

Greater Dublin Drainage

Alternative Sites Assessment and Route Selection Report (Phase 4): Final Preferred Site and Routes

Appendix 5 Ecology Assessment

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Originated by		Checked by	Reviewed by
ORIGINAL	NAME	NAME	NAME
	RPS	Denise Meade	Denise Meade
Approved by	NAME	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I approve them for issue	
	Ciaran O' Keeffe		
DATE	June 2013	Document status: Final	

REVISION 1		NAME	NAME	NAME
Approved by	NAME	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I approve them for issue		INITIALS
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5 Ecology Assessment

5.1 Introduction

An initial screening exercise, reported in the *ASA Phase One – Preliminary Screening Outcomes Report*, published in October 2011, identified a total of nine possible land parcels and their associated orbital pipeline corridors and marine outfall locations for the development of a Regional Wastewater Treatment Plant (WwTP). These land parcels, pipeline corridors and marine outfall locations were then subject to environmental assessment (i.e. Archaeology, Ecology, Landscape and Visual, Geology, Hydrology, Noise, Air Quality, etc.) during Phase 2 of the Alternative Site Assessment (ASA) process.

The ecological assessment carried out as part of this overall environmental assessment during Phase 2 of the ASA process, was undertaken by RPS. The ecological assessment involved a detailed desktop assessment and wind shield inspection of the 9 proposed land parcels and associated orbital pipeline corridors and marine outfall locations, and is summarised in Section 4.2 below.

As a result of the overall environmental assessment (i.e. Archaeology, Ecology, Landscape and Visual, Geology, Hydrology, Noise, Air Quality, etc.) undertaken during Phase 2 of the ASA process, three site options emerged as potentially the least constrained areas in which to develop the WwTP, associated orbital pipeline corridors and marine outfall locations. The three site options are all located within Fingal County at Annsbrook, Clonshagh (Clonshaugh) and Newtowncorduff. The details and outcomes of the overall environmental assessment can be found in the *Alternative Sites Assessment and Route Selection Report (Phase 2): Emerging Preferred Sites and Routes*, which was published in May 2012.

Further baseline ecological surveys have since been carried out on the three emerging preferred site options, and their associated orbital pipeline corridors and marine outfall location since June 2012 and are currently on-going. These surveys have been conducted in order to inform the selection of the optimum site option for the development of the Regional WwTP, associated orbital pipeline corridors and marine outfall.

Please note that this summary report should be read in conjunction with the *Alternative Sites Assessment and Route Selection Report (Phase 2); Emerging Preferred Sites and Routes; Appendix 5 Ecological Assessment*.

5.2 Summary of ASA Phase 2 – Ecological Assessments

This section provides a summary of the approach taken as part of the ecological assessments for the *Alternative Sites Assessment and Route Selection Report (Phase 2); Emerging Preferred Sites and Routes*. Full details of the approach and results can be found in *Appendix 5, Ecology Assessment* of the ASA Phase 2 Report.

5.2.1 Desktop Study

Details relating to the desktop studies undertaken for terrestrial, freshwater, marine and avian ecological aspects are detailed below.

(a) Terrestrial Ecology

A comprehensive review of GIS digital datasets and existing data sources was undertaken as part of the terrestrial ecology desktop study. Datasets listed in Table 4.1 were inspected.

Table 4.1: - GIS datasets used for desktop assessment

6 inch raster mapping
Aerial Photography
1:50,000 Discovery Mapping
Annex I Habitat
Tree Preservation Order
SPA
cSAC
pNHA
NHA
Designated Shellfish Waters
Fingal Development Plan Ecological Corridors
Fingal Development Plan Ecological Buffer Zones
Fingal Development Plan Nature Development Areas
Fingal County Council habitat layers
Woodland
EPA Water Framework Directive Watercourse Register

The Fingal Development Plan 2011-2017 has identified areas of ecological value within the Plan area and set Plan Objectives to protect these features. They are categorised as Core Biodiversity Conservation Areas; Ecological Buffer Areas; Nature Development Areas; and Ecological Corridors.

A GIS environmental database was built up and inspected for each land parcel, marine outfall option and each pipeline corridor. Potential pathways of effect along watercourses were also considered.

The Divisional Ecologist of National Parks and Wildlife Service and Vice-county recorders of Botanical Society of the British Isles were consulted by letter.

(b) Freshwater Ecology

The freshwater ecological assessment included a comprehensive review of existing data sources on the watercourses within and adjacent to the land parcels and each route corridor. Datasets listed in Table 4.2 were inspected.

Table 4.2: Data sources used for freshwater ecology desktop assessment

EPA Biological Water Quality Monitoring Data
Water Framework Directive (WFD) Ecological Status of Catchments Data
Biodiversity Ireland Data on Protected Species
National Parks and Wildlife Service Data
Inland Fisheries Ireland

Consultation was undertaken with Inland Fisheries Ireland regarding the present fisheries status of the watercourses / catchments relevant to the land parcels and pipeline corridors. This included the identification of those watercourses / catchments which support salmon or trout populations (salmonids), or both.

