Ecological Impact Assessment

Coliemore Harbour Permanent Remedial Works

prepared for ARUP

on behalf of Dun Laoghaire-Rathdown County Council

Scott Cawley, College House, 71 – 73 Rock Road, Blackrock, Co. Dublin, A94 F9X9, Ireland

Tel+353(1)676-9815 Fax +353(1) 676-9816

Document Control

Project Title	Coliemore Harbour Permanent Works		**Project No.**	210016
Document Title	Ecological Impact Assessment		**Status**	Final
Revision	**Issue Date**	**Author**	**Reviewed By**	**Approved By**
D01	21/02/2022	AF/LH	LH/NB	AS
D02	01/03/2022	AF/LH	LH/NB	AS
I01	07/03/2022	AF/LH	LH/NB	AS
I02	23/03/2022	AF/LH	LH/NB	AS
I03	28/03/2022	AF/LH	LH/NB	AS

© Copyright Scott Cawley Limited.

This report has been prepared by Scott Cawley Ltd. for the sole use of our client (the 'Client') and, unless otherwise agreed in writing by Scott Cawley Ltd., no other party may use, make use of or rely on the contents of this report. No liability is accepted by Scott Cawley Ltd. for any use of this report, other than the purpose for which it was prepared.

This report has been prepared by Scott Cawley Ltd. in accordance with the particular instructions and requirements of our agreement with the Client, the project's budgetary and time constraints and in line with best industry standards. The methodology adopted and the sources of information used by Scott Cawley Ltd. in providing its services are outlined in this report. The scope of this report and the services are defined by these circumstances.

Where the conclusions and recommendations contained within this document are based upon information provided by others than Scott Cawley Ltd., no liability is accepted on the validity or accuracy of that information. It is assumed that all relevant information has been provided by those parties from whom it has been requested and that the information is true and accurate. No independent verification of any documentation or information supplied by others has been made.

The conclusions presented in this report represent Scott Cawley Ltd.'s best professional judgement based on review of site conditions observed during the site visit (if applicable) and the relevant information available at the time of writing. Scott Cawley Ltd. has used reasonable skill, care and diligence in compiling this report and no warranty is provided as to the report's accuracy.

Table of Contents

Appendix V

Planning polices/objectives relating to the protection of European sites and water quality

1 Introduction

1 This Ecological Impact Assessment (EcIA) was authored by Alexis FitzGerald and Laura Higgins of Scott Cawley Ltd.

2 It provides an assessment of the potential ecological effects of the proposed development at Coliemore Harbour, Dalkey, Co. Dublin (refer to Figure 1 for location). The proposed development consists of permanent remedial works to reinstate public access to Coliemore Harbour, with a design aim for minimum intrusion. This includes the grouting and infill works, rock anchoring dentition of the voids utilising up to 16 rock anchors and reinstatement of the walkway and parapet as per original. A detailed description of the proposed development is included in Section 2.

3 The purpose of the report is to:

- Establish and evaluate the baseline ecological environment, as relevant to the proposed development
- Identify, describe and assess all potentially significant ecological effects associated with the proposed development
- Set out the mitigation measures required to address any potentially significant ecological effects and ensure compliance with relevant nature conservation legislation
- Provide an assessment of the significance of any residual ecological effects
- Identify any appropriate compensation, enhancement or post-construction monitoring requirements.

2 Description of the Proposed Development

4 On 13th August 2020, a localised collapse of the granite stone bedrock supporting the footpath leading to the southern jetty in Coliemore Harbour occurred. A large section of granite bedrock beneath the footpath sheared off and fell into the harbour. This led to the closure of access to the southern jetty and restricted access to the harbour due to concerns around the integrity of the bedrock. A temporary gangway was installed to allow public access to the Coliemore jetty for the 2021 summer season.

5 The proposed development involves permanent works to reinstate public access to Coliemore Harbour, with a design aim for minimum intrusion. This includes the grouting and infill works, rock anchoring dentition of the voids utilising up to 16 rock anchors and reinstatement of the walkway and parapet as per original.

Timing of Works

6 The proposed works will be carried out in the autumn/winter season of 2022. The duration of the works is anticipated to be eight weeks. The core construction working hours for the proposed development will be 8am to 6pm from Monday to Friday, and 8am to 2pm on Saturdays with drilling works carried out within these periods as required, dependent on the suitability of the tides. All rock breaking/fracturing activities and pile driving will be undertaken during daytime hours. The removal of waste material off site by road and regular deliveries to site will be confined to daytime hours, from 10am to 4pm outside of peak traffic hours, where feasible.

Site preparation

7 The temporary walkway will be removed, prior to works commencing. Two granite bollards will be removed from the viewing platform for accessibility. A single lane traffic closure will be required for approximately four hours during this period. The laydown and works area will be secured.

Guniting/Pointing

8 This initial step seals the face of rock mass and masonry wall as much as possible, with the aim of limiting grout or water leaking from the rock mass or masonry wall during the compensation grouting and rock anchoring. A crane will be setup in a lifting position.

9 The crane will lift the man basket into position in front of the rock face, directed by a banksman via 2-way radio communication. The operative will apply mortar to the small joints using a trowel.

10 For larger rock joints where mortar will not be effective to seal, guniting will be used. The operative will be suspended in the man basket with the nozzle pointed in position.

11 Once the nozzle of the hose is directed at the specific joint, the banksman will direct the ground crew on the viewing platform to turn on air compressor and water feed. This will pump the, now liquid, mix into the joint and seal it.

12 The guniting mix is dry until it reaches the discharge point of the nozzle, which minimises the potential for uncontrolled discharge. The discharge will be targeted specifically at rock joint cleavages. Once the joints are sealed, the compensation grouting can commence.

Compensation Grouting

13 This secondary step fills the voids behind the rock face prior to rock anchor installation.

14 Grout injection will be carried out from the existing tarmac walkway via vertical holes drilled using a mini piling rig (Technodrill TD 308).

15 Grouting will be carried out in a bottom-up sequence as follows:

- Stage 1 grouting will be carried out in two rows along the walkway at 2m centres on either side of the walkway and to depth not exceeding 2m.
- Stage 2 grouting will be carried out in similar fashion but a 1 m centres and to depth not exceeding 6m.

16 Where larger voids are found sand filler will be used within the grout and the drill string will be removed and replaced with a 35mm grout lance. Measures will be taken to ensure that grout losses will be curtailed as far as possible to ensure minimal grout can enter the harbour.

Boring to depth

17 The drilling rig is set up over the pin position by positioning the drilling head directly above setup position.

18 The required depth is achieved by means of rotary percussive driving of the drilling head fitted with rock bit (approximately 85 - 110mm). The “returns” are flushed out from the hole via swivel through the drilling head. This process uses air flushing to target depth to avoid spoil contaminating the surrounding environment / harbour water.

19 The pre-prepared hollow stem rods of the correct length and size are inserted into the bore holes. The additional lengths will be added in sections. The final depth will be checked by means of checking rod lengths.

Grouting of pile

20 Grout is pumped through a perforated pipe when drilling is completed, injecting grout at the bottom of the hole to displace any water and to ensure that the tendon is completely encased with grout. The cement grout is mixed in a Putzmeister SP11 mixer and pumped by the pumping operative. Cement bags will be disposed of in a site skip. The grout pump will be bunded with heavy duty polythene to maintain onsite housekeeping.

21 The volume of injected grout per borehole will be recorded and noted on the daily report sheet.

22 If grout is detected to be rising to the top of the borehole, the drill rig operator will immediately direct the grout pump operator to stop pumping, to minimise liquid grout discharged to the surrounding area.

23 The bottom of walkway will be bunded to catch any flowing grout which escapes the top of the bores. Any escaped grout will be scraped up once it sets at the bund and will be disposed of offsite.

24 During compensation grouting, the operative will be in a man basket at the rock face, monitoring the sealed rock joints for escaping grout. If grout leakage is detected, the operative will signal for the pumping to cease immediately, and the joint will be repointed locally to re-seal it.

25 Rods will be withdrawn from position at each location. On completion of all positions, the rock anchor installation can commence.

Installation of Rock Anchors

26 The purpose of this step is to install tie-back anchors which keep the rock mass in place for the design life duration. The access arrangements to the rock face will be via crane and man basket.

27 The contractor will core a hole within the granite rock face to enable the headplate and rock anchor to be recessed flush to the rock face.

28 A cradle-mounted drill will be used to install the inclined anchors. The objective is to bore to depth by means of a rotary percussive drilling head using a compressed air as a flush for the bored materials and then to fill the resultant hole with cementitious grout and reinforcement.

29 The pile diameter is envisaged to be 85-110mm nominal diameter R51N DYWI type hollow stem pile founded with embedment into existing rock.

30 Boring to depth will be carried out as above, except the drill rod will be driven by a cradle-mounted unit rather than drill rig.

31 Grouting of rock anchors will be via standard procedure using natural hydraulic lime mortar mix or a 'prompt' mix which is a fast-setting mix to ensure the repointing works set before high waters. Alternatively, a dry grout/resin capsule bored in with drill rod which is activated during drilling, will be used. The capsule, if used, would further reduce the risk of liquid grout leaking or spilling to the seawater. It will be determined by detailed design if this option can be used. It is likely the standard procedure will be used and is considered the worst-case option in terms of potential for grout leak/spill.

32 Once the headplate is installed, a grey olive metal ring will be welded to the top of the bar.

3 Planning, Policy and Legislation

33 The collation of ecological baseline data and the preparation of this assessment has had regard to the following legislation and policy documents. This is not an exhaustive list but the most relevant legislative and policy basis for the purposes of preparing this EcIA.

34 The following international legislation is relevant to the proposed development:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter, referred to as the 'Habitats Directive'. The Habitats Directive is the legislation under which the Natura 2000 network[1] was established and special areas of conservation (SACs) are

[1] The Natura 2000 network is a European network of important ecological sites, as defined under Article 3 of the Habitats Directive 92/43/EEC, which comprises both special areas of conservation and special protection areas. Special conservation areas are sites hosting the natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of the Habitats Directive, and are established under the Habitats Directive itself. Special protection areas are established under Article 4 of the Birds Directive 2009/147/EC for the protection of endangered species of wild birds. The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats.

In Ireland these sites are designed as *European sites* - defined under the Planning Acts and/or the Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

designated for the protection of natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of that directive.

- Directive 2009/147/EEC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds; hereafter, referred to as the 'Birds Directive'. The Birds Directive is the legislation under which special protection areas are designated for the protection of endangered species of wild birds listed in Annex I of that directive.
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy hereafter, referred to as the 'Water Framework Directive'. The Water Framework Directive' is the legislation requiring the protection and improvement of water quality in all waters (rivers, lakes, groundwater, and transitional coastal waters) with the aim of achieving good ecological status by 2015 or, at the latest, by 2027.

35 The following national legislation is relevant to the proposed development:

- *Wildlife Acts 1976 to 2021*; hereafter collectively referred to as the 'Wildlife Acts'. The Wildlife Acts are the principal pieces of legislation at national level for the protection of wildlife and for the control of activities that may harm wildlife. All bird species, 22 other animal species or groups of species, and 86 species of flora are protected under this legislation.
- *Planning and Development Acts 2000 to 2021*; hereafter collectively referred to as the 'Planning and Development Acts'. This piece of legislation is the basis for Irish planning. Under the legislation, development plans (usually implemented at local authority level) must include mandatory objectives for the conservation of natural heritage and for the conservation of European Sites. It also sets out the requirements in relation to environmental assessment with respect to planning matters, including transposition of the Habitats and Birds Directive into Irish law.
- *European Communities (EC) (Birds and Natural Habitats) Regulations 2011 to 2015*; hereafter the 'Birds and Habitats Regulations'. This legislation transposes the Habitats and Birds Directives into Irish law. It also contains regulations (49 and 50) that deal with invasive species (those included within the Third Schedule of the regulations).
- *European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003)*. This legislation transposes the Water Framework Directive into Irish Law.
- *Flora (Protection) Order, 2015*. This lists species of plant protected under Section 21 of the Wildlife Acts.

36 The following plans and policies are relevant to the proposed development (See Appendix V):

- National Biodiversity Action Plan 2017-2021 (Department of Culture Heritage and the Gaeltacht, 2017)
- Dún Laoghaire-Rathdown County Development Plan 2016-2022 (Dún Laoghaire-Rathdown County Council, 2016)
- Dún Laoghaire-Rathdown Biodiversity Plan 2009-2013 (Dún Laoghaire-Rathdown County Council, 2013)

4 Methodology

4.1 Author Statement

37 This Ecological Impact Assessment (EcIA) was authored by Alexis FitzGerald and Laura Higgins, and was reviewed by Niamh Burke of Coisceim Ecology and Ashling Cronin of Scott Cawley Ltd. The field survey was completed by Eoin Cussen and Shane Brien of Scott Cawley Ltd.

38 Alexis FitzGerald holds an honours degree in Natural Sciences, with a specialisation in Botany, from Trinity College Dublin and obtained a distinction in his Masters in Biodiversity and Conservation from the same

institution. He is an expert at vascular plant, charophyte and bryophyte identification and habitat surveying, developed over more than seven years of intensive study in university, professional ecological surveying and with natural history groups such as the Botanical Society of Britain and Ireland (BSBI) and the Dublin Naturalists' Field Club (DNFC). He also has extensive professional experience with vegetation and habitat classification, mapping and data analysis (including EU Habitats Directive and Fossitt classification and statistical vegetation analysis), as well as rare, protected and invasive plant species surveying and monitoring. He has completed multiple Ecological Impact Assessments, Appropriate Assessment screening reports and Preliminary Ecological Appraisal reports Assessments for residential and infrastructural projects across the country. He also has experience with specialised bat, bird and terrestrial mammal surveys. In a voluntary capacity, he is actively involved with botanical and natural history groups such as the BSBI and the DNFC, organising and leading field outings and indoor teaching seminars. He has also been the BSBI County Recorder for Co. Monaghan since 2015, and the Editor of *Irish Botanical News* since 2021.

39 Laura Higgins is a Senior Ecologist with Scott Cawley Ltd. Laura holds a first class honours degree in Zoology from Trinity College Dublin. Laura has a range of fieldwork experience in Ireland including habitat, invasive species and protected species surveys. She has surveyed a wide range of mammal, bird and invertebrate species in terrestrial and aquatic habitats in Ireland. Laura has a great interest in ecology and is continually improving her professional skills through training courses and volunteer work. Since joining Scott Cawley, her work has included the collection of ecological data, data analysis and preparing Appropriate Assessment reports and Ecological Impact Assessments for residential and infrastructural projects across the country.

40 Niamh Burke is Principal Ecologist with Coiscéim Ecology. She holds a BSc (Hons) in Natural Sciences with Environmental Science and a PhD in salmonid ecology. She is a Chartered Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a Full Member of the CIEEM. Niamh is a senior scientist with academic research and consulting experience in terrestrial ecology, aquatic ecology and fluvial geomorphology. She is an experienced project manager with a full working knowledge of EIA, the planning process and relevant environmental legislation, both national and European. With a specialism in aquatic habitats, she also has experience of terrestrial species' surveys and mitigation approaches. In her extensive consultancy roles she has acted as reviewer for all ecological reporting, ensuring consistency of standards and approach.

41 Andrew Speer is a Technical Director at Scott Cawley Ltd. with over 14 years' professional ecological consultancy experience in ecological impact assessment. Andrew is a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and holds an honours degree in Zoology from NUI Galway, a Postgraduate Diploma in Geographic Information Systems (GIS) from the University of Ulster and an Advanced Diploma in Planning and Environmental Law from Kings Inns. He has extensive experience in the Appropriate Assessment (AA) process and has been the lead author for the preparation of numerous Screening for Appropriate Assessment Reports, Natura Impact Statements (NISs) and Natura Impact Reports (NIRs). Andrew also provides technical review and due diligence of Appropriate Assessment documentation for public and local authorities to aid their decision-making process as well as peer review of AA documentation prior to lodgement of planning applications.

