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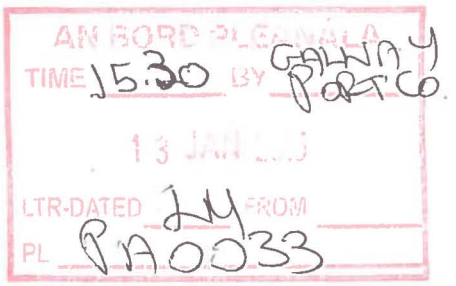
GALWAY HARBOUR EXTENSION

ORAL HEARING

TERRESTRIAL HABITATS, MAMMALS, BIRDS



BRIEF OF EVIDENCE

January 2015

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1. QUALIFICATIONS AND EXPERIENCE

My name is Dr. Chris Peppiatt. My qualifications are as follows:

- B.Sc. (Hons.) Botany. University of Bristol, 1987
- M.Sc. Biotechnology. University of Manchester Institute of Science and Technology (UMIST), 1990
- Ph.D. in Biotechnology. Loughborough University, 1996
- Full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM)

Since 2004 I have worked full-time as an ecological consultant, for five and a half years in an environmental consultancy firm and for the last four and a half years as an independent consultant. I have carried out flora and fauna assessments for a wide range of planning applications, including environmental impact statement (EIS) flora and fauna chapters, ecological assessments, appropriate assessment screening and Natura impact statements (NIS). I have been involved in a number of projects in many areas of the Republic of Ireland and some in Northern Ireland. These have included ecological studies related to proposed marine and freshwater developments/works (i.e. bridges, piers, ferry, wastewater treatment plants, group water schemes, drainage maintenance etc.), as well as residential and commercial building developments, building renovations, roads and wind energy developments. I have been involved in bird conservation and the recording and counting of birds since 1972.

2. ROLE IN EIS

I was sub-contracted by McCarthy Keville O'Sullivan in 2009 to continue work on the EIS for this proposed development that I had also worked on since 2004 while working with the same company. This included desk studies of available ecological information and field surveys of terrestrial habitats, birds, seals, otter, bats, cetaceans (whales and dolphins) and elvers (immature European Eel), as well as the writing of the appropriate parts of the EIS and NIS. Field work was carried out between February 2010 and May 2012, from October 2012 to March 2013 and from March 2014 to the present.

The purpose of my assessment was to establish existing baseline ecological conditions in the study area so that impacts could be assessed on habitats and associated wildlife and especially on habitats or species of conservation importance.

3. TERRESTRIAL HABITATS

METHODS

Site visits were made in July 2011 and October 2013. During these visits the survey areas (i.e. the site of the proposed development and nearby areas that were considered to be in the zone of potential influence of the proposed development) were walked, with habitats and flora species being recorded and mapped. Habitats were classified according to Fossitt (2000).

TERRESTRIAL HABITATS WITHIN THE DEVELOPMENT SITE

The majority of the terrestrial habitats within the site of the proposed development comprised those associated with human disturbance and development, including spoil and bare ground, recolonising bare ground and buildings and artificial surfaces.

The terrestrial habitats present, as classified according to the scheme detailed in Fossitt (2000) are outlined below:

- Spoil and bare ground (ED2) 4.34 hectares (ha)
- Buildings and artificial surfaces (BL3) 3.76 ha
- Recolonising bare ground (ED3) 0.26 ha
- Scrub (WS1) 0.11 ha
- Sea walls, piers and jetties (CC1) 570 metres in length

Gravel trackways, open gravel areas and existing rail track bed within the site have been classified as Spoil and bare ground habitat. The vegetation cover is less than 50% and the plant species found were mainly weed species that quickly establish in cleared stony environments.

Areas of finished hard standing and tarmacadam roads have been classified as artificial surfaces. Vegetation is often either completely absent or confined to occasional weeds growing in cracks and crevices.

A large spoil heap in the south-eastern corner of the terrestrial part of the development site has been classified as recolonising bare ground. The vegetation cover on this spoil heap was greater than 50% and contained many of the common species found in areas of spoil and bare ground.

A small area of land on the existing railway embankment has been classified as scrub. The vegetation was dominated by Common Sallow (or Sally), Hawthorn and Goat Willow, with some areas of Bramble and Nettle.

The rock armour that forms the wall of the reclaimed harbour park area has been classified as a sea wall habitat. The rock armour consists of an embankment made of large boulders that stands between the littoral zone and the infilled reclaimed area of the existing harbour park. The boulders at the bottom of the walling are covered by seawater at high tide and there is some growth of epiphytic marine algae. There is sparse vegetation, consisting of many of the species found in the spoil and bare ground areas, growing between the rocks and boulders at the top of the sea wall.

The diversity of terrestrial habitats within the development site is poor and much of the area has been or is still subject to human disturbance. None of the plants that are found in this area of particular conservation significance, some of them being introduced or escaped alien species. There are no annexed terrestrial habitats within the site of the proposed development.

TERRESTRIAL HABITATS IN THE ZONE OF POTENTIAL INFLUENCE

A review of habitats in the surrounding area within a zone of potential influence by the development was undertaken. The assessment concentrated mainly on habitats within the zone of potential influence, in the Galway Bay Complex cSAC, focussing on habitats that would be considered linked to those on Annex I of the EU Habitats Directive.

Lough Atalia and its surrounding vegetation was considered, in addition to Renmore Lough. This area is included within the Galway Bay Complex cSAC. Lough Atalia is a marine lagoon in Galway City that is approximately 40 ha in extent. To the south of the railway bridge there is a narrow (50-75 m wide) rocky shore outlet to the sea.

The terrestrial habitats surrounding Lough Atalia are as follows:

- Lower & Upper Saltmarsh (CM1/CM2) 9.4 ha
- Shingle and gravel banks (CB1) 0.3 ha
- Amenity grassland (GA2) 3.5 ha
- Dry meadows and grassy verges (GS2) 2.4 ha
- Improved agricultural grassland (GA1) 1.6 ha
- Scrub (WS1) 1.6 ha
- Flower beds and borders (BC4) 0.3 ha
- Stone walls and other stonework (BL1) 490 metres in length
- Sea walls, piers and jetties (CC1) 570 metres in length

The area along the east and southeastern shore of Lough Atalia was classified as Lower and Upper Salt marsh (CM1/CM2). The area contained Sea Aster, Sea Plantain, Common Scurvy-grass, Creeping Bent, Red Fescue, Sea Rush, Sea Club-rush and Saltmarsh Rush. There were also some small patches or beds of Reed, although these were not considered large enough to classify separately as Reed and large sedge swamps (FS1). This area of saltmarsh occupies the fringe of the eastern side of Lough Atalia and its south-eastern corner. It is a mosaic of lower and upper saltmarsh that is equivalent to both the EU Habitats Directive Annex I habitats 'Atlantic salt meadows (Natura 2000 Code 1330)' and 'Mediterranean salt meadows (Natura 2000 Code 1410)'.

Grassland habitats comprise much of the remaining terrestrial habitat surrounding Lough Atalia, including Amenity grassland (GA2), Dry meadows and grassy verges (GS2) and Improved agricultural grassland areas. Mown and managed Amenity grassland lines the western fringe of Lough Atalia by the side of Lough Atalia Road and at the northern end by the Huntsman public house. There are some areas of this habitat dominated by False Oat-grass and Couch-grass, with other herbs and punctuated with occasional patches of Bramble, on the eastern side of Lough Atalia between Lakeshore Drive and the water. This habitat does not correspond to an annexed habitat.

A small area of improved agricultural grassland is located on higher ground on the eastern side of Lough Atalia. This area can be reached via an old farm track and is the site of a number of large metal containers associated with a sailing club. This area does not appear to have been much used for grazing recently and the hedges do not seem to have recently been cut. The whole area (except where the containers are placed and where sailing club activities keep the ground open) is likely to revert to scrub unless management is undertaken to prevent this.

In addition to grassland and saltmarsh, there are several areas of scrub at Lough Atalia, particularly in the south-east corner near to the railway line. Species present included Gorse, Common Sallow, Whitebeam and Hawthorn. There are also a number of small garden plots on the western side of Lough Atalia between Lough Atalia Road and the water. These gardens belong to the houses opposite them on the other side of Lough Atalia Road and are considered Flower bed and border

habitat (BC4). Drystone walls act as boundary markers and stock barriers for old fields on the eastern side of Lough Atalia between Lakeshore Drive and the water. This habitat is classified as Stonewalls and other stonework (BL1) in accordance with Fossitt (2000). Stone sea walling at the northern end of Lough Atalia in the vicinity of the Huntsman public house is considered Sea wall, pier and jetties (CC1) habitat. None of the above corresponds to Annex I habitats and none of the species identified are considered rare or protected.

The areas and positions of Natura 2000 Annex I terrestrial habitats within the zone of potential influence are shown in the Table 7.4.1 of the EIS and in the Appendix to this brief. Terrestrial shoreline Annex I habitats present comprise: Atlantic salt meadows (Natura 2000 Code 1330), Mediterranean salt meadows (Natura 2000 Code 1410), Perennial vegetation of stony banks (Natura 2000 Code 1220) and Annual vegetation of drift lines (Natura 2000 Code 1210).

No future negative impacts on Annex I saltmarsh habitats are expected, although there is a legacy of past loss in Connection with the development of the existing harbour park. Dr. Micheline Sheehy-Skeffington will deal with potential negative impacts on the perennial vegetation of stony banks and the annual vegetation of drift lines at Renmore Beach.

4. SEAL SURVEY WORK

METHODS

Twelve monthly surveys of known seal haul-out sites in the area around the site of the proposed development were conducted in 2011-2012. Haul-out site surveys were conducted over the four hour period lasting from two hours before low tide until two hours after low tide. The optical equipment used was 8.5 X magnification binoculars and a tripod-mounted telescope with a 20-60 X zoom lens. The haul out sites covered during this survey work were situated along the coastline of inner Galway Bay from the vicinity of the site of the proposed development eastwards and then South as far as known haul-out sites in Kinvara Bay and at Deer Island. Some sites were observed from the shoreline, while for others (e.g. Deer Island, Earl's Rock/St. Brendan's Island and the seaward side of Hare Island) observations were made from a rigid inflatable boat.

In addition, specific surveys (25 visits at all states of the tide) of Lough Atalia were conducted by staff of McCarthy Keville O'Sullivan Ltd. to survey for seals between November 2011 and May 2012.

RESULTS

Seal data are presented in Appendix 7.14 of the EIS; seal haul-out survey results, results from the Lough Atalia survey visits and observations made during bird and cetacean surveys are also included. The results for the main seal haul-out surveys are also shown in the Appendix to this brief.

The haul-out survey work gave counts of between 31 and 169 Harbour (Common) Seal at or close to the eleven haul-out sites between Renmore and Deer Island. There was some variation, although the numbers were higher in the months before and after the birth of pups (June/July), with the lowest counts being made in the December – March period. On the 14th of July 2011, pups were recorded at the breeding sites in Oranmore Bay (8), Kinvara Bay (17) and Deer Island (6).