(c) Marine Ecology

The marine ecological assessment of the proposed marine outfall locations was carried out using existing literature for this section of the Irish Sea and the Fingal coastline. Key literature sources are listed in Table 4.3.

Table 4.3: Data sources used for marine ecology desktop assessment

Coastal Habitats: Ecological Study of the Coastal Habitats in County Fingal Phase IV: Intertidal Habitats (Ecoserve, 2005)

Fishing Ground and Fish Species: Fisheries Study of Fingal Coastal Zone (Ecoserve, 2006), Ecological Study of the Coastal Habitats in County Fingal Phase III – Estuarine Fish (Central Fisheries Board 2004) and Commercial Fishing Assessment (Brown and May Marine Ltd, 2008) along with information provided in submissions and by Irish East Coast Fisheries Board

Marine Ecology: Intertidal and Subtidal Benthic Studies in Broadmeadow Estuary (Aquafact, 2008), Environmental Baseline Survey of the Eirgrid Interconnector (Fugro Survey Limited 2008)

Geomorphology: Infomar bathymetric and habitat datasets (GSI), Regional habitat classification maps for the Irish Sea (JNCC, UK) and Admiralty chart data for the Fingal Coastline

(d) **Avian Ecology**

This ecological assessment included a comprehensive review of the birds of Fingal, which involved the examination of aerial photography and GIS mapping of known sites of importance to birds, including inter alia Special Protection Areas (SPAs), Irish Wetland Bird Survey (IWeBS) count areas, Natural Heritage Areas (NHAs) and Statutory Nature Reserves.

Key literature sources used in the desktop review included Gibbons et. al. (1993); Crowe (2005); and the National Parks and Wildlife Service website: www.npws.ie. Local ornithologists were also consulted as part of the data collection exercise.

5.2.2 Site Visits

A windshield survey of the nine land parcels and pipeline corridors was undertaken between November 3rd to 12th, 2011. The survey was restricted to publicly accessible lands and roadways, which limited the ground-truthing of the desktop datasets and aerial photography.

5.2.3 ASA Phase 2 work details

Full details of work undertaken for ASA Phase 2 can be found in *Appendix 5 – Ecology Assessment* of the “*Alternative Sites Assessment and Route Selection Report (Phase 2); Emerging Preferred Sites and Routes*”, which was published in May 2012.

5.3 Summary of ASA Phase 4 – Ecological Study

This “Alternative Sites Assessment - Phase Four – Site Assessment and Route Selection Report”, Appendix 4 – Ecology, provides the summary of Ecology Study undertaken by RPS up to March 2013.

Including the data collected as part of the ASA Phase 2 process, this section outlines the ecological baseline surveys which have been undertaken between June 2012 to March 2013 on the three preferred site options (i.e. Regional Wastewater Treatment Plant (WwTP) site, its associated orbital pipeline corridors and marine outfall location) to inform the ecological assessment for the ASA Phase 4 – Site Assessment and Route Selection Report.

5.3.1 Terrestrial Surveys

- Proposed treatment plant sites were surveyed and habitats mapped between July – August 2012;
- Proposed pipeline route was surveyed and mapped between October – December 2012;
- Potential badger sites identified during previous surveys were re-surveyed January – February 2013;
- Bat surveys (roosting behaviour, feeding and commuting activity) of the proposed treatment plants sites July 2012; and
- Bat surveys of proposed pipeline route June – August 2012.

5.3.2 Bird Surveys

- Breeding season walkover surveys (June 2012) and Winter walkover surveys (December 2012) of the proposed treatment plant sites;
- Baldoyle Bay bird habitat surveys June 2012;
- Baldoyle Bay High tide roost counts August – December 2012;
- Baldoyle Bay Low tide counts June 2012 – January 2013;
- Broadmeadow River Valley Survey June 2012;
- Brent Geese Surveys around Baldoyle Area November 2012 – January 2013; and
- Land-based observations of seabird usage of areas around the proposed outfall location(s): June 2012, August 2012, November 2012, December 2012, January 2013, March 2013;

5.3.3 Freshwater Surveys

- Macroinvertebrate biodiversity surveys of all watercourses potentially impacted by the proposed treatment plant sites and crossed by pipeline routes (as identified on a 1:50,000 OSI map) between July – August 2012;
- Salmonid, lamprey and crayfish habitat surveys of all watercourses potentially impacted by the proposed treatment plant sites and crossed by pipeline routes between July – August 2012;
- Otter surveys of all watercourses potentially impacted by the proposed treatment plant sites and crossed by pipeline routes between July – August 2012;
- Aquatic flora surveys of all watercourses potentially impacted by the proposed treatment plant sites or crossed by pipeline routes between July – August 2012.

