

# Stage 2 Natura Impact Statement (NIS)



Proposed development at RILTA Environmental Ltd.  
(Rilta), Unit 14A1, Greenogue Industrial Estate,  
Newcastle, Co. Dublin

March 2020

Prepared by

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<b>Project</b>	<b>Natura Impact Statement (NIS) for proposed development at Rilta Environmental Ltd, Unit 14A1 Greenogue Industrial Estate, Newcastle, Co. Dublin</b>		
<b>Client</b>	O'Callaghan Moran & Associates		
<b>Project ref</b>	<b>Report no</b>	<b>Client ref</b>	
2021	2021	-	
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<b>Date</b>	<b>Rev</b>	<b>Status</b>	<b>Prepared by</b>
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## 1. Introduction

### 1.1 Background

The information in this report has been compiled by DixonBrosnan Environmental Consultants, on behalf of the applicant. It provides information on and assesses the potential for the proposed development at Greenogue Industrial Estate, Newcastle, Co. Dublin, to impact on any Natura 2000 sites within its zone of influence. The information in this report forms part of and should be read in conjunction with the planning application documentation being submitted to South Dublin County Council in connection with the proposed development.

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network of sites of highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises Special Areas of Conservation (SACs, including candidate SACs) and Special Protection Areas (SPAs, including proposed SPAs). SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites and from these the conservation objectives of the site are derived. The Birds and Habitats Directives set out various procedures and obligations in relation to nature conservation management in Member States in general, and of the Natura 2000 sites and their habitats and species in particular. A key protection mechanism is the requirement to consider the possible nature conservation implications of any plan or project on the Natura 2000 site network before any decision is made to allow that plan or project to proceed. Not only is every new plan or project captured by this requirement, but each plan or project, when being considered for approval at any stage, must take into consideration the possible effects it may have in combination with other plans and projects when going through the process known as Appropriate Assessment (AA).

The obligation to undertake Appropriate Assessment (AA) derives from Article 6(3) and 6(4) of the Habitats Directive, and both involve a number of steps and tests that need to be applied in sequential order. Article 6(3) is concerned with the strict protection of sites, while Article 6(4) is the procedure for allowing derogation from this strict protection in certain restricted circumstances. As set out in Section 177U of the Planning and Development Act 2000 as amended, a screening for Appropriate Assessment of an application for consent for the proposed development must be carried out by the competent authority to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with another plan or project is likely to have a significant effect on any European site. Each step in the assessment process precedes and provides a basis for other steps. The results at each step must be documented and recorded carefully so there is full traceability and transparency of the decisions made.

### 1.2 Aim of this report

The purpose of this report is to inform the AA process as required under the Habitats Directive (92/43/EEC) in instances where a plan or project may give rise to significant impacts on a Natura 2000 site. This report aims to inform the AA process in determining whether the development, both alone and in combination with other plans or projects, are likely to have a

significant impact on the Natura 2000 sites in the study area, in the context of their conservation objectives and specifically on the habitats and species for which the sites have been designated.

Documentation/guidelines of relevance to this NIS include the following:

- European Commission, 2001. Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (EC, 2001);
- European Commission, 2000a. Communication from the Commission on the Precautionary Principle., Office for Official Publications of the European Communities, Luxembourg (EC, 2000a);
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC Office for Official Publications of the European Communities, Luxembourg (EC, 2018);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission; (EC, 2007);
- Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin (DEHLG, 2010a);
- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities (DEHLG, 2010b);
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013);
- Applications for approval for Local Authority Developments made to An Bord Pleanála under 177AE of the Planning and Development Act, 2000, as amended (Appropriate Assessment): Guidelines for Local Authorities. An Bord Pleanála, Dublin (ABP, 2013);
- CJEU Case C 164/17 Edel Grace Peter Sweetman v An Bord Pleanála.

### 1.3 Authors of Report

This report was prepared by Carl Dixon MSc. (Ecological Monitoring) and Tara Challoner MSc. (Ecological Monitoring). Carl Dixon MSc (Ecology) is a senior ecologist who has over 20 years' experience in ecological and water quality assessments with particular expertise in freshwater ecology. He also has experience in mammal surveys, invasive species surveys and ecological supervision of large-scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Upgrade of Mallow WWTP Scheme, Douglas Flood Relief Scheme, Great Island Gas Pipeline etc. He has carried out ecological surveys and prepared AA/NIS reports for a range of projects.

Tara Challoner MSc (Ecology) is an experienced ecologist with particular expertise in surveying for invasive species, mammal and bird surveys. She has carried out ecological surveys and prepared AA/NIS reports for a range of projects including industrial developments, pipelines, quarries, agricultural units etc.

## 2. Regulatory Context and the Appropriate Assessment Procedure

### 2.1 Regulatory context

The Habitats Directive (Council Directive 92/43/EEC on the *Conservation of Natural Habitats and of Wild Fauna and Flora* (as amended) aims to maintain or restore the favourable conservation status of habitats and species of community interest across Europe. The requirements of these directives are transposed into Irish law through the European Communities (Birds and Natural Habitats Regulations; S.I. No. 477 of 2011).

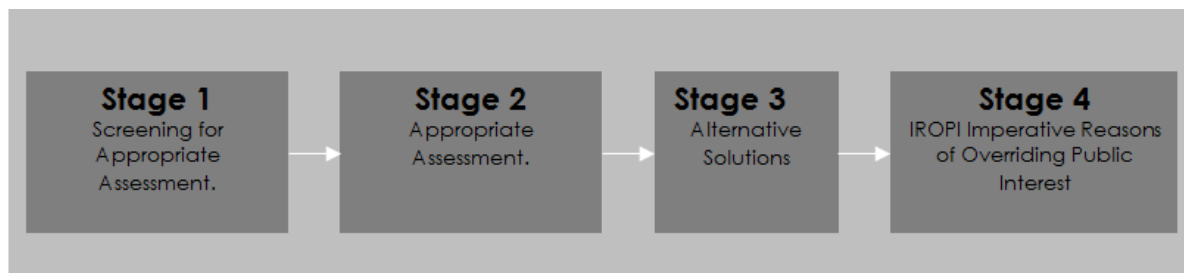
Under the Directive, a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland the network consists of SACs and SPAs, and also candidate sites, which form the Natura 2000 network.

Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the *Conservation of Natural Habitats and of Wild Fauna and Flora* (as amended) (hereafter 'the Habitats Directive') requires that, any plan or project not directly connected with, or necessary to the management of a designated site, but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. A competent authority (e.g. the OPW or Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned.

The possibility of a significant effect on a designated or "European" site has generated the need for an appropriate assessment to be carried out by the competent authority for the purposes of Article 6(3). A Stage Two Appropriate Assessment is required if it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site. The first (Screening) Stage for appropriate assessment operates merely to determine whether a (Stage Two) Appropriate Assessment must be undertaken on the implications of the plan or project for the conservation objectives of relevant European sites.

### 2.2 Appropriate Assessment Procedure

The assessment requirements of Article 6(3) establish a stage-by-stage approach. This assessment follows the stages outlined in the 2001 European Commission publications "Assessment of plans and projects significantly affecting Natura 2000 sites: methodological guidance on the provisions of Articles 6(3) and 6(4) of the Habitats Directive 92/43/EEC" (2001) and Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (Draft) Office for Official Publications of the European Communities, Luxembourg (EC, 2015);



The stages are as follows:

**Stage One:** Screening — the process which identifies any appreciable impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant;

**Stage Two:** Appropriate assessment — the consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;

**Stage Three:** Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site. It is confirmed that no reliance is placed by the developer on Stage Three in the context of this application for development consent;

**Stage Four:** Assessment where no alternative solutions exist and where adverse impacts remain — an assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed (it is important to note that this guidance does not deal with the assessment of imperative reasons of overriding public interest). Again, for the avoidance of doubt, it is confirmed that no reliance is placed by the developer on Stage Four in the context of this application for development consent.

It is the responsibility of the competent authority, in this instance South Dublin County Council, to make a decision on whether or not this proposed development should be approved, taking into consideration any potential impact upon any Natura 2000 site within its zone of influence.

### 3. Description of Development

#### 3.1 Description of waste management facility

RILTA Environmental Limited (Rilta) is a waste management facility in Greenogue Business Park that provides hazardous waste management services to commercial and industrial customers. The facility operates under a Waste Licence (W0185-01) issued by The EPA in December 2004 and amended in 2014. The licence approves the acceptance of 60,000 tonnes per annum of a combination of hazardous waste, commercial waste, construction and demolition waste, industrial sludges and industrial waste.

The facility encompasses 0.5ha and there are three adjoining buildings: main warehouse, a smaller external warehouse, waste storage pods and the offices. There is a weighbridge at the site entrance. There is a redundant backup generator in a bund in the north-eastern corner of the site. The open yards (2,760m<sup>2</sup>) are paved with a 120mm reinforced concrete slab.

The proposed development is to allow the acceptance and bagging of up to 33,000 tonnes of air pollution control residue (APCR), which is classified as hazardous waste.

The installation works will comprise of:

- Preparatory works;
- Installation of three storage silos (Total Usable Volume/ Tonnage + 525m<sup>3</sup>/ 262 tonnes);
- Installation of a pressure transfer system;
- Control measures to prevent fugitive emissions;
- Installation of two bulk bag loading systems (for main use and one for back- up/ redundancy);
- Installation of a pallet racking system for the warehouse

Once the bagging plant and racking area are installed, Rilta propose to aid in the recovery of waste residues from the DWtE (Dublin Waste to Energy) Covanta Plant. The DWtE Covanta Plant will produce three solid residues, two of which will be received by the Rilta Facility;

- Boiler ash (approximately 3,000 tonnes per annum); and
- Flue gas treatment residues (approximately 25,000 tonnes per annum)

All installation works will occur inside the buildings currently on site. All works associated with the Installation and operational phases of the development will occur within the existing main warehouse building. An overview of the project design is included as **Appendix 2**.

Rilta has prepared and adopted an Accident Prevention Policy and an Emergency Response Procedure that specifies roles, responsibilities and actions required to deal quickly and efficiently with all foreseeable major incidents and to minimise environmental impacts. Rilta has completed an Environmental Liability Risk Assessment (ELRA) that has identified the plausible accidents/incidents that may occur and evaluated the associated environmental effects. Based on the types of waste that are and will be accepted and the activities carried out, the only accident that presents a significant risk of environmental pollution is a fire. Rilta has completed a Firewater Retention Assessment.

Rilta implements the control measures specified in the current licence that are designed to ensure waste activities do not give rise to negative impacts on air quality and these will continue to be applied. The trucks that transport the wastes are typically fitted with Selective Catalytic Reduction (SCR) systems. The transfer of the APCR will be managed by a silo control system that will also control the safety system which will include a top air vent jet filter, pressure sensor, level sensors and pinch valves on the delivery hoses. Fast acting doors will be fitted on the building and these will only be opened and closed when the APCR is being delivered and the bagged APCR is being transferred. In the unlikely event of a failure in the

powder transfer resulting in the release of the contents on the building floor, the APCR will be collected using a dedicated industrial cleaning unit which will vacuum up the material.

The proposed development will not give rise to any new point emissions to air. There will be no additional traffic movements and therefore no change in the nature and volume of vehicle exhausts.

The current mitigation measures include the provision of an oil interceptor on the surface water drains that collect run-off from the yard and weighbridge; the inspection and repair of the paved areas; impermeable paving across the operational areas; the routine inspection and survey of the surface water and foul water drains; the adoption of an emergency response procedure, and staff training on appropriate spill response actions. There is one gate valve on the foul sewer and three drains on the surface water network that can be closed in the event of an incident at the site that has the potential to contaminate surface water.

There is a drain gate valve on the foul sewer that can be manually activated to stop the flow in the event of an incident inside the warehouse. There are three drain gate valves on the surface water network, one in the yard west of the office, one at the outlet from the attenuation tank and one in the loading docks. The valves in the yard and at the attenuation tank are activated remotely by the use of emergency stop buttons located in the Comms Room in the office and on the external wall of the warehouse. The valve at the delivery dock is manually operated. The valves can be closed in the event of an incident at the site that has the potential to contaminate surface water.

The current prevention and mitigation measures include; the routine inspection and survey of the surface water and foul water drainage systems; the adoption of an emergency response procedure and staff training on appropriate spill response actions.

Sanitary wastewater discharges to the foul sewer serving the Business Park which connects to the Irish Water foul sewer. There are two separate internal surface water drainage systems. The first collects the rainwater run-off from the building roof and this is directed to a 180m<sup>3</sup> flow attenuation tank. The second collects rainwater run-off from paved areas and weighbridge and this is passed through a Class 1 oil interceptor before entering the attenuation tank. The outflow from the attenuation tank is regulated by a 'hydrobrake' and there is an electrically and manually activated shut-off valve between the 'hydrobrake' and the connection to the sewer. The outfall from the tank connects to the site's foul sewer and the combined flow enters the foul sewer that serves the Business Park sewer.

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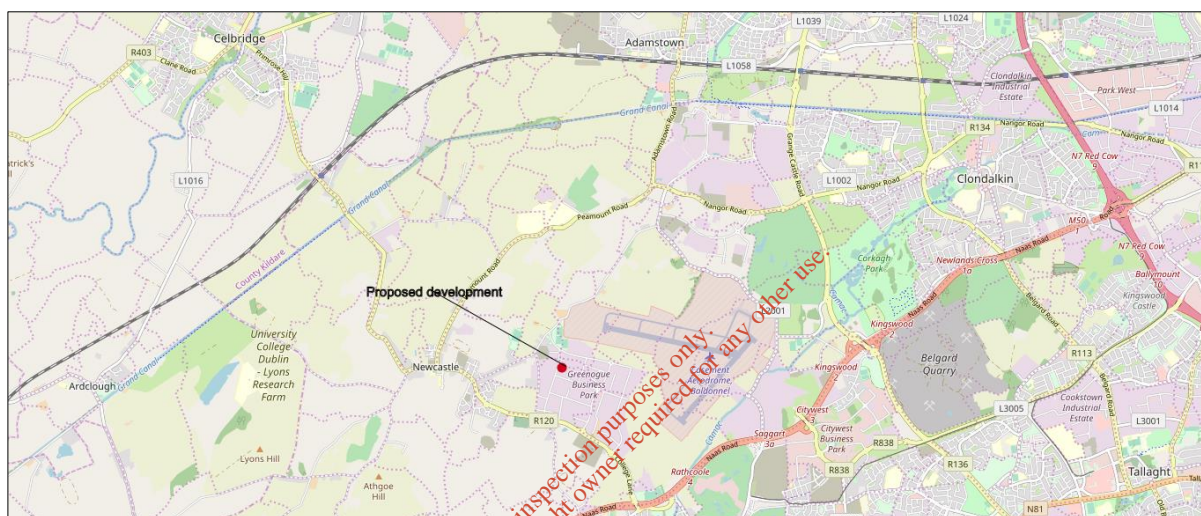


### 3.2 Description of surrounding environment

Rilta Environmental Ltd. is located in the northern section of the Greenogue Business Park, Rathcoole, County Dublin. Greenogue Business Park and the adjoining Aerodrome Business Park are one of Ireland's largest industrial campuses (c. 350 acres). The immediate locality of the business park is characterised by industrial development, in an otherwise agricultural landscape, located on the outskirts of Dublin City.

The Griffeen River bisects the Greenogue business park (200m from the footprint of the waste management facility) and flows north east for a distance of approximately 8.2 km before it meets the River Liffey in Lucan.

The location of the proposed development is shown in **Figure 1**.



**Figure 1. Location of proposed development**

### 4. Screening

This section of the report determines whether Appropriate Assessment is necessary. It does this by:

- I. Confirming in this instance that the proposed project is not directly connected with or necessary to, the conservation management of any of the European sites;
- II. Describing the details of the project/plan proposals and other plans or projects that may cumulatively affect any European sites.