42 Eoin Cussen is a Senior Consultant Ecologist with Scott Cawley Ltd. Eoin holds a BSc (Hons) in Zoology from University College Cork and MSc (Hons) in Ecological Assessment from the same institution. Eoin is an experienced ecologist with over 3.5 years' professional postgraduate experience in ecological consultancy including planning related casework for state and non-governmental organisations within Ireland, input to and preparation of Appropriate Assessment (AA) screenings, Natura Impact Statements, Preliminary Ecological Assessments and Ecological Impact Assessments, and a wide range of experience of ecological surveys for protected habitats and species including otters, bats, birds.

43 Shane Brien is a Consultant Ecologist with Scott Cawley. He holds an honours degree in Environmental Science from NUI Galway and completed his Masters in Ecological Assessment from University College Cork. Shane has professional experience working in Spain and different parts of Ireland for the last five years. His work has included conducting habitat surveys, floral species lists, bird surveys, mammal surveys (e.g. bats, otters, and badgers), and invertebrate surveys. He has a great interest and enthusiasm in

ecology, with a special interest towards botany, and continues to further his skills with training courses and volunteering with various environmental NGOs in Ireland. Since joining Scott Cawley his work has been assisting with senior ecologists on the collection of ecological data, data analysis, desktop work and preparation of Appropriate Assessment reports.

4.2 Scope of the Assessment

44 The study area is defined by the zone of influence of the proposed development with respect to the ecological receptors that could potentially be affected.

45 The Zone of Influence (ZoI), or distance over which potentially significant effects may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken has established the habitats and species present within, and in the vicinity of, the proposed development site. The ZoI and study area was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the proposed development.

46 The ZoI of habitat loss impacts will be confined to within the proposed development boundary.

47 The ZoI of potential impacts on coastal water quality in the receiving environment could extend to Dublin Bay.

48 The ZoI of general construction activities (i.e. risk of spreading/introducing non-native invasive species, dust deposition and disturbance due to increased noise, vibration, human presence and lighting) is not likely to extend more than several hundred metres from the proposed development.

4.3 Desk Study

49 A desk study was undertaken on the 17th February 2022 to collate available information on the local ecological environment. The following resources were used to inform the assessment presented in this report:

- Data on European sites, Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS) from https://www.npws.ie/protected-sites and https://www.npws.ie/maps-and-data – refer to **Appendix I** and

- **Figure *1*** for descriptions and locations of protected sites in the vicinity of the proposed development
- Records of rare and protected species for the 10km grid square(s), as held by the National Biodiversity Data Centre www.biodiversityireland.ie or the NPWS – refer to **Appendix II** for all desk study flora and fauna records
- Spatial information relevant to the planning process including land zoning and planning applications from Department of Housing Planning, Community and Local Government web map portal. Available from https://myplan.ie/
- Ordnance Survey Ireland mapping and aerial photography from http://map.geohive.ie/
- Data on waterbodies, available for download from the Environmental Protection Agency (EPA) web map service. Available from https://gis.epa.ie/EPAMaps/
- Information on soils, geology and hydrogeology in the area available from the Geological Survey Ireland (GSI) online Spatial Resources service. Available from https://www.gsi.ie/en-ie/data-and-maps/Pages/Groundwater.aspx
- Information on the conservation status of birds in Ireland from *Birds of Conservation Concern in Ireland* (Gilbert *et al.,* 2021)
- Information on the location, nature and design of the proposed development supplied by the applicant's design team.
- Appropriate Assessment Screening Report and Natura Impact Statement for the proposed development site, both completed by Scott Cawley.

4.3.1 Consultation

50 In collating ecological data for Coliemore Harbour, Arup engaged with a number of organisations to ensure all available data was accounted for. These organisations included the National Parks and Wildlife Service (NPWS), the Irish Whale and Dolphin Group (IWDG) and Dun Laoghaire Rathdown County Council (DLRCC).

51 The NPWS carried out a survey of Coliemore Harbour in 2015 in which they surveyed the area for Black Guillemot (*Cepphus grille*) – a highly marine bird only found on land during the breeding season in Spring. The findings of this survey concluded that there were approximately 6-7 pairs of Black Guillemot found within Coliemore Harbour, nesting within drainage pipes along the north wall.

52 The IWDG previously surveyed the surrounding area and have confirmed records of harbour porpoises near the entrance of Coliemore Harbour but no records of harbour porpoises inside the harbour. The IWDG advised that it is highly likely that seals enter the harbour considering the nearby designated sites providing the perfect habitats. The IWDG advised to assume occasional usage of the harbour by both seals and harbour porpoises.

53 The DLRCC advised that data from a recently conducted survey indicated that there are otter holts located along the coastline from Harbour Road approximately 1-1.5km North of Coliemore Harbour. Although the otter holts are not located within Coliemore Harbour itself, the harbour is likely to be within the otter foraging range.

4.4 Field Survey

4.4.1 Habitats and Flora Survey

54 A terrestrial habitat survey was undertaken of the proposed development site on the 10th February 2022 by Eoin Cussen and Shane Brien following the methodology described in *Best Practice Guidance for Habitat*

Survey and Mapping[2]. All habitat types were classified using the *Guide to Habitats in Ireland*[3], recording the indicator species and abundance using the DAFOR scale[4] and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of *The National Vegetation Database*[5], having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles*[6] and the British Bryological Society's *Mosses and Liverworts of Britain and Ireland: A Field Guide*[7]. Annex I habitat types were classified after the *Interpretation manual of European Union Habitats EUR28*[8] with reference to the corresponding national habitat survey reports and NPWS wildlife manuals, as applicable. The nomenclature for Annex I habitats follows that of the *Interpretation manual of European Union Habitats EUR28* with abbreviated names after those used in *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview*[9].

55 A marine habitat survey was also undertaken for the intertidal habitats in close proximity to the proposed development site on the 10th February 2021 by Eoin Cussen and Shane Brien following the methodology described in Joint Nature Conservation Committee Marine Habitat Classification (JNCC MHC) of Britain and Ireland[10]. Habitat types were classified as far as possible to biotope level using the Habitat Matrices for the Marine Habitat Classification of Britain and Ireland[11] and the detailed Littoral Rock[12] and Littoral Sediment[13] habitat descriptions of the Marine Habitat Classification of Britain and Ireland, recording indicator species and abundance using the SACFOR scale[14].

4.4.2 Fauna Surveys

4.4.2.1 Terrestrial Mammals (excl. Bats)

56 A terrestrial fauna survey (excluding bats) was undertaken on the 10th February 2022 by Eoin Cussen and Shane Brien. The presence/absence of terrestrial fauna species were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The

[2] Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.

[3] Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

[4] The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant, Abundant, Frequent, Occasional and Rare.

[5] Weekes, L.C. & FitzPatrick, Ú. (2010) The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

[6] Stace, C. (2019) *New Flora of the British Isles*. *4th Edition*. C&M Floristics.

[7] Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. Latimer Trend & Co., Plymouth.

[8] CEC. (Commission of the European Communities) (2013) *Interpretation manual of European Union Habitats EUR28.* European Commission, DG Environment.

[9] NPWS (2019). *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview.* Unpublished NPWS report.

[10] Connor, D.W., Allen, J.H., Golding, N., Howell, K. L., Lieberknecht, L. M., Northen, K. O. & Reker, J. B. (2004) *The Marine Habitat Classification for Britain and Ireland Version* 04.05. JNCC, Peterborough ISBN 1 861 07561 8 (internet version) www.jncc.gov.uk/MarineHabitatClassification.

[11] https://mhc.jncc.gov.uk/media/1023/allhabitatmatrices.pdf

[12] https://mhc.jncc.gov.uk/media/1028/04_05_lrdescriptions.pdf

[13] https://mhc.jncc.gov.uk/media/1029/04_05_lsdescriptions.pdf

[14] https://mhc.jncc.gov.uk/media/1009/sacfor.pdf

habitats on site were assessed for signs of usage by protected/red-listed fauna species, and their potential to support these species.

4.4.2.2 Marine Mammals

57 A watch for marine mammal species was carried out during the multi-disciplinary survey on 10th February. The multi-disciplinary survey was undertaken between the hours of 9:15 and 16:00. Low tide was at 12:30 on this date, meaning that marine mammals were surveyed for during the low tide cycle, covering both mid-tides on either side. Basking locations for seal species were recorded and the suitability of Coliemore Harbour for marine mammal species was assessed.

4.4.2.3 Birds

58 Bird activity within the subject lands was recorded in an ad hoc fashion on 10th February 2022 by Eoin Cussen and Shane Brien. A systematic inspection of the lands was also undertaken to search for birds' nests and holes in masonry that were suitable for nesting birds. The survey was carried out within the wintering bird season and any wintering birds in the vicinity of the proposed development site were recorded.

59 Birds were identified by sight as well as by identification of songs and calls, and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.

4.4.3 Survey Limitations

60 No species-specific fauna surveys (including winter bird, breeding bird, marine mammal, fish or bat surveys) were completed during the field survey. However, these species were recorded on an ad hoc basis during the multidisciplinary survey in February 2022, which also included a survey at low tide to assess the suitability of the lands for breeding birds, wintering birds, marine mammals and to record any signs of terrestrial mammals. This is not considered to be a limitation as the proposed development is a relatively small project to reinstate public access to Coliemore Harbour and has been designed for minimum intrusion. A precautionary approach was taken in instances where survey data was lacking, and appropriate mitigation has been proposed. In addition, an extensive desk study and consultation process was carried out.

61 The habitat survey of the proposed development site was undertaken during winter, outside of the optimal season for recording flora species. However, the terrestrial habitats on site are entirely built land, and so this is not considered to have significantly affected the ability of surveyors to assess the lands for floral diversity. There are no seasonal constraints for intertidal habitat surveys.

62 A large area of intertidal habitat to the south of the proposed development site (see Figure 4) was not directly accessible to the surveyors, and thus this area could not be fully classified down to Biotope level within the Marine Habitat Classification of Britain and Ireland. However, this area was classified as far as possible to Biotope Complex level (Level 4) utilising binoculars and comparing adjacent habitats. This is not considered to be a limitation as it is outside of the proposed development site and the proposed works area.

63 The intertidal marine habitat survey covered only a very limited extent of the surrounding marine habitats, due to poor tidal flux at the time of survey (the low tide was particularly high at 1.3m) and H&S limitations to do with water depth. Despite this, the surrounding habitats are considered to be relatively homogenous and sheltered due to their location within and around the protective walls of a harbour, as well as being sheltered from onshore waves, wind and tidal action by the Dalkey Islands. Despite this limited survey extent it is considered that, due to the relatively minor nature of the onshore works proposed and the limited extent of the physical ZoI, the survey was appropriate in scale.

64 Despite the limitations noted above, sufficient survey data were gathered to fully inform the assessment of impacts, the mitigation measures described in this report and the assessment of residual impacts predicted in relation to the proposed development. Furthermore, a precautionary approach was taken in instances where survey data was lacking, and an extensive desk study was also carried out.

4.5 Ecological Evaluation and Impact Assessment

4.5.1 Ecological Evaluation

65 Ecological receptors (including identified sites of ecological importance) are valued with regard to the ecological valuation examples set out in *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2*[15] and the guidance provided in *Guidelines for Ecological Impact Assessment in the UK and Ireland*[16] – refer to Appendix III for examples of how ecological importance is assigned. In accordance with these guidelines, important ecological features within what is referred to as the Zone of Influence (ZoI) of the proposed development which are "both of sufficient value to be material in decision making and likely to be affected significantly" are deemed to be 'Key Ecological Receptors' (KERs). These are the ecological receptors which may be subject to significant effects from the proposed development, either directly or indirectly. KERs are those biodiversity receptors with an ecological value of local importance (higher value) or greater.

4.5.2 Impact Assessment

66 Ecological impact assessment is conducted following a standard source-pathway-receptor model, where, in order for an impact to be established all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potentially significant effect would not occur.

- Source(s) – e.g. pollutant run-off from proposed works
- Pathway(s) – e.g. groundwater connecting to nearby qualifying wetland habitats
- Receptor(s) – e.g. wetland habitats and the fauna and flora species they support

4.5.2.1 Characterising and Describing the Impacts

67 The parameters considered in characterising and describing the potential impacts of the proposed development are per the EPA's *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*[17] and CIEEM's *Guidelines for Ecological Impact Assessment in the UK and Ireland*: whether the effect is positive, neutral or negative; the significance of the effects; the extent and context of the effect; the probability, duration and frequency of effects; and, cumulative effects.

68 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. The following development types are included in considering cumulative effects:

- Existing projects (under construction or operational)
- Projects which have been granted consent but not yet started
- Projects for which consent has been applied for which are awaiting a decision, including those under appeal
- Projects proposed at a plan level, if relevant (e.g. future strategic infrastructure such as roads or greenways)

[15] NRA (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2. National Roads Authority.

[16] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Chartered Institute of Ecology and Environmental Management, Winchester, UK.

[17] Environmental Protection Agency. (2017) Guidelines on the information to be contained in Environmental Impact Assessment Reports. Draft, August 2017. (refer to Table 3.3)

69 The likelihood of an impact occurring, and the predicted effects, can also be an important consideration in characterising impacts. In some cases it may not be possible to definitively conclude that an impact will not occur. In these cases the evaluation of significant effects is based on the best available scientific evidence but where reasonable doubt still remains then the precautionary principle is applied and it may need to be assumed that significant effects may occur. Professional judgement is used in considering the contribution of all relevant criteria in determining the overall magnitude of an impact.

4.5.2.2 Significant Effects

70 In determining whether potential impacts will result in significant effects, the CIEEM guidelines were followed. The approach considers that significant effects will occur when there are impacts on either:

- the structure and function (or integrity) of defined sites, habitats or ecosystems; or
- the conservation status of habitats and species (including extent, abundance and distribution).

Integrity

71 The term "integrity" may be regarded as the coherence of ecological structure and function, across the entirety of a site that enables it to sustain all of the biodiversity or ecological resources for which it has been valued (NRA, 2009).

72 The term 'integrity' is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. SACs, SPAs or pNHA/NHAs) but can also be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist with a defined ecosystem at a given geographic scale.

73 An impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing or changing the processes that support the sites' habitats and/or species; affect the nature, extent, structure and functioning of component habitats; and/or, affect the population size and viability of component species.

Conservation Status

74 Similar definitions for conservation status given in the EU Habitats Directive 92/43/EEC, in relation to habitats and species, are also used in the CIEEM (2018) and NRA (2009) guidance which are summarised as follows:

- For natural habitats, conservation status means the sum of the influences acting on the natural habitat and its typical species, that may affect its extent, structure and functions as well as its distribution, or the long-term survival of its typical species, at the appropriate geographical scale
- For species, conservation status means the sum of influences acting on the species concerned that may affect the abundance of its populations, as well as its distribution, at the appropriate geographical scale

75 An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status, having regard to the definitions of favourable conservation status provided in the EU Habitats Directive 92/43/EEC – i.e. into the future, the range, area and quality of habitats are likely to be maintained/increased and species populations are likely to be maintained/increased.

76 According to the CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological receptor will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international). In some cases an impact may not be significant at the geographic scale at which the ecological feature has been valued but may be significant at a lower geographical level. For example, a particular impact may not be considered likely to have a negative effect on the overall conservation status of a species which is considered to be internationally important. However, an impact may occur at a local level on this internationally important species. In this case, the impact on an internationally important species is considered to be significant at only a local, rather than an international level.

5 Baseline Ecological Environment

5.1 Designated Sites

5.1.1 European Sites

77 Special Areas of Conservation (SAC) are designated under the EC Habitats Directive (92/43/EEC) for the protection of habitats listed on Annex I and/or species listed on Annex II of the Directive. Special Protection Areas (SPAs) are designated under the Birds Directive (2009/147/EC) for the protection of bird species listed on Annex I of the Directive, regularly occurring populations of migratory species (such as ducks, geese or waders), and areas of international importance for migratory birds.