The current population estimate for Harbour seal in the Republic of Ireland is a minimum of 3,489 (NPWS Article 17 report, 2013). The latest published figure for the population counted in the two main areas of importance for this species in inner Galway Bay was 289 (130 in Kinvara Bay and 159 in Oranmore Bay) in 2011 (NPWS report). Surveys carried out by the development EIS team indicates that there may be approximately another 30 Harbour Seal in other parts of inner Galway Bay, giving an estimated population of approximately 320. This would equate to approximately 9% of

the national population and thus inner Galway Bay is a very important site both nationally and regionally for this species. Maximum counts from elsewhere in the Republic of Ireland during 2011 recorded the following important populations: Ballysadare Bay, Co. Sligo, 270; Kenmare River, Co. Kerry, 309; inner Bantry Bay, Co. Cork, 365.

Observations made during the vantage point watches for birds and cetaceans indicated that Harbour Seal are regular in the bird survey sea area (i.e. that around the site of the proposed development). The marine mammal risk assessment carried out by Kelp Marine Research mentioned that the measured size of the Inner Galway Bay Harbour Seal population was equivalent to the combined populations of the two breeding areas in Oranmore Bay and Kinvara Bay. While approximately 50 Harbour Seal were recorded in the area during an exceptional sprat run over winter 2010-2011, vantage point watches for birds and cetaceans at the site have shown that the usual number of seals using the bird study area (which encompasses the site of the proposed development) is in the range of from 0 to 5.

The seals recorded within the development site study area during the bird survey work (in addition to those recorded in Lough Atalia) are shown in Appendix 2.5 of the NIS Addendum/Errata of October 2014, while the data for those recorded during the bird surveys are also shown in the Appendix to this brief of evidence.

During the twelve haul-out surveys and 25 visits to Lough Atalia, Harbour Seals were recorded eight times, although they were also recorded incidentally on two occasions during I-WeBS counts. On most occasions single seals were recorded at Lough Atalia, although two were recorded on two occasions. The observations made indicate that Harbour Seal regularly visit Lough Atalia in small numbers (maximum two recorded) and can be seen at any state of tide, although they are unlikely to enter or leave Lough Atalia at low tide because of the rock sill at the mouth of the inlet. A small rock at the south-eastern end of Lough Atalia, close to the railway bridge, is used as a haul-out.

Grey Seal were recorded during three of the twelve monthly haul-out surveys, with the maximum number of individuals recorded being six. These Grey Seals were recorded at Goormeen Island in Kinvara Bay (12 km south-east of the site of the proposed development) and at Deer Island (8 km south of the site) only. Single Grey Seal were recorded at the development site study area on the 10th of October 2012 and the 25th of February 2013.

A marine mammal risk assessment for the proposed development, which was included in Appendix 2.6 of the NIS Addendum/Errata document in the response to further information, was carried out by Kelp Marine Research.

5. OTTER SURVEY WORK

The foreshore at the current Galway Harbour Park was surveyed for Otter at low tide on the 22nd of May 2011. There is a small amount of open shore at low tide that is a mixture of rocks, shell shingle and mud. On the landward side is the rock walling of the harbour park. No Otter were recorded during the site visit. The search of the foreshore did not reveal any signs of Otter (e.g. spraints, fish remains, couches or holts).The rock walling in this area varies between four and five m high and tide marks show that approximately the lower 3 m of same is inundated at high tide.

Otter often rest among rocks or seaweed at the coast and there is potential for individuals to do so in the area around the site of the proposed development (indeed they have been known to rest on the causeway to Mutton Island). The rock walling at the current harbour park foreshore consists of large boulders and there are large gaps and spaces between them. The nature of this rock walling (i.e. with open, draughty spaces unfilled by soil or sediment) and the fact that most of it is inundated by

the sea at high tide means that its potential as a site for a regularly used holt (particularly a natal holt) is low.

Otter were recorded five times during survey work in the area of the site, i.e. during visual cetacean surveys and bird surveys. One (probably an adult male) was recorded (for 12 minutes) during a cetacean watch on the 15th of December, feeding on Mutton Island. Another sighting was made (during surveys for seals in Lough Atalia) of one individual in the outflow channel of Lough Atalia on the 2nd of February 2012. Four Otter were observed (over a period of four hours and 32 minutes) on the 5th of February 2012 in the area of water from in front of Renmore Beach, along the front of the existing harbour park at Rinmore Point to the mouth of the River Corrib. This observation was made during one of the bird survey vantage point watches from near Rinmore point. The observer interpreted the observation to involve an adult male and female (possibly courting) and two younger animals (possibly the female's cubs from the year before). The area around Renmore Lough (i.e. behind the boulder ridge at the top of Renmore beach and around the lough) was investigated for signs of an Otter holt on the 7th of February 2012. A number of animal tracks were found close to the lough and Otter spraint was observed at multiple locations in the area. However, no signs of a holt were discovered and it seems likely that the Otter recorded in the area on the 5th of February 2012 were holting elsewhere. A single animal was recorded for four minutes on the 4th of Match 2014 and two animals were recorded for fourteen minutes on the 14th of May 2014.

6. BAT SURVEY WORK

METHODS

An ultrasound bat detector survey was carried out at the site over the night of the 13th and 14th of June 2011. A handheld bat detector (with broadband coverage from 20 kHz to 120 kHz) was used. Sunset on the 13th of June was at 22:05 and sunrise the next morning was at 05:12. The dusk survey was carried out between 21:30 and 02:00 and a dawn survey was carried out between 03:30 and 05:45 the next morning.

The weather conditions were favourable for bat activity during the whole of dusk/dawn survey period, as there were only very light westerly breezes (Beaufort Scale 1). There was no rain during the survey. The air temperature at sunset was 13 Celsius and the minimum recorded air temperature during the survey was 7.6 Celsius (within the recommended Bat Conservation Ireland guidelines for survey work). There was no cloud cover at the beginning of the survey and it was not more than 10% at dawn. The moon was about two days short of full on the night of the survey. Low tide was at 22:11 (i.e. it was low tide at the beginning of the survey). Conditions for bat survey (both in respect of the weather and state of the tide) were ideal. The survey route was along the rock walling at the current Harbour Enterprise Park between Rinmore Point and Renmore beach.

RESULTS

During the course of the night's survey only six registrations of bats were recorded, three each of Soprano Pipistrelle and Common Pipistrelle. The first registration was not made until more than 40 minutes after sunset and the last was more than four hours before sunrise. The behaviour observed was short periods of foraging, either by the lighting associated with the harbour enterprise park buildings, or (in one case) over seaweed at low tide on the shoreline. There was no indication of any roosting behaviour in the vicinity of the harbour enterprise park site investigated.

The two species of bats recorded are the two most numerous and frequently recorded in Ireland. They will forage at street lights where most other Irish bat species will avoid them and also feed along the tidelines of beaches in still conditions (presumably on winged insects associated with

washed-up seaweed). However, bats will avoid exposed coastal areas on occasions when the winds are anything more than moderate.

Given the small number of registrations of bats made, the behaviour observed and the species involved, indications are that the site is not of significance for bats, only for small-scale foraging during calm weather. There was no indication that the proposed development will be likely to have any negative impacts on local bat populations and there was nothing to suggest that any further survey work would be necessary. It should be noted that, in the experience of the author, one would expect far more bat activity to be recorded (i.e. in similar weather conditions at the same time of year) in a suburban garden than was recorded at the Galway Harbour Park.

7. VISUAL CETACEAN SURVEYS

METHODS

From June 2011 until May 2012, twelve monthly 100-minute cetacean watches were carried out over the site of the proposed development. The IWDG standard protocol for monitoring inshore sites for cetaceans was followed. The vantage point used was the top of the Mutton Island lighthouse (Grid Ref. E129750 N223120, approximately 5 metres elevation). The optical equipment used was 8.5 X magnification binoculars and a tripod-mounted telescope with a 20-60 X zoom eypepiece lens and an 80 mm objective lens.

RESULTS

The only occasion during the twelve watches on which cetaceans were recorded was during the watch of the 19th of October 2011. On this occasion two Harbour Porpoise were seen twice briefly travelling together in a south-easterly direction. The porpoises were first seen at a point approximately 800-900 m south-east of Hare Island and 800-900 m south of Rabbit Island (i.e. outside of the footprint of the proposed development). A single Bottle-nosed Dolphin was recorded for sixteen minutes within the development site study area (i.e. close to the mouth of the River Corrib) during bird survey work on the 8th of April 2014.

Although the IWDG database does contain a number of records of (mainly) small cetaceans in the area and the CPOD work carried out by IWDG indicated the regular presence of porpoises and dolphins in the area around the southern tip of Mutton Island, the low numbers of cetacean sightings made during the site visual cetacean surveys and bird surveys (in addition to the observations of the marine mammals observer during the site investigations) does nothing to indicate that the study area is of special importance for cetaceans within Galway Bay and thus potential impacts due to habitat loss and construction/operating disturbance would not be expected to be significance.

8. BIRD SURVEY WORK AT THE DEVELOPMENT SITE

METHODS

The original bird survey work data (designed to cover both the foreshore area and the marine area of the bay that will be directly affected by the construction of the proposed development) are presented in Appendix 7.13 of the EIS. This work consisted of watches from a vantage point above the foreshore of the current harbour park (i.e. from the area from which the reclamation of land out into the current harbour area is proposed) at E130500 N24595. The survey area consisted of the shoreline of the current harbour park (i.e. from Rinmore Point to just to the West of Renmore Beach), including all of the intertidal area that is exposed at low tide, and the marine area from this shoreline out as far as the end of Mutton Island and bounded by Mutton Island in the West and Hare Island in the East. This marine area is approximately 3 km^2 in extent at high tide. (an area that envelopes the

site of the proposed development; the footprint of the site of the proposed development and the marine area legacy loss due to the construction of the existing Galway Harbour Park is equal to a combined area of 1.07 km^2).

All states of the tide were covered. Watches were carried out in acceptable visibility conditions (minimum 2 km) and when the sea conditions were no worse than Sea State 4 (in most cases Sea State 2 or better). The optical equipment used was 8.5 X magnification binoculars and a tripod-mounted telescope with a 20-60 X zoom lens. Maximum species counts were recorded every 30/60 minutes.

Watches were carried out over the thirteen month period from March 2011 to March 2012. Initially, watches lasted three hours, but these were later extended to eight hours (effectively covering the whole day). In all, 18 watches were carried out, totalling 84 hours of observer effort.

In addition, six watches were made from a site at Traught Beach (Grid Ref.: E134130 N213900; West of Kinvara), 10 km SSE of the site of the proposed development. A marine area of approximately equivalent size (2.5 km^2) to that surveyed at the site of the proposed development was surveyed from November 2011 to March 2012, with a total of 33 hours of observer effort. The purpose of these watches was to compare the numbers of divers using the marine area with those at the site of the proposed development.