#### 4.1 Desktop Study

A desktop review facilitates the identification of the baseline ecological conditions and key ecological issues relating to Natura 2000 sites and facilitates an evaluation assessment of potential in-combination impacts. Sources of information used for this report include reports prepared and information from statutory and non-statutory bodies. The following sources of information and relevant documentation were utilised:

- National Parks & Wildlife Service (NPWS) - [www.npws.ie](http://www.npws.ie) including qualifying interests and conservation objectives for Natura 2000 sites.
- Environmental Protection Agency (EPA) – [www.epa.ie](http://www.epa.ie)

- National Biodiversity Data Centre – [www.biodiversityireland.ie](http://www.biodiversityireland.ie)
- Information on the status of EU protected habitats in Ireland (National Parks & Wildlife Service, 2013a & 2013b)
- BirdWatch Ireland – <http://www.birdwatchireland.ie/>
- Dublin City Biodiversity Action Plan 2015-2020

## 4.2 Study Area and Scope of Appraisal

Natura 2000 sites (European sites) are only at risk from significant effects where a source-pathway-receptor link exists between a proposed development and a Natura 2000 site(s). This can take the form of a direct impact (e.g. where the proposed development and/or associated construction works are located within the boundary of the Natura 2000 site(s) or an indirect impact where impacts outside of the Natura 2000 site(s) affect ecological receptors within (e.g. impacts to water quality which can affect riparian habitats at a distance from the impact source).

Considering the Natura 2000 sites present in the region, their Qualifying Interests (QIs) and conservation objectives, and any potential impact pathways that could link those sites to the proposed development area, a distance of 18km was considered appropriate to encompass all Natura 2000 sites potentially within the Zone of Influence (Zoi) of the proposed development.

Thus, any appreciable direct, indirect or cumulative impacts which could arise from the proposed development in relation to the designated sites within this zone were considered.

## 5. Natura 2000 sites

### 5.1 Designated sites within an 18km radius

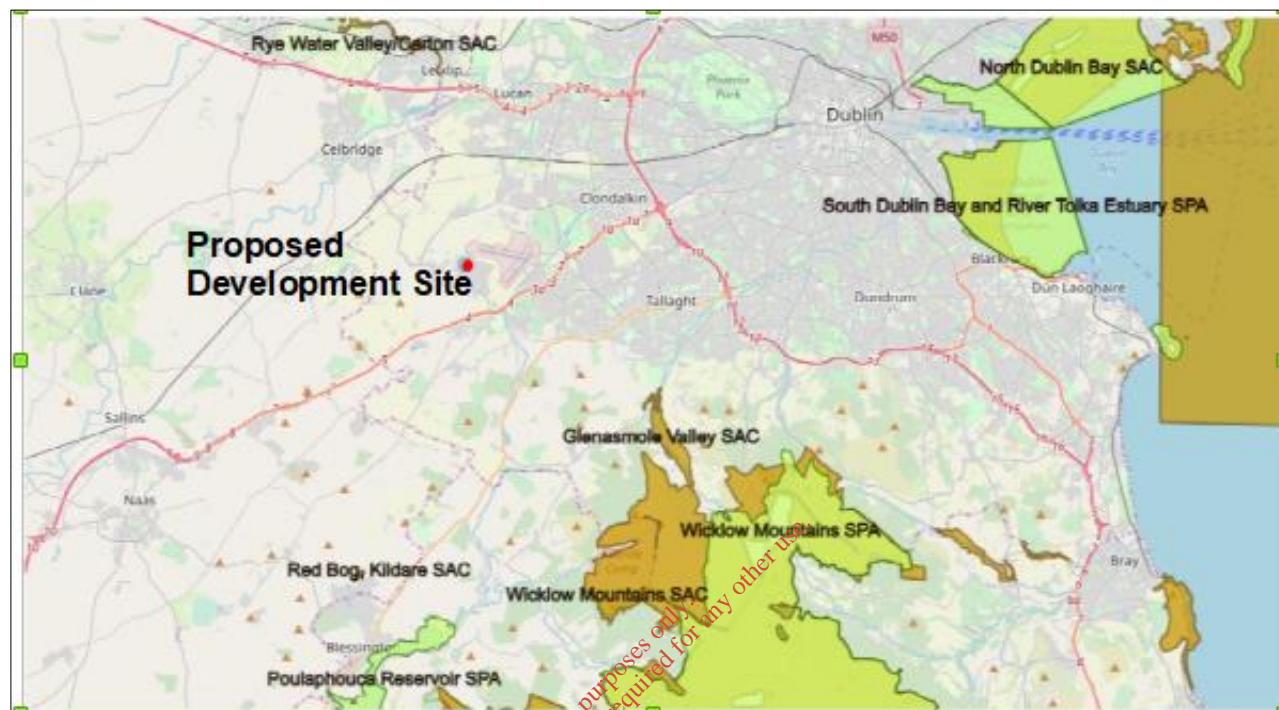
In accordance with the European Commission Methodological Guidance (EC2001), a list of Natura 2000 Sites that can be potentially affected by the proposed project has been compiled. All candidate SAC's (cSAC) and SPAs sites within an 18km radius of the proposed development have been identified, **Table 1**. It is noted that use of an 18km radius is a precautionary measure, as impacts at this distance from the proposed development are highly unlikely in the absence of significant aqueous emissions.

The Natura 2000 sites listed in Table 1 are of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the EU Habitats Directive. Further detail on these sites is provided below.

**Table 1. Designated sites and their location relative to the proposed works area.**

Natura 2000 sites within the Zone of Influence (Zoi)	Code	Distance at the closest point
<b>Special Area of Conservation (SAC)</b>		
Rye Water Valley/Carton	001398	7.04km north west
Glenasmole Valley	001209	8.40km south west
Wicklow Mountains	002122	9.58km south
Red Bog, Kildare	000397	11.95km south
South Dublin Bay	000206	17.97km east
<b>Special Protection Area (SPA)</b>		

Wicklow Mountains	004040	12.99km south
Poulaphouca Reservoir	004063	13.1km south
South Dublin Bay and River Tolka Estuary	004024	17.76km east



**Figure 2: Shows the location of the proposed development site in relation to nearby Natura 2000 sites**

### 5.1.1 Rye Water Valley/Carton SAC

A river valley site which includes at its western end a large area of estate woodland and an artificial lake. The eastern section of the site includes a section of railway, canal and aquaduct; it continues as far as Leixlip town. The site is underlain by carboniferous limestone over which has been laid a layer of glacial drift.

The importance of the site lies in the presence of a number of rare plant and animal species and a rare habitat, i.e. thermal, mineral, petrifying spring. The spring gives rise to a calcareous marsh, the habitat for *Vertigo angustior* and *Vertigo moulinsiana*. This marsh is species-rich and holds a number of plant and insect species which are rare or locally uncommon in Ireland. Four Red Data Book plant species have been recorded from the site, two of which, *Hypericum hirsutum* and *Viola hirta* are legally protected. The woods at the eastern end of the site have some ornithological interest.

### 5.1.2 Glenasmole Valley SAC

Glenasmole Valley lies at the northern foothills of the Dublin and Wicklow Mountains. It is a glaciated valley, with drift deposits, consisting of fluvioglacial sands and gravels of varying thickness and rich in Carboniferous limestone, occurring on the slopes. Spring lines occur along both sides of the northern part of the valley. The River Dodder flows through the valley

and within the site the river has been impounded to form two reservoirs. Associated with the reservoirs are areas of swamp and marsh vegetation. The valley is heavily wooded, mostly with mixed woodland of both deciduous and coniferous species but also some native woodland. Dry calcareous pasture grassland, improved to varying degrees, is a main habitat of the valley sides and occurs in association with wet grassland and, in places of seepage, fen or marsh type vegetation.

The site has important examples of petrifying springs. The physical and chemical properties of the springs have been studied. Good examples of orchid rich calcareous grassland, including *Pseudorchis albida* (legally protected) and *Orchis morio* (Red Data Book species) are found. The quality of grassland is variable owing to agricultural improvement. Molinia meadows are also represented. Several other Red Data Book plant species occur, along with a host of rare or scarce plant species for Co. Dublin. The botany of this site has been well studied since the 19th century. The site has *Alcedo atthis* (Kingfisher), and is important for bats, with four Red Data Book species present (*Pipistrellus pipistrellus*, *Nyctalus leisleri*, *Myotis daubentoni*, *Plecotus auritus*).

### 5.1.3 Wicklow Mountains SAC

An extensive upland site comprising much of the Wicklow Mountains and extending into Co. Dublin. The solid geology is mainly Leinster granites, flanked by Ordovician schists, mudstones and volcanics. The area has been glaciated and features fine examples of high corrie lakes, deep valleys and moraines. Most of the site is over 300m, with much ground over 600m and the highest peak of Lugnaquilla at 925m. The site includes the headwaters of several major rivers, including the Liffey, the Dargle and the Slaney. The substrate over much of the site is peat, with poor mineral soil on the slopes and lower ground. Exposed rock and scree is a feature. The dominant habitats on the site are blanket bog, heaths and upland grassland.

The site comprises the largest complex of upland habitats in eastern Ireland, with important examples of blanket bog, wet heath and dry heath, extensive in area and mostly of good quality. Alpine heath occurs at high levels, along with calcareous and siliceous rocky habitats harbouring an arctic-alpine flora. A fine series of oligotrophic lakes occur and some have *Salvelinus alpinus*. Several oakwoods of moderate quality, typical of the dry acidic woods of eastern Ireland, are found. Seven Red Data Book plant species occur, including the rare *Alchemilla alpina* and *Nitella gracilis* at its only Irish station. The site supports significant populations of breeding *Falco columbarius* and *Falco peregrinus*. The site is important for rare breeding passerines of oakwoods, notably *Phoenicurus phoenicurus* and *Phylloscopus sibilatrix*. The site also has breeding *Turdus torquatus* and *Lagopus lagopus*. *Lutra lutra* (otter) occurs on several of the riverine systems.

### 5.1.4 Red Bog Kildare SAC

The site comprises a relatively small wetland which lies between moranic ridges. Open water is a principal habitat though there are no obvious inflowing or outflowing streams. Open water is fringed by various wetland habitats, with bog (raised type), fens and freshwater marsh. Some willow (*Salix* spp.) occurs. The surrounding land is improved grassland. An extensive quarrying operation occurs to the east and south of site. The site displays a succession from open water (eutrophic in status) to ombrotrophic bog. Transition mire vegetation is considered

to be well represented at this site, with some typical species. A small colony of *Larus ridibundus* has bred in the past (current status unknown), which is one of few nesting sites in eastern Ireland, and the site also has breeding *Aythya fuligula* and *Fulica atra*.

### 5.1.5 South Dublin Bay SAC

This intertidal site extends from the South Wall at Dublin Port to the West Pier at Dun Laoghaire, a distance of c. 5 km. At their widest, the intertidal flats extend for almost 3 km. The seaward boundary is marked by the low tide mark, while the landward boundary is now almost entirely artificially embanked. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. A number of small streams and drains flow into the site. The proximity of the site to Dublin City results in it being a very popular recreational area. It is also important for educational and research purposes. Site possesses a fine and fairly extensive example of intertidal flats. Sediment type is predominantly sand, with muddy sands in the more sheltered areas. A typical macro-invertebrate fauna exists. Has the largest stand of *Zostera* on the east coast. Supports part of the important wintering waterfowl populations of Dublin Bay. Regularly has an internationally population of *Branta bernicila hortae*, plus nationally important numbers of at least a further 6 species, including *Limosa lapponica*. Regular autumn roosting ground for significant numbers of *Sterna* terns, including *S. dougallii*. The scientific interests of the site have been well documented.

### 5.1.6 Wicklow Mountains SPA

This is an extensive upland site, comprising a substantial part of the Wicklow Mountains. The underlying geology of the site is mainly of Cenozoic granites, flanked by Ordovician schists, mudstones and volcanics. The area was subject to glaciation and features fine examples of glacial lakes, deep valleys and moraines. Most of site is over 300 m, with much ground over 600 m and the highest peak of Lugnaquilla at 925 m. The substrate over much of site is peat, with poor mineral soil occurring on the slopes and lower ground. Exposed rock and scree are features of the site. The dominant habitats present are blanket bog, heaths and upland grassland. Fine examples of native Oak woodlands are found in the Glendalough area. The site, which is within the Wicklow Mountains National Park, is fragmented into about 20 separate parcels of land. The site supports good examples of both upland and woodland bird communities. It has breeding *Falco columbarius* and *Falco peregrinus*, as well as *Turdus torquatus* and *Lagopus lagopus*, both of the latter being Red-listed in Ireland. It is the only site in Ireland where *Mergus merganser* breeds regularly. It is important for rare breeding passerines of oakwoods, notably *Phoenicurus phoenicurus* and *Phylloscopus sibilatrix*. It also has *Sylvia borin* and *Sylvia atricapilla*.

### 5.1.7 Poulaphouca Reservoir SPA

Poulaphouca Reservoir, located in the western foothills of the Wicklow Mountains, was created in 1944 by damming of the River Liffey for the purpose of generating electricity from hydropower. The reservoir covers an area of approximately 20 square kilometres and is the largest inland water body in the mid-east and south-east regions. The reservoir receives water from two main sources, the River Liffey at the northern end, and the Kings River at the southern end. The exit is into the Liffey gorge at the western end. Underlying the reservoir are sands and gravels deposited during the last glaciation. The shores of the lake are mostly

sandy. When water levels are low exposed lake muds are colonised by an ephemeral flora of annual plant species. The site is of national importance for its population of *Anser anser*, which is one of the largest in the country. The site provides the main roost for the birds, with feeding mostly on improved grassland outside of the site. A range of other waterfowl species occur in relatively low numbers, including *Cygnus cygnus*, *Anas penelope* and *Bucephala clangula*. The reservoir attracts roosting gulls during winter.

### 5.1.8 South Dublin Bay and River Tolka Estuary SPA

This site comprises a substantial part of Dublin Bay. It includes virtually all of the intertidal area in the south bay, as well as much of the River Tolka Estuary to the north of the River Liffey. A portion of the shallow bay waters is also included. In the south bay, the intertidal flats extend for almost 3 km at their widest. The sediments are predominantly well-aerated sands. The sands support the largest stand of *Zostera noltii* on the East Coast. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. The landward boundary is now almost entirely artificially embanked. Sediments in the River Tolka Estuary vary from soft thixotropic muds with a high organic content in the inner estuary to exposed, well aerated sands off the Bull Wall. The proximity of the site to Dublin City results in it being a very popular recreational area. It is also important for educational and research purposes. The site possesses extensive intertidal flats which support wintering waterfowl which are part of the overall Dublin Bay population. It regularly has an internationally important population of *Branta bernicla hrota*, which feeds on *Zostera noltii* in the autumn. It has nationally important numbers of a further 6 species: *Haematopus ostralegus*, *Charadrius hiaticula*, *Calidris canutus*, *Calidris alba*, *Calidris alpina* and *Limosa lapponica*. It is an important site for wintering gulls, especially *Larus ridibundus* and *Larus canus*. South Dublin Bay is the premier site in Ireland for *Larus melanocephalus*, with up to 20 birds present at times. Is a regular autumn roosting ground for significant numbers of terns, including *Sterna dougallii*, *S. hirundo* and *S. paradisaea*.

Full site synopses for the Rye Water Valley/Carton SAC, Glenasmole Valley SAC, Wicklow Mountains SAC, Red Bog Kildare SAC, South Dublin Bay SAC, Wicklow Mountains SPA, Poulaphouca Reservoir SPA and South Dublin Bay and River Tolka Estuary SPA are included as **Appendix 1** of this report.

### 5.2 Natura 2000 sites – Features of interests and conservation objectives.

The EU Habitats Directive contains a list of habitats (Annex I) and species (Annex II) for which SACs must be established by Member States. Similarly, the EU Birds Directive contains lists of important bird species (Annex I) and other migratory bird species for which SPAs must be established. Those that are known to occur at a site are referred to as ‘qualifying interests’ and are listed in the Natura 2000 forms which are lodged with the EU Commission by each Member State. A ‘qualifying interest’ is one of the factors (such as the species or habitat that is present) for which the site merits designation. The National Parks and Wildlife Service (NPWS) are responsible for the designation of SACs and SPAs in Ireland.

The conservation objectives for the sites are detailed in:

1. NPWS (2018) Conservation objectives for Rye Water Valley/Carton SAC [001398]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht, NPWS (2018).