78 The proposed development does not overlap with any European sites. The nearest European site to the proposed development is Dalkey Islands SPA, c. 93m east. Dalkey Islands SPA is designated for its SCI populations of arctic tern *Sterna paradisaea*, common tern *Sterna hirundo* and roseate tern *Sterna dougallii*. The next nearest European site to the proposed development is Rockabill to Dalkey Island SAC located *c.* 183m east, which is designated for Annex I Reefs and Annex II harbour porpoise *Phocoena phocoena*.

79 The proposed development is also hydrologically connected to European sites in Dublin Bay, including South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA and Ireland's Eye SPA. There is potential that populations of SCI and/or QI species of other European sites use Dublin Bay and its habitats for foraging, commuting and/or roosting, including Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA.

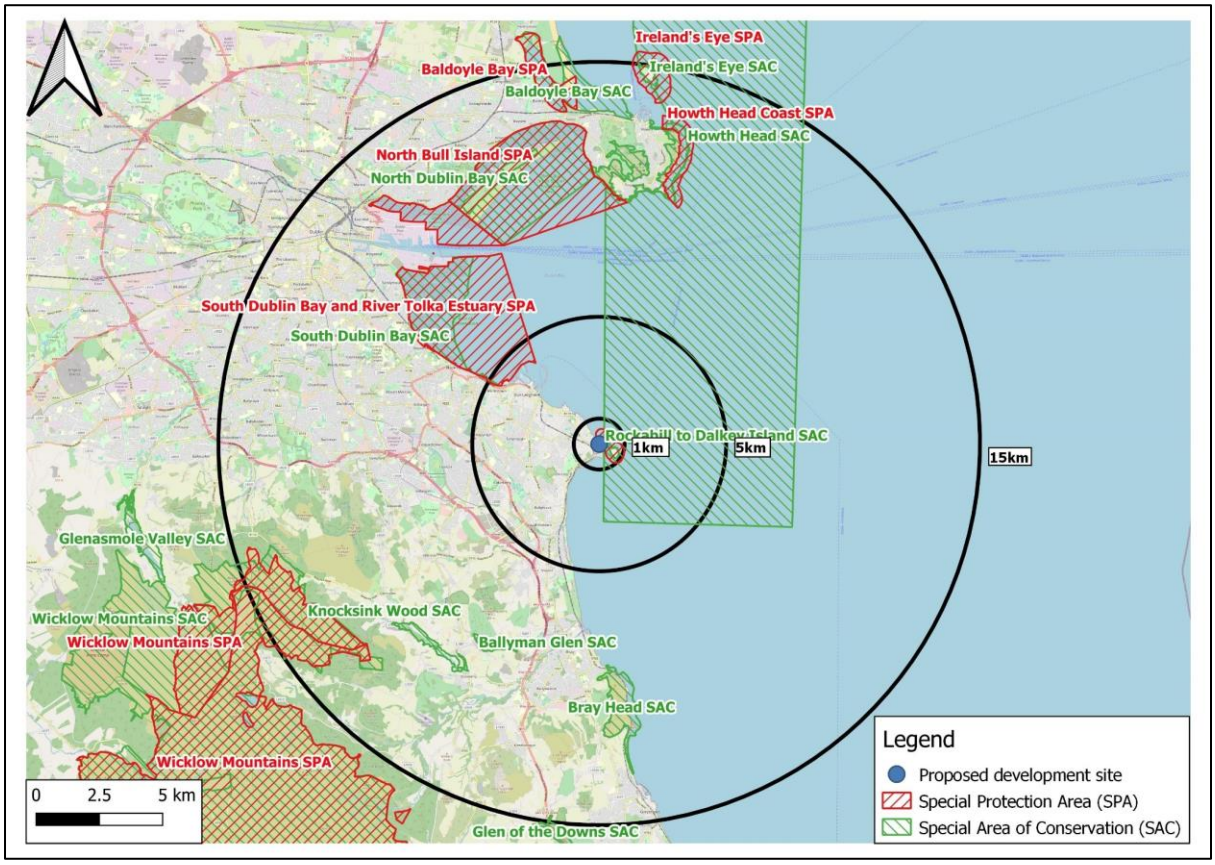
80 Coliemore Harbour and its adjacent coastal waters are likely to be used by QI marine mammal and SCI bird populations associated with European sites. As it is not possible to differentiate the SCI bird population into which each individual bird belongs to, they may belong to any QI marine mammal or SCI bird population of the following European sites which lie within the normal foraging range of these species: Dalkey Islands SPA, Rockabill to Dalkey Island SAC, South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA.

81 Howth Head SAC and Bray Head SAC are both present in the vicinity of the proposed development, however, the QI habitats for which these sites have been designated are terrestrial habitats above the high tide line. Therefore, these European sites have been excluded from consideration going forward.

82 The European sites in the vicinity of the proposed development, their distance from the proposed development and their qualifying interests/special conservation interests are presented in Appendix I.

83 The locations of those SAC and SPA sites relative to the proposed development are illustrated on Figure 1 below.

Figure 1 European sites in the vicinity of the proposed development



5.1.2 Nationally Designated Sites

84 Natural Heritage Areas (NHAs) are designated under the Wildlife Acts to protect habitats, species or geology of national importance. In addition to NHAs there are proposed NHAs (referred to as pNHAs), which are also sites of significance for wildlife and habitats and were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. Proposed NHAs are offered protection in the interim period under county or city development plans which requires that planning authorities give due regard to their protection in planning policies and decisions.

85 Dún Laoghaire-Rathdown County Council includes policies and objectives related to the protection of these pNHAs within the Dún Laoghaire-Rathdown County Development Plan 2016-2022[18]. One such objective, "*Policy LHB19*" on Protection of Natural Heritage and the Environment, states that "*it is Council policy to protect and conserve the environment including, in particular, the natural heritage of the County and to conserve and manage Nationally and Internationally important and EU designated sites - such as Special Protection Areas, candidate Special Areas of Conservation, proposed Natural Heritage Areas and Ramsar sites - as well as non-designated areas of high nature conservation value which serve as 'Stepping Stones' for the purposes of Article 10 of the Habitats Directive*".

86 There are 26 nationally designated sites located within the vicinity of the proposed development and hydrologically connected to the proposed development downstream in Dublin Bay. The proposed development overlaps with the Dalkey Coastal Zone and Killiney Hill pNHA.

[18] Dún Laoghaire-Rathdown County Council (2016). *Dún Laoghaire-Rathdown County Development Plan 2016-2022*. Available online at www.dlrcoco.ie

87 In addition, there are four nationally designated sites, South Dublin Bay pNHA, Booterstown Marsh pNHA, Dolphins, Dublin Docks pNHA and North Dublin Bay pNHA, hydrologically connected to the proposed development.

88 The NHA and pNHA sites in the vicinity of the proposed development, their distance from the proposed development and their qualifying interests/special conservation interests are presented in Appendix I.

89 The locations of those NHA and pNHA sites relative to the proposed development are illustrated on Figure 2 below.

Figure 2 Nationally designated sites in the vicinity of the proposed development

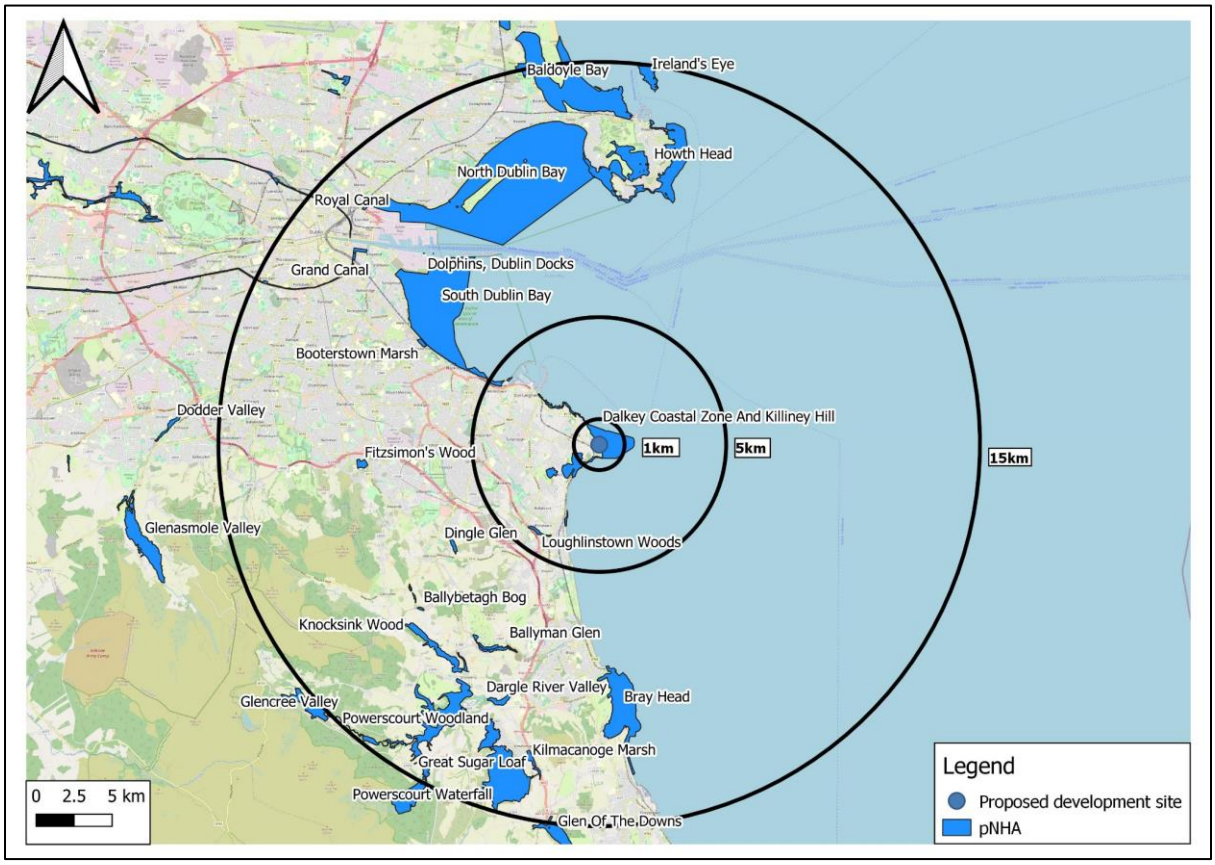
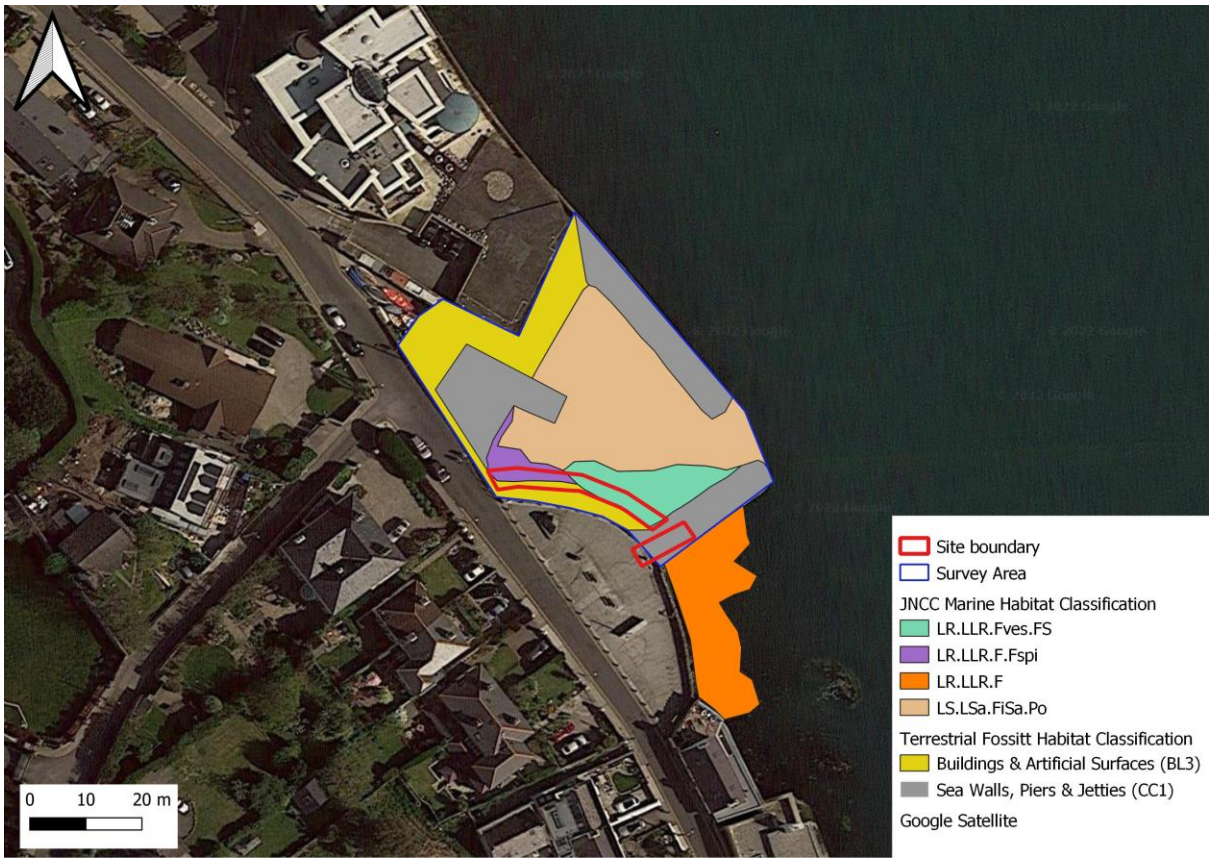


Figure 3 Nationally designated sites overlapping the proposed development site boundary

5.2 Habitats and Flora

90 The proposed development site is located in a coastal setting in Coliemore Harbour, with urban residential areas to the north, west and south, and the Irish Sea to the east. There are no watercourses on site. Terrestrial and intertidal habitat surveys were carried out on the proposed development site and are detailed in the sections below.

Figure 4 Habitat map of proposed development site (Terrestrial habitats classified according to Fossitt, 2000. Marine habitats classified according to the JNCC Marine Habitat Classification)



5.2.1 Terrestrial Habitats

91 The following terrestrial habitat types, assigned using the Heritage Council classification system[Error! Bookmark not defined.], were identified within the proposed development site and are mapped in Figure 4.

- Sea walls, piers and jetties (CC1)
- Buildings and artificial surfaces (BL3)

92 A habitat description for each habitat is provided in full below.

Sea walls, piers and jetties (CC1)

93 Sea walls, piers and jetties (CC1) habitat comprises the majority of the terrestrial habitat in the site boundary itself, as well as occurring north and west of the boundary in the wider survey area of Coliemore Harbour. The sea walls and piers are comprised of a mixture of old and repointed wall and are mostly unvegetated, with the exception of minor moss and lichen cover, and the occasional presence of *Malva arborea, Asplenium trichomanes, Cochlearia danica, Festuca rubra agg.* and *Plantago coronopus*, usually occurring in cracks and holes in the masonry.

94 This habitat type is valued as local importance (lower value) due to its artificial nature and relatively low floral diversity.

Buildings and artificial surfaces (BL3)

95 The remaining terrestrial habitat in the lands is comprised of buildings and artificial surfaces (BL3) (see Figure 4 and This habitat is assessed as being of negligible importance, due to its very low species diversity.

96 **Plate 1 & *1***). This includes sheds associated with the Dalkey Rowing Club and walking paths, etc. Their associated hardstanding areas have been colonised by plants along the wall edges and other more sheltered areas, The species growing here include occasional C*ochlearia danica, Asplenium trichomanes. Asplenium ruta-muraria* and *Soleirolia soleirolii*.

97 This habitat is assessed as being of negligible importance, due to its very low species diversity.

Plate 1 & 1 Sea walls, piers and jetties (CC1) and buildings and artificial surfaces (BL3) habitat found within the survey area

5.2.2 Marine Habitats

98 A number of marine habitats typical of sheltered rocky intertidal shores across Ireland were identified during the marine habitat survey, these included Fucoid dominated bedrock and boulders, Fucoid dominated mixed sediment and areas of barren or Polychaete dominated sandy sediment, each marine habitat is described separately below. Algal species recorded in these areas include *Fuscus spiralis, Fuscus vesiculosis, Pelvetia canaliculata, Ascophyllum nodosum, Polysiphonia sp., Lithophyllum incrustans, Chaetomorpha sp.* and *Laminaria digitata*.