5.3.4 Marine Surveys

- Summer benthic survey (site map below) between 31.07.12 to 06.08.12. - Water profiles & samples, benthic sampling, chemistry and seabed photography.
- Winter water quality campaign repeated on the 11.12.12. -Water profiles & samples

5.4 Summary Results of Baseline Surveys for ASA Phase 4

5.4.1 Terrestrial Ecology

An overview of terrestrial habitats and badger activity within the three preferred site options at Clonshagh, Annsbrook and Newtowncorduff is presented below.

The habitats recorded during survey were predominately intensively managed agricultural lands, most notably improved agricultural grassland (GA1) and Arable crop fields (BC1). Such habitats are generally considered to be of low conservation value but provide foraging and breeding opportunities for birds and mammals. No rare or protected plant species were recorded at the time of survey.

Hedgerows at Clonshagh, Annsbrook and Newtowncorduff are typical of agricultural boundaries with regards structure and composition. They are largely dominated by hawthorn (*Crateagus monogyna*) and almost always accompanied by a wet or dry drainage ditch. Medium and occasional mature trees are also frequently common.

There are no International or nationally designated ecological sites within or in the immediate vicinity of any of the three preferred site options.

Based on the ecological surveys undertaken between June 2012 and March 2013 at the three preferred site options, Clonshagh presented the lowest ecological value. This site option has the lowest habitat diversity with the shortest network of hedgerows compared to both Annsbrook and Newtowncorduff, as detailed in the following sections.

(a) **Annsbrook**

Overview

- This site is located in the townland of Annsbrook approximately 2.5km north east of Ballyboughil.
- The site is located a minimum of 50m to the south of the Rath Little Stream, which is a tributary of the Ballough River and is part of an ecological corridor identified in the Fingal County Development Plan 2011-2017. The Grallagh Stream, which is a tributary of the Ballyboghil River, flows to the south and west of the site.
- There are no International and nationally designated ecological sites within or in the immediate vicinity of the site.
- The site is located 4.1km upstream of Rogerstown Estuary SPA and cSAC.

Habitats

The site comprises cultivated fields (BC1) primarily of oilseed rape and improved arable grasslands (GA1). Field boundaries are of hawthorn and blackthorn (*Prunus spinosa*) hedgerows with ash trees, largely abutting dry drainage ditches.

Badger

Mammal tracks were noted across the site. An active badger sett was subsequently located outside of the site within an arable field hedgerow, just to the south of the site on the southern bank of the Grallagh Stream. The 2004 Dublin Landfill Siting Study also reports a badger sett to the north on this site.

Bats

The hedgerows within and around this site was generally well developed with some areas of large ash trees. No trees showed evidence of bat usage and no bats were audible within any of the trees examined in the daytime (this may occur if bats are active on a warm day). There is no water body or water course within the site and this would reduce its attractiveness for some bat species. There are numerous buildings in close proximity to the site to the west, south and east and one proximate farmyard at Irishtown to the north of the site.

There are no suitable buildings (e.g. farm sheds) within or immediately adjacent to the lands that would serve as bat roosts. Farm buildings and the house to the west offer the best roosting opportunities.

Three bat species; common pipistrelle (the most frequently encountered species), soprano pipistrelle and Leisler's bat (the least encountered species) were recorded within and around the site. Bat activity was high overall with very high activity noted by the passive monitors in the farmyard.

Natterer's bats and brown long-eared bats have been noted in the Ballyboughal and Naul areas as well as the species recorded during the surveys. Daubenton's bats are

noted from the Delvin River to the north of the region but were not recorded in the current surveys and are considered unlikely in the immediate area of the site.

Birds

The site is typical of lowland Ireland but is generally quite natural in character and supports a diverse community of common breeding bird species including breeding Yellowhammer, a Red Listed Bird of Conservation Concern in Ireland. The site is however not of particular importance to significant congregations of overwintering birds such as waders or wildfowl. The site is considered to be only of marginally higher value for birds than Newtowncorduff, and of substantially higher value than Clonshagh.

(b)

Newtowncorduff

Overview

- This site is located in the townland of Newtoncorduff approximately 2.2km west of Lusk. The site abuts the M1 motorway along part of its western flank.
- There are no International and nationally designated ecological sites within or in the immediate vicinity of the site.
- The site is located 2.9km upstream of Rogerstown Estuary SPA and cSAC.

Habitats

The site comprises cultivated cereal fields (BC1) and brassicas (BC2), improved grassland (GA1), dry calcareous/natural grassland (GS1) and dry meadow (GS2). Field boundaries were typical of the wider scheme area comprising of hawthorn hedgerows.

Dry calcareous/natural grassland (GS1) occurs in the most south-westerly corner of this site. It is noted for its high ration of broadleaved herbs to grasses, a generally low sward and the presence of at least one orchid sp. (unidentified - flowers had gone-over). Species include sweet vernal grass *Anthoxanthum odoratum*, crested dog'd tail *Cynosurus cristatus*, glaucous sedge *Carex flacca*, self-heal *Prunella vulgaris*, birdsfoot trefoil *Lotus corniculatus*, ribwort plantain *Plantago lanceolata*, meadow thistle *Cirsium palustre*.