A further series of counts were carried out from the development site viewpoint from October 2012 to March 2013 and from March 2014 to December 2014, with the latter series of counts to continue beyond December 2014. These watches were paired with watches at another comparison site west of the site of the proposed development on the edge of the Inner Galway Bay SPA at Barna. The watches were paired so that (weather permitting) they were carried out of consecutive days, with the second watch starting from half an hour to one hour later than the first, so that the tidal conditions were the same for both counts. The grid reference of the watch point at Barna is E124010 N222627 and the marine area surveyed there is 3.45 km^2 in area.

In all, 12 eight-hour counts were carried at both the study area at the site of the proposed development and at the Barna comparison site from October 2012 to March 2013, giving a total of 96 hours of watch time at each site. A further ten watches were carried out at each of the two sites between March 2014 and December 2014, giving a total of 80 hours of watch time at each site.

A grand total of 40 watches have been carried out at the development site study area during the periods from March 2011 to March 2012, October 2012 to March 2013 and March 2014 to December 2014. These watches have covered every month of the year and all states of the tide. The total watch time at the site of the proposed harbour extension to the end of December 2014 was 260 hours.

RESULTS

A total of 37 bird species were recorded using the shoreline and marine area in the site of the proposed development. This included birds that were feeding or resting along the rock wall boundary of the existing harbour park and areas that were exposed at lower tides. Birds recorded as using the marine area were those that were either on or in the water (resting, roosting or feeding) or that were feeding from flight (e.g. plunge feeding Gannet and terns, shearwaters), but not birds that were merely flying through the area.

The list of bird species recorded comprises: Black Guillemot, Black-headed Gull, Light-bellied Brent Goose, Common Guillemot, Common Gull, Common Scoter, Common Tern, Cormorant, Curlew, Forster's Tern, Gannet, Great Black-backed Gull, Great Northern Diver, Great-crested Grebe,

Greenshank, Grey Heron, Herring Gull, Hooded Crow, Iceland Gull, Kittiwake, Little Egret, Mallard, Manx Shearwater, Meadow Pipit, Mute Swan, Oystercatcher, Razorbill, Red-breasted Merganser, Redshank, Red-throated Diver, Ringed Plover (single bird on one occasion), Rock Pipit, Sandwich Tern, Scaup, Shag, Turnstone and Wigeon.

This list includes 14 of the 20 birds listed as Special Conservation Interests of the Inner Galway Bay SPA. In addition, five of the species recorded (Common Tern, Great Northern Diver, Little Egret, Red-throated Diver and Sandwich Tern) are listed in Annex I of the EU Birds Directive.

The following eleven species (that were not recorded at the marine site) - Goldfinch, House Martin, Jackdaw, Kestrel, Linnet, Magpie, Pied Wagtail, Rook, Swallow, Twite and Wheatear- were recorded within the existing harbour park close to the site of the proposed development.

Eight of the species recorded (Black-headed Gull, Common Scoter, Curlew, Herring Gull, Meadow Pipit, Redshank, Twite and Wigeon) are placed in the Birds of Conservation Concern in Ireland (BoCCI) Red List as being of conservation concern. However, five of these species (Black-headed Gull, Common Scoter, Herring Gull, Meadow Pipit and Twite) are placed in the Red List in respect of the conservation concern for Irish breeding (not wintering) populations. There is no suitable breeding habitat for any of these five species within the footprint of the site of the proposed development. There are no known breeding sites for Black-headed Gull, Curlew or Redshank in the vicinity of the site, while the nearest breeding colony of Herring Gull is on the tops of the higher buildings in the centre of Galway City (approximately 1 km North-west of the site of the proposed development). Meadow Pipit has recently (i.e. in 2013) been moved from the BoCCI green list (low conservation concern) to the red list (high conservation concern) because the Irish breeding population declined by 50% or more over the 13-year period from 1998-2011. It is considered that this species declined suddenly because of severe winters between 2009/10 and 2011/12. However, recent data from the Countryside Bird Survey (CBS, 2014) indicate this species has been in recovery since 2011.

One or two Ringed Plover were occasionally recorded in the harbour park over the summer months. One favoured breeding habitat for this species is gravel areas (on beaches or at the sides of rivers) and it is possible that a pair or two may have prospected the gravel areas of the harbour park with a view to breeding. However, the birds observed have never been present for the whole of the breeding season and breeding is considered highly unlikely given the disturbance in the area. Ringed Plover is a Special Conservation Interest for the Inner Galway Bay SPA, but as a wintering species, rather than as a breeding one. Ringed Plover has only been recorded once within the marine study area at the site of the proposed development; a single bird landed on a rock on the study area shoreline for a few seconds before flying onwards on the 14th of May 2014.

A single Twite was recorded for eight minutes feeding on weed seeds in the existing harbour park close to the survey watch point on the 13th of January 2012. This species is part of the BoCCI Red List. Twite have been declining steadily in Ireland in recent years. Recent population studies have estimated a breeding population of only 54-110 pairs. The majority of these birds are found in Co. Mayo and in West Donegal, with smaller numbers in Counties Antrim, Galway and Kerry. Twite prefer upland heather-dominated areas and coastal areas, while they are usually coastal in winter. There is no confirmed breeding population of Twite in Co. Galway, although there may be a few pairs in the Clifden area. Twite have been recorded during Winter in the Harbour Park/Nimmo's Pier/Mutton Island area on 22 occasions since 2001, although some of these records certainly refer to multiple sightings of the same flock or group. The numbers are usually few (less than ten), although 22 were recorded at Nimmo's Pier on the 2nd of January 2003 and 21 were recorded at the same place on the 5th of November 2008. Further afield, there are occasional winter records from Salthill, Rusheen Bay, near Kinvara, Connemara, the Aran Islands and Inishbofin.

The following nine species (that were not recorded using the site) - Arctic Skua, Bar-tailed Godwit, Dunlin, Leach's Petrel, Lesser Black-backed Gull, Merlin, Shelduck, Whooper Swan and Whimbrel - were recorded overflying the area. Leach's Petrel, Merlin and Whooper Swan are listed in Annex I of the EU Birds Directive. A female Merlin was observed to fly south-eastwards out over Galway Bay from Mutton Island on the 19th of October 2011. On the same day, seven Whooper Swan were observed close to Mutton Island flying at height towards the South. A single Leach's Petrel was observed over the sea close to Mutton Island on the 22nd of September 2011. These observations were made during cetacean watches. Merlin are widely (though thinly) distributed around the coast during the winter. There are a number of breeding pairs on the Connemara bogs West of Spiddal. Whooper Swan are widely-distributed in Co. Galway's wetlands during winter; 783 birds were recorded in the county during the national census of January 2010. The only known breeding site in Ireland for Leach's Petrel is on the Stags of Broadhaven off the North coast of Co. Mayo. The birds spend most of their time in deep waters out of sight of land. They are rarely seen in Galway Bay, almost always after spells of strong westerly gales, which had indeed occurred in the days before the watch during which the bird was observed.

Birds using the site shoreline and intertidal area, March 2011-March 2012

The maximum recorded numbers of the bird species that were observed using the shoreline and intertidal area within the site of the proposed development during the watches that were held during the March 2011 to March 2012 period included nine of the 20 Special Conservation Interest (SCI) species of the inner Galway Bay SPA. Maxima were 4 Black-headed Gull, 16 Brent Goose, 2 Common Gull, 2 Cormorant, 2 Curlew, 2 Grey Heron 1 Redshank, 19 Turnstone and 2 Wigeon.

Birds using the site marine area, March 2011-March 2012

The maximum numbers of bird species that were observed using the site marine area during the March 2011 to March 2012 period are included nine of the 20 SCI species of the Inner Galway Bay SPA (in total 13 were recorded in the marine area and on the shoreline within the study area). Maxima were 69 Black-headed Gull, 6 Brent Goose, 7 Common Gull, 4 Common Tern, 6 Cormorant, 8 Great Northern Diver, 3 Red-breasted Merganser, 13 Sandwich Tern and 12 Wigeon.

The counts of the birds recorded both the site shoreline and intertidal area and the site marine area during the March 2011 to March 2012 period are shown in Appendix 7.13 of the EIS and in the Appendix to this brief of evidence.

Birds using the site shoreline and intertidal area, October 2012-March 2013

The maximum recorded numbers of the bird species that were observed using the shoreline and intertidal area within the site of the proposed development during the watches that were held during the October 2012 to March 2013 period included eight of the 20 SCI species of the inner Galway Bay SPA. Maxima were 7 Black-headed Gull, 2 Common Gull, 6 Cormorant, 3 Curlew, 2 Grey Heron, 1 Redshank, 7 Turnstone and 3 Wigeon.

Birds using the site marine area, October 2012-March 2012

The maximum numbers of bird species that were observed using the site marine area during the October 2012 to March 2013 period are included seven of the 20 SCI species of the Inner Galway Bay SPA (in total eleven were recorded in the marine area and on the shoreline within the study area). Maxima were 22 Black-headed Gull, 17 Brent Goose, 19 Common Gull, 23 Cormorant, 10 Great Northern Diver, 5 Red-breasted Merganser and 4 Wigeon.

The counts of the birds recorded both the site shoreline and intertidal area and the site marine area during the March 2011 to March 2012 period are shown Appendix 2.7 of the appendices to the NIS addendum/errata of October 2014 and in the Appendix to this brief of evidence.

Birds using the site shoreline and intertidal area, March 2014-December 2014

The maximum recorded numbers of the bird species that were observed using the shoreline and intertidal area within the site of the proposed development during the watches that were held during the March 2014 to December 2014 period included nine of the 20 SCI species of the inner Galway Bay SPA. Maxima were 17 Black-headed Gull, 2 Brent Goose, 8 Common Gull, 2 Cormorant, 4 Curlew, 2 Grey Heron, 2 Redshank, 1 Ringed Plover and 10 Turnstone.

Birds using the site marine area, March 2014-December 2014

The maximum numbers of bird species that were observed using the site marine area during the March 2014 to December 2014 period are included eight of the 20 SCI species of the Inner Galway Bay SPA (in total fourteen were recorded in the marine area and on the shoreline within the study area). Maxima were 169 Black-headed Gull, 24 Common Gull, 14 Common Tern, 52 Cormorant, 10 Great Northern Diver, 11 Red-breasted Merganser, 11 Sandwich Tern and 3 Wigeon.

The counts of the birds recorded both the site shoreline and intertidal area and the site marine area during the March 2014 to December 2014 period are shown Appendix 2.7 of the appendices to the NIS addendum/errata of October 2014 and in the Appendix to this brief of evidence.

Count maxima are one part of the data that has been collected during the extensive survey work that has been carried out at the site of the proposed development and at the two comparison sites. Further analysis of these data has been used to make predictions about the potential for negative impacts on the populations of the special conservation interests of the SPA and these are presented by Dr. Tom Gittings.