2. Conservation objectives for Glenasmole Valley SAC [001209]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.
3. NPWS (2017) Conservation Objectives: Wicklow Mountains SAC 002122. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
4. NPWS (2019) Conservation Objectives: Red Bog, Kildare SAC 000397. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.
5. NPWS (2013) Conservation Objectives: South Dublin Bay SAC 000210. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht
6. NPWS (2018) Conservation objectives for Wicklow Mountains SPA [004040]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.
7. NPWS (2018) Conservation objectives for Poulaphouca Reservoir SPA [004063]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.
8. NPWS (2019) Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network. European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status sites designated as Special Areas of Conservation and Special Protection Areas. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. Favourable conservation status of a habitat is achieved when its natural range, and area it covers within that range, is stable or increasing, and the ecological factors that 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 favourable conservation status of a species is achieved when population data on the species concerned indicate that it is maintaining itself, and the natural range of the species is neither being reduced or 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. The species and habitats listed as qualifying interests for the Rye Water Valley/Carton SAC, Glenasmole Valley SAC, Wicklow Mountains SAC, Red Bog Kildare SAC, South Dublin Bay SAC, Wicklow Mountains SPA, Poulaphouca Reservoir SPA and South Dublin Bay and River Tolka Estuary SPA and specific conservation objectives are included in **Tables 2** to

**Table 11.** (Restore = Restore favourable conservation condition, Maintain = Restore favourable conservation condition. \* denotes a priority habitat)

**Table 2. Qualifying habitats for Rye Water Valley/Carlton SAC**

Habitat Code	Habitat	Conservation objective
7220	Petrifying springs with tufa formation (Cratoneurion)*	Maintain/restore

**Table 3: Qualifying species for Rye Water Valley/Carlton SAC**

Species code	Species	Scientific name	Conservation objective
1014	Narrow-mouthed Whorl Snail	<i>Vertigo angustior</i>	Maintain/restore
1016	Desmoulin's Whorl Snail	<i>Vertigo moulinsiana</i>	Maintain/restore

**Table 4: Qualifying habitats for Glenasmole Valley SAC**

Habitat Code	Habitat	Conservation objective
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> ) (* important orchid sites)	Maintain/restore
6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> )	Maintain/restore
7220	Petrifying springs with tufa formation (Cratoneurion)*	Maintain/restore

**Table 5: Qualifying habitats for Wicklow Mountains SAC**

Habitat Code	Habitat	Conservation objective
3110	Oligotrophic waters containing very few minerals of sandy plains ( <i>Littorelletalia uniflorae</i> )	Maintain
3160	Natural dystrophic lakes and ponds	Maintain
4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	Restore
4030	European dry heaths	Restore
4060	Alpine and Boreal heaths	Restore
6130	<i>Calaminarian grasslands of the Violetalia calaminariae</i>	Maintain
6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)*	Restore
7130	Blanket bogs (* if active bog)	Restore
8110	Siliceous scree of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i> )	Restore
8210	Calcareous rocky slopes with chasmophytic vegetation	Restore
8220	Siliceous rocky slopes with chasmophytic vegetation	Restore
91A0	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	Restore

**Table 6: Qualifying species for Wicklow Mountains SAC**

Species code	Species	Scientific name	Conservation objective
1355	Otter	<i>Lutra lutra</i>	Maintain



**Table 7: Qualifying habitats for Red Bog, Kildare SAC**

Habitat Code	Habitat	Conservation objective
7140	Transition mires and quaking bogs	Maintain

**Table 8: Qualifying habitats for South Dublin Bay SAC**

Habitat Code	Habitat	Conservation objective
1140	Mudflats and sandflats not covered by seawater at low tide	Maintain. <b>Target 1</b> The permanent habitat area is stable or increasing, subject to natural processes. <b>Target 2</b> Maintain the extent of the <i>Zostera</i> -dominated community, subject to natural processes. <b>Target 3</b> Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes. <b>Target 5</b> Conserve the following community type in a natural condition: Fine sands with <i>Angulus tenuis</i> community complex.
1210	Annual vegetation of drift lines	Not listed
1310	Salicornia and other annuals colonising mud and sand	Not listed
2110	Embryonic shifting dunes	Not listed

**Table 9: Qualifying species for Wicklow Mountains SPA**

Species code	Species	Scientific name	Conservation objective
A098	Merlin	<i>Falco columbarius</i>	Maintain/restore
A103	Peregrine	<i>Falco peregrinus</i>	Maintain/restore

**Table 10: Qualifying species for Poulaphouca Reservoir SPA**

Species code	Species	Scientific name	Conservation objective
A043	Greylag Goose	<i>Anser anser</i>	Maintain/restore
A183	Lesser Black backed gull	<i>Larus fuscus</i>	Maintain/restore

**Table 11. Qualifying species for South Dublin Bay and River Tolka Estuary SPA**

Species code	Species	Scientific name	Conservation objective
A046	Light-bellied Brent goose	<i>Branta bernicla hrota</i>	Maintain

A130	Oystercatcher	<i>Haematopus ostralegus</i>	Maintain
A137	Ringed plover	<i>Charadrius hiaticula</i>	Maintain
A141	Grey plover	<i>Pluvialis squatarola</i>	N/A
A143	Knot	<i>Calidris canutus</i>	Maintain
A144	Sanderling	<i>Calidris alba</i>	Maintain
A149	Dunlin	<i>Calidris alpina alpina</i>	Maintain
A157	Bar-tailed Godwit	<i>Limosa lapponica</i>	Maintain
A162	Redshank	<i>Tringa totanus</i>	Maintain
A179	Black-headed gull	<i>Chroicocephalus ridibundus</i>	Maintain
A192	Roseate tern	<i>Sterna dougallii</i>	Maintain
A193	Common Tern	<i>Sterna hirundo</i>	Maintain
A194	Arctic tern	<i>Sterna paradisaea</i>	Maintain
A999	Wetlands and waterbirds		Maintain

## 6. Screening conclusion

Potential impacts could arise from the following:

- Potential impacts from noise and disturbance
- Potential impacts on water quality
- Impacts from invasive species

### 6.1 Natura 2000 sites for which potential impacts from the proposed development have been identified.

South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA are overlapping estuarine sites located >17.5km from the proposed development site. The closest hydrological connection to these Natura 2000 sites is the Griffeen River (a tributary of the River Liffey) which is located within 200m of the waste management facility.

The Griffeen River bisects Greenogue business park (200m from the footprint of the development site) and flows north east for a distance of approximately 8.2 km before it meets the River Liffey in Lucan. The Liffey continues eastwards for approximately 19.2km before it enters Dublin Bay. Therefore, a source-pathway-receptor link does exist between the source (development proposal) and the receptor (South Dublin Bay SAC (site code 000210) and South Dublin Bay and River Tolka Estuary SPA (site code 004024)) via a potential pathway (Discharge of surface water run-off). There is limited potential for impacts from aqueous discharges as a result of changes to the waste handling system and it is considered unlikely that this project will impact on surface water and water quality.

Given the distances of the proposed project to the Natura 2000 sites, impacts from habitat loss/displacement or impacts from increased noise and disturbance will not occur as a result of activities at this facility.

No high-risk invasive species were recorded within the proposed works site. Thus, no impact from the spread of invasive species outside the site boundary has been identified.

After an initial review of all other Natura 2000 sites within 18km of the proposed survey area, it was considered that “no pathway” exists by which the proposed development could impact upon on the following Natura 2000 sites:

- Rye Water Valley/Carton SAC
- Glenasmole Valley SAC
- Wicklow Mountains SAC
- Red Bog Kildare SAC
- Wicklow Mountains SPA
- Poulaphouca Reservoir SPA

Due to distance of these European sites and lack of recognisable pathways from the proposed development site, there is no potential for any effects on these Natura 2000 sites and they can be screened out for AA. Potential impacts, although improbable, have been identified for the South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA. Further detail is provided below in **Table 12**.

**Table 12 Screening conclusions**

Natura 2000 Site	Qualifying Interest	Potential Impacts	Screened In/Out
Rye Water Valley/Carton SAC (site code 00139)	Petrifying springs with tufa formation (Cratoneurion)* [7220]	This wetland habitat type does not occur within or in proximity to the d ion. No potential impacts have been identified.	<b>Screened Out</b>
Rye Water Valley/Carton SAC (site code 001398)	<i>Vertigo angustior</i> (Narrow-mouthed Whorl Snail) [1014]	This species does not occur within or adjacent to the development footprint. No potential impact has been identified.	<b>Screened Out</b>
Rye Water Valley/Carton SAC (site code 001398)	<i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016]	This species does not occur within or adjacent to the development footprint. No potential impact has been identified.	<b>Screened Out</b>
Glenasmole Valley SAC (site code 001209)	Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> ) (* important orchid sites) [6210]	This habitat does not occur within or adjacent to the development footprint. No potential impact has been identified.	<b>Screened Out</b>

Glenasmole Valley SAC (site code 001209)	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]	This habitat does not occur within or adjacent to the development footprint. No potential impact has been identified.	<b>Screened Out</b>
Glenasmole Valley SAC (site code 001209)	Petrifying springs with tufa formation (Cratoneurion) [7220]	This wetland habitat type does not occur within or in proximity to the development footprint and there is no hydrological connection. No potential impacts have been identified.	<b>Screened Out</b>
Wicklow Mountains SAC (site code 002122)	<ul style="list-style-type: none"> <li>- Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</li> <li>- Natural dystrophic lakes and ponds [3160]</li> </ul>	These wetland habitat types do not occur within or in proximity to the development footprint and there is no hydrological connection. No potential impacts have been identified.	<b>Screened Out</b>
Wicklow Mountains SAC (site code 002122)	<ul style="list-style-type: none"> <li>- Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</li> <li>- European dry heaths [4030]</li> <li>- Alpine and Boreal heaths [4060]</li> <li>- Calaminarian grasslands of the <i>Violetalia calaminariae</i> [6130]</li> <li>- Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230]</li> <li>- Blanket bogs (* if active bog) [7130]</li> <li>- Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110]</li> <li>- Calcareous rocky slopes with chasmophytic vegetation [8210]</li> <li>- Siliceous rocky slopes with chasmophytic vegetation [8220]</li> </ul>	Terrestrial habitats which do not occur within or in proximity to the development footprint and no potential impacts have been identified.	<b>Screened Out</b>

	- Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]		
Wicklow Mountains SAC (site code 002122)	<i>Lutra lutra</i> (Otter) [1355]	Otter is known to occur on the Griffeen River (Clifton Scannell Emerson Associates Limited, 2015), although it was not recorded adjacent to the waste treatment facility. There is no hydrological connectivity between the Griffeen River and Wicklow Mountains SAC. Therefore there will be no effect on otter.	<b>Screened Out</b>
Red Bog Kildare SAC (site code 000397)	Transition mires and quaking bogs [7140]	Terrestrial habitat which does not occur within or in proximity to the development footprint and no potential effects have been identified.	<b>Screened out</b>
South Dublin Bay SAC (site code 000210)	- Mudflats and sandflats not covered by seawater at low tide [1140]  - Annual vegetation of drift lines [1210]  - Salicornia and other annuals colonising mud and sand [1310]  -Embryonic shifting dunes [2110]	Marine habitats which do not occur within or adjacent to the development footprint but which may be affected by effects on water quality.	<b>Screened In</b>
Wicklow Mountains SPA (site code 004040)	- Merlin ( <i>Falco columbarius</i> ) [A098] - Peregrine ( <i>Falco peregrinus</i> ) [A103]	These birds of prey species are associated with coniferous plantations, open peatlands and cliffs and crags within this site. These terrestrial habitats do not occur within or in proximity to the development footprint and no potential effects have been identified.	<b>Screened out</b>
Poulaphouca Reservoir (site code 004063)	- Greylag Goose ( <i>Anser anser</i> ) [A043]  - Lesser Black-backed Gull ( <i>Larus fuscus</i> ) [A183]	- Winter migrant, with Icelandic birds between November & April. Feral birds are present year round  - Summer visitor to lakes and coasts from March to September, wintering in Iberia and northwest Africa. Winter visitor in small numbers along eastern and southern coasts. There is no suitable breeding or foraging habitat for these species within or in proximity to the development	<b>Screened out</b>

		footprint and no potential impacts have been identified.	
South Dublin Bay and River Tolka Estuary SPA (site code 004024)	<ul style="list-style-type: none"> <li>- Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]</li> <li>- Oystercatcher (<i>Haematopus ostralegus</i>) [A130]</li> <li>- Ringed Plover (<i>Charadrius hiaticula</i>) [A137]</li> <li>- Grey Plover (<i>Pluvialis squatarola</i>) [A141]</li> <li>- Knot (<i>Calidris canutus</i>) [A143]</li> <li>- Sanderling (<i>Calidris alba</i>) [A144]</li> <li>- Dunlin (<i>Calidris alpina</i>) [A149]</li> <li>- Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]</li> <li>- Redshank (<i>Tringa totanus</i>) [A162]</li> <li>- Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]</li> <li>- Roseate Tern (<i>Sterna dougallii</i>) [A192]</li> <li>- Common Tern (<i>Sterna hirundo</i>) [A193]</li> <li>- Arctic Tern (<i>Sterna paradisaea</i>) [A194]</li> <li>- Wetland and Waterbirds [A999]</li> </ul>	These species are known to occur in wetland habitats adjacent to South Dublin Bay and River Tolka Estuary SPA. While habitats of importance for these species do not occur within or in proximity to the development footprint, the species may be affected by impacts on water quality, including impacts affecting prey availability such as small fish, benthic shellfish, polychaete worms and crustaceans.	<b>Screened In</b>

## 6.2 Status of qualifying habitats potentially affected by the proposed development.

### 6.2.1 Mudflats and sandflats not covered by seawater at low tide [1140]

Tidal mudflats and sandflats habitat is comprised of the intertidal section of the coastline where sands and muds dominate. They are dynamic ecosystems, dependent on the balance of natural accretion and erosion. The fundamental building block of this habitat is sediment ranging from around 1µm to 2mm. The finer silt and clay sediments are dominant in mudflats and the larger sand fractions are associated with areas exposed to significant wave energy. A range of physical pressures operate in these habitats including dynamic fluctuations in salinity, temperature, and immersion. The fine sediment of intertidal mudflats is usually deposited in estuaries. These sediments are often rich in nutrients but the depth of suitable habitat for fauna is limited by the access of oxygen-rich seawater to buried mud. Where conditions are suitable, the sediment can form into stable mixed sediment flats. In areas exposed to large waves with little riverine influence the habitat is mostly composed of larger sand grains. The most frequent biological community of mudflats and sandflats is the Mud to Fine sand community, which is characterised by molluscs (*Macomangulus tenuis*, *Peringia ulvae*), crustaceans (*Crangon crangon*, *Corophium volutator*), polychaetes (e.g. *Hediste diversicolor*) and oligochaetes (*Tubificoides benedii*). The next most prevalent community type is the Fine sand to sand

community, characterised by molluscs (e.g. *Macomangulus tenuis*), crustaceans (*Bathyporeia pilosa*, *Pontocrates* spp.) and polychaetes (e.g. *Nephtys cirrosa*, *Scolecopsis* spp.). The largest proportion of the remainder is made up of the Muddy sands/sandy muds community. The Overall status of the habitat is Inadequate and deteriorating, the change in trend from improving to deteriorating due to a genuine decline in the habitat since 2013. This was caused partly by pollution from agricultural, forestry and wastewater sources, as well as impacts associated with marine aquaculture, particularly the Pacific oyster (*Magallana gigas*).

### 6.2.2 Annual vegetation of drift lines [1210]

Drift lines occur on sandy or shingle substrate at the upper part of the strand, around the high tide mark. Water-borne material including organic matter is deposited on the shore and provides nutrients and a seed source for vegetation. The vegetation predominantly consists of annual species, such as orache species (*Atriplex* spp.), sea rocket (*Cakile maritima*) and prickly saltwort (*Salsola kali*), which are highly specialised to deal with the harsh conditions of high salinity, wind exposure and drought. This habitat is generally very species-poor and fragmented, and tends not to occupy large areas due to its narrow, linear nature. It exists in a state of instability and may be absent in some years due to natural and/or anthropogenic causes. In Ireland, the habitat includes drift line vegetation on sandy substrates as well as drift line vegetation on shingle. The Overall Status is assessed as Inadequate due to pressures associated with activities such as recreation and coastal defences, which can interfere with sediment dynamics, and the fact that the current area is still below the favourable reference area. The trend is deteriorating due to anthropogenic area losses.