The two fields to the north more resemble dry meadow (GS2) with a longer sward and less frequent broadleaved herbs. These fields are cut for hay (Landowner comment). Yorkshire fog *Holcus lanatus*, meadow foxtail *Alopecurus pratensis*, creeping bent *Agrostis stolonifera*, clovers *trifolium* spp. and the climbing broadleaved herbs meadow vetchling *Lathyrus pratensis* and tufted vetch *Vicia cracca* all occur. At least one orchid sp. (unidentified - flowers had gone-over) occurs in the south corner of the lower field. There are areas of impeded drainage with *Juncus* spp. occurring.

Watercourses flow to the southwest (Rath Little Stream) and southeast (Ballough River) of the site, before converging and continuing to the south.

Badger

There is a badger sett located along the eastern boundary of this site. Four sett entrances were located along a 40m stretch of hedgerow and underlying ditch. This sett would require closure upon approval under licence granted by the National Parks and Wildlife Service prior to construction works if this site is selected.

Bats

The principal areas of high quality habitat for bats lie to outside the site boundary to the south-of-centre section of the proposed site. There is a watercourse flowing through this area which has mature trees flanking it. This area and trees are entirely outside of the proposed site. The best quality trees in terms of bat potential include a mature willow, mature poplar and mature ash trees.

To the south of the site, there are a number of mature trees in the hedgerow leading to a partially ruined shed. Both the trees and the shed offer bat roost potential. Away from this hedgerow, there are very few trees with roost potential. One tree to the north has low to moderate potential while all other trees have very low to no potential.

In all, three bat species: common pipistrelle, soprano pipistrelles and Leisler's bat were recorded on site with feeding activities concentrated along the streams. A brown long-eared bat was recorded at the farm buildings adjacent to the main road and at the end of the lane way leading to the site.

Other surveys in the Donabate and Ballyboughal areas have recorded the presence of Natterer's bat in this region of Fingal, but this species was not recorded during the these surveys. Daubenton's bats are noted from the Delvin River to the north and have also been recorded in the Swords area, but were not recorded in this case and are considered unlikely in the immediate area of the site.

Birds

Similar to Annsbrook this site is typical of lowland Ireland supporting a diverse community of common breeding bird species including breeding Yellowhammer, a Red Listed Bird of Conservation Concern in Ireland. Buzzards also nest in the vicinity of the site. The site is not of particular importance to overwintering birds such as waders or wildfowl. The site is of marginally lower value for birds than Annsbrook, but of substantially higher value than Clonshagh.

(c)

Clonshagh

Overview

- This site is located in the townland of Clonshagh, approximately 2.5km east of Dublin Airport and 1.3km north of Belcamp and Darndale.
- The site is located a minimum of 50m to the south of the Cuckoo Stream, a tributary of the Mayne River.

- There are no International and nationally designated ecological sites within or in the immediate vicinity of the site.
- The site is located 4.6km upstream of Baldoyle Bay SPA and cSAC.

Habitats

The site comprised cultivated cereal fields (BC1) and tilled land (BC3) at the time of survey. Field boundaries were predominantly comprised of hawthorn with mature ash (*Fraxinus excelsior*) trees abutted by dry and wet drainage ditches. Habitats present on the site are considered to be of low conservation value.

Badger

There was no confirmed badger activity within this site; however, a number of mammal paths were noted crossing drainage ditches at field boundaries.

Bats

There are few hedgerows given the area of the proposed site with one continuous hedgerow at the southern side of the site and lesser hedgerows emanating north from this hedgerow. There are no trees with high roost potential for bats within these hedgerow.

There were three species of bat recorded at this site, common pipistrelle, soprano pipistrelles and Leisler's bat; however, none of these bats are considered to be roosting within the trees on this site.

Further afield, there are recordings of *Myotis* bat species at Kinsealy (potentially Natterer's bats and whiskered bats also), together with brown long-eared bats and Daubenton's bats. A Leisler's bat was previously recorded in an office at Balgriffin and brown long-eared bats roost has been recorded at St. Doulagh's Church.

Birds

This site has a low diversity of bird habitats and supports a limited range of common breeding bird species, but like Annsbrook and Newtowncorduff it also supports breeding Yellowhammer. The site is not of particular importance to overwintering birds such as waders or wildfowl. This site is considered to be of least value to both breeding and non-breeding birds than either the Annsbrook or Newtowncorduff sites.

(d)

Pipeline Corridors

Habitats

The habitats throughout most of the pipeline corridors and sites are predominately intensively managed agricultural lands, particularly improved agricultural grassland (GA1) arable crops (BC1) and horticultural lands (BC2). Amenity grasslands (GA2) and grassy verges (GS2) are particularly common around infrastructure nearing Dublin

City. The only woodlands are immature woodland (WS2) typically common abutting new road infrastructure. No rare or protected plant species were recorded within the pipeline corridor. Invasive plant species were also limited throughout the pipeline corridor, however, the corridor intercepts a small stand of Japanese Knotweed in the Roganstown Golf Course. A small stand of Giant Hogweed (*Heracleum mantegazzianum*) also exists on the boundary of an electricity station at Kildonan just outside of the pipeline corridor at this location.