99 None of the recorded intertidal habitats correspond to any Annex I habitat type.

Littoral Rock

100 Littoral rock habitat was recorded in three areas in the vicinity of Coliemore Harbour. The areas of littoral rock within the harbour were surveyed and classified to JNCC MHC Level 5. A mosaic of two littoral rock habitats was recorded in the harbour and is described below (LR.LLR.F.Fspi). A second area of littoral rock was recorded in the harbour (LR.LLR.Fves.FS). The third area of littoral rock habitat identified was present

directly south of the proposed development site, outside of Coliemore Harbour. This area was not fully accessible to surveyors and was therefore classified to JNCC MHC Level 3 (LR.LLR.F).

101 *LR.LLR.F.Fspi – Fucus spiralis* on moderately exposed to very sheltered upper eulittoral rock, dominates the upper eulittoral shore (upper intertidal shore).

102 This habitat is represented as a matrix of both biotopes LR.LLR.F.Fspi.FS (*Fucus spiralis* on full salinity moderately exposed to very sheltered upper eulittoral rock) and LR.LLR.F.Fspi.X (*Fucus spiralis* on full salinity upper eulittoral mixed substrata) (described in Table 1 below) with no clear distinction between the two zones. The habitat is characterised by low energy littoral bedrock and boulders dominated by Abundant *Fuscus spiralis,* with Occasional *Pelvitia canniculata* and *Fuscus vesiculosus,* the winkles *Littorina littorea and Littorina obtusata* were Frequent to Occasional as was the common limpet *Patella vulgata*. The Tubeworm *Spirorbis spirorbis* was also Common on the fronds of the Fucoid algae.

103 *LR.LLR.Fves.FS- Fucus vesiculosus* on full salinity moderately exposed to sheltered mid eulittoral rock, encompasses a small area of mixed sediment including boulders, cobbles and small portions of bedrock.

104 This habitat is located in the lower eulittoral shore (lower intertidal shore) and is characterised by sheltered low energy littoral bedrock and boulders dominated by Abundant *Fuscus vesiculosus* with Frequent *Fuscus spiralis* and occassional *Ascophyllum nodosum*. The winkles *Littorina littorea* and *Littorina obtusata* and the common limpet *Patella vulgate* were Frequent. The Tubeworm *Spirorbis spirorbis* was also Frequent on the fronds of the Fucoid algae. Two individuals of oarweed *Laminaria digitata* were also recorded on the lower extent of this habitat.

105 A large intertidal area to the south of the proposed development site was not directly accessible to the surveyors, and thus this area could not be classified down to JNCC MHC Level 5. However, this area was classified as far as possible utilising binoculars and comparing adjacent habitats. This habitat was dominated by a mix of Fucoid algae on mixed sediment within the mid-eulittoral. This habitat has been classified as LR.LLR.F - Fucoids on sheltered marine shores.

106 These littoral rock habitat types have low species diversity, and are typical of sheltered rocky shores within Ireland, which are abundant in the surrounding landscape, and across Ireland, as such, these habitats are valued as being of local importance (lower value).

Plate 3 Littoral rock habitat found within the survey area

Table 1 Littoral rock classifications recorded in the survey area

Biotope Class	JNCC Marine habitat classification description

Biotype type	
Littoral Rock Habitat type 1- Mosaic of LR.LLR.F.Fspi.FS and LR.LLR.F.Fspi.X	
LR.LLR.F.Fspi.FS	*'Moderately exposed upper eulittoral bedrock characterised by a band of the spiral wrack Fucus spiralis overlying the black lichen Verrucaria maura and the olive green lichen Verrucaria mucosa. Underneath the fronds of F. spiralis is a community consisting of the limpet Patella vulgata, the winkles Littorina saxatilis and Littorina littorea and sparse individuals of the barnacle Semibalanus balanoides while the mussel Mytilus edulis can be found attached in cracks and crevices. A variety of red algae including Hildenbrandia rubra may be present underneath the fronds. During the summer months ephemeral green seaweeds such as Enteromorpha intestinalis can be common.'*
LR.LLR.F.Fspi.X	*'Moderately exposed to sheltered full salinity upper eulittoral mixed substrata characterised by a band of the wrack Fucus spiralis. Occasional clumps of the wrack Pelvetia canaliculata can be overgrowing the black lichen Verrucaria maura and the olive green lichen Verrucaria mucosa. On the more stable boulders underneath the fronds the red crust Hildenbrandia rubra can be found along with the barnacle Semibalanus balanoides and the limpet Patella vulgata. The winkles Littorina littorea and Littorina saxatilis can be found on and among the boulders and cobbles, while amphipods and the crab Carcinus maenas can be present either underneath the boulders or among the brown seaweeds. The green seaweed Enteromorpha intestinalis can occur in some abundance especially during the summer.'*
Littoral Rock Habitat type 2- LR.LLR.F.Fves.FS	
LR.LLR.F.Fves.FS	*'Moderately exposed to sheltered mid eulittoral bedrock and large boulders characterised by a dense canopy of the wrack Fucus vesiculosus (Abundant to Superabundant). Beneath the seaweed canopy the rock surface has a sparse covering of the barnacle Semibalanus balanoides and the limpet Patella vulgata. The mussel Mytilus edulis is confined to pits and crevices. A variety of winkles including Littorina littorea, Littorina saxatilis and the whelk Nucella lapillus are found beneath the seaweeds, whilst Littorina obtusata/mariae graze on the fucoid fronds. The calcareous tube-forming polychaete Spirorbis spirorbis may also occur epiphytically on the fronds. In areas of localised shelter the wrack Ascophyllum nodosum may occur, though never at high abundance. Damp cracks and crevices often contain patches of the red seaweed Mastocarpus stellatus and even the wrack Fucus serratus may be present. The crab Carcinus maenas may be present in pools or among the boulders.'*
Littoral Rock Habitat type 3- LR.LLR.F (inaccessible area to the south classified to Level 3)	
LR.LLR.F	This Biotope Complex is described as *'Dense blankets of fucoid seaweeds dominating sheltered to extremely sheltered rocky shores and/or in locally sheltered patches on exposed to moderately exposed rocky shores. Typically, the wrack Pelvetia canaliculata (Pel) occurs on the upper shore, with the wrack Fucus spiralis (Fspi) below. The middle shore is dominated by vast areas of the wrack Ascophyllum nodosum or the wrack Fucus vesiculosus (Asc, Fves) or a mixture of both. The wrack Fucus serratus covers lower shore bedrock and boulders (Fser). Sheltered to very sheltered mixed substrata (pebbles and cobbles overlying muddy sand and gravel) shores can support fucoid communities (Fspi.X; Fves.X; Asc.X; Fserr.X).'*

Littoral Sediment

107 Intertidal sediment encompasses the majority of the Coliemore Harbour intertidal area, however, it is not present within the proposed development site. This habitat is comprised of littoral medium to fine sands, with shells, stones and sea-glass occasionally present on the surface. No clay or mud particulates were recorded and no anoxic layer was evident within the top 10cm of sand. No evidence of polychaetes or amphipods were recorded, although these are considered likely to be present. This habitat has been classified to biotope level LS.LSa.FiSa.Po - Polychaetes in littoral fine sand.

108 The littoral sediment habitat present within the proposed development site is of low species diversity, and is typical of sheltered sandy shores within Ireland, which are abundant in the surrounding landscape, as such, these habitats are valued as being of local importance (lower value).

Plate 4 Littoral sediment habitat found within the survey area

Table 2 Littoral sediment classifications recorded in the survey area

Biotope Class *Biotype type*	JNCC Marine habitat classification description
LS Habitat type	
LS.LSa.FiSa.Po	This biotope is described as '*Moderately exposed or sheltered beaches of medium and fine, usually clean, sand, though the sediment may on rare occasions contain a small silt and clay fraction. The sediment is relatively stable, remains damp throughout the tidal cycle, and contains little organic matter. It is often rippled and typically lacks an anoxic sub-surface layer. Where an anoxic layer is present, it occurs at a depth below 10 cm and tends to be patchy. The biotope occurs mainly on the lower part of the shore, and relatively frequently on the mid shore. It is only rarely present above mid shore level, except where coastal defences cause backwash onto the upper shore. Conditions are usually fully marine, though the biotope can also occur in open lower estuarine conditions. The infaunal community is dominated by a range of polychaete species such as Nephtys cirrosa, Paraonis fulgens, Spio spp., Pygospio elegans, Ophelia rathkei and Scoloplos armiger. The presence of polychaetes may be seen as coloured burrows running down from the surface of the*

	sediment, and Arenicola marina casts may be present on the sediment surface. The amphipods Bathyporeia spp. and Pontocrates arenarius frequently occur, and nemerteans are often present.'

5.2.3 Rare and Protected Flora

109 The desktop study did not find records for any Annex II flora within *c.* 2km of the proposed development. However, there are records for two protected and/or rare plant species within *c.* 2km of the proposed development site on the National Biodiversity Data Centre (NBDC) database: *Sorbus hibernica* (Vulnerable according to Wyse Jackson *et al.,* 2016) and *Trifolium scabrum* (Near Threatened according to Wyse Jackson *et al.,* 2016). There is potentially suitable habitat for *T. scabrum* within the proposed development site, as this species has been recorded from Dalkey Island as abundant on the old battery wall tops (FitzGerald, 2019). However, these wall tops on Dalkey Island are very old, wide, and largely undisturbed, in contrast to the relatively highly disturbed and often cleaned walltops at Coliemore Harbour, which are frequented by fishermen and other visitors. Additionally, the wall tops at Coliemore Harbour are narrower than those on Dalkey Island, reducing the suitability of this habitat for *T. scabrum. S. hibernica* has very low potential to occur within the site, as a large proportion of the site is either hardstanding or marine in nature. In addition, based on the species composition present, the habitat is only suitable for species which are salt-tolerant to some degree, due to salt spray from the adjacent sea, therefore making it unsuitable for a tree species such as *S. hibernica* to grow in.

110 The field survey undertaken in 2022 at the proposed development site did not record any rare and/or protected flora within Coliemore Harbour. Considering the habitats found within the proposed development site, there is no suitable habitat for the rare and/or protected flora listed above.

5.2.4 Non-native Invasive Flora

111 With regards to records for non-native invasive species within *c.* 2km of the proposed development, the NBDC database search returned records for the following non-native invasive species:

- Three cornered garlic *Allium triquetrum,*
- Hottentot fig *Carpobrotus edulis,*
- Giant hogweed *Heracleum mantegazzianum,*
- Japanese wireweed *Sargassum muticum*,

112 All of these species are listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations, 2011* (as amended).

113 No non-native invasive flora listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended)* were recorded within the proposed development site during the survey in 2022. An undesirable non-native species *Soleirolia soleirolii* was identified within the lands. This species is not listed on the Third Schedule but can be invasive in some situations.

5.3 Fauna

5.3.1 Terrestrial Mammals (Excluding Otter and Bats)

114 The NBDC data search returned records for badger *Meles meles*, Irish hare *Lepus timidus subsp. hibernicus*, pygmy shrew *Sorex minutus* and red squirrel *Sciurus vulgaris* within c. 2km of the proposed development site. These species, and their breeding and resting places, are protected under the Wildlife Acts, and they are all listed as "least concern" in the *Ireland Red List No. 12: Terrestrial Mammals* due to their stable Irish

populations (Marnell et al., 2019). The local terrestrial mammal populations are assessed as being of local importance (higher value).

115 The proposed development site does not contain grasslands, hedgerows, woodlands or any other habitat that would support terrestrial mammals such as those returned from the NBDC database search. No signs of terrestrial mammal activity, such as droppings, resting places or hair, were identified within the proposed development site during the survey in 2022. Considering the above, the proposed development site is considered unsuitable for terrestrial mammals and is of negligible value to them, and therefore they are not considered to be key ecological receptors, provided that there will be no indirect off-site effects.

5.3.2 Otter

116 Otter *Lutra lutra*, and their breeding and resting places, are protected under the Wildlife Acts. Otter are also listed on Annex II and Annex IV of the EU Habitats Directive and are afforded strict protection under the *Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended)*. The NBDC data search returned records for otter within c. 2km of the proposed development. This closest record is from c. 600m south of the proposed development, from 1980.

117 DLRCC have advised that there are recent records of otter holts along the coastline from Harbour Road, approximately 1-1.5km north of Coliemore Harbour. Although the otter holts are not located within the harbour itself, Coliemore Harbour is likely to be within the foraging range of these otter. No evidence of otter was recorded within the proposed development site during the field survey undertaken in 2022. The sea walls, piers and jetties (CC1) habitat represents suitable commuting and foraging during night time, when there is potential for less disturbance.

118 There is no there suitable habitat for otters to build holts within the proposed development site. Cracks in the walls of Coliemore Harbour are too small for otter holts, and the gap in the southern wall where the granite was sheared off was inspected and deemed to not be suitable. However, Coliemore Harbour and the nearby rocky shores and coastal waters of the Irish Sea in the immediate vicinity of the proposed development provide suitable habitat for foraging and commuting otter. Otters are regularly encountered along the County Dublin coast, as shown by the Dublin City Otter Survey[19] and by the records on the NBDC database. The nearest SAC designated for otter is the Wicklow Mountains SAC, c. 12km south-west of the proposed development. Research carried out by Ó Néill *et al.* (2008)[11] on ranging behaviours of otter on river systems in Ireland found that female otter ranges averaged 7.5km while male otter home ranges varied between 7-19km. The proposed development site is located c.20.9km from the Wicklow Mountains SAC when measured along the coastline and river network. Therefore, the proposed development site is located outside of the normal foraging range of otter associated with the SAC population associated with Wicklow Mountains SAC.

119 Considering that there is potential habitat for otter directly adjacent and within the proposed development site (walls, piers and jetties (CC1) habitat), and the species' status under the EU Habitats Directive the local otter populations are considered to be of county importance, as they are unlikely to form a part of any SAC population.

5.3.3 Bats

120 Bats, and their breeding and resting places, are protected under the Wildlife Acts. All bat species are also listed on Annex IV of the EU Habitats Directive (with the lesser horseshoe bat *Rhinolophus hipposideros* also listed on Annex II) and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). All Irish bat species are listed as 'least concern' in the Ireland Red List No. 12: Terrestrial Mammals (Marnell et al., 2019).

[19] Macklin, R., Brazier, B. & Sleeman, P. (2019). *Dublin City otter survey*. Report prepared by Triturus Environmental Ltd. for Dublin City Council as an action of the Dublin City Biodiversity Action Plan 2015- 2020.

121 The NBDC databases hold records for three bat species within c. 2km of the proposed development:

- Leisler's bat *Nyctalus leisleri,*
- Common pipistrelle bat *Pipistrellus pipistrellus,*
- Soprano pipistrelle *Pipistrellus pygmaeus*, and,

122 The habitats in the proposed development site are of negligible suitability for foraging bats due to lack of vegetation that would attract their prey (insects). The proposed development site is not well-connected with higher quality foraging habitats in the vicinity, such as Dillon's Park and Killiney Hill Park located south/south-west of Coliemore Harbour. There are no buildings on the proposed development site that represent suitable roosting habitat for bat species, and the wall which will be repaired as part of the works comes into frequent and regular contact with seawater and therefore is not suitable for roosting bats. Therefore, the proposed development site is considered unsuitable for roosting bats. However, cracks in the pier walls, and boat sheds in the wider Coliemore Harbour area could represent suitable roosting habitat for bats. It is also possible that bats commute and forage in the vicinity of the proposed development site. Bat species likely to be present in the vicinity of the proposed development site include species which are tolerant of artificial lighting such as common pipistrelle, soprano pipistrelle, and Leisler's bat. The local bat populations are considered to be of local importance (higher value).