Species Profiles

As part of the RFI process, species profiles were prepared for 14 of the 20 SCI species, namely Light-bellied Brent Goose, Wigeon, Red-breasted Merganser, Great Northern Diver, Cormorant, Grey Heron, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Black-headed Gull, Common Gull, Sandwich Tern and Common Tern. These profiles are general reviews of the ecology, Irish status and distribution and occurrence within Inner Galway Bay. They include detailed assessment of their occurrence within and adjacent to the development site; and a review of their sensitivities to potential impacts.

The remaining six SCI species (Teal, Shoveler, Ringed Plover, Golden Plover, Lapwing, and Dunlin) have never, or only very rarely been recorded within the development site and it is considered that the habitat conditions are unsuitable for these species. Two of these species (Ringed Plover and Dunlin) have been recorded in adjacent areas, but only occurred irregularly and in very small numbers, so any potential disturbance impacts are not considered likely to be significant.

The literature on the disturbance impacts of vessels on Great Northern Diver was reviewed within the species profiles mentioned above. In summary, Furness *et al.* (2012) mention that "*divers are especially sensitive to approaching boats more than 1 km*", quoting Schwemmer *et al.* (2011) as the authority for this statement. However, this statement does not appear in the paper by Schwemmer *et al.* (2011) that has been referenced in Furness *et al.* (2012). In the tabulated data supplementary to Furness *et al.* (2012) (which are available for online download), it is stated that Great Northern Diver are "apparently less sensitive than other diver species" (i.e. c.f. Red-throated and Black-throated

divers, which are stated to have "*a very great flush distance*") to ship traffic disturbance, without a clear authority being given. In the same supplementary data, Topping and Petersen (2011) are quoted as stating that Great Northern Diver "fly from boats more than 1000m away". A total of 14 Great Northern Divers were recorded during five studies at four offshore wind farm sites in the U.K.: Argyll Array, Humber Gateway, Gwynt Y Mor and Burbo Bank. Of these, none recorded Great Northern Divers flying within the generic collision risk zone, while Red-throated and Black-throated divers where regularly recorded flying, although it should be noted that 14 sightings is a small sample. Topping and Petersen (2011) actually state that "*Red-throated Divers are susceptible to human disturbances while in the marine environment. From ship-based bird surveys it is known that birds often flush at distances of about 1 km from an approaching ship*". Schwemmer *et al.* (2011) detail research that they carried out in the German North Sea in which they determined that Red-throated Diver (*Gavia stellata*) and Black-throated Diver (*Gavia arctica*) avoid active shipping lanes. In this study these two species were lumped together due to an inability to differentiate them during aerial surveys. While Great Northern Diver can certainly be flushed to flight by approaching ships, it seems that there is a certain amount of confusion in the literature that is currently available. There is the suggestion that Great Northern Diver may be less sensitive to ship traffic disturbance than the other two species, but it appears that no authoritative studies have been carried out. Red-throated Diver appears to have been the subject of most survey work, due to concerns that have been raised about marine renewable energy projects (wind and wave) in the North Sea, where this species is by far the commonest diver. Experience from within inner Galway Bay has shown that Great Northern Diver do not take to the air at the approach of large slow-moving vessels (i.e. the type of situation that would be likely near to the proposed harbour extension), but either dive of swim out of the path of the vessel. Smaller fast-moving vessels (e.g. RIBs travelling at speed) will cause Great Northern Diver to flush to flight.

10. PREDICTED IMPACTS AND PROPOSED MITIGATION

Impacts on Terrestrial Communities during the Construction Phase– Habitat Loss/Disturbance Short-term Slight Negative Impact

The terrestrial part of the site of the proposed development is small (less than 10%) in comparison to the development area as a whole. Most of the redevelopment of the harbour enterprise park will involve works on existing roads, or will affect areas covered by habitats that are not of importance (*e.g.* spoil and bare ground or recolonising bare ground). An area of 0.29 ha of scrub (not an annexed habitat) will be lost on the existing railway embankment in the making of the proposed rail connection. In addition, there will a short-term impact of noise/construction disturbance during the construction phase.

Mitigation: None possible

Impacts on Terrestrial Communities during the operational phase – Habitat Permanent Slight Positive Impact

The terrestrial part of the site of the proposed development is small (less than 10%) in comparison to the development area as a whole. Most of the redevelopment of the harbour enterprise park will involve works on existing roads, or will affect areas covered by habitats that are not of importance (*e.g.* spoil and bare ground or recolonising bare ground). An area of 0.29 ha of scrub (not an annexed habitat) will be lost on the existing railway embankment in the making of the proposed rail connection.

Mitigation: Loss of terrestrial habitats will be mitigated through the proposed planting plan and landscaping scheme which incorporates a planting of native planting of 5.44 ha (to occur at the end of the construction phase). The residual associated impact is therefore considered a permanent slight positive impact.

Impacts on Lough Atalia/Zone of Potential Influence during the construction and operation phases of the proposed development

By adopting the recommended mitigation measures and adopting the environmental management framework, no additional suspended sediments will enter Lough Atalia and Renmore Lagoon and their sedimentary characteristics will not alter. The model predicts a possible decrease in salinity of 1.29 ppt within Lough Atalia. Given the measured range of 0.4 – 29.4 ppt, it is not considered that such a potential increase will have any effect on the ecological functioning of this water body. The model predicts that salinities to the east of the new structure may increase.

Since there will be no perceptible change in tidal range or erosion/deposition regimes as a result of the construction of the proposed development and no significant change to the salinity regime in Lough Atalia, terrestrial habitats outside of the site red line area will not be impacted negatively as a result of the proposed development.

Impacts on Mammals

Impacts on Marine Mammals due to Disturbance during the Construction and Operational Phases of the Development

Impact threshold distances have been calculated by Mr. Eugene McKeown.

Temporary Slight Negative Impact

There will be direct disturbance within 78.71 ha of subtidal habitat (excluding 5.93 ha of intertidal habitat) (and disturbance in the wider area around this) as a result of the construction of the proposed development. The maximum potential disturbance will occur during blasting and piledriving, while the potential disturbance during other works will be less. Noise modelling for blasting and impulsive piledriving has predicted the following ranges for Harbour Seal: permanent threshold shift (PTS, permanent hearing damage) 100 metres, temporary threshold shift (TTS, temporary hearing damage) 500 metres, disturbance high within 100 metres, disturbance moderate with 1,000 metres and disturbance low at greater than 1,000 metres. Modelling for construction activities has predicted the following ranges: PTS 60 metres, TTS 350 metres, disturbance high within 100 metres, disturbance moderate with 1,000 metres and disturbance low at greater than 1,000 metres. Modelling for shipping traffic impact has predicted the following ranges: PTS, does not occur, TTS, less than 2 metres, disturbance high within 100 metres and low at greater than 100 metres. Noise modelling for blasting and impulsive piledriving has predicted the following ranges for cetaceans: Harbour Porpoise, permanent threshold shift (PTS, permanent hearing damage) 16 metres, temporary threshold shift (TTS, temporary hearing damage) 90 metres, disturbance high within 100 metres, disturbance moderate with 1,000 metres and disturbance low at greater than 1,000 metres; dolphin, permanent threshold shift (PTS, permanent hearing damage) 19 metres, temporary threshold shift (TTS, temporary hearing damage) 100 metres, disturbance high within 100 metres, disturbance moderate with 1,000 metres and disturbance low at greater than 1,000 metres.

The major source of potential negative impacts on local aquatic and marine mammals will come from underwater blasting, drilling and pile driving. Noise and vibration will also be generated by the general construction activity (dumping of fill material, use of heavy goods vehicles *etc.*) at the site. Sound waves may be propagated over long distances through water and there is evidence to suggest that sea mammals are likely to be very sensitive to loud noises. Most of the noise caused by shipping, dredging and drilling is of low frequency (approximately 5 to 160 Hz). However, noise is not transmitted over long distances in shallow water such as that to be found at the site of the proposed development and this is particularly true of low frequency noise of the type produced by shipping dredging and drilling.

Possible indirect negative impacts of the operational phase of the proposed development on marine mammals are: increased disturbance from shipping noise, the increased possibility of injury caused by impact of ships and their propellers with marine mammals and the increased possibility of harmful pollution incidents that the expected increase in marine traffic will bring with it.

The sea is an environment that is naturally a relatively high noise environment. Cetaceans in particular have evolved ears that function well within this high natural background or ambient noise and which may be more resistant to hearing damage than land mammals. It has been calculated that the exposure of marine mammals to 500 Hz sounds at sound pressure levels of 210 dB re. 1 µPa could cause bubble growth that could theoretically cause 'the bends'. Measurements of the hearing thresholds of Bottlenose Dolphins and Belugas that had been exposed to noises that were designed to mimic those produced by distant explosions. No threshold shifts (i.e. deafness) were observed in these experiments, but disruption of trained behaviour was noted at distances of several kilometres from the theoretical explosion points.

While mysticete (i.e. baleen, or non-toothed) whales may be affected by low frequency noise due to their use of low frequency infrasounds for communication, this type of cetacean is not at all common in the area (one known record of a stranded Minke Whale since 1970). Odontocete (toothed) cetaceans, a group that includes Short-beaked Common Dolphin, Harbour Porpoise and Bottle-nosed Dolphin, are most sensitive to sounds in the frequency range 10 kHz to 60 kHz. As far as disturbance by shipping goes, the group of Short-beaked Common Dolphin that are regularly found in the area often follow ships entering and leaving Galway Harbour. In addition, Harbour Porpoise (a species that is considered shy) are often observed in areas of intense shipping activity.

Both Common Seal and Grey Seal are members of the phocinid or true seal group. The lowest limit of hearing sensitivity measured for Common Seal was 100 Hz, but a noise level of 96 dB was necessary for this to be possible. It was also found that there was intraspecific variation in the hearing ability of this species (i.e. different individuals had varying hearing abilities). It has been claimed that, if phocinid seals can perceive noise in the frequency range below 1000 Hz (1 kHz), they are probably not able to hear it above general ambient noise levels. It seems, therefore, that seals are unlikely to be significantly affected by the low frequency noises that would be produced by drilling, dredging or by boat noise.

Acoustic Deterrent Devices (ADDs) are used by some fish farms and fisheries to deter seals that might otherwise prey on stocked fish. These devices typically produce strong pulse noises in the range 8 to 17 kHz (much higher frequencies than boat or construction noise) at levels of 175 to 210 dB. Some individual seals become habituated to even this loud, high frequency noise.

All of the mammal species found in the local marine environment are particularly mobile. Although there may be some temporary disturbance during the construction phase of the proposed development, there are large areas of adjoining suitable habitats into which seals, dolphins and Otter can move. Since these mammals are accustomed to ambient water noise and the noise generated by the current harbour and its activities, no direct long-term negative impacts of the proposed development on mammal populations in the area is anticipated.