Field boundaries typically comprise defunct hedgerows in-line with those described in the above preferred site options. The majority of hedgerows have an accompanying wet or dry drainage ditch.

Badger

Badger activity is largely confined to the most outreaching pipeline corridor sections in the north and east of the scheme area. A number of active badger setts were recorded within or immediately adjacent to the proposed pipeline route options and are outlined below.

- Route Section F: (1) An active badger sett was located immediately to the south of the Annsbrook site on the bank of the Grallagh Stream. Four well-used entrance holes were noted at the time of survey and it is likely to be a main sett. The sett lies directly within the pipe line route corridor and will require closure upon approval under licence granted by the National Parks and Wildlife Service prior to construction. (2) A second active badger set is located within the proposed pipeline corridor approximately 150 m north of Skidoo Stud. Two well-used entrance holes were recorded at the time of survey. This sett is likely to be an outlier sett and will require closure upon approval under licence granted by the National Parks and Wildlife Service prior to construction. (3) A third active badger sett was located within the pipeline corridor in the townland of Cookstown. This is likely to be the main sett linked to the outlier sett above. Four well-used entrance holes were recorded within a drainage bank at the time of survey. This sett will require closure upon approval under licence granted by the National Parks and Wildlife Service. (4) A fourth active badger sett with two well-used entrance holes occurs approximately 300m northwest of farm buildings at Baldurgan and lies directly within the proposed pipeline corridor. This sett will require closure upon approval under licence granted by the National Parks and Wildlife Service prior to construction.
- Route Section D: (1) An active badger sett is located immediately to the north of the pipeline corridor as it passes through the Emmaus Retreat and Conference centre at Balheary. Five entrance holes were recorded on an east-facing bank of a wet ditch beneath mixed woodland. A further two mammal entrance holes were also located c.20m north of the sett, but were not considered to be in use by badgers, with only evidence of rabbit use. This is likely to be a main sett but it is unlikely it will require closure to facilitate construction.
- Route Section G: (1) An active badger sett was located in the townland of Suralstown North, approximately 5 km west-northwest of Swords. The sett

occurs in hedgerow, along the pipeline corridor boundary. The sett was not in use at the time of survey and appears abandoned. Badger tracks were however confirmed on the opposing side of this section of hedgerow approximately 5-10m inside the corridor boundary.

The highest concentrations of badger activity were recorded in the adjoining townlands of Skidoo, Cookstown and Baldurgan approximately 2 km southeast of Ballyboghil, with three setts occurring in each of the aforementioned townlands.

Bats

The bat fauna of the lands crossed by the proposed pipeline corridor was examined between June and August 2012. In all there were three widespread bat species two of which; common and soprano pipistrelle, were abundant, while Leisler's bats were widespread but less abundant. Brown long-eared bats were encountered at one location only.

While there are no buildings within the land take of the proposed pipeline corridor there is the potential for roost loss from tree removal and there will clearly be a loss of habitat and of hedgerow elements that assist in bat feeding and orientation.

(e)

Outfall Locations

Northern – Thomastown

At Thomastown the corridor passes through improved pasture (GA1) and cereal fields (BC1) to the coastal outfall location. The coastal outfall location is categorised by sheltered rocky shores, sea cliffs (CS3) and shingle and gravel banks (CB1). The sea cliff is well-vegetated with coverage exceeding 50% in part. Brambles (*Rubus spp.*) were dominant and therefore the overriding habitat resides as scrub (WS1). No protected plant species were recorded.

Southern – Portmarnock

The southern pipeline corridor reaches the coastline at Maynetown. The corridor diverges southeast before the coastline towards Baldoyle, entering neutral grassland (GS1) and recolonising bare ground (ED3). Once at the coastline, this corridor again meets dry calcareous natural grassland (GS1) before crossing the estuary and the Baldoyle SPA/ cSAC.

Once through the marine estuary habitats the corridor then passes over the Portmarnock Spit, which is now the Portmarnock Golf Club playing course (the "Old" course). The corridor passes over fixed dunes (CD3), managed fairways (GA2) and a

narrow belt of marram dunes (CD2) at this point before re-entering and crossing the Baldoyle Bay cSAC reaching the coastal outfall location on the Portmarnock Velvet Strand.

No protected plant species were recorded during survey but the coastal habitats here are considered of high-conservation value.

The corridor crosses the Baldoyle cSAC which contains four habitats listed on Annex I of the EU Habitats Directive: *Salicornia* mud, Mediterranean salt meadows, Atlantic salt meadows and Tidal mudflats. Portmarnock Spit previously had a well-developed sand dune system but has been largely replaced by golf courses.

The marram dunes recorded at the Portmarknock Spit are within the pipeline corridor correspond to the Annex I Habitat shifting dunes along the shoreline with *Ammophila arenaria*.