### 6.2.3 Salicornia and other annuals colonising mud and sand [1310]

Salicornia and other annuals colonising mud and sand is a pioneer saltmarsh community that may occur on muddy sediment seaward of established saltmarsh, or form patches within other saltmarsh communities where the elevation is suitable and there is regular tidal inundation. The typical species for this habitat are common saltmarsh-grass (*Puccinellia maritima*), glassworts (*Salicornia europaea* agg., *Salicornia pusilla*), hard grass (*Parapholis strigosa*), buck's-horn plantain (*Plantago coronopus*), sea pearlwort (*Sagina maritima*), knotted pearlwort (*Sagina nodosa*) and annual sea-blite (*Suaeda maritima*). Mono-specific swards of *Salicornia* spp. growing on muddy sediments are the most common plant community of this habitat found in Ireland. As this habitat is dominated by annuals it can be ephemeral or transient in nature and is highly susceptible to erosion. Its distribution can vary considerably from year to year and it can move in response to changing conditions, e.g. in estuaries with shifting river channels. However, no significant pressures were identified that would affect the long-term viability of the habitat. The Overall Status is assessed as Favourable with a stable trend. The change in assessment from Inadequate in the 2013 report is due partly to a change in the threshold for favourable structure and functions, and partly because of a lack of evidence for the recent spread of the invasive non-native species, common cordgrass (*Spartina anglica*), although the extent and potential spread of this species should be monitored closely.

## 6.3 Status of qualifying species potentially affected by the proposed development.

### 6.3.1 Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]

The light-bellied Brent Goose population in South Dublin Bay is a winter migrant from high-Arctic Canada. This population winters almost entirely in Ireland and occurs in internationally important numbers exceeding its thresholds for a qualifying species for the South Dublin and River Tolka Estuary SPA in several months of the year. It is Amber listed on the Birds of Conservation Concern list in Ireland.

### **6.3.2 Oystercatcher (*Haematopus ostralegus*) [A130]**

Oystercatcher occur in numbers of international importance within Dublin Bay. This species is Amber-listed on the Birds of Conservation Concern list for Ireland. Oystercatchers breed widely along coasts in northwestern Europe and winter on estuarine mudflats, saltmarshes and sandy and rocky shores. Irish-breeding birds are joined by immigrants from Iceland, Scotland, The Faroe Islands and Norway in winter (Wernham *et al.* 2002). (Bird Watch Ireland).

The main threat to Oystercatcher is the overexploitation of the benthic shellfish on which they rely (Atkinson *et al.* 2003, Verhulst *et al.* 2004, Ens 2006, van de Pol *et al.* 2014). Bait digging has also been identified as a threat, through loss of prey species and disturbance to the benthic fauna (van de Pol *et al.* 2014). Other threats to Oystercatchers include land reclamation for industrial development (Melville *et al.* 2014), pollution, human disturbance (Burton *et al.* 2002b, Phalan & Nairn 2007, van de Pol *et al.* 2014) and coastal barrage construction (Burton 2006).

### **6.3.3 Ringed Plover (*Charadrius hiaticula*) [A137]**

This species is a resident and winter visitor from areas further north where this population also breeds (Iceland, the Baltic & southern Scandinavia). Peak numbers occur between August and early October, and then numbers decline slightly (passage birds move further south) and stabilise between November and January. It is mostly recorded along sandy stretches or along the upper shores of estuaries and non-estuarine coastline. Ringed Plover is an Amber-listed species of bird in Ireland. Birdwatch Ireland reported a decline of 23% between 1972 and 2013. Reasons for population decline include oil pollution, avian botulism, human disturbance, drainage of their wetland habitat an increase in their natural predators and climate change.

### **6.3.4 Grey plover (*Pluvialis squatarola*) [A141]**

Grey Plover is proposed for removal from the list of Special Conservation Interests for South Dublin Bay and River Tolka Estuary SPA. As a result, a site-specific conservation objective has not been set for this species.

### **6.3.5 Knot (*Calidris canutus*) [A143]**

This species is a winter visitor from northern Greenland and from the Queen Elizabeth Islands of high Arctic Canada west to Prince Patrick Island. Most occur between October and February. The wintering distribution is entirely coastal, and their preferred habitat mostly includes estuarine sites with extensive areas of muddy sand. It is Red listed on the Birds of Conservation Concern list in Ireland.



### 6.3.6 Sanderling (*Calidris alba*)[A144]

This species is a winter visitor. Most birds wintering in Ireland are of Siberian origin, while birds on passage are Nearctic, and pass through on their way towards more southerly wintering areas as far as South Africa. First seen along the Irish coastline in July or August, though most arrive in Ireland between September & April. The numbers of these species are particularly important in a national context (Crowe and Holt 2013), with peak counts of Sanderling *Calidris alba* occurring in Dublin Bay each making up 6% of the national population.

### 6.3.7 Dunlin (*Calidris alpina*) [A149]

This species is a winter visitor from Scandinavia to Siberia, and also occurs as a passage migrant from Greenland (heading south to winter in Africa). Most occur during the mid-winter period. It is Amber-listed on the Birds of Conservation Concern list in Ireland. The numbers occurring in Dublin Bay are nationally important, comprising 11% of the national population.

### 6.3.8 Bar-tailed Godwit (*Limosa lapponica*) [A157]

This species is a winter visitor to coastal estuaries from October to April from Russia and Scandinavia. It is Amber-listed on the Birds of Conservation Concern list in Ireland. The number of Black-tailed Godwits exceeded the threshold for being a qualifying species for the South Dublin Bay and River Tolka Estuary SPA, during the autumn and winter months, showing the importance of the site for this species not only during the winter, but also during the passage periods in spring and autumn. Bar-tailed Godwits occurred in internationally important numbers during the mid-winter period, between November and January. The numbers occurring within Dublin Bay are particularly important in a national context with peak counts of Bar-tailed Godwit comprising 10% of the Irish population.

### 6.3.9 Redshank (*Tringa totanus*) [A162]

This species is a resident, winter visitor from Iceland, it also occurs as a passage migrant (birds on passage from Scandinavia/the Baltic breeding areas to west African wintering areas). Highest numbers occur during the early autumn, when there is overlap of the populations. Threats to Redshank include loss of habitat associated, industrial development and land reclamation (del Hoyo *et al.* 1996), encroachment of Cordgrass *Spartina* spp on mudflats (Evans 1986), coastal barrage construction (Burton 2006), disturbance on intertidal mudflats from construction work (Burton *et al.* 2002a) and amenity-related disturbance (Burton *et al.* 2002b). This species is Red listed on the Birds of Conservation Concern List in Ireland.

### 6.3.10 Black-headed Gull (*Chroicocephalus ridibundus*)[A179]

This species is resident along all Irish coasts, with significant numbers arriving from the Continent in winter. Black-headed Gulls were present in the River Tolka Estuary, Liffey Channel and Dublin Port throughout the year, but numbers were greatest between July and March. During low tides, most (60%) of the Black-headed Gulls in Dublin Bay occurred in this region. (Dublin Bay Birds Project 2013-2016). This species is listed as Red on the Birds of Conservation Concern List in Ireland.

### 6.3.11 Roseate Tern (*Sterna dougallii*) [A192]

This species is a rare summer visitor from April to October, the majority breeding at two sites in the Irish Sea, with another colony in Wexford. Safeguarding the passage populations of three species: Roseate Tern, Common Tern and Arctic Tern, as well as the breeding population of Common Terns are listed as conservation objectives for the South Dublin Bay and River Tolka Estuary SPA Evening surveys of roosting terns in South Dublin Bay and River Tolka Estuary SPA confirm the conservation importance of the south Dublin Bay area during the post-breeding/pre-migration period. It is listed as Amber on the Birds of Conservation Concern List in Ireland.

### 6.3.12 Common Tern (*Sterna hirundo*) [A193] [A193]

This species is a summer visitor from March to October. The Dublin Bay staging site is especially important as there are only a small number of other such sites in the Irish Sea, in the southeast of Ireland close to the Lady's Island Lake Tern colony in Wexford, and on the west coast of England at Seaforth, near Liverpool. Evening surveys of roosting terns in South Dublin Bay and River Tolka Estuary SPA confirm the conservation importance of the south Dublin Bay area during the post-breeding/pre-migration period. It is listed as Amber on the Birds of Conservation Concern List in Ireland.

### 6.3.13 Arctic tern (*Sterna paradisaea*) [A194]

This species is a summer visitor from March to September. Evening surveys of roosting terns in South Dublin Bay and River Tolka Estuary SPA confirm the conservation importance of the south Dublin Bay area during the post-breeding/pre-migration period. This staging site is especially important as there are only a small number of other such sites in the Irish Sea, in the southeast of Ireland close to the Lady's Island Lake Tern colony in Wexford, and on the west coast of England at Seaforth, near Liverpool. It is listed as Amber on the Birds of Conservation Concern List in Ireland.

### 6.3.14 Wetlands [A999]

The conservation objective of this habitat is to maintain the favourable conservation condition of the wetland habitat in South Dublin Bay and River Tolka Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise it. The wetland habitat area was estimated as 2,192ha (NPWS, 2013)

### 6.4 Qualifying habitats and species potentially affected.

Potential impacts could theoretically arise for the South Dublin Bay SAC qualifying habitats: Mudflats and sandflats not covered by seawater at low tide, Annual vegetation of drift lines, Salicornia and other annuals colonising mud and sand and Embryonic shifting dunes and for species and habitats listed as qualifying interests for South Dublin Bay and River Tolka Estuary SPA: Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Grey Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern, Arctic Tern and Wetland and Waterbirds.

No significant potential risk to the remaining qualifying species and habitats has been identified. The NPWS conservation objectives for South Dublin Bay SAC (NPWS, 2013) and

South Dublin Bay and River Tolka Estuary SPA (NPWS, 2015) details the following targets for these species and habitats (**Tables 13 and 14**).

**Table 13. QI species for which a potential impact has been identified – specific targets**

Species	Attribute	Measure	Target	
<b>Light-bellied Brent Goose <i>Branta bernicla hrota</i>, Oystercatcher <i>Haematopus ostralegus</i>, Ringed plover <i>Charadrius hiaticula</i>, Knot <i>Calidris canutus</i>, Sanderling <i>Calidris alba</i>, Dunlin <i>Calidris alpina alpina</i>, Bar-tailed Godwit <i>Limosa lapponica</i>, Redshank <i>Tringa totanus</i>, Black-headed Gull <i>Chroicocephalus ridibundus</i></b>	Population trend	Percentage change	Long term population trend stable or increasing	
	Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by the species listed, other than that occurring from natural patterns of variation	
<b>Roseate Tern <i>Sterna dougallii</i></b>	Passage population: individuals	Number	No significant decline	
	Distribution: roosting areas	Number; location; area (hectares)	No significant decline	
	Prey biomass available	Kilogrammes	No significant decline	
	Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	
	Disturbance at roosting site	Level of impact	Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns	
	<b>Common tern <i>Sterna hirundo</i></b>	Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline
		Productivity rate: fledged young per breeding pair	Mean number	No significant decline
	Passage population: individuals	Number	No significant decline	

	Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline
	Distribution: roosting areas	Number; location; area (Hectares)	No significant decline
	Prey biomass available	Kilogrammes	No significant decline
	Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase
	Disturbance at breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding common tern population
	Disturbance at roosting site	Level of impact	Human activities should occur at levels that do not adversely affect the numbers of common tern among the post-breeding aggregation of terns
<b>Arctic Tern <i>Sterna paradisaea</i></b>	Passage population	Number of individuals	No significant decline
	Distribution: roosting areas	Number; location; area (hectares)	No significant decline
	Prey biomass available	Kilogrammes	No significant decline
	Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase
	Disturbance at roosting site	Level of impact	Human activities should occur at levels that do not adversely affect the numbers of Arctic tern among the post-breeding aggregation of terns
<b>Wetlands</b>	Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,192 hectares, other than that occurring from natural patterns of variation.

Table 14. QI habitats for which a potential impact has been identified – specific targets

Habitats	Attribute	Measure	Target
<b>Mudflats and sandflats not covered by seawater at low tide [1140]</b>	Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes

	Community extent	Hectares	Maintain the extent of the Zostera-dominated community, subject to natural processes
	Community structure/Zostera density	Shoots/m <sup>2</sup>	Conserve the high quality of the Zostera-dominated community, subject to natural processes
	Community distribution	Hectares	Conserve the following community type in a natural condition: Fine sands with <i>Angulus tenuis</i> community complex.
Annual vegetation of drift lines [1210]	No specific targets listed		
Salicornia and other annuals colonising mud and sand [1310]	No specific targets listed		
Embryonic shifting dunes [2110]	No specific targets listed		

## 7. Water Quality data

### 7.1 EPA Water Quality Data

The Environmental Protection Agency carries out a biological assessment of most river channels in the country on a regular basis. The assessments are used to derive Q values, indicators of the biological quality of the water. The biological health of a watercourse provides an indication of long-term water quality. The EPA Q value scheme is summarised in **Table 15**. The relationship between the Q-rating system and the Water Framework Directive classification as defined by the Surface Waters Regulations 2009 (S.I. 272 of 2009) is shown in **Table 16**. EPA biological monitoring data for the closest freshwater monitoring sites applicable to the development site, in relation to flow direction and topography are shown in **Table 17**.

The Q Value system, which is used by the Environmental Protection Agency, describes the relationship between water quality and the macro-invertebrate community in numerical terms. The presence of pollution causes changes in flora and fauna of rivers. Well documented changes occur in the macro-invertebrate community in the presence of organic pollution: sensitive species are progressively replaced by more tolerant forms as pollution increases. Q5 waters have a high diversity of macro-invertebrates and good water quality, while Q1 have little or no macro-invertebrate diversity and unsatisfactory water quality.

The intermediate ratings Q1-2, Q2-3, Q3-4 and Q4-5 are used to denote transitional conditions, while ratings within parenthesis indicate borderline values. Great importance is attached to the EPA biotic indices, and consequently it is these data that are generally used to form the basis of water quality management plans for river catchments.

Results indicate that the water quality of the Griffeen River which is located approximately 200m from the waste management facility is classified as poor at all freshwater biological monitoring stations upstream and downstream of the development site. However these results relate to sampling in 1991 and thus may not be indicative of current water quality status.

Water quality at Lucan Bridge on the River Liffey was classified as 'Good' in 2016. Further downstream water quality in the River Liffey deteriorates. Water quality in Dublin Bay was classified as 'Good' (2010- 2012). **Figure 3** below shows the waste management facility in relation to the Griffeen River and **Figure 4** shows the waste management facility in relation to Griffeen river, the River Liffey and Dublin Bay.