However, the blasting phase of the development construction has the potential to cause serious negative impacts (e.g. including injury and possible death) on local cetaceans and seals. The design of the drill holes, their depths and the amount of explosives used has minimised the numbers of blasts, the number of blasting days and the total period over which the blasts would be staged during the construction period. It has been calculated that (with a multi-small charge ripple blast) this could only happen at the site with animals that were within ten metres of the blast site.

Using available information and current suggested best practice, it has been calculated that the impact threshold distances for physical damage caused by dredging (worst case scenario is for backhoe dredging of rock in particular of which there is less than 1.3% of the total dredging quantity i.e. 24,000 m^3) at the site are up to 64 metres for seals and 16 metres for Harbour Porpoise (based on an unlikely 24 hour exposure at that distance). The impact threshold distances for disturbance caused by dredging at the site are up 128 metres for seals and one kilometre for Harbour Porpoise (all based on a 5 minute exposure at that distance). There are no significant seal haul outs within this distance of the dredging site. There will be a constant mammal watch and there will be a gradual build up of noise to allow time for mammals not in view but within earshot, to move out of range i.e. a "soft start" to the work.

Mitigation: Blasting and pile driving works will only be carried out during daylight hours. Blasting will not be permitted if cetaceans or seals are sighted within one kilometre of the blast site; this area is defined as the exclusion area. Marine Mammal Observers will take up position before a day's blasting begins. They will be equipped with binoculars, telescopes and tripods with which to watch for the animals, and two-way radios with which to communicate with each other and the explosives engineers. Blasting will not occur if a seal or cetacean is sighted within one kilometre of the blast site, or for a period of 30 minutes after one has been sighted within the 'exclusion area'. Observers will use Mutton Island and Hare Island as watch points. A Marine Mammal Watch Plan giving full details of the methodology and standard operating procedures for the blasting watches will be carried out before blasting works begin.

The IWDG runs a national strandings scheme that covers Galway Bay. It is anticipated that the project team will arrange with IWDG to receive news of any strandings that occur in the area during the construction period, but it is further proposed that:

i. after episodes of blasting a search party will be sent out in a RIB to search the area around the blast site for dead or injured seals or cetaceans.
ii. a public awareness campaign will be launched in which members of the public are encouraged to report dead or injured seals in the inner Galway Bay via a designated phone line.

Impacts on Marine Mammals due to Disturbance from Pile Driving during the Construction Phase of the Development

Temporary Potentially Moderate Negative Impact
Impact threshold distances for physical damage caused by pile driving at the site are up to 4 metres for both seals and Harbour Porpoise. The impact threshold distances for disturbance caused by pile driving at the site are up to 64 metres for both seals and Harbour Porpoise.

Impact threshold distances for physical damage caused by blasting at the site are up to 500 metres for seals and 128 metres for Harbour Porpoise. The impact threshold distances for disturbance caused by blasting at the site are up to one kilometre for seals and 256 metres for Harbour Porpoise.

Mitigation: Pile driving will not be permitted if cetaceans or seals are sighted within one kilometre of the blast site; this area is defined as the exclusion area. Marine Mammal Observers will take up position before a day's pile driving begins. They will be equipped with binoculars, telescopes and tripods with which to watch for the animals, and two-way radios with which to communicate with each other and the explosives engineers. Pile driving will not occur if a seal or cetacean is sighted within one kilometre of the blast site, or for a period of 30 minutes after one has been sighted within the 'exclusion area'. Observers will use Mutton Island and Hare Island as watch points. A Marine Mammal Watch Plan giving full details of the methodology and standard operating procedures for the blasting watches will be carried out before pile driving works begin.

Impacts on Marine Mammals during the Construction Phase of the Development from dredging operations

Temporary Potential Minor Negative Impact
Research from the U.K. suggests that there is the potential for seals to be killed by ducted propellers if barges etc. with this propeller type are used in the construction works and perform manoeuvres while either static or moving slowly (i.e. while still operating the propeller/propellers). Workers have theorised that the seals were killed after being attracted to the vicinity of the propellers, either as a result of concentrations of prey fish close to vessels, or as an inappropriate response to the acoustic output of the propellers. This type of propeller is common in tugs, construction vessels and construction barges and is used when such vessels are either manoeuvring slowly, or trying to maintain position. This situation could occur for long periods during the construction phase.

Mitigation: If barges with ducted propellers are used during the construction stage and these are likely to be making the types of manoeuvres mentioned above, mesh screens will be fitted to vessels at the ends of the ducts will prevent seal entry into them.

Impacts on Marine Mammals due to loss of habitat

Permanent Minor Negative Impact
There will be a loss of 26.93 ha of potential sub-tidal and intertidal foraging habitat for seals and cetaceans.

Mitigation: None possible. Residual impact minor negative.

Temporary Minor Negative Impact
The NPWS considers that Otter in the marine environment do the majority of their foraging within 80 metres of the shoreline. There will be an initial loss of 4.64 hectares of such habitat. After 2-5 years (the time taken for the newly constructed coastline to be fully colonised by algae, invertebrates and fish), 16.08 hectares of new shoreline habitat will suitable foraging habitat for Otter. Thus, the initial loss of 4.64 hectares of main foraging habitat will be short-term, followed by a permanent gain of 11.44 hectares of Otter foraging habitat.

Mitigation: None possible. Residual impact minor positive.

Impacts on Marine Mammals due to barriers to habitat connectivity within the SAC

Permanent Minor Negative Impact
The construction of the new infilled area and the new deepwater pier will constitute a minor barrier to connectivity between areas immediately to the east of the harbour extension (e.g. in the Renmore Beach area) and areas to the west of it, although no complete barriers will be formed.

Mitigation: A pass will be built in to the harbour extension design at the base of the deepwater pier (i.e. at the point that this is joined to the reclaimed part of the harbour extension) that will shorten the route from the east to the west (or vice versa) of the extension by a distance of one kilometre. Tis pass will be of use to Otter and to seals (in the latter case at least in the periods outside low tide). Residual impact not significant.

SUMMARY POINTS

- Monthly seal haul-out surveys were carried out between May 2011 and April 2012. While the Common Seal population of inner Galway Bay may be between 290-320 individuals and approximately 50 Harbour Seal were recorded in the development site study area during an exceptional sprat run over winter 2010-2011, vantage point watches for birds and cetaceans at the site have shown that the usual number of seals using the study area (which encompasses the site of the proposed development) is in the range of from 0 to 5.

- Otter were recorded within the development site study area on five occasions during surveys dating from 2011 to the present. No holting have been found in the immediate vicinity of the site of the proposed development.

- All indications from visual surveys in the area (i.e. cetacean surveys, bird surveys and marine mammal observer watches) are that the site of the proposed development is not heavily used by cetaceans (although porpoises and dolphins are present in the area). Behavioural disturbance is possible for cetaceans during blasting, dredging, pile driving and other construction operations within one kilometre of the works. The potential for permanent threshold shift (PTS) hearing damage will be limited to within 16-19 metres of work site and measures will be in place to halt works if they are seen close to same by marine mammal observers.

- A dusk and dawn bat survey at the site of the proposed development in June 2011 recorded minimal bat activity and the available habitat adjacent to the site of the proposed development is not optimal for bat usage.

- Bird surveys of either three or eight hours durations have been carried out at the site of the proposed development on 40 dates in the periods from March 2011 to March 2012, October 2012 to March 2013 and March 2014 to December 2014. This has totalled 260 hours of watches. Survey work has also been carried out at comparison sites at Traught and Barna. Fourteen 14 of the 20 SCI species of the Inner Galway Bay SPA, namely Light-bellied Brent Goose, Wigeon, Red-breasted Merganser, Great Northern Diver, Cormorant, Grey Heron, Ringed Plover, Curlew, Redshank, Turnstone, Black-headed Gull, Common Gull, Sandwich Tern and Common Tern, have been recorded within the development site study area (in the case of Ringed Plover a single bird on one occasion). The remaining six SCI species (Teal, Shoveler, Bar-tailed Godwit, Golden Plover, Lapwing, and Dunlin) have never been recorded within the development site and it is considered that the habitat conditions are unsuitable for these species. Three species (Ringed Plover, Bar-tailed Godwit and Dunlin) have been recorded in adjacent areas, but only occurred irregularly and in small numbers, so any potential disturbance impacts are not considered likely to be significant.

Appendix

The areas and positions of Natura 2000 Annex I terrestrial shoreline habitats within the zone of potential influence are shown in the table below.

Habitat Type	Location and Area	Natura Habitat Link
Saltmarsh (CM1/CM2)	9.4 ha by Lough Atalia (E130970 N225220)	Atlantic salt meadows (Natura 2000 Code 1330)' and 'Mediterranean salt meadows (Natura 2000 Code 1410)'
	Small patches over shingle at the western edge of Renmore Beach (E130930 224800)	Atlantic salt meadows (Natura 2000 Code 1330)
	Small area at (E131300 N224650)	Atlantic salt meadows (Natura 2000 Code 1330)
	Small areas surrounding Renmore Lough (E131070 N224910)	Atlantic salt meadows (Natura 2000 Code 1330)
Shingle and gravel banks (CB1)	Shingle/cobble bank at top of Renmore Beach (E131070 N224790)	Perennial vegetation of stony banks (Natura 2000 Code 1220)
Shingle and gravel shores (LS1)	Thin strip at strandline at Renmore Beach (E131010 N224810)	Annual vegetation of drift lines (Natura 2000 Code 1210)

Seal haul-out surveys, 2011-2012

Site	19.05.2011	16.06.2011	14.07.2011	12.08.2011	27.09.2011	14.10.2011
Deer Island	0	0	33 (6) Common	26 Common, 1 Grey	3 Common	8 Common
Kinvara Bay/Tarrea Pier area	27 Common	20 Common	63 (17) Common	87 Common, 3 Grey	71 Common, 3 Grey	43 Common
Tawin	55 Common	50 Common	11 Common	3 Common	4 Common	12 Common
St.Brendan's Island/Earl's Rock	0	0	5 Common	0	0	0
Skerry nr. Rinville	0	0	0	0	0	0
Oranmore Bay	40 Common	23 Common	46 (8) Common	53 Common	45 Common	50 Common
Rabbit Island	0	0	0	0	0	4 Common
Hare Island	0	0	0	0	0	0
Point 900 m E Rinmore Point	0	0	0	0	0	0
Lough Atalia	0	0	0	0	0	0
Claddagh Beach, South Park	0	0	0	0	0	0
Total	122 Common	93 Common	158 Common (31)	169 Common, 4 Grey	123 Common, 3 Grey	117 Common

Numbers in brackets refer to pups.