The corridor also crosses the Baldoyle SPA which has been designated for the protection of Light-bellied Brent Goose, Shelduck, Ringed Plover, Golden Plover, Grey Plover, Bar-tailed Godwit and Wetlands & Waterbirds. Shelduck and other wetland and waterbirds have been recorded roosting within the pipeline corridor.

It is anticipated that should the southern outfall be brought forward the pipeline would be tunnelled under Baldoyle Bay to avoid direct and indirect impacts on Baldoyle Bay cSAC and SPA.

Any proposed tunnelling will have to ensure that both noise and vibrations from the tunnelling process will not impact species at the surface or habitats and species in the marine environment.

Given the international ecological designations associated with Baldoyle Bay, the southern outfall location is considered to have a significant ecological value and is therefore considered more ecologically sensitive in comparison to the northern outfall location.

5.4.2 Freshwater Ecology

(a) Annsbrook

The northern boundary of the Annsbrook site is a minimum of 50m from a tributary of the Ballough River, the Rath Little Stream and any development of this site must ensure that it will not impact on this watercourse as part of the proposed development.

The proposed access road to the WwTP will cross a tributary of the Ballyboghil River, the Grallagh Stream.

The Ballough River system supports local populations of both resident Brown trout and migratory Sea trout (both *Salmo trutta*) and importantly a small but biological significant

population of Atlantic salmon (*Salmo salar*). The fisheries habitat along this section of the Rath Little Stream is classified as fair for salmonids.

The Ballyboghil River supports Brown trout throughout and Sea trout, Eels (*Anguilla anguilla*) and importantly a small but biologically significant population of Atlantic salmon in its lower reaches, in addition to other fish species. The fisheries habitat at the proposed crossing point for the access road and immediately downstream is classified as poor to fair for salmonids.

The biological water quality for both the Rath Little Stream and the Grallagh Stream at the site and access road is Q4 and Q3, respectively in accordance with the current Environmental Protection Agency (EPA) Q-value determinations. A Q4 determination is considered to be of satisfactory water quality and of good ecological status under the Water Framework Directive (WFD) for the invertebrate element. While a Q3 determination is considered to be of unsatisfactory water quality and of poor ecological status under the WFD for the invertebrate element.

(b)

Newtowncorduff

The south eastern boundary of the Newtowncorduff site is a minimum of 50m from the Ballough River, while the south western boundary of the site is a minimum of 50m from a tributary of the Ballough River, the Rath Little Stream. However, the proposed access road to the WwTP will cross the Ballough River. Any development of this site must ensure that it will not impact on these watercourses as part of the proposed development.

The Ballough River system supports local populations of both resident Brown trout and migratory Sea trout (both *Salmo trutta*) and importantly a small but biological significant population of Atlantic salmon (*Salmo salar*). The fisheries habitat at the proposed crossing point of the Ballough River and immediately downstream is classified as poor to fair for salmonids. The fisheries habitat downstream at the convergence of the Ballough River and the Rath Little Stream is classified as fair to good for salmonids.

The biological water quality for both the Rath Little Stream and the Ballough River at the site and access road is Q3-4 and Q2-3, respectively in accordance with the current EPA Q-value determinations. A Q3-4 determination is considered to be of unsatisfactory water quality and of moderate ecological status under the Water Framework Directive (WFD) for the invertebrate element. While a Q2-3 determination is considered to be of unsatisfactory water quality and of poor ecological status under the WFD for the invertebrate element.

(c) Clonshagh

The northern boundary of the Clonshagh site is a minimum of 50m from the Cuckoo Stream, a tributary of the Mayne River. Any development of this site must ensure that it will not impact on this watercourse as part of the proposed development.

The Mayne River constitutes a non-salmonid system because of the presence of an impassable barrier to fish movement at the lower end of the system. However, water quality has been noted as improving and Inland Fisheries Ireland is currently assessing the viability of a salmonid reintroduction programme.

The biological water quality for the Cuckoo Stream 50m to the north of the site is Q3 in accordance with the current EPA Q-value determinations. A Q3 determination is considered to be of unsatisfactory water quality and of poor ecological status under the Water Framework Directive (WFD) for the invertebrate element.

(d) Pipeline Corridors

The proposed pipeline corridors will involve 38 watercourse crossings (33no. on pipeline corridors associated with the sites at Annsbrook and Newtowncorduff and 5no. on pipeline corridors associated with the site at Clonshagh).

A total of 12 catchments will be potentially impacted by the proposed pipeline corridor, some more so than others. For example, the Broadmeadow River itself will be crossed at 3 locations, while a further 10 crossings are proposed for tributaries of the Broadmeadow River by the pipeline corridor associated with the sites at Annsbrook and Newtowncorduff. The Broadmeadow River constitutes a salmonid system. The system (main channel and tributaries) supports Brown trout throughout, Sea trout and a small but biologically significant population of Atlantic salmon and Eels in its lower reaches, in addition to other fish species.