**Table 15. EPA biotic index scheme.**

Q value	Water quality	Pollution	Condition
5	Good	Unpolluted	Satisfactory
4	Fair	Unpolluted	Satisfactory
3	Doubtful	Moderately polluted	Unsatisfactory
2	Poor	Seriously polluted	Unsatisfactory
1	Bad	Seriously polluted	Unsatisfactory

Source: EPA

**Table 16. Correlation between the WFD classification and Q values**

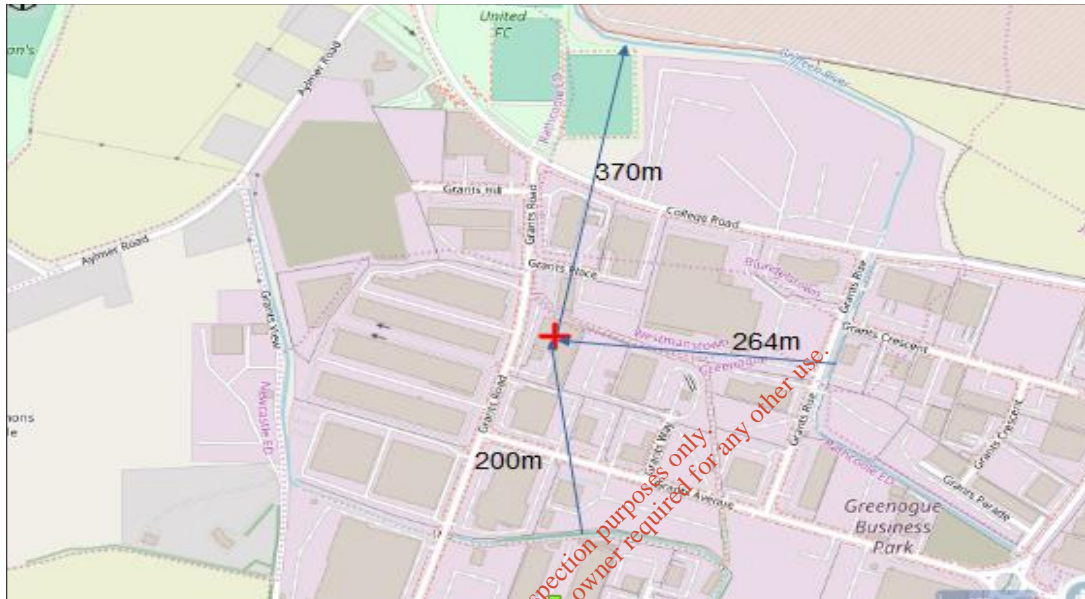
Ecological status WFD	Q Values
High	Q5, Q4-5
Good	Q4
Moderate	Q3-4
Poor	Q3, Q2-3
Bad	Q2, Q1

**Table 17. EPA water quality status**

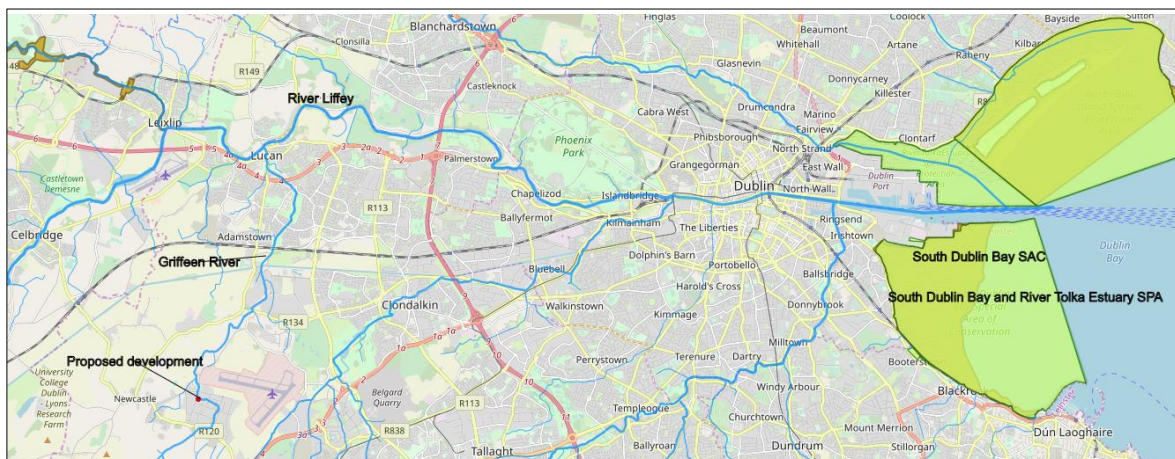
Q-Value location	Distance from waste management facility	Q-Value
<b>Griffeen River</b>		
College Rd	Located approximately 859m southeast of the waste treatment facility upstream (u/s)	Q2-3 – Poor (1991)
First bridge east of Milltown	Located approximately 3.1km north of the waste treatment facility downstream (d/s)	Q3–Poor Status (1991)
Esker Bridge	3.73km d/s of First bridge east of Milltown monitoring station	Q3 – Poor Status (1991)
Lucan Village (gauging station)	1.28km d/s of Esker Bridge monitoring station	Q2-Q3 – Poor Status (1991)
<b>River Liffey</b>		
Lucan Bridge	610m d/s of Lucan village (gauging station) monitoring station	Q4 – Good (2016)
Mill Lane studio	7.75km d/s of Lucan bridge monitoring station	Q3– Poor (2002)

1km u/s Chapelizod bridge (Glencullen park)	5.87m d/s of Mill lane studio monitoring station	Q3 – Poor (2005)
Liffey 0.2km d/s Chapelizod bridge (Lynch’s lane)	1.06km d/s of 1km u/s Chapelizod bridge (Glencullen park)	Q3–4 Moderate (2016)
Liffey Islandbridge- UCD boatclub	1.94km d/s Liffey 0.2km d/s Chapelizod bridge (Lynch’s lane)	Q3–4 Poor (2016)
<b>Dublin Bay</b>		
Dublin Bay	6.03km d/s Liffey Islandbridge- UCD boatclub	2010-2012 unpolluted

Source: EPA Envision map system



**Figure 3: Proposed development in relation to the Griffen River- It is noted that the Griffen river is mapped incorrectly on EPA maps.**



**Figure 4. Proposed development in relation to South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA, hydrologically linked via Griffen River and River Liffey**

## 7.2 River Basin Management Plan for Ireland 2018 – 2021 (2<sup>nd</sup> Cycle)

The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are very significant. Therefore, a key purpose of the River Basin Management Plan (RBMP) is to set out priorities and ensure that implementation is guided by these priorities.

The second-cycle RBMP aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). The former measure has resulted in significant progress in terms both of compliance levels and of the impact of urban waste-water on water quality. The latter provides a considerable environmental baseline which all Irish farmers must achieve and has resulted in improving trends in the level of nitrates and phosphates in rivers and groundwater. It is acknowledged, however, that sufficient progress has not been made in developing and implementing supporting measures during the first cycle.

Overall, RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of our water bodies. The characterisation process also takes into account wider water quality considerations, such as the special water-quality requirements of protected areas. The characterisation process identifies those water bodies that are *At Risk* of not meeting the objectives of the WFD, and the process also identifies the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas. Data relating to the watercourses within the study area is provided in **Table 18**.

**Table 18. WFD Status**

<b>WFD – 2<sup>nd</sup> Cycle: Catchment: Liffey and Dublin Bay– Sub catchment: Liffey_SC_090</b>			
<b>River Status</b>	<b>2010-2015</b>	<b>2010-12</b>	<b>2007-2009</b>
Liffey _170 (Griffeen)	Moderate	Moderate	Moderate
<b>River Risk</b>	<b>WFD risk</b>	<b>Significant pressure</b>	<b>Pressures</b>
	At risk	Yes	Urban waste water, urban run-off
<b>Ecological status /potential</b>	<b>2013-2018</b>	<b>2010-2015</b>	<b>2007-2009</b>
	Good	Moderate	Moderate
<b>Estuary Status</b>	<b>2013-2018</b>	<b>2010-2015</b>	<b>2007-2009</b>
Liffey Estuary Upper	Good	Moderate	Poor

Source: wfdireland map system & www.catchments.ie

## 8. Site inspection



A site inspection was carried out on the 28<sup>th</sup> of January, 2020 to identify the habitats, flora and fauna present at the site. The survey consisted of walking systematically through the site and recording habitats and plant species, in addition to relative abundance, condition and degree of disturbance. The terrestrial and aquatic habitats within or adjacent to the proposed development site were classified using the classification scheme outlined in the Heritage council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and cross referenced with Annex 1 Habitats where required. No rare species were noted, nor are they expected to occur given that the habitats within the study area are common.

Habitats noted within the proposed development area consist of:

- BL3 Buildings and artificial surfaces

Habitats within the wider area consist primarily of:

- BL3 buildings and artificial surfaces;
- Hedgerows WL1;
- Depositing/lowland rivers FW2

Immediately North of the ENVA facility, there is a hard-standing path which runs between industrial units. This 3m wide path runs between palisade fencing which delineates each industrial compound is lined with shrubs/trees on either side. The path continues southwards bisecting the business park and extending for a distance of approximately 919m to College Lane. The path is intersected along its length by roads at Grants Avenue and Grants Drive, both situated within the Business park. After a distance of approximately 435m from its starting point, beyond Grants Avenue, the path meets the Griffeen river where the river turns west through the business park. (See **Figure 3** and **Figure 4**) and **Photos 3** and **4**)

### **BL3 Buildings and artificial surfaces**

The Facility encompasses approximately 0.5 hectares of hard standing of low ecological value. The buildings onsite have a gross floor area of 2,183m<sup>2</sup> and consists of a main warehouse, ancillary offices, a hazardous chemical store with an underground water retention tank, three covered and bulk-tanker bays and a covered dispatch area along with a weighbridge, parking and associated surface water infrastructure. The existing waste management facility is shown in **Photo 1**.

### **Hedgerows WL1**

The shrubs and trees that line both sides of palisade fencing which separates industrial units are continuous but do not form wide or valuable wildlife habitats and have limited ground layer vegetation. This line of vegetation is composed of Hawthorn (*Crataegus monogyna*), Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior*), Birch (*Betula* sp.), Elder *Sambucus nigra*, Buddleia (*Buddleia davidii*), with Ivy (*Hedera helix*) and Herb Robert (*Geranium robertianum*) recorded as understory species. This habitat is shown in **Photo 2**.

## Depositing/lowland rivers FW2

The river within the business park, is highly modified and canalised, It is walled within a concrete embankment with rock along its southern bank and scrub vegetation (Bramble (*Rubus fruticosus* agg.), Tufted Vetch (*Vicia cracca*), Wild Angelica (*Angelica sylvestris*), Pendulous Sedge (*Carex pendula*), Common Reed (*Phragmites australis*), Lesser Water Parsnip (*Berula erecta*), Lesser Celandine (*Ficaria verna*) and Hogweed (Heracleum sphondylium) on its northern bank of approx 3m in width bordering palisade fencing of industrial units. The river at this location is dominated by glide habitat, with rifle habitat occurring at road culverts. The substrate is a mix of cobble, gravel and sand. The river is culverted under Grants Road, and then continues westwards for approximate 164m to the western edge of the business park at Grants View when it turns Northwards and it flows through a second business park (Grange Castle Business Park), through Adamstown and is culverted under the Grand Canal. From here it passes through several housing estates, Lucan Village Park and Vessey Park before reaching Griffeen Valley Park. After leaving the park it flows past Lucan house and demesne and enters the River Liffey at the Lucan Weir, a distance of approximately 8.2km from Greenogue Business Park. The River in Greenogue Business park is shown in **Photos 3** and **4**.

### 8.1 Mammals

A mammal survey was undertaken of the site and surrounding area during the site inspection. The main focus of the mammal survey was Otter, which is listed on Annex II of the Habitats Directive, and is listed as qualifying interest of Wicklow Mountains SAC.

Although rare in parts of Europe they are widely distributed in the Irish countryside in both marine and freshwater habitats. Otters are solitary and nocturnal and as such are rarely seen. Thus, surveys for otters rely on detecting signs of their presence. These include spraints (faeces), anal gland secretions, paths, slides, footprints and remains of prey items. Spraints are of particular value as they are used as territorial markers and are often found on prominent locations such as grass tussocks, stream junctions and under bridges. In addition, they are relatively straightforward to identify.

Otters occasionally dig out their own burrows but generally they make use of existing cavities as resting placing or for breeding sites. Suitable locations include eroded riverbanks, under trees along rivers, under fallen trees, within rock piles or in dry drainage pipes or culverts etc. If ground conditions are suitable the holt may consist of a complex tunnel and chamber system. Otters often lie out above ground especially within reed beds where depressions in the vegetation called "couches" are formed. Generally, holts or resting areas can be located by detecting signs such as spraints or tracks.

In contrast natal holts which are used by breeding females can be difficult to locate. They are often located a considerable distance from any aquatic habitats and otters may also use habitats adjoining small streams with minimal or no fish populations. In addition, natal holts are usually carefully hidden and without obvious sprainting sites. Otters do not have a well-defined breeding season.

It is noted that otters are largely nocturnal, particularly in areas subject to high levels of disturbance as evidenced by the presence of otters in the centre of Irish cities. Thus, otters

are able to adapt to increased noise and activity levels; however, breeding holts are generally located in areas where disturbance is lower.

No signs of otter were recorded in proximity to the proposed development site. The Griffeen River has the potential to support fish including salmonids (Brown trout) and otter may forage within the stream. However, the bank-side habitat offers limited cover and this watercourse is unlikely to be a critical resource for local otter populations. Otter occurs along the Grand Canal and River Liffey downstream of the proposed development. No other protected mammals including bats or suitable habitats for bats were recorded during site survey.

## 8.2 Birds

During the site survey, all birds seen or heard within the development site were recorded. The majority of birds utilising the site were common in the local landscape. Certain bird species are listed by BirdWatch Ireland as Birds of Conservation Concern in Ireland (BOCCI). These are bird species suffering declines in population size. BirdWatch Ireland and the Royal Society for the Protection of Birds have identified and classified these species by the rate of decline into Red and Amber lists. Red List bird species are of high conservation concern and the Amber List species are of medium conservation. Green listed species are regularly occurring bird species whose conservation status is currently considered favourable. Birds species listed in Annex I of the Birds Directive (2009/147/EC) are considered a conservation priority. Species recorded within the site are shown in **Table 19**.

**Table 19: Bird Species recorded during site survey on the 28th of January 2020**

Species		Birds Directive Annex			BOCCI	
		I	II	III	Red List	Amber List
<i>Turdus merula</i>	Blackbird					
<i>Carduelis carduelis</i>	Goldfinch					
<i>Fringilla coelebs</i>	Chaffinch					
Symbol	Description					
I	<b>Annex 1:</b> species and sub-species are particularly threatened. Member States must designate Special Protection Areas (SPAs) for their survival and all migratory bird species.					
II	<b>Annex 2:</b> bird species can be hunted. However, the hunting periods are limited and hunting is forbidden when birds are at their most vulnerable: during their return migration to nesting areas, reproduction and the raising of their chicks.					
III	<b>Annex 3:</b> overall, activities that directly threaten birds, such as their deliberate killing, capture or trade, or the destruction of their nests, are banned. With certain restrictions, Member States can allow some of these activities for species listed here.					

Overall, the study area is of a local value for a small number of terrestrial bird species that are common in the Irish countryside. It is noted that there is no loss of habitat associated with the proposed development. There will be no impacts during either the construction or operational phases of the development to any terrestrial bird species.



Photo 1



Photo 2



Photo 3



Photo 4

## 9. Assessment of Potential Impacts

All potential impacts relate to discharges into the Griffeen River which may result in impacts to relevant habitats and fauna. Based on the EC Article 6 Guidance Document (2001) and IEEM guidelines '*Guidelines for Ecological Impact Assessment*' (IEEM, 2006), impacts are listed as significant using a combination of professional judgement and criteria or standards where available, if impacts have the potential to have a significant impact on the ecological integrity on the habitats and species for which the site is designated. As the Natura 2000 sites are of International importance, any significant adverse impacts would be significant at an 'International' level.

The potential impacts associated with the proposed development are discussed in the following section with respect to their likelihood to have significant impacts on Natura 2000 sites.

As part of the assessment direct, indirect and cumulative impacts were considered. Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development. Indirect and secondary impacts do not have a straight-line route between cause and effect, and it is potentially more challenging to ensure that all the possible indirect impacts of the project/plan – in combination with other plans and projects have been established.

### 9.1 Potential impacts from loss of habitat.

The proposed development is not located within a designated site and the habitats recorded within or adjacent to the site footprint do not correspond to habitats listed on Annex 1 of the Habitats Directive or qualifying habitats for Natura 2000 sites. No habitats will be affected by the proposed development. Thus, no potential impact on Natura 2000 sites resulting from loss of habitat will occur.

### 9.2 Impacts on Water Quality

The emissions licence review submission will require a change of handling equipment within an existing industrial building. All works associated with the installation and operational phases of the facility will occur within an existing warehouse. The entire site is either paved with concrete, or occupied by buildings that prevent accidental seepages to soils. Therefore, the proposed development will not result in any impact on water quality during its construction phase.

Sanitary wastewater and rainwater run-off from the building roof and paved open areas discharge to the foul sewer that serves the Business Park. The proposed development will not result in any change to the volume and quality of the rainwater run-off. The proposed development does not require any alteration to the existing foul and surface water drainage layout, and will not result in any change to either the quality or quantity of the discharge.

Inadvertent spillages of hydrocarbon and/or other chemical substances could introduce toxic chemicals into the aquatic environment via direct means, surface water run-off or groundwater contamination. Some hydrocarbons exhibit an affinity for sediments and thus become entrapped in deposits from which they are only released by vigorous erosion or turbulence. Oil products may contain various highly toxic substances, such as benzene, toluene,

naphthenic acids and xylene which are to some extent soluble in water; these penetrate into the fish and can have a direct toxic effect. The lighter oil fractions (including kerosene, petrol, benzene, toluene and xylene) are much more toxic to fish than the heavy fractions (heavy paraffins and tars). In the case of turbulent waters, the oil becomes dispersed as droplets into the water. In such cases, the gills of fish can become mechanically contaminated and their respiratory capacity reduced (Svobodova *et al.* 1993).