Site	30.11.2011	12.12.2011	10.01.2012	09.02.2012	08.03.2012	06.04.2012
Deer Island	1 Common	0	0	0	0	0
Kinvara Bay/Tarrea Pier area	0	2 Common	3 Common	0	0	1 Common, 6 Grey
Tawin	59 Common	18 Common	23 Common	23 Common	26 Common	58 Common
St.Brendan's Island/Earl's Rock	0	0	1 Common	1 Common	0	0
Skerry nr. Rinville	0	0	0	0	0	0
Oranmore Bay	66 Common	11 Common	15 Common	10 Common	13 Common	3 Common
Rabbit Island	0	0	0	0	0	13 Common
Hare Island	0	0	0	0	0	1 Common
Point 900 m E Rinmore Point	0	0	0	0	0	2 Common
Lough Atalia	0	0	0	0	0	2 Common
Claddagh Beach, South Park	0	0	0	0	0	0
Total	126 Common	31 Common	42 Common	34 Common	39 Common	80 Common, 6 Grey

Seals recorded during on-site bird surveys, 2011-2014

Species	31-Mar-11	17-Apr-11	17-May-11	15-Jun-11	11-Jul-11
Common Seal	1	5	1	0	1
Grey Seal	0	0	0	0	0
Common hauled out at Renmore Barracks Point	0	5	0	0	0
Common hauled out at Rabbit Island	0	5	1	0	0

Species	11-Aug-11	26-Sep-11	12-Oct-11	11-Nov-11	03-Dec-11
Common Seal	0	0	0	0	0
Grey Seal	0	0	0	0	0
Common hauled out at Renmore Barracks Point	0	0	0	1	0
Common hauled out at Rabbit Island	0	0	4	0	0

Species	29-Dec-11	01-Jan-12	13-Jan-12	20-Jan-12	05-Feb-12
Common Seal	1	0	1	1	1
Grey Seal	0	0	0	0	0
Common hauled out at Renmore Barracks Point	0	0	1	0	0
Common hauled out at Rabbit Island	0	0	0	0	0

Species	28-Feb-12	06-Mar-12	25-Mar-12
Common Seal	1	1	0
Grey Seal	0	0	0
Common hauled out at Renmore Barracks Point	0	0	0
Common hauled out at Rabbit Island	0	0	2

Species	10 Oct 2012	30 Oct 2012	16 Nov 2012	27 Nov 2012	21 Dec 2012
Common Seal	1	3	2	1	1
Grey Seal	1	0	0	0	0
Common hauled out at Renmore Barracks Point	0	1	0	0	0
Common hauled out at Rabbit Island	0	14	2	0	0

Species	27 Dec 2012	22 Jan 2013	02 Feb 2013	22 Feb 2013	25 Feb 2013
Common Seal	2	0	1	1	3
Grey Seal	0	0	0	0	1
Common hauled out at Renmore Barracks Point	3	0	0	0	5
Common hauled out at Rabbit Island	0	0	0	0	13

Species	04 March 2013	14 March 2013
Common Seal	1	2
Grey Seal	0	0
Common hauled out at Renmore Barracks Point	0	0
Common hauled out at	0	0

Rabbit Island

Species	04 Mar 2014	08 Apr 2014	14 May 2014	14 Jun 2014	17 Jul 2014
Common Seal	**1**	**0**	**1**	**1**	**2***
Grey Seal	**0**	**0**	**0**	**0**	**0**
Common hauled out at Renmore Barracks Point	**3**	**0**	**0**	**0**	**0**
Common hauled out at Rabbit Island	**0**	**0**	**0**	**0**	**0**

* Fighting

Species	27 Aug 2014	27 Sep 2014	19 Oct 2014	27 Nov 2014	30 Dec 2014
Common Seal	**0**	**0**	**5**	**5**	**1**
Grey Seal	**0**	**0**	**0**	**0**	**0**
Common hauled out at Renmore Barracks Point	**0**	**0**	**0**	**0**	**0**
Common hauled out at Rabbit Island	**0**	**3**	**0**	**0**	**0**

Haul Out sites: Rabbit Island M/326/239; Renmore Barracks Point M/313/246

Development site bird surveys March 2011- March 2012

Development site survey details

Date	Start Time	Finish Time	Length	High tide	Low tide	Description
31-Mar-11	15:20	18:20	3 hours	16:50		High tide
17-Apr-11	09:40	12:40	3 hours		11:10	Low tide
17-May-11	10:03	13:03	3 hours		11:33	Low tide
15-Jun-11	09:44	12:44	3 hours		11:14	Low tide
11-Jul-11	13:15	16:15	3 hours	14:45		High tide
11-Aug-11	09:31	12:31	3 hours		11:01	Low tide
26-Sep-11	09:14	12:14	3 hours		10:44	Low tide
12-Oct-11	10:19	13:19	3 hours		11:49	Low tide
11-Nov-11	09:30	13:30	3 hours		10:59	Low tide
03-Dec-11	09:48	12:48	3 hours	11:18		High tide
29-Dec-11	12:30	15:30	3 hours		13:51	Low tide
01-Jan-12	12:30	15:30	3 hours	10:22	16:12	Mid tide, falling
13-Jan-12	09:00	17:00	8 hours	07:39	13:33	Falling after high tide until half tide after low.
20-Jan-12	09:00	17:00	8 hours	14:53	08:26	Just after low through to two hours after high
05-Feb-12	09:00	17:00	8 hours	15:55	09:30	Low tide through to an hour after high
28-Feb-12	10:00	18:00	8 hours	09:00	14:34	One hour after high tide through to half tide after low.
06-Mar-12	09:30	17:30	8 hours	16:09	09:43	Low tide through to an hour and a half after high
25-Mar-12	09:00	17:00	8 hours	07:48	13:23	One hour after high tide through to half tide after low.

Development site survey details

Date	Sea state	Cloud	Wind	Temp	Visibility (km)	Rain
31-Mar-11	2	50%	SW, Beaufort 4	10	3/4	None
17-Apr-11	0/1	30%	SE, Beaufort 1	12	5 +	None
17-May-11	1	100%	SW, Beaufort 2	15	5 +	Occ. Drizzle
15-Jun-11	1/2	95%	W, Beaufort 2/3	17	5 +	None
11-Jul-11	0	100%	Beaufort 0	18	5 +	None
11-Aug-11	1/2	100%	NW, Beaufort 2	17	2	Occ. Drizzle
26-Sep-11	2/3	70%	S, Beaufort 3	10	5 +	None
12-Oct-11	1	75%	WNW, Beaufort 1	15	2	None
11-Nov-11	2	80%	ESE, SE, Beaufort 3/4	8	4/5	None
03-Dec-11	1	50-100%	W, Beaufort 2/3	5	5 +	None
29-Dec-11	2	100%	SW, Beaufort 3/4	5	2/3	Occ. Short squalls
01-Jan-12	1/2	33%	SW, Beaufort 2/3	8	5 +	None
13-Jan-12	1	100%	SE, Beaufort 0/1	10	5+	None
20-Jan-12	1	100%	SW, Beaufort 2	11	3/4	Occ. Drizzle
05-Feb-12	0/1	100%	SW, Beaufort 0/1	7	2/4	Occ. Drizzle
28-Feb-12	1	100%	W, Beaufort 1/2	11	5 +	None
06-Mar-12	1	100%	S, Beaufort 1/2	8	5 +	None
25-Mar-12	0/1	0% (but haze)	Beaufort 0	17	3 +	None

Development site shore counts

Species	31 Mar 2011	17 Apr 2011	17 May 2011	15 Jun 2011	11 Jul 2011
Black-headed Gull	**0**	**0**	**0**	**0**	**0**
Brent Goose	**0**	**6**	**0**	**0**	**0**
Common Gull	**0**	**0**	**0**	**0**	**0**
Cormorant	**0**	**0**	**0**	**0**	**0**
Curlew	**0**	**0**	**0**	**0**	**0**
Grey Heron	**0**	**2**	**2**	**1**	**0**
Herring Gull	**0**	**0**	**3**	**2**	**0**
Redshank	**0**	**0**	**0**	**0**	**0**
Turnstone	**0**	**7**	**0**	**0**	**0**
Wigeon	**0**	**0**	**0**	**0**	**0**
Great Black-backed Gull	0	0	1	0	0
Greenshank	0	0	0	0	0
Iceland Gull	0	0	0	0	0
Little Egret	0	0	0	0	0
Oystercatcher	0	3	0	0	0
Shag	0	0	0	0	0

Development site shore counts

Species	11 Aug 2011	26 Sep 2011	12 Oct 2011	11 Nov 2011	03 Dec2011
Black-headed Gull	**0**	**4**	**1**	**2**	**0**
Brent Goose	**0**	**0**	**0**	**0**	**0**
Common Gull	**0**	**0**	**2**	**0**	**0**
Cormorant	**0**	**0**	**1**	**1**	**0**
Curlew	**1**	**1**	**3**	**1**	**0**
Grey Heron	**1**	**1**	**1**	**2**	**0**
Herring Gull	**4**	**2**	**4**	**2**	**0**
Redshank	**1**	**1**	**1**	**1**	**0**
Turnstone	**0**	**6**	**11**	**5**	**0**
Wigeon	**0**	**0**	**0**	**0**	**0**
Great Black-backed Gull	1	0	0	1	0
Greenshank	0	0	0	0	0
Iceland Gull	0	0	0	0	0
Little Egret	0	0	0	1	0
Oystercatcher	3	7	6	4	0
Shag	0	2	2	1	0

Development site shore counts

Species	29 Dec 2011	01 Jan 2012	13 Jan 2012	20 Jan 2012	05 Feb 2012
Black-headed Gull	**0**	**0**	**2**	**0**	**0**
Brent Goose	**0**	**0**	**4**	**0**	**0**
Common Gull	**1**	**0**	**2**	**0**	**1**
Cormorant	**2**	**0**	**0**	**0**	**0**
Curlew	**1**	**0**	**2**	**0**	**0**
Grey Heron	**1**	**0**	**2**	**1**	**1**
Herring Gull	**1**	**0**	**1**	**0**	**0**
Redshank	**1**	**0**	**1**	**0**	**0**
Turnstone	**1**	**5**	**1**	**6**	**10**
Wigeon	**0**	**0**	**0**	**0**	**0**
Great Black-backed Gull	1	0	2	0	0
Greenshank	1	0	0	0	0
Iceland Gull	0	0	1	0	0
Little Egret	1	0	0	0	0

Oystercatcher	4	2	4	4	3
Shag	0	0	1	0	0

Development site shore counts

Species	28 Feb 2012	06 Mar 2012	25 Mar 2012
Black-headed Gull	**0**	**0**	**0**
Brent Goose	**16**	**1**	**0**
Common Gull	**0**	**0**	**0**
Cormorant	**1**	**0**	**0**
Curlew	**0**	**0**	**0**
Grey Heron	**0**	**1**	**0**
Herring Gull	**2**	**0**	**1**
Redshank	**1**	**0**	**0**
Turnstone	**19**	**16**	**10**
Wigeon	**2**	**2**	**0**
Great Black-backed Gull	1	0	0
Greenshank	0	0	0
Iceland Gull	0	0	0
Little Egret	0	0	0
Oystercatcher	4	3	2
Shag	1	0	0