5.3.4 Marine Mammals

123 Marine mammals occurring in the Irish waters are protected under the Wildlife Acts. All marine mammals frequently occurring in the Irish waters are also listed on Annex IV and/or Annex V or of the EU Habitats Directive (with the bottle-nosed dolphin *Tursiops truncatus*, grey seal *Halichoerus grypus*, harbour porpoise *Phocoena phocoena* and common/harbour seal *Phoca vitulina* also listed on Annex II) and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). All Irish seal species are listed as 'least concern' on the Checklists of protected and threatened species in Ireland (Nelson et al., 2019). Cetaceans have not been evaluated for this Red List assessment.

124 The NBDC database search returned records for four Annex II marine mammal species, bottle-nosed dolphin, harbour seal, grey seal and harbour porpoise within 2km of the proposed development site. As part of the consultation process for the proposed development Arup consulted with the Irish Whale and Dolphin Group (IWDG). The IWDG have previously surveyed the area surrounding Coliemore Harbour and have confirmed records of harbour porpoise near the entrance of the harbour but not within it. The nearest European site designated for harbour porpoise is Rockabill to Dalkey Island SAC, located *c.* 183m east at its closest point, and the nearest European sites designated for the seal species is Lambay Island SAC, located *c*. 23.5km north. Given the nearby sites designated for marine mammals, and the habitats in the vicinity of Coliemore Harbour, the IWDG have advised to assume the occasional usage of the harbour by both seal species and harbour porpoise. Coliemore Harbour is unlikely to be suitable for bottle-nosed dolphin. During the field survey in February 2022 both grey seal and harbour seal were seen utilising rocks on Dalkey Islands as haul out sites.

125 Coliemore Harbour and the adjacent coastline and coastal waters provide for foraging, commuting and resting opportunities for all of these species. Considering there are records of four EU Habitats Directive Annex II-listed marine mammal species (bottle-nosed dolphin, grey seal, harbour porpoise, harbour seal) using Coliemore Harbour and/or the Dublin Bay for foraging and/or commuting, the local populations of QI species of Rockabill to Dalkey Island SAC (harbour porpoise) and Lambay Island SAC (harbour seal and grey seal) are valued to be of international importance, whereas the remaining marine mammals, which do not have a European site designated in the vicinity or which are not QI species of European sites, are valued to be of county importance.

5.3.5 Birds

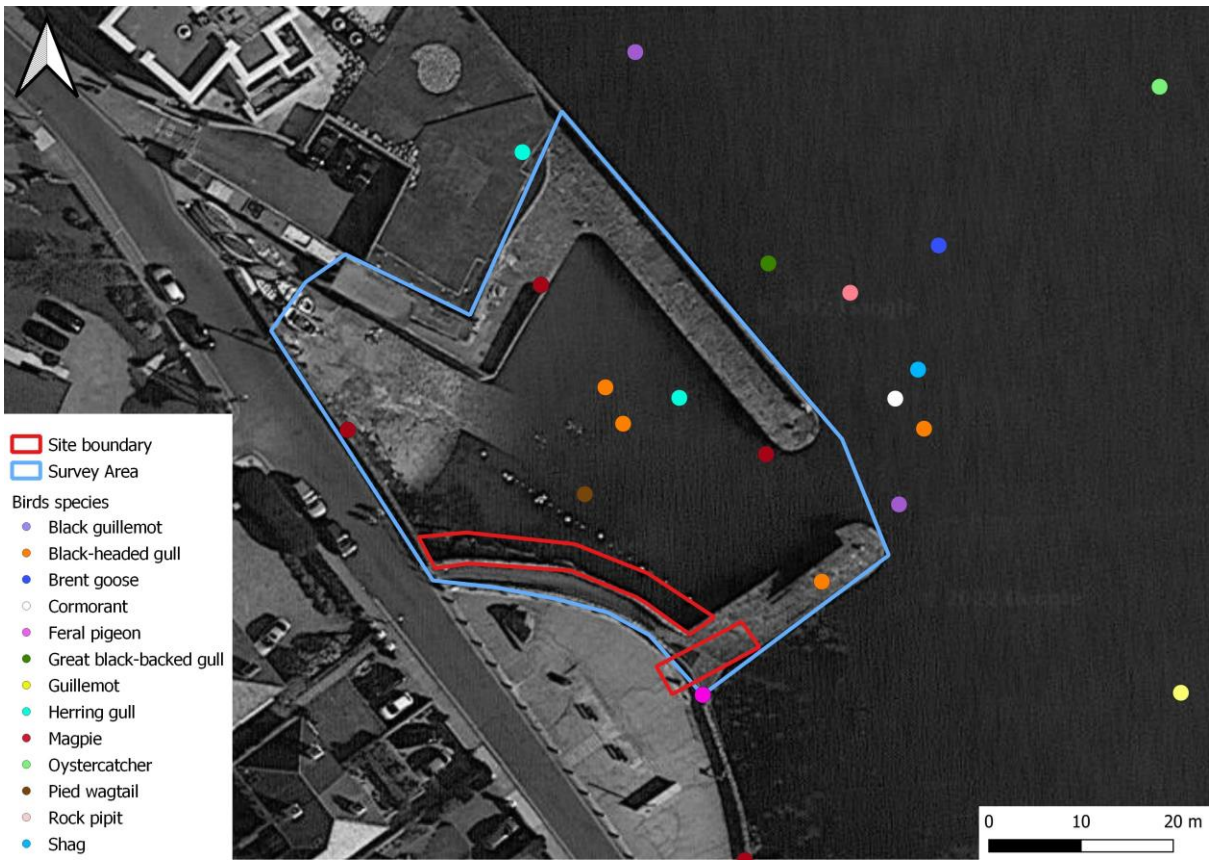
126 All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the EU Birds Directive. The NBDC database holds records for 99 bird species which have

been recorded within c. 2km of the proposed development site. Of these, eight are considered to be rare vagrant birds that are not usually recorded in Ireland. Of the remaining 91 bird species, 41 are green-listed, 34 are amber-listed and 14 are red-listed[20]. A total of 31 species are SCI species for which European sites are designated, of which 21 are breeding species, 18 are wintering species and eight are breeding and wintering species.

127 Habitats within the proposed development site include man-made habitats and littoral rock. The waters in and around Coliemore Harbour are suitable to support feeding and loafing waterbirds. Additionally, rocky shorelines and sandy habitats in the vicinity of Coliemore Harbour are suitable to support waders. Aquatic and shoreline habitats present in the vicinity of Coliemore Harbour are likely to support a range of SCI waterbird species for which European sites in the vicinity are designated, including gulls, waders, waterfowl and divers. The piers and man-made habitats within Coliemore Harbour represent suitable breeding and foraging habitats for common urban bird species, and there are suitable nesting holes for black guillemot within Coliemore Harbour.

128 Bird species present in the vicinity of the proposed development site and the wider Coliemore Harbour area were recorded during the multi-disciplinary survey in February 2022. The results of this survey are mapped below in Figure 5. Additional to the birds mapped in Figure 5 below, a number of bird species were recorded by surveyors in the vicinity of Dalkey Island, including common guillemot, common gull, kittwake and razorbill.

Figure 5 Map of bird species recorded within the proposed development site



[20] Gilbert, G., Stanbury, A. & Lewis, L. (2021) Birds of Conservation Concern in Ireland 4: 2020-2026. *Irish Birds* 43: 1-22.

Breeding birds

129 Dalkey Islands SPA, located c. 93m to the east of the site, is designated for roseate tern *Sterna dougallii*, common tern *Sterna hirundo* and Arctic tern *Sterna paradisaea*. The Dalkey Islands are important for breeding and staging terns, and there is a well-established colony of common tern and smaller numbers of Arctic tern present. Roseate tern have bred on Dalkey Island in the past (in 2003 and 2004). Dalkey Islands SPA is used by the three tern species as a post-breeding/pre-migration autumn roost area. Nesting tern colonies in Ireland are largely confined to offshore islands where predator populations (such as rats) are actively managed. There is no suitable shingle habitat for nesting terns within Coliemore Harbour or the surrounding area on the mainland. However, the open marine environment adjacent to Coliemore Harbour is likely to support foraging terns during their breeding and pre-migration seasons (May-September). Populations of terns in the vicinity of the proposed development site are considered to be of international importance, due to their status as SCI species of European sites.

Plate 5 View of Dalkey Island from Coliemore Harbour

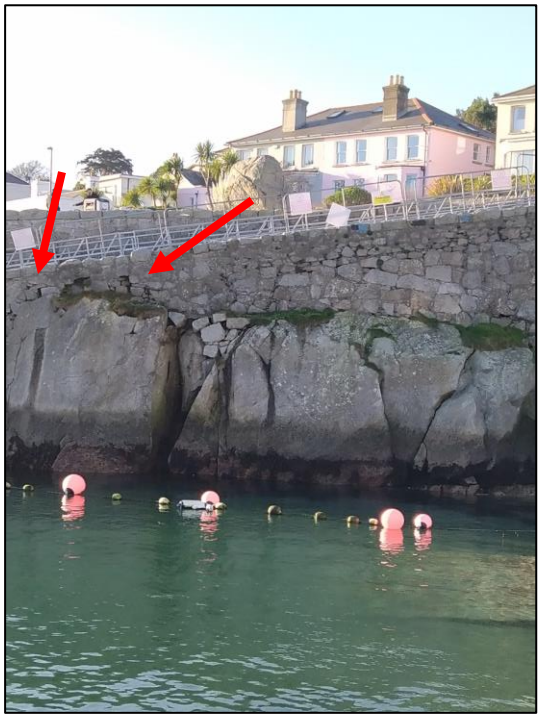
130 Black guillemot, an amber-listed species, are known to breed in the pier walls of Coliemore Harbour. The NPWS carried out a survey of Coliemore Harbour in 2015 in which they surveyed the area for black guillemot, a highly marine bird only found on land during the breeding season. The findings of this survey concluded that there were 6-7 pairs of black guillemot found within Coliemore Harbour, nesting within drainage pipes along the north wall. This would equate to approximately 0.2% of the most recent estimate of the national population[21]. The NPWS recommended that if the gap in the southern wall where the granite rock was sheared off was left for a significant period of time, there would be a risk that black guillemot could use this space for nesting. During the multi-disciplinary survey carried out in February 2022 this wall was inspected to determine the suitability for nesting black guillemot. The location where the granite rock was sheared off was confirmed to be unsuitable for black guillemot due to the large and open nature of the gap. There were some gaps in the southern wall which were considered to be suitable for nesting black guillemot, however, none were noted during the survey and feral pigeons were roosting in these locations. Black guillemot were recorded during the multi-disciplinary survey in the waters around Coliemore Harbour. The population of black guillemot in the vicinity of Coliemore Harbour is considered to be of county importance on a precautionary basis, due to their status as an amber listed species, their specific habitat requirements and because the most recent survey data for Coliemore Harbour is seven years old.

[21] The most recent estimate is 3,917 individuals. This is considered to be a minimum estimate.

Cummins, S., Lauder, C., Lauder, A. & Tierney, T. D. (2019) The Status of Ireland's Breeding Seabirds: Birds Directive Article 12 Reporting 2013 – 2018. Irish Wildlife Manuals, No. 114. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland

131 The proposed development site offers very little breeding habitat for other bird species due to the lack of vegetation such as trees, hedgerows and grassland habitats. Feral pigeons were recorded roosting within the gap in the southern wall where the granite was sheared off and may begin breeding in this location. Despite the overall lack of suitable breeding habitat for birds it is considered, that the marine habitats in the vicinity of the proposed development site offer suitable foraging and loafing habitat for a range of breeding waterbird species such as gulls, auks and divers. Additionally, the man-made habitats within the proposed development site may offer foraging opportunities for urban and coastal bird species such as pied wagtail and rock pipit. SCI breeding waterbird populations in the vicinity of Coliemore Harbour are valued as being of international importance, and all other bird species are valued as being of local importance (higher value).

Plate 6 Holes in sea wall of Coliemore Harbour within the site boundary that could be utilised by black guillemot



Wintering Birds

132 Aquatic and shoreline habitats present in the vicinity of Coliemore Harbour are likely to support a range of wintering waterbird species, including SCI species for which European sites in the vicinity are designated, including gulls, waders, waterfowl and divers. At high tide, Coliemore Harbour represents suitable loafing and foraging habitat for waterbird species and at low tide, shoreline habitats represent suitable foraging habitat for waders. SCI wintering waterbirds for which European sites are designated are generally present between September and March, with peak numbers present in the middle of this season.

133 During the multi-disciplinary survey carried out in February 2022, 13 wintering and early spring migrant bird species, of which seven are SCI species of European sites in the vicinity of the proposed development site, were recorded within or adjacent to Coliemore Harbour (see Figure 5). The SCI species recorded foraging or roosting in the vicinity of the proposed development included:

- black-headed gull *Chroicocephalus ridibundus*,
- cormorant *Phalacrocorax carbo*,

- guillemot *Uria aalge*,
- kittiwake *Rissa tridactyla*,
- oystercatcher *Haematopus ostralegus*,
- razorbill *Alca torda*,
- herring gull *Larus aregentatus,*
- redshank *Tringa totanus.*

134 In addition, non-SCI species such as great black-backed gull Larus marinus were recorded foraging and/or roosting within or adjacent to the proposed development site. Of the species recorded during the survey, seven (black-headed gull, black guillemot, cormorant, guillemot, herring gull, lesser black-backed gull and shag) are amber-listed (i.e. of medium conservation concern) and four species (kittiwake, oystercatcher, razorbill and redshank) are red-listed (i.e. of high conservation concern) due to their declining populations.

135 No light-bellied brent goose were recorded foraging within the harbour or its vicinity, however, one individual was observed flying southwards just east of the survey area. The proposed development site does not comprise of extensive areas of suitable foraging habitat (e.g. open amenity grassland, wetlands, open water) due to the site comprising of hardstanding or rocky areas. The site is situated in a harbour with frequent human disturbance from harbour activities, public and traffic on the adjacent Coliemore Road.

136 Other species recorded included common urban, garden species and coastal species, such as feral pigeon *Columba livia domestica* (no BOCCI classification), magpie, rock pipit and pied wagtail (all green-listed)

137 SCI wintering waterbird populations in the vicinity of Coliemore Harbour are valued as being of international importance, and all other bird species are valued as being of local importance (higher value).

5.3.6 Reptiles and Amphibians

138 The Wildlife Acts provide protection to Ireland's only reptile species, common lizard and two amphibian species, common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris*. These species are listed as "least concern" (Nelson et al., 2019).

139 The NBDC database hold records for common frog, within c. 2km of the subject lands. There are no records for common lizard within c. 2km of the proposed development.

5.3.6.1 Common lizard

140 Common lizard is widespread in Ireland and is found in a variety of habitats[22]. There is no suitable habitat for common lizard within the proposed development site, there is a record of the species within c. 2km of the proposed development. The nearest and most recent record for common lizard is located c. 1.2km south-west of the proposed development in Killiney/Dalkey Hill, from 2018. Common lizard populations are considered to be of local importance (higher value) however, they are not considered to be a key ecological receptor due to lack of suitable habitat, provided that there will be no indirect off-site effects.

5.3.6.2 Amphibians

141 Amphibians require access to aquatic habitats (including ephemeral ponds) to breed. No common frogs or smooth newts were observed in the lands during the surveys. The proposed development site does not contain any freshwater aquatic habitat features and therefore do not contain suitable habitat for breeding amphibians. Local common frog populations are of local importance (higher value), however, they are not

[22] The Herpetological Society of Ireland (2020) *Common Lizard*. Available online at www.thehsi.org Accessed 29th November 2021.

considered to be a key ecological receptor due to lack of suitable habitat, provided that there will be no indirect off-site effects.

5.3.7 Fish

142 There are records of 29 fish species within c. 2km of the proposed development site on the NBDC database. Dublin Bay is known to support populations of various fish species that are currently not considered under the Red-list assessment in Ireland but were returned from the NBDC database search. A full list of these species is not provided as they are not considered to be of conservation concern, nonetheless, the local fish populations in the coastal waters adjacent to Coliemore Harbour and therefore adjacent to the proposed development are considered to be of local ecological importance (higher value) as they support otter, marine mammal and bird populations associated with the harbour.