The development of the proposed pipeline corridor must ensure that it will not impact on any of these catchments and watercourses.

5.4.3 Marine Ecology

The marine ecological survey was carried out over an area of approximately 28 x 12 kilometres, calculated to encapsulate the main extent of a modelled dispersion plume based on one tidal excursion. Sites were selected on a combination of regional locations and a reference site, separating two proposed routes for a marine outfall. Further designated sites were located along these proposed routes. The survey works were broken down into two phases relating to the main habitat and ecological baseline survey carried out in the summer of 2012 (August), and an additional supplementary sampling campaign taking water quality measurements at repeated stations during the winter of 2012(December). The main aim of the surveys were to provide baseline environmental information as to the habitats found along the proposed outfall routes

that might be impacted by construction, as well as near and far field sites within the survey area that might be impacted by the resulting discharge plume. This information included physico-chemical and biological qualities of the sediments, further supplemented by two seasons of water quality profiling and sampling.

Survey operations were based on seabed photography, seabed sampling and water quality sampling. The field operations undertaken between 1st and 6th August 2012 were hampered by inclement weather which meant that the water clarity was generally poor. This had an impact on the seabed photography due to excessive suspended sediments, although some useable images were acquired at most of the stations sampled. For seabed sampling, the majority of stations exhibited a fine sandy substrate which was processed for both macro-invertebrate populations in addition to physico-chemical determination, whilst selected stations were further profiled for water quality assessed over two seasonal periods.

Survey locations were selected based on a range of criteria. Whilst sites would typically be selected based on geomorphological information (supplied by another contractor), this was not available at the time of the survey. This resulted in a strategy to select regional sites based on known geographical, topographical and oceanographic data (as observed from the literature search as detailed in ASA Phase 2) as well as pre-determined sites along the proposed outfall routes. Further sites were also located based on predicted plume modelling for spring tides for each of the possible outfalls along with a reference station located 4km east of Lambay Island.

Results showed typical sandy communities along both of the pipeline corridors. Area of geogenic reefs (cobble and possible bedrock) which are classified as Annex 1 habitat, were recorded in a number of areas, particular relating the coastal areas north and east of the Howth peninsula, along the southern pipeline corridor, in the central part of the survey area west/southwest of Lambay Island, and isolated patches in the north.

These were typically associated with developed communities of rhodophytes (red seaweeds), encrusting sponges and soft corals (*Alcyonium digitatum*) and foliose bryozoa (in particular *Flustra foliacea*). Mobile faunal species includes numerous brittle stars (ophiuroids) and common starfish (*Asterias rubens*) as well as other common shoreline species.

The pipeline corridors themselves were generally granular and mobile with low level rippled bedforms throughout, but particularly along the southern pipeline route where the sands were slightly coarser. With the exception of the geogenic reefs, no other Annex 1 habitats (as designated by the European habitats directive), no species or communities of particular conservational concern were recorded at these sites.

Further geomorphological data has been acquired following the acquisition multibeam bathymetric data for the two outfall corridors since the ecological survey was completed. Analysis of this data will inform further survey work and ground truthing of sites scheduled for the summer of 2013.

Until this data is analysed, together with additional ground truthing of sites proposed for the summer of 2013, the full extent of the geogenic reefs can not be determined. However, to date more geogenic reefs have been noted along the southern pipeline corridor in comparison to along the northern pipeline corridor during the summer surveys in 2012.

The southern pipeline corridor is adjacent to Ireland's Eye SPA which is designated for Cormorant, Herring Gull, Kittiwake, Guillemot and Razorbill. The development of the southern pipeline corridor will have to ensure that it will not impact on the qualifying features of this SPA.

The Rockabill to Dalkey Island cSAC (site code:003000) has recently been transmitted to the European Commission as an cSAC for reefs listed on Annex I and Harbour Porpoise listed on Annex II of the Habitats Directive. Both of the proposed outfall locations terminate within the cSAC. The development of the Regional Wastewater Treatment Plant and its marine outfall location, whether it's the northern or southern outfall, it will have to ensure that it will not impact on the qualifying features of this cSAC.

Chemical analysis has been undertaken on both sediment and water samples at selected sites in order to provide a broad background for existing conditions within the survey area prior to any development. All results show general low level background values throughout.

5.5 Conclusions from the Baseline Surveys for ASA Phase 4

There are no International or nationally designated ecological sites within or in the immediate vicinity of any of the three preferred site options.