Development site marine counts

Species	31 Mar 2011	17 Apr 2011	17 May 2011	15 Jun 2011	11 Jul 2011
Black-headed Gull	**1**	**0**	**0**	**0**	**0**
Brent Goose	**0**	**6**	**0**	**0**	**0**
Common Gull	**0**	**2**	**0**	**0**	**0**
Common Tern	**0**	**0**	**0**	**2**	**2**
Cormorant	**2**	**4**	**2**	**1**	**0**
Great Northern Diver	**2**	**4**	**3**	**0**	**0**
Herring Gull	**0**	**8**	**0**	**0**	**1**
Red-breasted Merganser	**0**	**0**	**0**	**0**	**0**
Sandwich Tern	**0**	**13**	**0**	**4**	**2**
Wigeon	**0**	**0**	**0**	**0**	**0**
Common Guillemot	0	0	0	0	0
Forster's Tern	0	1	0	0	0
Gannet	0	0	0	1	0
Great Black-backed Gull	1	2	0	1	1
Great-crested Grebe	1	0	0	0	0
Iceland Gull	0	0	0	0	0
Kittiwake	0	0	0	0	0
Mallard	0	0	0	0	1
Manx Shearwater	0	0	0	13	0
Mute Swan	2	7	0	0	0
Razorbill	0	0	0	0	0
Red-throated Diver	2	0	0	0	0
Shag	1	2	0	0	3

Development site marine counts

Species	11 Aug 2011	26 Sep 2011	12 Oct 2011	11 Nov 2011	03 Dec2011
Black-headed Gull	**1**	**3**	**0**	**0**	**1**
Brent Goose	**0**	**0**	**0**	**0**	**0**
Common Gull	**0**	**1**	**2**	**0**	**0**

Common Tern	**4**	**0**	**0**	**0**	**0**
Cormorant	**2**	**6**	**3**	**1**	**5**
Great Northern Diver	**0**	**1**	**0**	**1**	**8**
Herring Gull	**0**	**0**	**31**	**0**	**6**
Red-breasted Merganser	**0**	**0**	**0**	**0**	**1**
Sandwich Tern	**7**	**0**	**0**	**0**	**0**
Wigeon	**0**	**0**	**0**	**0**	**0**
Common Guillemot	0	0	1	0	2
Forster's Tern	0	0	0	0	0
Gannet	0	1	0	0	0
Great Black-backed Gull	0	1	4	0	1
Great-crested Grebe	0	0	2	0	4
Iceland Gull	0	0	0	0	0
Kittiwake	0	0	0	0	0
Mallard	0	0	0	0	0
Manx Shearwater	0	0	0	0	0
Mute Swan	0	0	2	0	0
Razorbill	0	0	0	0	0
Red-throated Diver	0	0	1	1	1
Shag	0	2	3	1	6

Development site marine counts

Species	29 Dec 2011	01 Jan 2012	13 Jan 2012	20 Jan 2012	05 Feb 2012
Black-headed Gull	**0**	**0**	**0**	**0**	**69**
Brent Goose	**0**	**0**	**0**	**0**	**0**
Common Gull	**0**	**0**	**0**	**0**	**7**
Common Tern	**0**	**0**	**0**	**0**	**0**
Cormorant	**4**	**1**	**1**	**1**	**2**
Great Northern Diver	**2**	**3**	**7**	**4**	**4**
Herring Gull	**9**	**0**	**0**	**0**	**4**
Red-breasted Merganser	**0**	**0**	**0**	**0**	**0**
Sandwich Tern	**0**	**0**	**0**	**0**	**0**
Wigeon	**0**	**0**	**2**	**0**	**0**
Common Guillemot	1	2	0	0	0
Forster's Tern	0	0	0	0	0
Gannet	0	0	0	0	0
Great Black-backed Gull	1	0	0	0	0
Great-crested Grebe	0	0	0	0	8
Iceland Gull	0	0	0	0	1
Kittiwake	0	0	0	0	0
Mallard	0	0	0	0	0
Manx Shearwater	0	0	0	0	0
Mute Swan	0	0	0	0	3
Razorbill	0	0	0	0	0
Red-throated Diver	0	0	0	0	1
Shag	5	1	8	2	4

Development site marine counts

Species	28 Feb 2012	06 Mar 2012	25 Mar 2012
Black-headed Gull	**12**	**0**	**0**
Brent Goose	**5**	**0**	**0**
Common Gull	**0**	**1**	**0**
Common Tern	**0**	**0**	**0**

Cormorant	**2**	**1**	**2**
Great Northern Diver	**2**	**2**	**2**
Herring Gull	**6**	**3**	**10**
Red-breasted Merganser	**3**	**2**	**0**
Sandwich Tern	**2**	**0**	**0**
Wigeon	**12**	**3**	**0**
Common Guillemot	0	0	0
Forster's Tern	0	0	0
Gannet	0	3	0
Great Black-backed Gull	2	0	0
Great-crested Grebe	1	0	5
Iceland Gull	0	1	0
Kittiwake	1	0	0
Mallard	3	0	0
Manx Shearwater	0	0	0
Mute Swan	2	2	0
Razorbill	1	4	4
Red-throated Diver	1	1	0
Shag	6	0	0

Development site bird surveys 2012/2013

Development site survey details, 2012-2013

Date	Start Time	Finish Time	Length	High tide	Low tide	Description
10.10.2012	10:00	18:00	8 hours	13:12	20:19	High tide mid, falling later
30.10.2012	09:00	17:00	8 hours	17:25	10:56	Low tide early; high late
16.11.2012	08:30	16:30	8 hours	18:45	12:12	Low mid, rising later
27.11.2012	09:00	17:00	8 hours	17:45	11:15	Low mid, rising later
21.12.2012	08:00	16:00	8 hours	11:25	17:19	High tide mid, falling later
27.12.2012	08:00	16:00	8 hours	16:46	10:21	Low tide early; nearly high before end
22.01.2013	08:00	16:00	8 hours	14:08	07:41	Low start; high 2 hr before end
02.02.2013	09:00	17:00	8 hours	08:53	14:55	High start; low 2 hr before end
22.02.2013	09:00	17:00	8 hours	15:34	08:59	Low tide start; high tide before end
25.02.2013	09:00	17:00	8 hours	17:22	10:53	Low tide early; nearly full end
04.03.2013	09:00	17:00	8 hours	09:39	15:23	High tide start; Low tide end
14.03.2013	09:00	17:00	8 hours	18:57	12:24	Low tide mid; rising later

Date	Sea state	Cloud	Wind	Temp	Visibility (km)	Rain
10.10.2012	1	100%	E, Beaufort 0-1	11	2 +	None
30.10.2012	1; 2-3	30%	NW, SW later, Beaufort 1-2; 3-4	9	5 +	None
16.11.2012	1-2	100%	SSW, Beaufort 2	9	5 +	Occ. Drizzle
27.11.2012	1	100%	SW, Beaufort 1-2	6	5 +	None
21.12.2012	1-2	100%	SW, later SE; Beaufort 1-2; 2-3	7	5 +	None
27.12.2012	0	25%	SW, Beaufort 0-1	7	2	None
22.01.2013	1	50%	E, Beaufort 1-2	0-3	2 +	None
02.02.2013	0-1	0%	W, Beaufort 1-2	5	5 +	None
22.02.2013	1-2	100%	E, Beaufort 1-2	3	5 +	None
25.02.2013	1	0%	E, Beaufort 1	3	5 +	None
04.03.2013	1	100%	ESE, Beaufort 1	5	3 +	None
14.03.2013	1-2	60-75%	W, Beaufort 1 start; 2/3 end	9	3 +	One short shower

Development site marine counts, 2012-2013

Species	10 Oct 2012	30 Oct 2012	16 Nov 2012	27 Nov 2012	21 Dec 2012
Black-headed Gull	**10 (0)**	**6 (0)**	**10 (0)**	**0**	**15 (0)**
Brent Goose	**17 (0)**	**7 (0)**	**0**	**0**	**0**
Common Gull	**19 (0)**	**0**	**4 (0)**	**10 (10)**	**15 (0)**
Red-breasted Merganser	**1 (0)**	**0**	**4 (0)**	**3 (1)**	**2 (2)**
Cormorant	**7 (5)**	**20 (1)**	**2 (2)**	**1 (1)**	**1 (1)**
Great Northern Diver	**0**	**2 (1)**	**5 (4)**	**2 (2)**	**6 (3)**
Wigeon	**0**	**0**	**0**	**0**	**0**
Great-crested Grebe	1 (1)	0	1 (0)	0	1 (1)
Shag	2 (1)	56 (56)	7 (5)	0	4 (3)
Great Black-backed Gull	2 (2)	1 (0)	1 (0)	0	2 (2)
Herring Gull	1 (0)	4 (0)	12 (0)	0	1 (1)
Mute Swan	6 (0)	0	2 (0)	0	0
Red-throated Diver	0	1 (0)	0	0	0
Razorbill	0	4 (2)	0	0	0
Common Scoter	0	2 (0)	0	0	0
Common Guillemot	0	0	0	0	0
Black Guillemot	0	0	0	0	0

Species	27 Dec 2012	22 Jan 2013	02 Feb 2013	22 Feb 2013	25 Feb 2013
Black-headed Gull	**0**	**1 (1)**	**12 (0)**	**2 (0)**	**22 (15)**
Brent Goose	**0**	**0**	**0**	**0**	**2 (0)**
Common Gull	**10 (0)**	**2 (1)**	**8 (0)**	**0**	**8 (8)**
Red-breasted Merganser	**0**	**2 (0)**	**3 (0)**	**2 (0)**	**1 (0)**
Cormorant	**0**	**2 (1)**	**1 (1)**	**4 (2)**	**2 (0)**
Great Northern Diver	**6 (4)**	**3 (1)**	**9 (4)**	**4 (3)**	**7 (3)**
Wigeon	**0**	**1 (0)**	**0**	**3 (0)**	**4 (0)**
Great-crested Grebe	1 (0)	1 (1)	1 (0)	0	2 (0)
Shag	4 (1)	0	17 (3)	24 (12)	10 (0)
Great Black-backed Gull	0	0	2 (0)	0	3 (3)
Herring Gull	6 (0)	1 (1)	15 (0)	0	19 (12)
Mute Swan	2 (0)	0	4 (0)	1 (0)	2 (0)
Red-throated Diver	0	0	0	0	0
Razorbill	2 (0)	0	0	0	0
Common Scoter	0	0	0	0	0
Common Guillemot	6 (0)	0	0	0	0
Black Guillemot	0	0	0	0	0