5.3.7.1 Non-native Invasive Fauna

143 With regards to records for non-native invasive species within c. 2km of the proposed development, the NBDC database search returned records for the following non-native invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended):

- Eastern grey squirrel *Sciurus carolinensis*

144 No non-native invasive fauna listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were recorded within the proposed development site during the surveys in 2022.

5.4 Summary of Ecological Evaluation

145 Table 3 below summarises the ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identifies the Key Ecological Receptors (KERs). Species, habitats and features not qualifying as KERs are not subjected to impact assessment in line with current best practice of assessing the impacts on what are determined to be important ecological or biodiversity features: CIEEM and TII guidelines (CIEEM, 2018 and National Roads Authority, 2009).

Table 3 Summary of the ecological evaluation

Ecological Receptor	Ecological Valuation	KER?
Designated Sites		
Rockabill to Dalkey Island SAC	International	**Yes**
Dalkey Islands SPA	International	**Yes**
South Dublin Bay SAC	International	**Yes**
North Dublin Bay SAC	International	**Yes**
South Dublin Bay and River Tolka Estuary SPA	International	**Yes**
North Bull Island SPA	International	**Yes**
Howth Head Coast SPA	International	**Yes**
Baldoyle Bay SPA	International	**Yes**
Ireland's Eye SPA	International	**Yes**
All other SAC and SPA sites	International	No
Dalkey Coastal Zone and Killiney Hill pNHA	National	**Yes**
Loughlinstown Woods pNHA	National	No
South Dublin Bay pNHA	National	**Yes**

Booterstown Marsh pNHA	National	**Yes**
Dingle Glen pNHA	National	No
North Dublin Bay pNHA	National	**Yes**
Fitzsimon's Wood pNHA	National	No
Dolphins, Dublin Docks pNHA	National	**Yes**
Howth Head pNHA	National	**Yes**
Ballybetagh Bog pNHA	National	No
Ballyman Glen pNHA	National	No
Bray Head pNHA	National	No
Grand Canal pNHA	National	No
Knocksink Wood pNHA	National	No
Dargle River Valley pNHA	National	No
Royal Canal pNHA	National	No
Powerscourt Woodland pNHA	National	No
Baldoyle Bay pNHA	National	No
Ireland's Eye pNHA	National	No
Kilmacanoge Marsh pNHA	National	No
Dodder Valley pNHA	National	No
Sluice River Marsh pNHA	National	No
Glencree Valley pNHA	National	No
Glen of the Downs pNHA	National	No
Powerscourt Waterfall pNHA	National	No
Feltrim Hill pNHA	National	No
Glenasmole Valley pNHA	National	No
Liffey Valley pNHA	National	No
Lambay Island pNHA	National	**Yes**
All other NHA or pNHA sites	National	No
Habitats		
Sea walls, piers and jetties (CC1)	Local importance (lower value)	No
Buildings and artificial surfaces (BL3)	Local importance (lower value)	No
Littoral rock intertidal habitats (LR.LLR.F.Fspi.FS, LR.LLR.F.Fspi.X, LR.LLR.F.Fves.FS, and LR.LLR.F)	Local importance (lower value)	No
Littoral sand intertidal habitat (LS.LSa.FiSa.Po)	Local importance (lower value)	No
Fauna Species		
Terrestrial mammals (excl. otter and bats)	Local importance (higher value)	No
Otter	County importance	**Yes**

Bats	Local importance (higher value)	**Yes**
Harbour porpoise (QI of Rockabill to Dalkey Island SAC	International	**Yes**
Harbour and grey seal (QIs of Lambay Island SAC)	International	**Yes**
Other marine mammals	County importance	**Yes**
Breeding birds (SCI species)	International importance	**Yes**
Breeding birds (non-SCI species)	Local importance (higher value)	**Yes**
Wintering birds (SCI species)	International importance	**Yes**
Wintering birds (non-SCI species)	Local importance (higher value)	**Yes**
Common lizard	Local importance (higher value)	No
Amphibians	Local importance (higher value)	No
Fish	Local importance (higher value)	**Yes**

6 Assessment of Effects and Mitigation Measures

6.1 European Sites

6.1.1 Potential Impacts

146 This section describes and assesses the potential for the proposed development to result in likely significant effects on European sites that lie within the ZoI of the proposed development. In the context of European sites this is focussed on the habitats and species for which the sites are selected (QIs for cSACs and SCIs for SPAs) and the conservation objectives supporting their conservation status in each site. This assessment is directly related to the assessment methodology for European sites required under the Habitats Directive, which is presented separately in the Appropriate Assessment Screening Report (Scott Cawley Ltd 2022a) and Natura Impact Statement (Scott Cawley 2022b) for the proposed development that accompanies this application.

147 The assessment presented in Section 3.3 of the Appropriate Assessment Screening Report concluded that the potential impacts associated with the proposed development has the potential to affect the receiving environment and, consequently, have the potential to affect the conservation objectives supporting the qualifying interests or special conservation interests European sites; either alone or in combination with any other plans or projects.

148 The assessment considered potential impacts arising from ex situ habitat loss and fragmentation on Dalkey Islands SPA, Rockabill to Dalkey Island SAC, South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA. This is because QI marine mammal and SCI bird species for which these sites are designated would be vulnerable to habitat loss and fragmentation. However, the loss of intertidal littoral rock habitat is negligible in size and the loss will be temporary until the rocky shore communities re-establish in 2-10 years. Machinery associated with the construction phase of the proposed development may result in temporary loss of suitable high tide loafing habitat for SCI species associated with nearby European sites. However, given that there are extensive areas of suitable alternative foraging and loafing habitats in the vicinity of the proposed development, the loss of this habitat is negligible in size and the loss will be temporary until the works are complete. The duration of works is estimated to be eight weeks. Therefore,

it is considered that habitat loss as a result of the proposed development has no potential to result in any population level effects on the QI/SCI species of any European site.

149 The assessment also considered potential impacts arising from disturbance and displacement during construction of the proposed development. A Construction Noise Calculation report was prepared for the proposed development by Arup. Results of this noise calculation informed the full assessment of noise impacts on QI marine mammal and SCI bird species associated with European sites, as detailed in the NIS accompanying this application. In summary, given that the anticipated noise levels will be a maximum of 97dBA at 10m, and 77dBA at 300m from construction activity, the highest possible noise levels modelled will only occur for short periods at a time (i.e. up to 30 minutes at a time), the works will be completed within eight weeks and the timing of works in the autumn/winter months of 2022, the proposed works have no potential to result in any population level effects on any QI marine mammal or SCI bird species associated with European sites.

6.1.1.1 Dalkey Islands SPA

150 As described in Section 7.1.5 of the NIS, the proposed development has the potential to affect the special conservation interests and conservation objectives, and therefore the integrity, of the Dalkey Islands SPA because of:

- Habitat degradation as a result of hydrological impacts

151 Affecting the integrity of the Dalkey Islands SPA would result in a likely significant effect at the international geographic scale.

6.1.1.2 Rockabill to Dalkey Island SAC

152 As described in Section 7.2.5 of the NIS, the proposed development has the potential to affect the special conservation interests and conservation objectives, and therefore the integrity, of the Rockabill to Dalkey Island SAC because of:

- Habitat degradation as a result of hydrological impacts

153 Affecting the integrity of the Rockabill to Dalkey Island SAC would result in a likely significant effect at the international geographic scale.

6.1.1.3 South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA

154 As described in Section 7.3.5 of the NIS, the proposed development has the potential to affect the special conservation interests and conservation objectives, and therefore the integrity, of the South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA because of:

- Habitat degradation as a result of hydrological impacts

155 Affecting the integrity of South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA would result in a likely significant effect at the international geographic scale.

6.1.2 Mitigation Measures

156 This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential effects of the proposed development on European sites.

157 All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.

Measures to Protect Surface Water Quality during Construction

Environmental Manager

158 An environmental manager will be appointed by the Contractor to ensure that the CEMP is implemented effectively. The environmental manager will be a suitably qualified, competent and experienced professional who will perform the necessary tasks, review environmental procedures and consult with the members of the construction team and stakeholders as required. The environmental manager will be required to have a detailed level of knowledge on all aspects of environmental information associated with the proposed development. The environmental manager will be responsible for:

- Reviewing, updating, maintaining and implementing the CEMP;
- Establishing, implementing, and maintaining the EMS in line with ISO 14001 requirements;
- Ensuring that construction is undertaken in accordance with the relevant environmental requirements and that such compliance is adequately recorded and documented;
- Completing a site inspection and compiling an environmental compliance report on a monthly basis;
- Attending site and stakeholder meetings as required;
- Keeping up to date with relevant environmental best practice and legislative changes;
- Liaising with the relevant staff to prepare method statements and relevant plans for all activities where there is a risk of environmental damage;
- Delivering general environmental awareness training and toolbox talks and provide specific environmental briefings prior to all activities
- Ensuring all personnel have undertaken adequate environmental inductions, and awareness briefings and training (including subcontractors);
- Dealing with environmental complaints; and
- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner.

Training

159 PJ Edwards & Co. Ltd. construction staff and their subcontractors are required to hold the relevant qualifications and experience to construct the project. The Contractor will employ construction staff with the skills, qualifications and experience appropriate to the needs of the works to be carried out.

160 The Contractor will provide a site induction to all construction staff before they commence work on site. The Contractor will identify specific training needs for the construction workforce and will ensure that appropriate training requirements are fulfilled.

161 The Contractor will establish an Environmental Training and Awareness Programme and ensure that all personnel receive adequate training prior to the commencement of construction activities. A baseline level of environmental awareness will be established through the site induction programme. Key environmental considerations and objectives will be incorporated into this induction. Specifically, site inductions will cover the following as a minimum:

- Introduction to the environmental manager;
- Description of the CEMP requirements and consequences of non-compliance;
- The requirement of due diligence and duty of care;
- Overview of the conditions attached to the consents, permits and licences;

- Requirements associated with community engagement and stakeholder liaison;
- Identification of environmental constraints and notable features within the site; and
- Procedures associated with incident notification and reporting, including procedures for dealing with damage to the environment.

162 Nobody will work on site without first receiving the environmental induction. Signed records of environmental training received will be established, maintained and made available to the employer's representative.

163 Site briefings and toolbox talks will be carried out on a regular basis to ensure that construction staff have an adequate level of knowledge of the relevant environmental issues and community relations requirements and can effectively follow the environmental control procedures throughout construction period.

Monitoring and corrective actions

164 Monitoring will be carried out to ensure that construction activities are undertaken correctly. The results of all environmental monitoring activities will be reviewed by the environmental manager on an ongoing basis to enable trends or exceedance of criteria to be identified and corrective actions to be implemented as necessary. The Contractor will be required to inform the employer's representative of any continuous exceedances of criteria.

165 Corrective actions are measures to be implemented to rectify any non-conformances (i.e., exceedance of criteria or targets) identified during monitoring. In the first instance, an investigation will be undertaken by the environmental manager to identify the cause of any non-conformances. Appropriate remedial measures will be identified and implemented as soon as practicable to prevent further exceedances. If necessary, the appropriate statutory authority and stakeholders will be notified. Where new or amended measures are proposed, the CEMP will be updated accordingly by the environmental manager and the employer's representative will be informed at the earliest opportunity.

166 A corrective actions' report will be prepared on foot of any non-conformances identified during environmental monitoring. The corrective actions report will describe in detail the cause and effect of a non-conformance on site and describe the recommended corrective action that is required to remedy it.

167 An appropriate timeline for closing out the corrective actions will be identified by the contractor in the updated CEMP, as well as arrangements for the environmental manager to verify the corrective actions' report and, if appropriate, inform the appropriate authorities and stakeholders in a timely manner.

Environmental Compliance Report

168 The Contractor will be required to submit a monthly environmental compliance report to the employer's representative for review and approval. The report shall address the following as a minimum:

- Summary of compliance with the CEMP including identification of any non-conformances;
- Interpretation of the results of ongoing monitoring;
- Detailed description of any issues and/or non-conformances identified during inspections;
- Record of incidents and corrective actions, including corrective actions reports as appropriate;
- Synopsis of environmental complaints received / queries raised by stakeholders; and
- Records of environmental training undertaken as appropriate.

Grout Management- General

169 Grouting works will be undertaken from a suspended man basket via crane located on the viewing platform. This will facilitate operatives to manually carry out the works on the seaward side. The grouting works will be carefully planned to minimise spillage into the harbour.

170 As the bedrock and harbour wall is exposed during low waters this work can be programmed within suitable tide times. Grouting of rock anchors will be via standard procedure using natural hydraulic lime mortar mix or a 'prompt' mix which is a fast-setting mix to ensure the repointing works set before high waters. It is likely the standard procedure will be used and is considered the worst-case option in terms of potential for grout leak/spill.

171 Alternatively, a dry grout/resin capsule bored in with drill rod which is activated during drilling, will be used. The capsule, if used, would further reduce the risk of liquid grout leaking or spilling to the seawater. It will be determined by detailed design if this option can be used.

172 The volume of injected grout per borehole will be recorded and noted on the daily report sheet. Immediately when grout is detected to be rising to top of borehole, the drill rig operator will direct the grout pump operator to stop pumping, to minimise the liquid grout discharged to the surrounding area. The bottom of the walkway will be bunded to catch any flowing grout which escapes to the top of the bores. Any escaped grout will be scraped from the bund once it sets and will be disposed of offsite to a permitted facility by a licenced contractor.

Grout Management- Guniting/Pointing

173 During the initial pointing step, lime mortar will be used. Prior to pointing, the vegetation at relevant joints will be removed.

174 The mortar mix will be mixed on viewing platform and carried in a bucket into works man basket by operative. The mixing area will be bunded with heavy duty polythene to maintain housekeeping.

175 The lime mortar mix is dry until it reaches the discharge point of the nozzle, which minimises the potential for uncontrolled discharge. The discharge will be targeted specifically at rock joint cleavages.

176 Pumping discharge will not commence until the guniting operative signals that the nozzle directed at the specific required location is in place. Pumping will cease immediately on signal from the guniting operative. This mix does not 'flow' so is not susceptible to large volume spillage. The lower-level works will be carried out at low tide to allow gunite maximum time to set before it comes in contact with seawater.

Grout Management – Compensation Grouting

177 Sand/cement dry mix will be mixed on viewing platform. The mixing area will be bunded with heavy duty polythene to maintain housekeeping.

178 During compensation grouting, operative will be in man basket at rock face, monitoring the sealed rock joints for escaping grout. If grout leakage is detected, operative will direct pump to cease immediately and joint will be repointed locally to re-seal it.

179 Care will be taken to make sure grout egressing from top of the borehole locations is collected and not allowed to enter the harbour. This will be achieved by bunding bottom of walkway to prevent escape of surface runoff grout into harbour. The bunded grout will be allowed to set, then scraped up once in solid form and disposed of offsite by a licenced contractor.

180 If grout is detected to be rising to the top of the borehole, the drill rig operator will immediately direct the grout pump operator to stop pumping, to minimise liquid grout discharged to the surrounding area.

Grout Management – Grouting of Installed Rock Anchors

181 During this step, the contractor will use a natural hydraulic lime mortar mix which will be fast-setting (or potentially grout/resin capsules) to minimise quantity and duration of liquid grouting and risk of escaped liquid. The specific grouting solution will be confirmed in detail design.

Grout Management – Additional Measures to Protect European Sites

182 The following additional procedures will be implemented to protect European sites:

- Fast-setting grout or mortar will be used.

- Bunds will be installed where practical, at bottom of walkway site to contain surface runoff to the seawater.
- A licenced waste collector will remove the accumulated wastewater off site and this will be confirmed by the Contractor to DLRCC with appropriate documentation retained.
- Measures will be put in place on the site compound, such as drip trays, spillkits and lined wastewater skips.