Sanitary wastewater from the facility discharges to the foul sewer that serves the Business Park. The warehouse is designed to collect floor wash downs in a 5m<sup>3</sup> sealed sump from where it can be pumped to the foul sewer that serves the industrial estate. However, as putrescible wastes are not accepted at the facility, floor wash downs are not required and the sump is not used.

There are no current direct or indirect emissions to groundwater and the proposed development will not result in any new emissions. There is the potential for accidental releases of the APCR, oil leaks from the mobile plant, and firewater run-off in the event of a fire. The potential pathway to surface waters is overland flow onto the industrial estate access road that could enter surface water gullies. The pathways to groundwater are infiltration through damaged paving and leaks from the storm drains.

The emissions licence requires quarterly monitoring of surface water quality. Results from the most recent monitoring period July, August & September 2019 are presented in **Table 20** below. The Table also includes for comparative purposes the environmental quality standards (EQS) set out in the Surface Water Environmental Objectives (Surface Water) Regulations 2009 (SI 272 of 2009).

**Table 20 Surface Water monitoring results for Rilta Quarter 3 2019**

Parameter	Unit	SW-1	EQS	Warning Level	Action Level
pH	PH units	8.29	6.5-9.0	8.78	9.34
Electrical Conductivity	µS/cm	402	NE	573	715
COD	mg/l	<7	NE	57	76

NE= limit not established

All parameters were below the proposed warning and action levels.

The current mitigation measures in place by Rilta include the provision of an oil interceptor on the surface water drains that collects run-off from the yard and weighbridge; the inspection and repair of the paved areas; impermeable paving across the operational areas; the routine inspection and survey of the surface water and foul water drains; the adoption of an emergency response procedure, and staff training on appropriate spill response actions. There is one gate valve on the foul sewer and three drains on the surface water network that can be closed in the event of an incident at the site that has the potential to contaminate surface water.

Rilta has prepared and adopted an Accident Prevention Policy and an Emergency Response Procedure that specifies roles, responsibilities and actions required to deal quickly and efficiently with all foreseeable major incidents and to minimise environmental impacts. Rilta has completed an Environmental Liability Risk Assessment (ELRA) that has identified the plausible accidents/incidents that may occur and evaluated the associated environmental effects. Based on the types of waste that are and will be accepted and the activities carried out, the only accident that presents a significant risk of environmental pollution is a fire. Rilta has completed a Firewater Retention Assessment. (Rilta, EIA, 2019).

Due to the location and nature of the facility, potentially nutrients/pollutants in surface water run-off could impact Griffeen River and theoretically on Natura 2000 sites downstream of the facility. However, mitigation procedures will be employed by Rilta during installation and operational phases of the proposed development to minimise the potential for impacts on water quality. These mitigation methods will effectively minimise/prevent potential impacts from accidental spills. Furthermore, any such spills, in the unlikely event of their occurrence, would be minor in the context of the available dilution and distance to Dublin Bay. Thus, no impact on water quality during the installation or operation phases is will occur and no long-term impact on the qualifying interests for Natura 2000 sites will occur.

### 9.3 Impacts from Noise and Disturbance

The proposed development consisting of an APCR bagging plant will be a source of noise emissions. These will be associated with the air compressor used to transfer the APCR from the bulk tankers to the silos and the reverse jet air filters fitted to each silo. Potentially increased noise and disturbance associated with the proposed changes could cause disturbance/displacement of fauna.

The Rilta industrial emissions licence (Reg. No. W0185-01) sets limits on day time noise at 55dB. Annual monitoring is required to measure this. Previous monitoring results carried out at 3 approved on site noise monitoring locations in February 2018, showed that site operations were not audible at any of the stations and were therefore lower than the 55dB daytime limit as specified in the licence.

Rilta implements the control measures specified in the licence that are designed to ensure waste activities do not give rise to noise emissions that will be a cause of nuisance or impairment outside the facility boundary. All waste processing and storage is carried out inside the buildings. The doors are only opened to allow vehicles to enter and exit the buildings. Vehicle movements in and out of the site are sources of noise; however these activities are part of the normal activities in the Business Park and prevention and mitigation measures are not required. Rilta has a policy not to allow engine idling within the site boundary.

Any increased noise levels resulting from the proposed APCR bagging plant will comply with the licence emissions limit, and thus would not pose a significant risk to any fauna in adjacent habitats. Due to the distance from Natura 2000 sites no effects on qualifying species from increased noise levels will occur.

### 9.4 Cumulative Impacts

Cumulative impacts refer to a series of individually modest impacts that may in combination produce a significant impact. The underlying intention of this in combination provision, is to

take account of cumulative impacts from existing or proposed plans and projects and these will often only occur over time.

Potential threats to South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA include land reclamation, industrial discharges, increased human population, recreational disturbance, development of cord-grass (*Spartina sp.*) and flood relief works. Eutrophication due to nutrient run-off from the catchment area also threatens the quality of the habitat. Run-off from urban areas introduce various hazardous substances, that can accumulate in the soft sediments. Oil spills at sea that are washed ashore on mudflats or sandflats pose a serious threat, as oil is very difficult to remove from this type of soft sediment.

The EPA list urban waste water as the significant pressure for waterbodies in The Liffey and Dublin Bay Catchment including the Liffey estuaries and River Tolka Estuary (Catchments.ie)

The Liffey catchment is associated with three urban waste water treatment plants (Swords, Upper Liffey Valley Sewerage Scheme, and Ringsend (Liffey and River Tolka Estuaries)). Two of the three urban waste water treatment plants (Swords and Upper Liffey Valley Sewerage Scheme) have tertiary treatment and, therefore, were compliant with the environmental objectives for Nutrient Sensitive Areas. Ringsend urban waste water treatment was not compliant with the environmental objective for Nutrient Sensitive Areas but is due to be upgraded to tertiary treatment in 2021.

Other developments near site and potential cumulative impacts are identified in **Table 20**. In the absence of any significant impacts on qualifying interests or conservation objectives associated with this project no significant cumulative impacts have been identified.

**Table 20. Other developments near site and potential cumulative impacts**

Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Impact
<b>River Basin Management Plan 2018-2021</b>	<p>The project should comply with the environmental objectives of the Irish RBMP which are to be achieved generally by 2021.</p> <ul style="list-style-type: none"> <li>• Ensure full compliance with relevant EU legislation</li> <li>• Prevent deterioration</li> <li>• Meeting the objectives for designated protected areas</li> <li>• Protect high status waters</li> <li>• Implement targeted actions and pilot schemes in focus sub-catchments aimed at: targeting water bodies close to meeting their objective and addressing more complex issues which will build knowledge for the third cycle.</li> </ul>	<p>The implementation and compliance with key environmental policies, issues and objectives of this management plan will result in positive in-combination effects to European sites. The implementation of this plan will have a positive impact for the biodiversity. It will not contribute to in-combination or cumulative impacts with the proposed development.</p>



Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Impact
<p><b>Inland Fisheries Ireland Corporate Plan 2016 -2020</b></p> <p><b>The Inland Fisheries Act 2010.</b></p>	<p>To ensure that Ireland's fish populations are managed and protected to ensure their conservation status remains favourable. That they provide a basis for a sustainable world class recreational angling product, and that pristine aquatic habitats are also enjoyed for other recreational uses.</p> <p>To develop and improve fish habitats and ensure that the conditions required for fish populations to thrive are sustained and protected.</p> <p>To grow the number of anglers and ensure the needs of IFI's other key stakeholders are being met in a sustainable conservation focused manner.</p> <p>EU (Quality of Salmonid Waters) Regulations 1988. All works during development and operation of the project must aim to conserve fish and other species of fauna and flora habitat; biodiversity of inland fisheries and ecosystems and protect spawning salmon and trout.</p>	<p>The implementation and compliance with key environmental issues and objectives of this corporate plan will result in positive on-combination effects to European sites. The implementation of this corporate plan will have a positive impact for biodiversity of inland fisheries and ecosystems. It will not contribute to in-combination or cumulative impacts with the proposed works.</p>
<p><b>Irish Water Capital Investment Plan 2017-2021</b></p>	<p>Proposals to upgrade and secure water services and water treatment services countrywide.</p>	<p>Likely net positive impact due to water conservation and more effective treatment of water.</p>
<p><b>Water Services Strategic Plan (WSSP, 2015)</b></p>	<p>Irish Water has prepared a Water Services Strategic Plan (WSSP, 2015), under Section 33 of the Water Service No. 2 Act of 2013 to address the delivery of strategic objectives which will contribute towards improved water quality and biodiversity requirements through reducing:</p> <ul style="list-style-type: none"> <li>• Habitat loss and disturbance from new / upgraded infrastructure;</li> <li>• Species disturbance;</li> <li>• Changes to water quality or quantity; and Nutrient enrichment /eutrophication.</li> </ul>	<p>The WSSP forms the highest tier of asset management plans (Tier 1) which Irish Water prepare and it sets the overarching framework for subsequent detailed implementation plans (Tier 2) and water services projects (Tier 3). The WSSP sets out the challenges we face as a country in relation to the provision of water services and identifies strategic</p>

Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Impact
	<p style="text-align: center; color: red; font-style: italic;">For inspection purposes only. Consent of copyright owner required for any other use.</p>	<p>national priorities. It includes Irish Water's short, medium and long-term objectives and identifies strategies to achieve these objectives. As such, the plan provides the context for subsequent detailed implementation plans (Tier 2) which will document the approach to be used for key water service areas such as water resource management, wastewater compliance and sludge management. The WSSP also sets out the strategic objectives against which the Irish Water Capital Investment Programme is developed. The current version of the CAP outlines the proposals for capital expenditure in terms of upgrades and new builds within the Irish Water owned assets. The overarching strategy was subject to AA and highlighted the need for additional plan/project environmental assessments to be carried out at the tier</p>

Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Impact
		2 and tier 3 level. Therefore, no likely significant in-combination effects are envisaged.
<p><b>NPWS Conservation Management Plans</b></p>	<p>Conservation Management Plans have not been fully prepared for the European sites being assessed. However, conservation objectives along with supporting documents (i.e. Marine habitats) have been established for South Dublin Bay SAC (Site Code 000210).</p> <p style="color: red; transform: rotate(-45deg); opacity: 0.5;">For inspection purposes only. Consent of copyright owner required for any other use.</p>	<p>The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site. The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. The resultant effects of conservation objectives are a net positive and there is no potential for in combination effects on European sites.</p>
<p><b>IPPC Programme</b></p>	<p>There are a number of IPPC Licence holders discharging directly to the Griffeen River downstream of the proposed development i.e. Takeda Ireland Limited, Grange BackUp Power</p>	<p>Discharges from these facilities are governed by strict meeting water quality</p>

Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Impact
	Limited Pfizer Ireland Pharmaceuticals (Grange Castle) and several others in the greater Dublin area that discharge into South Dublin Bay SAC.	standards. The long-term cumulative impact is predicted to be negligible.
<b>Residential Applications Under consideration</b>	Regional Planning Guidelines for the Greater Dublin Area 2010-2022 (2010) have identified a population growth target for the region of 1,464,299 by the year 2022. Therefore, there is likely to be significant housing development in the area in the short to medium term.	Future developments will only be granted permission where discharges from same meet with relevant water quality standards. The long-term cumulative impact is predicted to be negligible.

## 10. Mitigation Measures

All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of the Griffeen River, to re-emphasize the precautions that are required as well as the mitigation to be implemented. Site managers, foremen and workforce, including all subcontractors, will be suitably trained in pollution risks and preventative measures.

All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of Natura 2000 sites and to re-emphasize the precautions that are required as well as the precautionary measures to be implemented. All staff and subcontractors have the responsibility to:

- Work to agreed plans, methods and procedures to eliminate and minimise environmental impacts,
- Understand the importance of avoiding pollution on-site, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact;
- Respond in the event of an incident to avoid or limit environmental impact;
- Report all incidents immediately to their project manager;
- Monitor the work place for potential environmental risks and alert the immediate project manager if any are observed; and
- Co-operate as required, with site inspections.

### 10.1 Mitigation accidents

The current licence conditions require the provision of mitigation measures, both infrastructural and procedural, that effectively minimise the risk of environmental liabilities

associated with major accidents. Such measures, which are subject to regular review by Rilta include:

- The building construction incorporates fire prevention and containment measures and all have Fire Safety Certificates issued by South Dublin County Council. The warehouse is fitted with a fire detection and alarm system, with smoke detectors fitted in the offices. There are firewalls between the three compartments in the Waste Storage Pods. There are two (2 No.) fire hydrants and one (1 No.) hose reels and appropriate fire extinguishers are provided at strategic locations in the buildings.
- The Main Warehouse is provided with a reinforced containment kerb around the entire building with ramps at the entrances providing a retention capacity of 235m<sup>3</sup>. The floor of each compartment in the Waste Storage Pods drains into gullies that connect to an underground 300m<sup>3</sup> tank. The Small Warehouse is contained by retaining kerb and floors slope to a sump providing a retention capacity of 31m<sup>3</sup>
- Separation of foul and surface water drainage system. Surface run-off from areas where there is the potential for contamination to occur (weighbridge) area passes through a Class 1 oil interceptor. Provision of flow attenuation tank for all surface water run-off and an automatically activated shut-off valve between the outflow from the attenuation tank and the connection to the storm sewer serving the Business Park.
- Implementation of a site specific Environmental Management System, including an Environmental Management Programme and Emergency Response Procedure (ERP) Procedures.
- Provision of an appropriately experienced facility management team and training of site staff in safe handling and emergency response actions.
- Completion of a Firewater Retention Assessment.
- Provision and maintenance of appropriate spill clean-up materials inside the warehouse.
- Routine integrity testing of the bunds and underground tanks and pipework to ensure that they are and remain fit for purpose.
- Implementation of environmental monitoring programme to confirm site activities are not having a significant adverse environmental impact.

## 11. NIS Conclusion Statement

Following the implementation of construction mitigation measures the project will avoid significant negative impacts to key sensitive receptors and other qualifying features of the Natura 2000 sites.

The likely changes that will arise from the proposed development have been examined in the context of a number of factors that could potentially result in a significant effect on the identified European Sites.

On the basis of the findings of this NIS, it is concluded that the proposed development site does not support the species or habitats for which this Natura 2000 site was selected. Both surface and wastewater emissions from the site will be managed to ensure that the water quality of the designated Natura 2000 sites are not compromised. No effect from increased noise and disturbance or invasive species will occur.

Based on the above, the project does not present any risk of a direct adverse effect on either the habitats or species for which Natura 2000 sites were selected. On the basis of the findings of this report, it is concluded that:

The proposed emissions licence review is not directly connected to the management of a European site; For those European sites which do not support connectivity (either direct or indirect) to the proposed development, or where it has been established that there is no potential for impact, it can be objectively concluded that there is no likelihood of any significant negative effects on these European sites and therefore no further assessment is required. In conclusion given the scale and nature of the project and proposed construction mitigation measures, it can be objectively concluded that the proposed development on its own, and in combination with other plans and projects, will not have a significant impact on qualifying interests and conservation objectives for Natura 2000 sites, and that the integrity of these sites will not be adversely affected. No significant direct or indirect on Natura 2000 sites have been identified.