Species	04 March 2013	14 March 2013
Black-headed Gull	**10 (0)**	**0**
Brent Goose	**17 (0)**	**0**
Common Gull	**0**	**0**
Red-breasted Merganser	**1 (0)**	**5 (0)**
Cormorant	**23 (2)**	**8 (2)**
Great Northern Diver	**10 (10)**	**8 (4)**
Wigeon	**2 (0)**	**2 (0)**
Great-crested Grebe	3 (0)	0
Shag	19 (19)	12 (2)
Great Black-backed Gull	2 (0)	1 (0)
Herring Gull	7 (1)	3 (0)
Mute Swan	2 (0)	2 (0)
Red-throated Diver	0	1 (0)
Razorbill	0	2 (0)
Common Scoter	0	0
Common Guillemot	0	0
Black Guillemot	0	1 (0)

Development site shore counts, 2012-2013

Species	10 Oct 2012	30 Oct 2012	16 Nov 2012	27 Nov 2012	21 Dec 2012
Black-headed Gull	**0**	**7 (7)**	**1 (0)**	**1 (1)**	**0**
Common Gull	**0**	**1 (0)**	**0**	**0**	**0**
Cormorant	**0**	**6 (0)**	**2 (0)**	**0**	**0**
Grey Heron	**2 (1)**	**2 (1)**	**2 (1)**	**1 (1)**	**1 (0)**
Wigeon	**0**	**0**	**3 (0)**	**0**	**0**
Turnstone	**0**	**1 (1)**	**7 (0)**	**0**	**1 (0)**
Curlew	**0**	**0**	**3 (1)**	**0**	**0**
Redshank	**0**	**1 (1)**	**0**	**0**	**0**
Shag	0	10 (7)	0	1 (1)	1 (0)
Herring Gull	1 (0)	2 (1)	2 (0)	0	1 (0)
Oystercatcher	0	0	5 (1)	0	0
Greenshank	0	1 (1)	0	0	0

Species	27 Dec 2012	22 Jan 2013	02 Feb 2013	22 Feb 2013	25 Feb 2013
Black-headed Gull	**1 (0)**	**0**	**2 (0)**	**0**	**1 (0)**
Common Gull	**1 (0)**	**0**	**2 (0)**	**0**	**1 (0)**
Cormorant	**2 (1)**	**0**	**0**	**0**	**0**
Grey Heron	**2 (2)**	**0**	**2 (0)**	**0**	**1 (1)**
Wigeon	**0**	**0**	**0**	**0**	**0**
Turnstone	**4 (1)**	**0**	**7 (0)**	**5 (5)**	**2 (2)**
Curlew	**0**	**0**	**1 (0)**	**2 (2)**	**2 (0)**
Redshank	**1 (1)**	**0**	**1 (0)**	**0**	**1 (0)**
Shag	2 (1)	0	3 (0)	1 (1)	1 (1)
Herring Gull	0	0	8 (0)	0	2 (2)
Oystercatcher	4 (2)	0	2 (0)	3 (3)	5 (2)
Greenshank	1 (0)	0	0	1 (1)	1 (1)

Species	04 March 2013	14 March 2013
Black-headed Gull	**0**	**0**
Common Gull	**0**	**0**
Cormorant	**0**	**1 (0)**
Grey Heron	**0**	**0**
Wigeon	**2 (0)**	**2 (0)**
Turnstone	**6 (0)**	**1 (0)**
Curlew	**1 (0)**	**2 (0)**
Redshank	**1 (0)**	**1 (0)**
Shag	0	0
Herring Gull	0	2 (0)
Oystercatcher	1 (0)	3 (1)
Greenshank	1 (0)	0

Development site bird surveys 2014

Development site survey details, 2014

Date	Start Time	Finish Time	Length	High tide	Low tide	Description
04-Mar-14	08:00	16:00	8 hours	07:00	12:48	High start, low mid, rising at end.
08-Apr-14	12:00	20:00	8 hours	12:26	19:10	High start, through low, rising at end
14-May-14	08:30	16:30	8 hours	17:52	11:26	Low mid, rising towards end
14-Jun-14	08:45	16:45	8 hours	18:58	12:28	Low mid, rising towards end
17-Jul-14	09:00	17:00	8 hours	09:39	15:25	Rising start, high early, low and then rising at end
27-Aug-14	07:00	15:00	8 hours	07:12	12:43	High start, low mid, rising at end.
27-Sep-14	11:00	19:00	8 hours	19:54	13:25	Falling start, low mid, nearly high by end
19-Oct-14	09:30	17:30	8 hours	15:36	08:42	Rising at start, high after 6 hours, falling at end
27-Nov-14	08:30	16:30	8 hours	08:10	14:06	High at start, low after 5.5 hours, the rising again
30-Dec-14	08:30	16:30	8 hours	12:02	18:04	Rising to high at middle of watch, falling to 1.5 hrs short of low

Date	Sea	Cloud	Wind	Temp	Visibility (km)	Rain
04-Mar-14	1	100%	SW, Beaufort 0-1	9-10	3 +	None
08-Apr-14	2	50%	W, Beaufort 3	6-11	3 +	None
14-May-14	1	100%	W, Beaufort 1	13	5 +	None
14-Jun-14	0-1	100%	SW, Beaufort 0-1	16-20	3 +	None
17-Jul-14	0-1	100%	SE, Beaufort 0-1	17	4-5	Light between 10:00 & 10:30
27-Aug-14	2-3	100%	E, Beaufort 3; then SE 4	16	3-5 +	Some after 14:00
27-Sep-14	2	50-100%	SW, Beaufort 2	18-20	3 +	None
19-Oct-14	2	100%	SW, Beaufort 2	14	3 +	Several showers
27-Nov-14	2-3	75%	SE, Beaufort 2-3	5-10	3 +	None
30-Dec-14	2	25%	S, Beaufort 3; 2-3	6-8	3 +	None

Development site marine counts, 2014

Species	04 Mar 2014	08 Apr 2014	14 May 2014	14 Jun 2014	17 Jul 2014
Black-headed Gull	**15 (0)**	**0**	**0**	**4 (0)**	**10(0)**
Common Gull	**2 (0)**	**0**	**0**	**0**	**0**
Red-breasted Merganser	**11 (3)**	**0**	**0**	**0**	**0**
Wigeon	**3 (0)**	**0**	**0**	**0**	**0**
Cormorant	**1 (0)**	**3 (3)**	**5 (0)**	**2 (0)**	**3(1)**
Great Northern Diver	**10 (6)**	**6 (6)**	**8 (5)**	**1 (1)**	**0**
Sandwich Tern	**0**	**6 (0)**	**6 (4)**	**2 (2)**	**2(0)**
Common Tern	**0**	**0**	**10 (8)**	**14 (2)**	**12(9)**
Shag	17 (6)	5 (4)	0	0	0
Great Black-backed Gull	5 (0)	0	2 (0)	0	3(0)
Herring Gull	33 (0)	4 (0)	5 (0)	1 (0)	0
Kittiwake	0	0	0	0	0
Mute Swan	3 (0)	2 (0)	1 (0)	3 (0)	2(0)
Mallard	0	0	1 (0)	0	0
Scaup	2 (0)	0	0	0	0
Manx Shearwater	0	28 (0)	0	0	0
Razorbill	0	2 (1)	0	0	0
Common Guillemot	1 (0)	4 (4)	1 (1)	0	0
Gannet	0	0	0	0	0

Species	27-Aug-2014	27-Sep-2014	19 Oct 2014	27 Nov 2014	30 Dec 2014
Black-headed Gull	**0**	**0**	**8(0)**	**169(83)**	**0**
Common Gull	**0**	**0**	**0**	**24(12)**	**0**
Red-breasted Merganser	**0**	**0**	**0**	**0**	**0**
Wigeon	**0**	**0**	**0**	**0**	**2(0)**
Cormorant	**2(0)**	**3(2)**	**5(3)**	**52(43)**	**8(3)**
Great Northern Diver	**0**	**0**	**0**	**5(2)**	**2(0)**
Sandwich Tern	**11(5)**	**4(1)**	**0**	**1(0)**	**0**
Common Tern	**10(4)**	**2(0)**	**0**	**0**	**0**
Shag	0	1(0)	0	81(22)	15(13)
Great Black-backed Gull	1(0)	1(0)	0	3(0)	0
Herring Gull	0	10(0)	0	42(30)	0
Kittiwake	0	0	83(50)	0	0
Mute Swan	0	1(0)	3(0)	2(0)	0
Mallard	0	0	0	0	0
Scaup	0	0	0	0	0
Manx Shearwater	0	0	0	0	0
Razorbill	0	0	0	2(0)	0
Common Guillemot	0	0	0	0	0
Gannet	2(0)	0	22(5)	0	0

Development site shore counts, 2014

Species	04 Mar 2014	08 Apr 2014	14 May 2014	14 Jun 2014	17 Jul 2014
Black-headed Gull	**7 (0)**	**0**	**0**	**0**	**0**
Common Gull	**2 (0)**	**0**	**0**	**0**	**0**
Common Tern	**0**	**0**	**1 (0)**	**0**	**0**
Cormorant	**1 (0)**	**0**	**0**	**0**	**0**
Grey Heron	**2 (0)**	**0**	**1 (1)**	**1 (1)**	**1(0)**
Brent Goose	**0**	**2 (0)**	**0**	**0**	**0**
Turnstone	**10 (0)**	**0**	**0**	**0**	**0**
Curlew	**3 (0)**	**0**	**0**	**0**	**0**
Ringed Plover	**0**	**0**	**1 (0)**	**0**	**0**
Redshank	**1 (0)**	**0**	**0**	**0**	**0**
Little Egret	0	0	1 (0)	0	0
Shag	1 (0)	0	0	0	0
Mallard	0	1 (0)	0	0	0
Herring Gull	3 (0)	1 (0)	1 (0)	3 (0)	1(0)
Great Black-backed Gull	0	0	1 (0)	0	0
Oystercatcher	3 (0)	0	0	0	0
Greenshank	1 (0)	0	0	0	0

Species	27-Aug-2014	27-Sep-2014	19 Oct 2014	27 Nov 2014	30 Dec 2014
Black-headed Gull	**4(0)**	**1(0)**	**0**	**17(0)**	**0**
Common Gull	**0**	**0**	**0**	**8(0)**	**0**
Common Tern	**0**	**0**	**0**	**0**	**0**
Cormorant	**0**	**2(0)**	**0**	**1(0)**	**0**
Grey Heron	**1(0)**	**1(0)**	**0**	**2(0)**	**1(0)**
Brent Goose	**0**	**0**	**0**	**0**	**0**
Turnstone	**0**	**3(0)**	**0**	**4(0)**	**0**
Curlew	**1(0)**	**4(0)**	**0**	**1(0)**	**1(0)**
Ringed Plover	**0**	**0**	**0**	**0**	**0**
Redshank	**1(0)**	**2(0)**	**0**	**1(0)**	**1(0)**
Little Egret	0	0	0	1(0)	0
Shag	0	1(0)	0	3(0)	0
Mallard	0	0	0	0	0
Herring Gull	8(0)	29(0)	0	7(0)	0
Great Black-backed Gull	0	1(0)	0	1(0)	0
Oystercatcher	1(0)	5(0)	0	4(0)	0
Greenshank	1(0)	0	0	0	1(0)