainable drainage systems as set out in the Greater Dublin Strategic Drainage Study. Rainfall event depths have been factored up by 20% as an allowance for climate change.

The allowable flow into the existing culverted drain will be restricted to the green field run off rate. As a result of the increased impermeable areas within the site, an attenuation tank system is proposed to cater for the additional stormwater storage requirement

5.5.1.3 *Storm Attenuation Design*

The stormwater attenuation tank will be sized to cater for a 6-hour 100-year storm event. Designing the system to cater for storage for a 6-hour 100 year storm event and a restricted stormwater outfall flow of 5.0 l/sec, gives a capacity requirement of 480 cubic metres satisfying

recommendations for sustainable drainage systems as set out in the Greater Dublin Strategic Drainage Study.

5.5.1.4 EPS CNSB Full Retention Separator & Silt Trap

It is proposed to install full retention Silt and Oil Separators prior to the outfall to the stormwater attenuation tanks of the storm drainage systems of the site. The stormwater entering these systems will include run-off water and silt from the roadways and parking areas throughout the site and therefore may have hydrocarbons within their flow. These hydrocarbon pollutants require removal, so they are not discharged back into the environment. The separators have been sized to cater for roads, carparking and footpath areas of the site.

A NSFA 030 and NSFA 015 or similar interceptors will be installed to cater for the hydrocarbons and silt which may be present in the stormwater.

5.6 OPERATION PHASE MEASURES TO MINIMISE NOISE EMISSIONS

The primary noise source to the external area will be as a result of the mechanical plant associated with the development. All plant will be designed to have a rating level lower than the existing background noise level in the existing area and an inspection of the operation and maintenance of the system will form part of the ongoing operations of the site.

5.7 EVALUATION OF MITIGATION MEASURES

Standard construction phase mitigation measures are detailed in this Natura Impact Statement that will provide effective measures for avoiding the potential for adverse effects to the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and the Cummeen Strand SPA during standard construction phase operations.

However given the nature of the project site and the former landfill occurring at and surrounding the project site and the risks posed by leachate and gas migration from the project site during the construction phase and operation phase of the development it is considered that site-specific construction phase method statements are requirement for the effective control of leachate and gas migration.

Such documentation will be required to inform the effectiveness of the mitigation measures necessary of the project and the overall conclusion of the impact risk posed by the project to the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and the Cummeen Strand SPA.

6.0 CONCLUSION

This NIS presents an analysis of the potential for the project to result in adverse impacts to the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and Cummeen Strand SPA. An evaluation of the potential impact of discharges of drainage waters, noise generated during the construction phase and air emissions generated during the operation phase has been completed.

During the evaluation of potential impacts associated with the discharge of drainage waters it was found that, in the absence of mitigation measures, the potential will exist for contaminants to be released from the project site to the Cummeen Strand Estuary European Sites. The impact of such emissions to the estuary has been identified as having the potential to result in a negative impact to the marine communities of tidal mudflats and sandflats and estuaries, the habitat of common seal, lamprey habitat and wetland bird species.

While measures are detailed in this Natura Impact Statement, it is considered that further mitigation measures are required to inform the Natura Impact Statement with respect to the control and treatment of leachate and gas emissions arising from the former use of the site as a landfill.

REFERENCES

BES (2012). Screening Statement for Former Finisklin Landfill and Proposed Remediation Works.

Burton, N.H.K., Rehfisch, M.M. & Clark, N.A. (2002). Impacts of disturbance from construction work on the densities and feeding behavior of waterbirds using the intertidal mudflats of Cardiff Bay, UK. *Environmental Management* 30: 865-871.

Cutts, N., Phelps, A. & Burdon, D. (2009). Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance. Institute of Estuarine & Coastal Studies (IECS) University of Hull.

Cutts, N., Hemingway, K. & Spencer, J. (2013). Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects. Institute of Estuarine & Coastal Studies (IECS) University of Hull.

Department of the Environment Heritage and Local Government (DEHLG) (2010). *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities*. Second Edition, February, 2010.

European Commission (2002). *Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. Luxembourg.

European Commission (2006). *Explanatory Notes and Guidelines for the Assessment, Monitoring and Reporting under Article 17 of the Habitats Directive*. Luxembourg.

Fossitt J. A. (2000). *A Guide to Habitats in Ireland*. Heritage Council.

Heritage Council (2002). *Draft Habitat Survey Guidelines*. Heritage Council.

Malone O'Regan (2011). Former Finisklin Landfill: Environmental Assessment Project

Nairn, R. (2005). Use of a high tide roost by waders during engineering work in Galway Bay, Ireland. *Irish Birds* 7, 489-496.

NPWS (2013a). Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC. Conservation Objectives Supporting Document: Marine Habitats. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013b). Cummeen Strand SPA. Conservation Objectives Supporting Document: Marine Habitats. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Revitt, D.M., Lundy, L., Coulon, F. & Fairley, M. (2014). The sources, impact and management of car park runoff pollution: A review. Journal of Environmental Management. Vol 146: p552 – 567.

Scally, L., Pfeiffer, N. and Hewitt, E. (2020) The monitoring and assessment of six EU Habitats Directive Annex I Marine Habitats. Irish Wildlife Manuals, No. 118. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.