Pollution Control and Spill Protection

183 Fuel/oil spillages can only occur on viewing platform or walkway, based on envisaged logistics. The Contractor will ensure that the following procedures are in place to control and/or prevent spills:

- Emergency response awareness training for all project personnel on-site works.
- Grout machine, pressure washer and any fuel/oils on viewing platform laydown area will be stored in drip trays
- Appropriate and sufficient spill control materials will be installed onsite. Spills kits for immediate use will be kept on viewing platform.
- Spill kits will include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum;
    - Absorbent granules;
    - Absorbent booms; and
    - Absorbent mats/cushions.
- Potentially contaminated run off from plant and machinery on walkway will be contained by bunded area at end of walkway catching surface runoff. This will be disposed of offsite.
- Bunds will be installed where practical, at bottom of walkway site to contain surface runoff to the seawater.
- Damaged or leaking containers will be removed from use and replaced immediately.
- Wastewater will be generated from washing out of pumps each evening after grouting. This will be collected in lined skip onsite and a licenced waste collector will remove the accumulated wastewater off site and this will be confirmed by the Contractor to DLRCC with appropriate documentation retained.
- Empty cement bags will be generated as waste and these will be disposed of in separate 3 cu yd skip which shall be disposed of offsite by licensed waste haulier.

Incident management

184 Should an environmental incident occur on-site PJE will record the event on an Environmental Incident Record. These records will include the following:

- Any malfunction of any environmental protection system,
- Any occurrence with the potential for environmental pollution,
- Any emergency.

185 The Environmental Incident Record will include relevant details associated with the incident and recommend measures which will prevent a similar incident occurring in the future. The effectiveness of the amendments to the procedures and plans will be verified by the environmental site manager. A list of contact details for relevant personnel e.g. DLRCC, the local fire station etc. will be maintained in the site office. Access to the emergency phone list will be made available to all member of staff. The Contractor's staff will be informed of the emergency phone list at the tool box talks.

Good Housekeeping

186 The Contractor will ensure "good housekeeping" at all times. This will include, but not necessarily be limited to, the following:

- General maintenance of working areas and cleanliness of welfare facilities and storage areas;
- Provision of site layout map showing key areas such as first aid posts, spill kits, material and waste storage and welfare facilities;
- Maintaining all plant, material and equipment required to complete the construction work in good order, clean, and tidy;
- Keeping construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. at all times;
- Provision of signs giving details of site management contact numbers, including out of hours, and public information at the boundaries of the working areas;
- Provision of adequate welfare facilities for site personnel;
- Installation of appropriate security, lighting, fencing and hoarding at each working area;
- Effective prevention of oil, grease or other objectionable matter being discharged from any working area;
- Provision of appropriate waste management at each working area and regular collections to be arranged;
- Prevention of infestation from pests or vermin including arrangements for regular disposal of food and material attractive to pests. If infestation occurs the contractor will take appropriate action to eliminate and prevent further occurrence;
- Maintenance of wheel washing facilities and other contaminant measures as required in each working area;
- No discharge of site runoff or water discharge without agreement of the relevant authorities;
- Prohibition of open fires at all times;
- Use of less intrusive noise alarms, which meet the safety requirements, such as broadband reversing warnings, or proximity sensors to reduce the requirement for traditional reversing alarms;
- Maintenance of public rights of way, diversions and entry/ exit areas around working areas for pedestrians and cyclists where practicable;
- All loading and unloading of vehicles will take place off the public highway wherever this is practicable; and
- Material handling will be appropriately located to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.
- Cement bags to be disposed of in site skip and grout pump will be bunded with heavy duty polythene to maintain onsite housekeeping.

6.1.3 Significance of Residual Effects

187 The assessment presented in the NIS, of the potential for the proposed development to impact upon the Dalkey Islands SPA, Rockabill to Dalkey Island SAC, South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA, Ireland's Eye SPA, Malahide Estuary SPA, The Murrough SPA, Lambay Island SAC, Lambay Island SPA and Rogerstown Estuary SPA, concluded that, with the implementation of the mitigation measures proposed,

the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of any of these aforementioned European sites, either alone or in combination with other plans or projects. Therefore, the proposed development is not likely to have significant residual effects on any European sites.

6.2 Nationally Designated Sites

188 In the case of NHAs and pNHAs the assessment considers whether the integrity[23] of any such site would be affected by the proposed development with reference to the ecological features for which the site is designated, or is proposed.

189 The potential effects on European sites as described above in Section 6.1 may also negatively affect the pNHA and NHA sites located within the boundaries of these European sites and designated for similar reasons i.e. Dalkey Coastal Zone and Killiney Hill pNHA, South Dublin Bay pNHA, Booterstown Marsh pNHA, North Dublin Bay pNHA, Dolphins, Dublin Docks pNHA, Howth Head pNHA and Lambay Island pNHA. These potential impacts are summarised below in Section 6.2.1, in the context of national sites.

190 The proposed development also has the potential to affect biodiversity in a broader sense than just the QIs/SCIs of those European sites. With the exception of habitat loss impacts associated with Dalkey Coastal Zone and Killiney Hill pNHA, where biodiversity receptors in these pNHAs do not form part of the QIs/SCIs in the NIS assessment, they are considered under the other individual impact assessment headings for each KER below.

191 The boundary of the Dalkey Coastal Zone and Killiney Hill pNHA overlaps with the proposed development site (see Figure 3). This pNHA is designated for its coastal system with habitats ranging from sub-littoral to coastal heath. The Dalkey Sound is the area between Dalkey Island and the mainland, and is noteworthy for the occurrence of west and south coast invertebrates, and rare European invertebrate species. The flora of this pNHA is well developed and includes some scarce species. The Dalkey islands are important breeding sites for a range of bird species including shelduck, oystercatcher, mallard, rock pipits herring gull, great black-backed gull and lesser black-backed gull. It is also an important summer breeding, and autumn roosting site for tern species. In autumn and winter Dalkey Island is an evening roosting site for a range of wintering bird species including cormorant, shag, curlew, large gulls, turnstone and purple sandpiper. This pNHA also includes the Killiney Hill area and coastal cliffs that provide breeding habitat for bird species. This pNHA also has geological importance.

6.2.1 Potential Impacts

192 This section describes and assesses the potential for the proposed development to result in likely significant effects on nationally designated sites that lie within the ZoI of the proposed development. Cumulative effects are generally considered as part of the assessment of residual effects.

193 Marine mammals and waterbird species associated with the pNHAs within the ZoI of the proposed development would be vulnerable to habitat loss and fragmentation. However, the loss of intertidal littoral rock habitat is negligible in size and the loss will be temporary until the rocky shore communities re-establish in 2-10 years. Machinery associated with the construction phase of the proposed development may result in temporary loss of suitable high tide loafing habitat for waterbird species associated with the pNHAs. However, given that there are extensive areas of suitable alternative foraging and loafing habitats in the vicinity of the proposed development, the loss of this habitat is negligible in size and the loss will be temporary until the works are complete. The duration of works is estimated to be eight weeks. Therefore, it is considered that habitat loss as a result of the proposed development has no potential to result in any effects on the marine mammal or waterbird species associated with this pNHA, at any geographic scale.

[23] Refer to Section 4.5.2 for definition and impact assessment methodology

194 The Dalkey Coastal Zone and Killiney Hill pNHA is within the disturbance ZoI of the proposed development. Additionally, mobile species for which pNHAs in the vicinity of the proposed development site have been designated could also be present within the disturbance ZoI. As outlined above in Section 6.1, the NIS considered potential impacts arising from disturbance and displacement during construction of the proposed development. A Construction Noise Calculation report was prepared for the proposed development by Arup. Results of this noise calculation informed the full assessment of noise impacts on QI marine mammal and SCI bird species associated with European sites, as detailed in the NIS accompanying this application. In summary, given that the anticipated noise levels will be a maximum of 97dBA at 10m, and 77dBA at 300m from construction activity, the highest possible noise levels modelled will only occur for short periods at a time (i.e. up to 30 minutes at a time), the works will be completed within eight weeks and the timing of works in the autumn/winter months of 2022, the proposed works have no potential to result in any population level effects on any QI marine mammal or SCI bird species associated with European sites. As no population level effects are anticipated on fauna species associated with European sites, no population effects are anticipated on any fauna species associated with pNHAs. However, during the construction phase, disturbance impacts on fauna associated with pNHAs could result in a temporary significant effects at the local geographic scale.

195 Contaminated surface water run-off or an accidental pollution event, of a sufficient magnitude during the construction phase of the proposed development has the potential to affect water quality in the Dalkey Coastal Zone and Killiney Hill pNHA, and the wider Dublin Bay area as the proposed development site drains to the coastal waterbody. Fauna associated with these pNHAs would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely. Aquatic and marine habitats associated with these pNHAs could also be affected by a significant pollution event. Impacts on fauna species and habitats associated with this pNHAs arising from the proposed development are likely to be significant at the national scale.

6.2.1.1 Dalkey Coastal Zone and Killiney Hill pNHA [001206]

196 As the Dalkey Coastal Zone and Killiney Hill pNHA partly overlaps with the footprint of the proposed development site, the proposed development has the potential to impact the pNHA through temporary loss of intertidal habitats. This pNHA is designated for a range of habitats including marine habitats which support a diverse assemblage of invertebrates, and habitats associated with Killiney Hill and the cliff faces in the vicinity. The habitats within the proposed development boundary were surveyed to inform this report, and are considered to have an ecological value of either local importance (lower value) in the case of the marine habitats or negligible importance in the case of the terrestrial habitats. Therefore, the temporary loss of these habitats as a result of the construction of the proposed development is not considered to be a significant impact at any geographic scale.

6.2.2 Mitigation Measures

197 The mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application to prevent habitat degradation as a result of hydrological impacts arising from the proposed development will mitigate the effects of surface water pollution on Dalkey Coastal Zone and Killiney Hill pNHA, South Dublin Bay pNHA, Booterstown Marsh pNHA, North Dublin Bay pNHA, Dolphins, Dublin Docks pNHA, Howth Head pNHA and Lambay Island pNHA

6.2.3 Significance of Residual Effects

198 In the absence of mitigation, hydrological impacts arising from the proposed development have potential to result in significant impacts on nationally designated sites at the national geographic scale. With the implementation of the mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application, the proposed development does not pose the risk of adversely affecting the integrity of any nationally designated sites, either alone or in combination with other plans or projects. Therefore, the proposed development is not likely to have significant residual effects on nationally designated sites at any geographic scale.

199 Mobile fauna associated with nationally designated sites could be present within the disturbance ZoI. However, as outlined in Section 6.2.1 above, disturbance effects arising from the proposed development will not result in long-term effects on the population size or viability of any fauna populations associated with national sites, either alone or in combination with other plans or projects. Therefore, there are no residual effects predicted on nationally designated sites at any geographic scale.

6.3 Habitats and Flora

6.3.1 Potential Impacts

Habitat loss

200 The proposed development will result in the temporary loss of a small area of littoral rock habitat (JNCC marine habitat classification types LR.LLR.Fves.FS and LR.LLR.F.Fspi) during construction works. As these habitats are of local biodiversity importance (lower value), their loss or modification will not result in a likely significant effect on biodiversity. Additionally, rocky shore communities typically re-establish in 2-10 years[24], meaning that any impacts on these communities arising from the proposed development will be temporary in nature.

Introducing or spreading non-native invasive plant species

201 Planting, dispersing, or allowing/causing the dispersal, spread or growth of certain non-native plant species is controlled under Article 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011; and refers to plant or animal species listed on the Third Schedule of those regulations. As no non-native invasive species were recorded on the proposed development site, there is no potential for non-native invasive species to spread as a result of the proposed development.

202 The undesirable non-native species *Soleirolia soleirolii* was recorded within the survey area, however, it is not anticipated that the works to the southern wall of Coliemore Harbour will result in the spread of this garden escape.

6.3.2 Mitigation Measures

203 As there are no significant potential impacts on habitats and flora associated with the proposed development no mitigation is required.

6.3.3 Significance of Residual Effects

204 Littoral rock habitats which have been classified as being of local importance (lower value) will be temporarily lost as a result of the proposed development. As rocky shore communities typically re-establish in 2-10 years, there will be no permanent loss of habitats and flora associated with the proposed development. Therefore, there are no residual effects predicted on habitats at any geographic scale.

6.4 Bats

6.4.1 Potential Impacts

205 The proposed development will not result in the removal of any habitats suitable for roosting or foraging bats, therefore there will be no habitat loss or fragmentation impacts on bat species as a result of this proposed development.

[24] MarLIN - The Marine Life Information Network - Fucus vesiculosus on full salinity moderately exposed to sheltered mid eulittoral rock.

206 The proposed development site is located in a residential area and is likely to be subject to some artificial illumination. Temporary lighting required during construction could increase artificial illumination in the vicinity of the proposed development, rendering commuting flight paths unsuitable to bats. All bat species can be adversely affected by lighting. Therefore, in the absence of mitigation, the potential impact on bat activity is regarded to be a temporary significant effect at a local level.

207 There is no permanent artificial lighting proposed as part of this development. Following the construction period, the artificial light levels at Coliemore Harbour will return to baseline levels. Therefore, there will be no permanent impacts on local bat populations arising from the proposed development.

6.4.2 Mitigation Measures

6.4.2.1 Measures to Control and Reduce Light Spill During Construction

208 Given the residential nature of the surrounding environment, the local bat population are likely to be habituated to a degree of light spill. Therefore, the measures outlined in the CEMP (Arup, 2021) to reduce light spill during the construction phase of the proposed development will suitably mitigate artificial lighting impacts on the local bat population.

209 Site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas;
- Motion sensor lighting and low energy consumption fittings will be installed to reduce usage and energy consumption; and
- Lighting will be positioned and directed so that it does not to unnecessarily intrude on adjacent buildings and land uses, ecological receptors and structures used by protected species, nor cause distraction or confusion to motorists.

6.4.3 Significance of Residual Effects

210 In the absence of mitigation, artificial lighting associated with the construction phase of the proposed development could result in significant impacts on bat populations at the local geographic scale. Following the implementation of measures to reduce artificial lighting during the construction phase of the proposed development (Section 6.4.2), there will be no effects on bats arising from the proposed development either on its own or cumulatively with other plans, projects or activities. Therefore, the proposed development will not have significant residual effects on bats at any geographic scale.

6.5 Otter

6.5.1 Potential Impacts

211 The proposed development site is hydrologically connected to Coliemore Harbour and Dublin Bay which is used by foraging and commuting otters. Contaminated surface water run-off or an accidental pollution event during construction, has the potential to affect water quality in Dublin Bay as the proposed development site ultimately drains to the coastal waterbody. Contaminated surface water run-off or a pollution event, of a sufficient magnitude, has the potential to affect otter in Dublin Bay by direct contact with pollutants and indirect effects on their food supply or supporting habitats. In the event of a pollution event pollutants could extend to Dublin Bay and effects on otter are likely to be significant at the county scale.

212 As otter are generally nocturnal in habit, they are sensitive to artificial lighting. Although the proposed development is in a residential area and otter in the vicinity are likely to be habituated to artificial lighting,

ttemporary lighting required during construction could increase artificial illumination in the vicinity of the proposed development, reducing the suitability of marine commuting and foraging habitats for otter. Artificial lighting impacts on the local otter population arising from the construction phase of the proposed development are likely to be temporary and significant at the local scale.

213 There is no permanent artificial lighting proposed as part of this development. Following the construction period, the artificial light levels at Coliemore Harbour will return to baseline levels. Therefore, there will be no permanent impacts on the local otter population arising from the proposed development.

214 As otter are generally nocturnal in habit, and construction works will be undertaken during daylight hours, disturbance arising from the construction stage of the proposed development is unlikely to result in significant effects on otter. The proposed development involves rock stabilisation work at Coliemore Harbour. Once the proposed development is complete and Coliemore Harbour is operational it is not considered likely that this proposed development would result in any disturbance effects on otter.

215 No suitable breeding or resting places for otter are present within Coliemore Harbour. Therefore there will be no loss of breeding or resting sites which could have a likely significant effect on the conservation status of otter, at any geographic scale.

6.5.2 Mitigation Measures

216 The mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application to prevent habitat degradation as a result of hydrological impacts arising from the proposed development will mitigate the effects of surface water pollution on otter and their prey availability.