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## Appendix 1 Natura 2000 Site Synopses

**Site Name:** Rye Water Valley/Carton SAC

**Site Code:** 001398

Rye Water Valley/Carton SAC is located between Leixlip and Maynooth, in Counties Meath and Kildare, and extends along the Rye Water, a tributary of the River Liffey. 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):

[7220] Petrifying Springs\*

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

[1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*)

The Rye Water in Carton Estate is dammed at intervals, creating a series of lakes. Reed Sweet-grass (*Glyceria maxima*) is frequent around the lakes, along with Yellow Iris (*Iris pseudacorus*), Reed Canary-grass (*Phalaris arundinacea*), Bulrush (*Typha latifolia*), Water Forget-me-not (*Myosotis scorpioides*), Marsh-marigold (*Caltha palustris*) and starworts (*Callitriche* spp.). Along the remainder of the site the river has been dredged and much of the reed fringe removed. To the north-west of Carton Bridge a small clump of willows (*Salix* spp.), with dogwood (*Cornus* sp.), Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior*) and Elder (*Sambucus nigra*) occurs. The ground flora found here includes Golden Saxifrage (*Chrysosplenium oppositifolium*), Meadowsweet (*Filipendula ulmaria*), Common Valerian (*Valeriana officinalis*), Wavy Bitter-cress (*Cardamine flexuosa*) and Bittersweet (*Solanum dulcamara*). The woods on Carton Estate are mostly old demesne woods with both deciduous and coniferous species. Conifers, including some Yew (*Taxus baccata*) – a native species, are dominant, with Beech (*Fagus sylvatica*), oak (*Quercus* sp.), Sycamore (*Acer pseudoplatanus*), Ash and Hazel (*Corylus avellana*) also occurring. The ground flora is dominated by Ivy (*Hedera helix*), with such species as Hedge Woundwort (*Stachys sylvatica*), Wood Speedwell (*Veronica montana*), Woodruff (*Galium odoratum*), Wood Avens (*Geum urbanum*), Common Dog-violet (*Viola riviniana*), Wild Angelica (*Angelica sylvestris*), Ramsons (*Allium ursinum*), Ground-ivy (*Glechoma hederacea*) and Ivy Broomrape (*Orobanche hederæ*) also found. Hairy St. John's-wort (*Hypericum hirsutum*), a species legally protected under the Flora (Protection) Order, 1999, occurs in Carton Estate and there is an old record from the estate for the similarly protected Hairy Violet (*Viola hirta*). However, this latter species has not been recorded from the site in recent years. Another species listed in the Red Data Book, Green Figwort (*Scrophularia umbrosa*), occurs on the site in several locations by the Rye Water. The woods at Carton Demesne are the site of a rare Myxomycete fungus, *Diderma deplanatum*. The marsh, mineral spring and seepage area found at Louisa Bridge supports a good diversity of plant species, including stoneworts, Marsh Arrowgrass (*Triglochin palustris*), Purple Moor-grass (*Molinea caerulea*), sedges (*Carex* spp.), Common Butterwort (*Pinguicula vulgaris*), Marsh Lousewort (*Pedicularis palustris*), Grass-of parnassus (*Parnassia palustris*) and Cuckooflower (*Cardamine pratensis*). The mineral spring found at the site is of a type considered to be rare in Europe and is a habitat listed on Annex I of the E.U. Habitats Directive. The Red Data Book species Blue Fleabane (*Erigeron acer*) is found growing on a wall at

Louisa Bridge. Within the woods, Blackcap, Woodcock and Long-eared Owl have been recorded. Little Grebe, Coot, Moorhen, Tufted Duck, Teal and Kingfisher, the latter a species listed on Annex I of the E.U. Birds Directive, occur on and about the lake. The Rye Water is also a spawning ground for Trout and Salmon, and the rare, Whiteclawed Crayfish (*Austropotamobius pallipes*) has been recorded at Leixlip. The latter two species are listed on Annex II of the E.U. Habitats Directive. The rare Narrowmouthed Whorl Snail and Desmoulin's Whorl Snail occur in marsh vegetation near Louisa Bridge. Both are rare in Ireland and in Europe, and are listed on Annex II of the E.U. Habitats Directive. The scarce dragonfly, *Orthetrum coerulescens*, has also been recorded at Louisa Bridge. The conservation importance of the site lies in the presence of several rare and threatened plant and animal species, and the presence of petrifying springs, a habitat type listed on Annex I of the E.U. Habitats Directive. The woods found on Carton Estate and their birdlife are of additional interest.

**Site Name:** Glenasmole Valley SAC

**Site Code:** 001209

Glenasmole Valley in south Co. Dublin lies on the edge of the Wicklow uplands, approximately 5 km from Tallaght. The River Dodder flows through the valley and has been impounded here to form two reservoirs which supply water to south Dublin. The non-calcareous bedrock of the Glenasmole Valley has been overlain by deep drift deposits which now line the valley sides. They are partly covered by scrub and woodland, and on the less precipitous parts, by a herb-rich grassland. There is much seepage through the deposits, which brings to the surface water rich in bases, which induces local patches of calcareous fen and, in places, petrifying springs. 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):

[6210] Orchid-rich Calcareous Grassland\*

[6410] Molinia Meadows [7220]

Petrifying Springs\*

At this site, examples of calcareous fen and flush occur between the two reservoirs, where sedges (including *Carex flacca* and *C. panicea*) are joined by such species as Grass-of-parnassus (*Parnassia palustris*), Few-flowered Spike-rush (*Eleocharis quinqueflora*), Zig-zag clover (*Trifolium medium*) and the scarce Fen Bedstraw (*Galium uliginosum*). Tufa depositing springs are long-known from the site, along the valley sides, and some have substantial tufa mounds and banks. Tufa formation is also known from small streams within the woodland at the site. Within the hazel woods, and associated with the springs and flushes, a distinctive flora with Marsh Hawk'sbeard (*Crepis paludosa*) and luxuriant stands of Great Horsetail (*Equisetum telmateia*) has developed. Orchid-rich grassland occurs in the drier parts of this site and in places grades into Molinia meadow. Orchids recorded in these habitats include Frog Orchid (*Coeloglossum viride*), Northern Marsh-orchid (*Dactylorhiza purpurella*), Fragrant

Orchid (*Gymnadenia conopsea*), Marsh Helleborine (*Epipactis palustris*), Early-purple Orchid (*Orchis mascula*) and Greater Butterfly Orchid (*Platanthera chlorantha*). Two further orchid species, both Red Data Book-listed, have also been found here, Greenwinged Orchid (*Orchis morio*) and Small-white Orchid (*Pseudorchis albida*). Common grasses in the sward include Sweet Vernal-grass (*Anthoxanthum odoratum*), Creeping Bent (*Agrostis stolonifera*) and Crested Dog's-tail (*Cynosurus cristatus*). Other species which occur are Common Bird's-foot-trefoil (*Lotus corniculatus*), Kidney Vetch (*Anthyllis vulneraria*), Common Restharrow (*Ononis repens*), Yellow-wort (*Blackstonia perfoliata*) and Autumn Gentian (*Gentianella amarella*). While much of the calcareous grassland has been improved to some extent for agriculture, a suite of typical species still remain. The areas of *Molinia* meadows at the site occur associated with the grasslands on the valley sides, and in particular in seepage and flushed areas. Typical and indicative species include Greater Bird's-foot-trefoil (*Lotus uliginosus*), Tormentil (*Potentilla erecta*), Purple Moor-grass (*Molinia caerulea*), Sharp-flowered Rush (*Juncus acutiflorus*), Adder's-tongue (*Ophioglossum vulgatum*), Meadow Thistle (*Cirsium dissectum*) and Fen Bedstraw. As noted above, orchids are frequent in the grasslands at this site. Woodland occurs in patches around the site. On the east side of the valley, below the northern lake, a Hazel (*Corylus avellana*) wood has developed on the unstable calcareous slopes and includes other species such as Ash (*Fraxinus excelsior*), Downy Birch (*Betula pubescens*), Goat Willow (*Salix caprea*) and (Irish) Whitebeam (*Sorbus hibernica*). Spring Wood-rush (*Luzula pilosa*), Wood Speedwell (*Veronica montana*) and Bramble (*Rubus fruticosus* agg.) are present in the ground flora. Wet semi-natural broadleaved woodland is also found around the reservoirs and includes Alder (*Alnus glutinosa*) and willow (*Salix* spp.), with Yellow Iris (*Iris pseudacorus*), horsetails (*Equisetum* spp.), Bramble and localised patches of Japanese Knotweed (*Reynoutria japonica*), an introduced and invasive species. The lake shore vegetation is not well developed, which is typical of a reservoir. There are occasional patches of Reed Canary-grass (*Phalaris arundinacea*) and Purpleloosestrife (*Lythrum salicaria*), which are more extensive around the western shore of the northern lake, along with Common Marsh-bedstraw (*Galium palustre*) and Water Mint (*Mentha aquatica*). Other vegetation includes Shoreweed (*Littorella uniflora*) and the scarce Water Sedge (*Carex aquatilis*). As well as the Green-winged Orchid and Small-white Orchid, two other threatened species which are listed in the Irish Red Data Book occur in the site, Yellow Archangel (*Lamium galeobdolon*) and Yellow Bird's-nest (*Monotropa hypopitys*). Small-white Orchid is legally protected under the Flora (Protection) Order, 1999. The site provides excellent habitat for bats, with at least four species recorded: Pipistrelle, Leisler's, Daubenton's and Brown Long-eared. Otter occurs along the river and reservoirs. The site supports Kingfisher, an Annex I species under the E.U. Birds Directive. Glenasmole Valley contains a high diversity of habitats and plant communities, including three habitats listed on Annex I of the E.U. Habitats Directive. The presence of four Red Data Book plant species further adds to the value of the site, as does the presence of populations of several mammal and bird species of conservation interest.

**Site Name:** Wicklow Mountains SAC

**Site Code:** 002122

Wicklow Mountains SAC is a complex of upland areas in Counties Wicklow and Dublin, flanked by the Blessington reservoir to the west and Vartry reservoir in the east, Cruagh Mountain in the north and Lybagh Mountain in the south. Most of the site is over 300 m, with much ground over 600 m. The highest peak is 925 m at Lugnaquilla. The Wicklow uplands comprise a core of granites flanked by Ordovician schists, mudstones and volcanics. The form of the Wicklow

Glens is due to glacial erosion. The topography is typical of a mountain chain, showing the effects of more than one cycle of erosion. The massive granite has weathered characteristically into broad domes. Most of the western part of the site consists of an elevated moorland, covered by peat. The surrounding schists have assumed more diverse outlines, forming prominent peaks and rocky foothills with deep glens. The dominant topographical features are the products of glaciation. High corrie lakes, deep valleys and moraines are common features of this area. The substrate over much of the area is peat, usually less than 2 m deep. Poor mineral soil covers the slopes, and rock outcrops are frequent. The Wicklow Mountains are drained by several major rivers including the Dargle, Liffey, Dodder, Slaney and Avonmore. The river water in the mountain areas is often peaty, especially during floods. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive

(\* = priority; numbers in brackets are Natura 2000 codes):

[3110] Oligotrophic Waters containing very few minerals

[3160] Dystrophic Lakes

[4010] Wet Heath

[4030] Dry Heath [4060] Alpine and Subalpine Heaths

[6130] Calaminarian Grassland [6230]

Species-rich Nardus Grassland\*

[7130] Blanket Bogs (Active)\*

[8110] Siliceous Scree

[8210] Calcareous Rocky Slopes

[8220] Siliceous Rocky Slopes

[91A0] Old Oak Woodlands

[1355] Otter (*Lutra lutra*)

The vegetation over most of Wicklow Mountains SAC is a mosaic of heath, blanket bog and upland grassland (mostly on peaty soil, though some on mineral soil), stands of dense Bracken (*Pteridium aquilinum*), and small woodlands mainly along the rivers. Mountain loughs and corrie lakes are scattered throughout the site. The two dominant vegetation communities in the area are heath and blanket bog. Heath vegetation, with both wet and dry heath well represented, occurs in association with blanket bog, upland acid grassland and rocky habitats. The wet heath is characterised by species such as Heather (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*), cottongrasses (*Eriophorum* spp.), Tormentil (*Potentilla erecta*), Mat-grass (*Nardus stricta*), bent grasses (*Agrostis* spp.) and bog mosses (*Sphagnum* spp.). In places the wet heath occurs in conjunction with flush communities and streamside vegetation, and here species such as Heath Rush (*Juncus squarrosus*) and sedges (*Carex* spp.) are found. Dry heath at this site is confined to shallow peaty soils on steep slopes where drainage is better and particularly in sheltered conditions. It is characterised by species such as

Heather, gorse (*Ulex* spp.), Bell Heather (*Erica cinerea*), Bilberry (*Vaccinium myrtillus*), Purple Moor-grass (*Molinia caerulea*) and lichens (*Cladonia* spp.). In places the heath grades into upland grassland on mineral soil. Blanket bog is usually dominated by cottongrasses, Heather and bog mosses. On steeper slopes there is some flushing and here Purple Moor-grass, Heath Rush and certain Sphagnum species become more common. The Liffey Head blanket bog is among the best of its kind in eastern Ireland, with deep peat formations and an extensive system of dystrophic pools developed among the hummocks and hollows on the bog surface. The vegetation is largely dominated by Heather and Cross-leaved Heath, with cottongrasses (*Eriophorum vaginatum* and *E. angustifolium*), Deergrass (*Scirpus cespitosus*) and Bog Asphodel (*Narthecium ossifragum*). In drier areas, Bilberry and Cowberry (*Vaccinium vitis-idaea*) are common, while the scarce Bog-rosemary (*Andromeda polifolia*) is also found. Blanket bog occurs over extensive areas of deeper peat on the plateau and also on gentle slopes at high altitudes. Due to the underlying rock strata, the water of the rivers and streams is acid rather than alkaline. The water is generally oligotrophic and free from enrichment. The lakes within the area range from the high altitude lakes of Lough Firrib and Three Lakes, to the lower pater-noster lakes of Glendalough, Lough Tay and Lough Dan. Spectacular corrie lakes, such as Loughs Bray (Upper and Lower), Ouler, Cleevaun, Arts, Kellys and Nahanagan, exhibit fine sequences of moraine stages. The deep lakes are characteristically species-poor, but hold some interesting plants including an unusual form of Quillwort (*Isoetes lacustris* var. *morei*), a stonewort (*Nitella* sp.) and Floating Bur-reed (*Sparganium angustifolium*). Alpine vegetation occurs on some of the mountain tops, notably in the Lugnaquilla area, and also on exposed cliffs and scree slopes elsewhere in the site. Here alpine heath vegetation is represented with heath species such as Crowberry (*Empetrum nigrum*) and Cowberry, and others such as Dwarf Willow (*Salix herbacea*), the greygreen moss *Racomitrium lanuginosum*, and scarce species such as Mountain Clubmoss (*Diphasiastrum alpinum*), Firmoss (*Huperzia selago*), and Starry Saxifrage (*Saxifraga stellaris*). Some rare arctic-alpine species have been recorded, including Alpine Lady's-mantle (*Alchemilla alpina*) and Alpine Saw-wort (*Saussurea alpina*). Old lead mine workings at Glendasan support an estimated 3.6 hectares of Calaminarian Grassland, with a suite of rare metallophyte (metal-loving) bryophytes, including the moss *Ditrichum plumbicola* and the liverworts *Cephaloziella massalongi* and *C. nicholsonii*. Small areas of old oakwood (*Blechno-Quercetum petraeae* type) occur on the slopes of Glendalough and Glenmalure, near Lough Tay and Lough Dan, with native Sessile Oak (*Quercus petraea*) trees, many of which are 100-120 years old. On wetter areas, wet broadleaved semi-natural woodlands occur which are dominated by Downy Birch (*Betula pubescens*). Mixed woodland with non-native tree species also occurs. The site supports a range of rare plant species. Parsley Fern (*Cryptogramma crispa*), Marsh Clubmoss (*Lycopodiella inundata*), Lanceolate Spleenwort (*Asplenium billotii*), Small-white Orchid (*Pseudorchis albida*) and Bog Orchid (*Hammarbya paludosa*) are all legally protected under the Flora (Protection) Order, 2015. Greater Broomrape (*Orobanche rapum-genistae*), Alpine Saw-wort and Alpine Lady's-mantle are listed in the Irish Red Data Book. The rare Myxomycete fungus *Echinostelium colliculosum* has been recorded from the Military Road. The Red Data Book fish species Arctic Char has been recorded from Lough Dan, but this population may now have died out. Mammals and birds which occur are typical of the uplands. Deer are abundant, mainly hybrids between Red and Sika Deer. Other mammals include Hare, Badger and Otter, the latter being a species listed on Annex II of the E.U. Habitats Directive. Pine Marten has recently been confirmed as occurring within the site. Among the birds, Meadow Pipit, Skylark, Raven and Red Grouse are resident throughout the site. Wheatear, Whinchat and the scarce Ring Ouzel are summer visitors. Wood Warbler and Redstarts are

rare breeding species of the woodlands. Dipper and Grey Wagtail are typical riparian species. Merlin and Peregrine, both Annex I species of the E.U. Birds Directive, breed within the site. Recently, Goosander has become established as a breeding species. Large areas of the site are owned by the National Parks and Wildlife Service (NPWS) and are managed for nature conservation based on traditional land uses of upland areas. The most common land use is traditional sheep grazing, but others include turf cutting, mostly hand-cutting but some machine-cutting also occurs. These activities are largely confined to the Military Road, where there is easy access. Large areas which had been previously hand-cut and are now abandoned are regenerating. In the last 40 years, forestry has become an important land use in the uplands, and has affected both the wildlife and the hydrology of the area. Amenity use is very high, with Dublin city close to the site. Peat erosion is frequent on the peaks. This may be a natural process, but is likely to be accelerated by activities such as grazing. Wicklow Mountains is important as a complex, extensive upland site. It shows great diversity from a geomorphological and a topographical point of view. The vegetation provides examples of the typical upland habitats with heath, blanket bog and upland grassland covering large, relatively undisturbed areas. In all, twelve habitats listed on Annex I of the E.U. Habitats Directive are found within the site. Several rare or protected plant and animal species occur, adding further to its value.