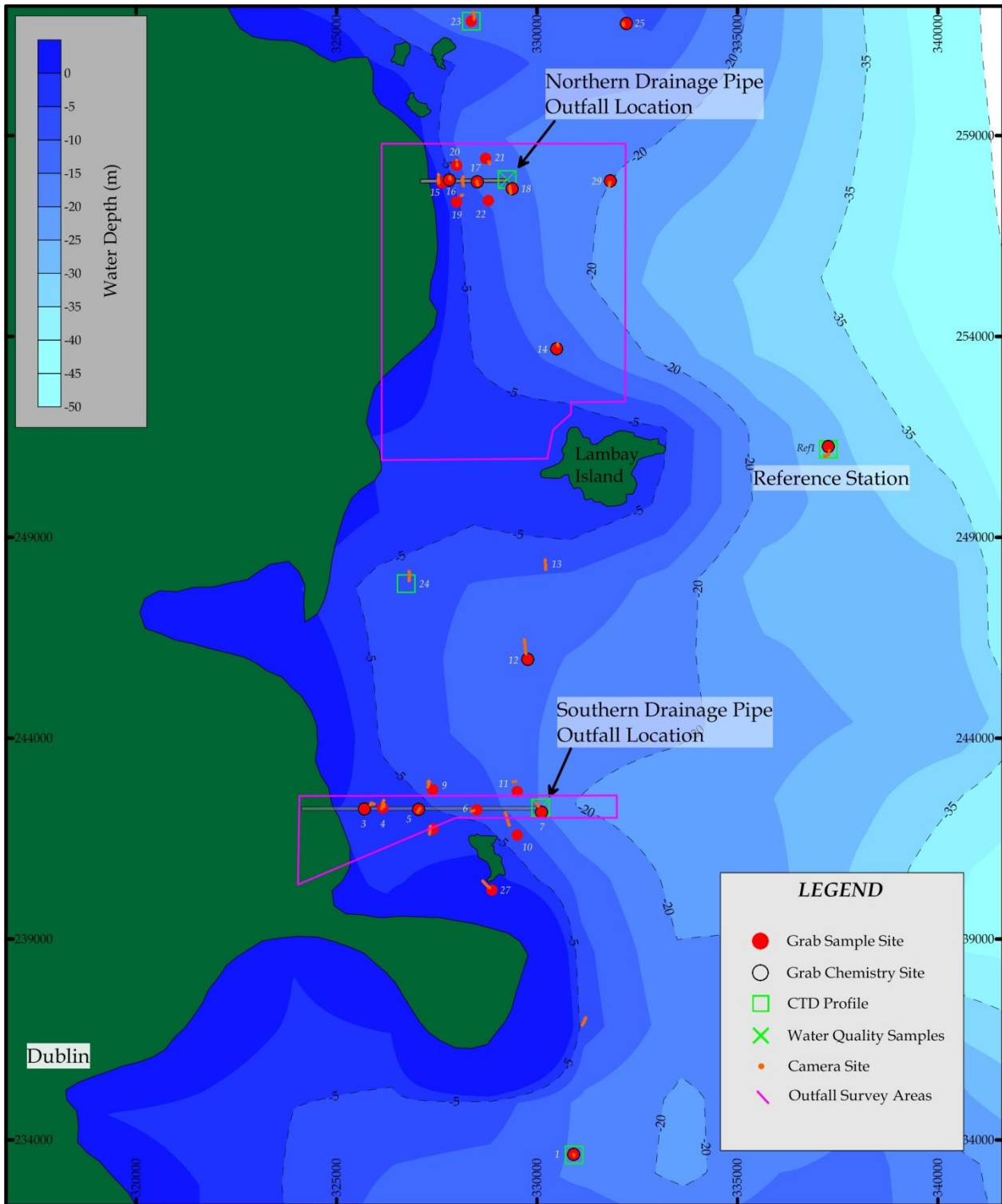
Based on the ecological surveys undertaken between June 2012 and March 2013 at the three preferred site options, Clonshagh presented the lowest ecological value. No protected species were recorded within this site and it is located 4.6km upstream of Baldoyle Bay SPA and cSAC. This site option has the lowest habitat diversity with the shortest network of hedgerows compared to both Annsbrook and Newtowncorduff.

The habitats throughout most of the pipeline corridor and sites are predominately intensively managed agricultural lands, particularly improved agricultural grassland (GA1) arable crops (BC1) and horticultural lands (BC2). Amenity grasslands (GA2) and grassy verges (GS2) are particularly common around infrastructure nearing Dublin City. A number of active badger setts were recorded within or immediately adjacent to the proposed pipeline corridors and sites.

The most significant ecological issues relating to the proposed development of a Regional Wastewater Treatment Plant and its associated pipeline corridors and its marine outfall location are in regards to Baldoyle Bay SPA and cSAC, and potentially the Rockabill to Dalkey Island cSAC and Ireland's Eye SPA. The southern corridor crosses the Baldoyle Bay SPA and cSAC, terminates in the Rockabill to Dalkey Island

cSAC and is adjacent to Ireland's Eye SPA. Given the international ecological designations associated with Baldoyle Bay and Ireland's Eye, the southern outfall location is considered to have a significant ecological value and is therefore considered more ecologically sensitive in comparison to the northern outfall location.

Both of the proposed marine outfall locations terminate within the area of the recently transmitted Rockabill to Dalkey Island cSAC. The development of the marine outfall location, whether it's the northern or southern outfall, will have to ensure that it will not impact on the qualifying features of this cSAC.



Dublin Drainage Project

- August 2012 -