**Site Name:** Red Bog, Kildare SAC

**Site Code:** 000397

Red Bog, Kildare is located 3 km north of the village of Blessington in east Co. Kildare, close to the boundary with Co. Wicklow. It comprises a wetland complex of lake, fen and bog situated in a hollow between ridges of glacially-deposited material and underlain by rocks of Ordovician age. 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):

[7140] Transition Mires

The shores of the lake are muddy and support such species as Bog Stitchwort (*Stellaria alsine*), Brooklime (*Veronica beccabunga*) and Soft Rush (*Juncus effusus*). Fringing the lakeshore is a narrow zone with emergent Soft Rush, Water-plantain (*Alisma plantago-aquatica*), Bottle Sedge (*Carex rostrata*), as well as the moss *Climacium dendroides*. In places, particularly at either end of the lake and along its south-eastern side, this zone grades into extensive areas of quaking scraw vegetation of dense Bogbean (*Menyanthes trifoliata*) and Marsh Cinquefoil (*Potentilla palustris*), accompanied by such species as Sharp-flowered Rush (*Juncus acutiflorus*), Cuckooflower (*Cardamine pratensis*), Marsh Speedwell (*Veronica scutellata*), Common Marsh-bedstraw (*Galium palustre*), Water Horsetail (*Equisetum fluviatile*), Common Sedge (*Carex nigra*), Common Spotted-orchid (*Dactylorhiza fuchsii*) and the mosses *Rhytidiadelphus squarrosus* and *Sphagnum squarrosum*. Bulrush (*Typha latifolia*) and areas of Willow (*Salix* spp.) scrub also occur in association with this vegetation. The deeper water supports submerged aquatic plants such as Water-starworts (*Callitriche* spp.) and Water-crowfoots (*Ranunculus* spp.), while in sheltered areas floating plants including Common Duckweed (*Lemna minor*) and the liverwort *Riccia fluitans* are found. At the north-east end of the site, bog vegetation has developed, with Heather (*Calluna vulgaris*) and

Hare's-tail Cottongrass (*Eriophorum vaginatum*) being the most frequent species. Other bog plants found here include Bog Asphodel (*Narthecium ossifragum*), Cross-leaved Heath (*Erica tetralix*), Tormentil (*Potentilla erecta*), Heath Wood-rush (*Luzula multiflora*), the mosses *Sphagnum palustre*, *S. capillifolium*, *S. subnitens*, *Hypnum cupressiforme*, *Polytrichum commune* and *Dicranum scoparium*, and the lichen *Cladonia portentosa*. Red Bog is of ornithological significance and breeding birds recorded from the site include Mute Swan, Mallard, Tufted Duck, Coot, Moorhen, Snipe and Black-headed Gull (estimated <20 pairs). Gravel extraction, drainage and eutrophication of the wetland from agricultural activities in the surrounding lands all pose a threat to the site. Red Bog, Kildare is a site of particular conservation significance, supporting a good example of transition mire, a habitat that is listed on Annex I of the E.U. Habitats Directive.

**Site Name:** South Dublin Bay

**SAC Site Code:** 000210

This site lies south of the River Liffey in Co. Dublin, and extends from the South Wall to the west pier at Dun Laoghaire. It is an intertidal site with extensive areas of sand and mudflats. The sediments are predominantly sands but grade to sandy muds near the shore at Merrion Gates. The main channel which drains the area is Cockle Lake. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive

(\* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats

[1210] Annual vegetation of drift lines

[1310] *Salicornia* and other annuals colonising mud and sand

[2110] Embryonic shifting dunes

The bed of Dwarf Eelgrass (*Zostera noltii*) found below Merrion Gates is the largest stand on the east coast. Green algae (*Enteromorpha* spp. and *Ulva lactuca*) are distributed throughout the area at a low density. Furoid algae occur on the rocky shore in the Maretime to Dún Laoghaire area. Species include *Fucus spiralis*, *F. vesiculosus*, *F. serratus*, *Ascophyllum nodosum* and *Pelvetia canaliculata*. Several small, sandy beaches with incipient dune formation occur in the northern and western sectors of the site, notably at Poolbeg, Irishtown and Merrion/ Booterstown. The formation at Booterstown is very recent. Drift line vegetation occurs in association with the embryonic and incipient fore dunes. Typically drift lines occur in a band approximately 5 m wide, though at Booterstown this zone is wider in places. The habitat occurs just above the High Water Mark and below the area of embryonic dune. Species present are Sea Rocket (*Cakile maritima*), Frosted Orache (*Atriplex laciniata*), Spear-leaved Orache (*A. prostrata*), Prickly Saltwort (*Salsola kali*) and Fat Hen (*Chenopodium album*). Also occurring is Sea Sandwort (*Honkenya peploides*), Sea Beet (*Beta vulgaris* subsp. *maritima*) and Annual Sea-blite (*Suaeda maritima*). A small area of pioneer saltmarsh now occurs in the lee of an embryonic sand dune just north of Booterstown Station. This early stage of saltmarsh development is here characterised by the presence of pioneer stands of glassworts (*Salicornia* spp.) occurring below an area of drift line vegetation. As this is of very recent origin, it covers



a small area but ample areas of substrate and shelter are available for the further development of this habitat. Lugworm (*Arenicola marina*), Cockles (*Cerastoderma edule*) and annelids and other bivalves are frequent throughout the site. The small gastropod *Hydrobia ulvae* occurs on the muddy sands off Merrion Gates. South Dublin Bay is an important site for waterfowl. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. The principal species are Oystercatcher (1215), Ringed Plover (120), Sanderling (344), Dunlin (2628) and Redshank (356) (average winter peaks 1996/97 and 1997/98). Up to 100 Turnstones are usual in the south bay during winter. Brent Goose regularly occur in numbers of international importance (average peak 299). Bar-tailed Godwit (565), a species listed on Annex I of the E.U. Birds Directive, also occur. Large numbers of gulls roost in South Dublin Bay, e.g. 4,500 Black-headed Gulls in February 1990; 500 Common Gulls in February 1991. It is also an important tern roost in the autumn, regularly holding 2000-3000 terns including Roseate Terns, a species listed on Annex I of the E.U. Birds Directive. South Dublin Bay is largely protected as a Special Protection Area. At low tide the inner parts of the south bay are used for amenity purposes. Baitdigging is a regular activity on the sandy flats. At high tide some areas have windsurfing and jet-skiing. This site is a fine example of a coastal system, with extensive sand and mudflats, and incipient dune formations. South Dublin Bay is also an internationally important bird site.

**Site Name:** Wicklow Mountains SPA

**Site code:** 004040

This is an extensive upland site, comprising a substantial part of the Wicklow Mountains. Most of the site is in Co. Wicklow, but a small area lies in Co. Dublin. The underlying geology of the site is mainly of Leinster granites, flanked by Ordovician schists, mudstones and volcanics. The area was subject to glaciation and features fine examples of glacial lakes, deep valleys and moraines. Most of site is over 300 m, with much ground being over 600 m; the highest peak is Lugnaquilla (925 m). The substrate over much of site is peat, with poor mineral soil occurring on the slopes and lower ground. Exposed rock and scree are features of the site. The predominant habitats present are blanket bog, heaths and upland grassland. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Merlin and Peregrine. A series of surveys of the Wicklow Mountains SPA indicates that up to 9 pairs of Merlin breed within the site in any one year. Traditionally a ground-nesting species, Merlin in the Wicklow Mountains are usually found nesting in old crows nests in conifer plantations. The open peatlands provide excellent foraging habitat for Merlin with small birds such as Meadow Pipit being their main prey. The cliffs and crags within the site also provide ideal breeding locations for Peregrine (20 pairs in 2002). Other birds of the open peatlands and scree slopes that have been recorded within the site include Ring Ouzel and Red Grouse. The Wicklow Mountains SPA is of high ornithological importance as it supports nationally important populations of Merlin and Peregrine, both species that are listed on Annex I of the E.U. Birds Directive. Part of Wicklow Mountains SPA is a Statutory Nature Reserve.

**Site name:** Poulaphouca Reservoir SPA

**Site Code:** 004063

Poulaphouca Reservoir SPA, located in the western foothills of the Wicklow Mountains, was created in 1944 by damming of the River Liffey for the purpose of generating electricity from hydropower. The reservoir covers an area of approximately 20 square kilometres and is the largest inland water body in the mid-east and south-east regions. The reservoir receives water from two main sources, the River Liffey at the northern end, and the Kings River at the southern end. The exit is into the River Liffey gorge at the western end. Underlying the reservoir are sands and gravels deposited during the last glaciation. The shores of the lake are mostly sandy. When water levels are low the exposed lake muds are colonised by an ephemeral flora of annual plant species. Wet grassland areas occur in sheltered bays around the lake but especially in the northern part. Reed Canary-grass (*Phalaris arundinacea*) is the main grass species present, but other plant species characteristic of wet grasslands occur, including Creeping Bent (*Agrostis stolonifera*), Meadowsweet (*Filipendula ulmaria*), Yellow Iris (*Iris pseudacorus*) and Water Mint (*Mentha aquatica*). Sedges (*Carex* spp.) are locally common, while Rusty Willow (*Salix cinerea* subsp. *oleifolia*) scrub is often found associated with the wet grassland. In some places the water washes against grassy banks which are generally less than a metre high, and in a few places there are steep sand and clay cliffs, up to 15 m high – these are remnants of the old River Liffey channel. In many places the banks are actively eroding, and a strip of conifers has been planted around much of the perimeter of the reservoir in an attempt to stabilize the banks. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Greylag Goose and Lesser Blackbacked Gull. Poulaphouca Reservoir is of national importance for its Greylag Goose population, which is one of the largest in the country. The site provides the main roost for the birds, with feeding occurring mostly on improved grassland outside of the site. A mean peak of 701 individuals occurred during the five seasons 1995/96 to 1999/2000. Other waterfowl species occur in relatively low numbers, including Whooper Swan (22), Wigeon (180), Teal (107), Mallard (186), Goldeneye (22), Cormorant (11), Great Crested Grebe (8), Curlew (86) and Mute Swan (11). The site is also used by Grey Heron (6). The reservoir attracts roosting gulls during winter, most notably a large population of Lesser Black-backed Gull (651), which in Ireland is rare in winter away from the south coast. Black-headed Gull (915) and Common Gull (183) also occur. Breeding birds at the site include Great Crested Grebe (several pairs), which is localised in its distribution in eastern Ireland, as well as Snipe and Lapwing. The principal interest of the site is the Greylag Goose population, which is of national importance. A range of other wildfowl species also occurs, including Whooper Swan, a species that is listed on Annex I of the E.U. Birds Directive. The site is also notable as a winter roost for gulls, especially Lesser Black-backed Gull. Part of Poulaphouca Reservoir SPA is a Wildfowl Sanctuary.

**Site name:** South Dublin Bay and River Tolka Estuary SPA

**Site Code:** 004024

The South Dublin Bay and River Tolka Estuary SPA comprises a substantial part of Dublin Bay. It includes the intertidal area between the River Liffey and Dun Laoghaire, and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. A portion of the shallow marine waters of the bay is also included. In the south bay, the intertidal flats extend for almost 3 km at their widest. The sediments are predominantly well-aerated sands. Several permanent channels exist, the largest being Cocker Lake. A small sandy beach occurs

at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. The landward boundary is now almost entirely artificially embanked. There is a bed of Dwarf Eelgrass (*Zostera noltii*) below Merrion Gates which is the largest stand on the east coast. Green algae (*Ulva* spp.) are distributed throughout the area at a low density. The macroinvertebrate fauna is well-developed, and is characterised by annelids such as Lugworm (*Arenicola marina*), Nephthys spp. and Sand Mason (*Lanice conchilega*), and bivalves, especially Cockle (*Cerastoderma edule*) and Baltic Tellin (*Macoma balthica*). The small gastropod Spire Shell (*Hydrobia ulvae*) occurs on the muddy sands off Merrion Gates, along with the crustacean *Corophium volutator*. Sediments in the Tolka Estuary vary from soft thixotropic muds with a high organic content in the inner estuary to exposed, well-aerated sands off the Bull Wall. The site includes Booterstown Marsh, an enclosed area of saltmarsh and muds that is cut off from the sea by the Dublin/Wexford railway line, being linked only by a channel to the east, the Nutley stream. Sea water incursions into the marsh occur along this stream at high tide. An area of grassland at Poolbeg, north of Irishtown Nature Park, is also included in the site. 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, Ringed Plover, Grey Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern and Arctic Tern. The E.U. Birds Directive pays particular attention to wetlands, and as these form part of the SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds. The site is an important site for wintering waterfowl, being an integral part of the internationally important Dublin Bay complex – all counts for wintering waterbirds are five year mean peaks for the period 1995/96 to 1999/2000. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. An internationally important population of Light-bellied Brent Goose (368) occurs regularly and newly arrived birds in the autumn feed on the Eelgrass bed at Merrion. At the time of designation the site supported nationally important numbers of a further nine species: Oystercatcher (1,145), Ringed Plover (161), Grey Plover (45), Knot (548), Sanderling (321), Dunlin (1,923), Bar-tailed Godwit (766), Redshank (260) and Black-headed Gull (3,040). Other species occurring in smaller numbers include Great Crested Grebe (21), Curlew (127) and Turnstone (52). Little Egret, a species which has recently colonised Ireland, also occurs at this site. South Dublin Bay is a significant site for wintering gulls, with a nationally important population of Black-headed Gull, but also Common Gull (330) and Herring Gull (348). Mediterranean Gull is also recorded from here, occurring through much of the year, but especially in late winter/spring and again in late summer into winter. Both Common Tern and Arctic Tern breed in Dublin Docks, on a man-made mooring structure known as the E.S.B. dolphin – this is included within the site. Small numbers of Common Tern and Arctic Tern were recorded nesting on this dolphin in the 1980s. A survey in 1995 recorded nationally important numbers of Common Tern nesting here (52 pairs). The breeding population of Common Tern at this site has increased, with 216 pairs recorded in 2000. This increase was largely due to the ongoing management of the site for breeding terns. More recent data highlights this site as one of the most important Common Tern sites in the country with over 400 pairs recorded here in 2007. South Dublin Bay is an important staging/passage site for a number of tern species in the autumn (mostly late July to September). The origin of many of the birds is likely to be the Dublin breeding sites (Rockabill and the Dublin Docks) though numbers suggest that the site is also used by birds from other sites, perhaps outside the state. This site is selected for designation for its autumn tern populations: Roseate Tern (2,000 in 1999), Common Tern (5,000 in 1999) and Arctic Tern (20,000 in 1996). The South Dublin Bay and River Tolka

Estuary SPA is of ornithological importance as it supports an internationally important population of Light-bellied Brent Goose and nationally important populations of a further nine wintering species. Furthermore, the site supports a nationally important colony of breeding Common Tern and is an internationally important passage/staging site for three tern species. It is of note that four of the species that regularly occur at this site are listed on Annex I of the E.U. Birds Directive, i.e. Bar-tailed Godwit, Common Tern, Arctic Tern and Roseate Tern. Sandymount Strand/Tolka Estuary is also a Ramsar Convention site.

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