217 The mitigation measures outlined above in Section 6.4.2, and in the CEMP accompanying this planning application to reduce artificial light spill during the construction stage of the proposed development, particularly on ecological receptors (i.e. the marine environment surrounding the proposed development site) will mitigate the effects of artificial lighting on otter.

6.5.3 Significance of Residual Effects

218 In the absence of mitigation, hydrological impacts arising from the proposed development have potential to result in significant impacts on otter at the county geographic scale. With the implementation of the mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application, the proposed development will not affect otter populations by hydrological impacts, either alone or in combination with other plans or projects. Therefore, the proposed development will not have significant residual effects on otter at any geographic scale.

219 In the absence of mitigation, artificial lighting associated with the construction phase of the proposed development could result in significant impacts on otter populations at the local geographic scale. Following the implementation of measures to reduce artificial lighting during the construction phase of the proposed development (Section 6.4.2), there will be no effects on otter arising from the proposed development either on its own or cumulatively with other plans, projects or activities. Therefore, the proposed development will not have significant residual effects on otter at any geographic scale.

6.6 Marine Mammals

6.6.1 Potential Impacts

220 There are records of harbour porpoise, grey seal, harbour seal and bottle-nosed dolphin in the vicinity of the proposed development site. Of these species, the IDWG have advised that harbour porpoise and both seal species may occasionally use Coliemore Harbour. Machinery associated with the construction phase of the proposed development may result in temporary loss of suitable aquatic habitat for harbour porpoise, grey seal and harbour seal, and low tide haul-out sites for both seal species. However, the loss of any habitat is negligible in size and the loss will be temporary until the works are complete. The duration of works is estimated to be eight weeks. Therefore, there will be no significant habitat loss or fragmentation impacts on marine mammal species as a result of the proposed development, at any geographic scale.

221 Contaminated surface water run-off or an accidental pollution event, of a sufficient magnitude during the construction phase of the proposed development has the potential to affect water quality in Dublin Bay as the proposed development site ultimately drains to the coastal waterbody. Marine mammals would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely. Harbour porpoise, grey seal and harbour seal in the vicinity of Coliemore Harbour are likely to be associated with European sites and therefore, impacts on these species arising from the proposed development are likely to be significant at the international scale. Impacts on bottle-nosed dolphin and other marine mammals species are likely to be significant at the county geographic scale.

222 There is potential that noise and vibration associated with the construction phase of the proposed development could result in temporary disturbance and displacement effects on marine mammals in the vicinity of the proposed development site. Noisy activities associated with the proposed development include the use of equipment such as a grout mixer and pump, mobile telescopic crane, hand-held pneumatic rock drill, and hand-held pneumatic breaker (see full details of noisy equipment in Appendix IV - Construction Noise Calculation). The noisiest piece of equipment that will be used during the proposed works is the hand-held pneumatic rock breaker, which will generate a sound pressure level of up to 95dBA at 10m. Noise modelling was carried out on the four noisiest pieces of equipment (95dBA, 90dBA, 86dBA and 84dBA). There is no potential for more than one of any of these four pieces of equipment to be in operation at the same time. Simultaneous operation of equipment sums to a total equivalent sound pressure of 97dBA at 10m from construction activity. At 100m, the sound pressure will be 77dBA, and at 300m, the sound pressure will be 68dBA. According to the behavioural response criteria proposed by Southall *et al.* (2008)[25] this level will not elicit a behavioural response, temporary threshold shift (TTS) or permanent threshold shift (PTS) in marine mammals in the vicinity of the proposed works. Southall *et al.* (2007) proposed sound pressure level criteria of 230 dB re 1 µPa (peak broadband level) for injury in cetaceans and 218 dB re 1 µPa for pinnipeds. They also recommended behavioural changes can occur at 224 dB re 1 µPa (peak broadband level) for cetaceans and 212 dB re 1 µPa for pinnipeds. Given the above, the fact that works will be complete within eight weeks, and the extent of suitable alternative foraging habitat within Dublin Bay and the Irish Sea, the proposed works have no potential to result in effects on marine mammal species at any geographic scale.

6.6.2 Mitigation Measures

223 The mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application to prevent habitat degradation as a result of hydrological impacts arising from the proposed development will mitigate the effects of surface water pollution on marine mammals and their prey availability.

6.6.3 Significance of Residual Effects

224 In the absence of mitigation, hydrological impacts arising from the proposed development have potential to result in significant impacts on marine mammals at the international geographic scale in the case of harbour porpoise, grey seal and harbour seal, and at the county geographic scale for bottle-nosed dolphin and other marine mammals. With the implementation of the mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application, the proposed development will not affect marine populations by hydrological impacts, either alone or in combination with other plans or projects. Therefore, the proposed development will not have significant residual effects on marine mammals at any geographic scale.

[25] Southall, B.; Bowles, A.; Ellison, W.; Finneran, J.; Gentry, R.; Greene, C. Jr.; Kastak, D.; Ketten, D.; Miller, J.; Nachtigall, P.; Richardson, W.; Thomas, J.; Tyack, P. (2008). *Marine Mammal Noise Exposure Criteria: Initial Scientific Recommendations.* Aquatic Mammals, *33(4), 273-275.*

6.7 Breeding Birds

6.7.1 Potential Impacts

225 The multi-disciplinary survey carried out in February 2022 confirmed that there is some suitable nesting habitat for black guillemot within the proposed development site. As the proposed works will be carried out in the autumn/winter season of 2022, it is unlikely that the construction period will overlap with the black guillemot breeding season. However, if black guillemot were to be nesting at the time of works, there is potential for mortality of black guillemots nesting within the proposed development site. It is considered that mortality impacts arising from the proposed development would result in significant effects at the county level.

226 Surveys carried out by the NPWS in 2015 confirmed that black guillemot breed in drainage pipes in the northern wall of Coliemore Harbour. The proposed works are to the southern wall only and therefore, will not result in any impacts on the nesting features located along the northern wall. The suitable crevices identified within the southern wall will not be infilled or grouted as part of the proposed works. Therefore, there will be no loss of suitable breeding habitat for black guillemot as a result of this proposed development. Therefore, the proposed development will not result in significant habitat loss effects on black guillemot, at any geographic scale.

227 Breeding waterbird species would be vulnerable to habitat loss and fragmentation as a result of the proposed development. However, the loss of intertidal littoral rock habitat is negligible in size and the loss will be temporary until the rocky shore communities re-establish in 2-10 years. Machinery associated with the construction phase of the proposed development may result in temporary loss of suitable high tide loafing habitat for breeding bird species. However, given that there are extensive areas of suitable alternative foraging and loafing habitats in the vicinity of the proposed development, the loss of this habitat is negligible in size and the loss will be temporary until the works are complete. The duration of works is estimated to be eight weeks. Therefore, habitat loss as a result of the proposed development has no potential to result in significant effects on breeding bird species at any geographic scale.

228 Contaminated surface water run-off or an accidental pollution event, of a sufficient magnitude during the construction phase of the proposed development has the potential to affect water quality in Dublin Bay as the proposed development site ultimately drains to the coastal waterbody. Breeding waterbird species would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely. These impacts could be long-lived and result in significant effects on breeding birds, even if the pollution event were to occur outside of the breeding bird season. There are a range of breeding bird species that are likely to be associated with European sites and therefore, impacts on these species are likely to be significant at the international scale. Impacts on other breeding waterbird species are likely to be significant at the local geographic scale. A marine pollution event would not have a significant effect on terrestrial bird species at any geographic scale.

229 Noise and vibration arising from the construction phase of the proposed development has the potential to cause disturbance and displacement effects on breeding bird species. As the works are proposed to be carried out in the autumn/winter season of 2022, it is unlikely that noise and vibration arising from the proposed development will result in significant disturbance of the majority of breeding bird species as works will be carried out outside of the main breeding season. However, it is possible that during the construction phase, disturbance impacts on birds are expected to result in a temporary significant effect at a local scale. Disturbance effects arising from the proposed development will not result in long-term significant effects on the population size or viability of local bird populations.

230 Breeding and migrating tern species associated with the Dalkey Islands SPA are likely to be present in the vicinity of the proposed development site between the months of May and September. Noisy activities associated with the proposed development include the use of equipment such as a grout mixer and pump, mobile telescopic crane, hand-held pneumatic rock drill, and hand-held pneumatic breaker (see full details of noisy equipment in Appendix III- Construction Noise Calculation). The noisiest piece of equipment that will be used during the proposed works is the hand-held pneumatic rock breaker, which will generate a

sound pressure level of up to 95dBA at 10m. Noise modelling was carried out on the four noisiest pieces of equipment (95dBA, 90dBA, 86dBA and 84dBA). There is no potential for more than one of any of these four pieces of equipment to be in operation at the same time. Simultaneous operation of equipment sums to a total equivalent sound pressure of 97dBA at 10m from construction activity. At 100m, the sound pressure will be 77dBA, and at 300m, the sound pressure will be 68dBA. The highest possible noise levels modelled will only occur for relatively short periods of time, i.e. up to 30 minutes at a time. This is likely to cause brief disturbance effects[26] to shorebirds in the vicinity of the proposed development[27]. In a worst-case scenario, noise levels of up to 68dBA may be experienced at 300m from the proposed works. This is below the 70dB threshold which would result in birds moving out of the affected zone. Therefore, given that in a worst-case scenario noise levels will not reach this threshold, works will be completed within eight weeks, and that the extent of suitable alternative foraging habitat within Dalkey Islands SPA the proposed works have no potential to result in any population level effects on foraging SCI tern species. Additionally, it is proposed that works will be carried out in the autumn/winter season of 2022. Therefore, the majority of the disturbance works will be carried out outside of the breeding and pre-migration season for tern species (May-September). Impacts on tern species are likely to be temporary and significant at the local scale.

6.7.2 Mitigation Measures

231 Where feasible, works will not begin in the breeding bird season (i.e. between the 1st March and 31st August) to avoid impacts on breeding black guillemot. Where the construction programme does not allow this seasonal restriction to be observed, a pre-construction check of suitable habitat for nesting black guillemot will be carried out by a suitably qualified ecologist in advance of works commencing. Where it can be confirmed that no nesting birds are present, works must commence within three days, otherwise a repeat survey will be required. Where birds are confirmed to be present, construction works must not commence until it can be confirmed that the chicks have fledged and the site has been abandoned.

232 The mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application to prevent habitat degradation as a result of hydrological impacts arising from the proposed development will mitigate the effects of surface water pollution on breeding waterbird species and their prey availability.

6.7.3 Significance of Residual Effects

233 In the absence of mitigation, works associated with the construction phase of the proposed development could result in significant mortality impacts on black guillemot populations at the county geographic scale. Following the implementation of measures to prevent mortality of black guillemot during the construction phase of the proposed development (Section 6.7.2), there will be no mortality effects on black guillemot

[26] The duration of effects has been described based on information within *'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (EPA, 2017)

[27] Current understanding of construction related noise disturbance to shorebirds is based on the research presented in Cutts et al. (2013) and Wright et al. (2010). In terms of construction noise, levels below 50dB would not be expected to result in any response from foraging or roosting birds. Noise levels between 50dB and 70dB would provoke a moderate effect/level of response from birds, i.e. birds becoming alert and some behavioural changes (e.g. reduced feeding activity), but birds would be expected to habituate to noise levels within this range. Noise levels above 70dB would likely result in birds moving out of the affected zone, or leaving the site altogether. At c. 300m, typical noise levels associated with construction activity (BS 5228) are generally below 60dB or, in most cases, are approaching the 50dB threshold.

Cutts, N., Hemingway, K. and Spencer, J. (2013). *Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects. Version 3.2.* Institute of Estuarine & Coastal Studies (IECS) University of Hull.

Wright, M., Goodman, P., Cameron, T. (2010). *Exploring behavioural responses of shorebirds to impulsive noise*. Institute of Integrative and Comparative Biology, University of Leeds

arising from the proposed development either on its own or cumulatively with other plans, projects or activities. Therefore, the proposed development will not have significant residual effects on black guillemot populations at any geographic scale.

234 In the absence of mitigation, hydrological impacts arising from the proposed development have potential to result in significant impacts on breeding bird species at the local to international geographic scale. With the implementation of the mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application, the proposed development does not pose the risk of adversely affecting breeding bird species, either alone or in combination with other plans or projects. Therefore, the proposed development will not have significant residual effects on breeding bird species at any geographic scale.

235 Breeding bird species could be present within the disturbance ZoI of the proposed development site. However, as outlined in Section 6.7.1 above, disturbance effects arising from the proposed development will not result in long-term effects on the population size or viability of any breeding bird population, either alone or in combination with other plans or projects. Therefore, there are no residual effects predicted on breeding bird species at any geographic scale.

6.8 Wintering Birds

6.8.1 Potential Impacts

236 Wintering waterbird species would be vulnerable to habitat loss and fragmentation as a result of the proposed development. However, the loss of intertidal littoral rock habitat is negligible in size and the loss will be temporary until the rocky shore communities re-establish in 2-10 years. Machinery associated with the construction phase of the proposed development may result in temporary loss of suitable high tide loafing habitat for wintering bird species. However, given that there are extensive areas of suitable alternative foraging and loafing habitats in the vicinity of the proposed development, the loss of this habitat is negligible in size and the loss will be temporary until the works are complete. The duration of works is estimated to be eight weeks. Therefore, habitat loss as a result of the proposed development has no potential to result in significant effects on wintering bird species at any geographic scale.

237 Contaminated surface water run-off or an accidental pollution event, of a sufficient magnitude during the construction phase of the proposed development has the potential to affect water quality in Dublin Bay as the proposed development site ultimately drains to the coastal waterbody. Wintering birds would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely. There are a range of wintering bird species that are likely to be associated with European sites and therefore, impacts on these species are likely to be significant at the international scale. Impacts on other wintering waterbird species are likely to be significant at the local geographic scale. A marine pollution event would not have a significant effect on terrestrial bird species at any geographic scale.

238 A range of wintering bird species were returned from the desk study, and recorded during the multi-disciplinary survey in February 2022. The majority of these species are wintering waterbirds associated with nearby European sites, in Dublin Bay and the Irish Sea. The waters in and around Coliemore Harbour are considered to be suitable to support feeding and loafing wintering waterbirds. Additionally, intertidal habitats in the vicinity of Coliemore Harbour are suitable to support wintering waders. Works are proposed to be carried out in the autumn/winter season of 2022, therefore, there is potential that temporary noise and vibration associated with the construction of the proposed development could result in disturbance and displacement of wintering waterbird species. However, noise produced as a result of the proposed development will not result in effects on these waterbird species that would affect the population size or distribution due to the brief nature of the works which will only be undertaken over the course of a single wintering bird season (as outlined in detail in Section 6.1 above). However, it is possible that during the construction phase, disturbance impacts on birds are expected to result in a temporary significant effect at a local scale. Disturbance effects arising from the proposed development will not result in long-term significant effects on the population size or viability of local bird populations.

6.8.2 Mitigation Measures

239 The mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application to prevent habitat degradation as a result of hydrological impacts arising from the proposed development will mitigate the effects of surface water pollution on wintering waterbird species and their prey availability.

6.8.3 Significance of Residual Effects

240 In the absence of mitigation, hydrological impacts arising from the proposed development have potential to result in significant impacts on wintering bird species at the local to international geographic scale. With the implementation of the mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application, the proposed development does not pose the risk of adversely affecting wintering bird species, either alone or in combination with other plans or projects. Therefore, the proposed development will not have significant residual effects on wintering bird species at any geographic scale.

241 Wintering bird species could be present within the disturbance ZoI of the proposed development site. However, as outlined in Section 6.7.1 above, disturbance effects arising from the proposed development will not result in long-term effects on the population size or viability of any wintering bird population, either alone or in combination with other plans or projects. Therefore, there are no residual effects predicted on wintering bird species at any geographic scale.

6.9 Fish

6.9.1 Potential Impacts

242 Contaminated surface water run-off or an accidental pollution event, of a sufficient magnitude during the construction phase of the proposed development has the potential to affect water quality in Dublin Bay as the proposed development site ultimately drains to the coastal waterbody. Fish in the vicinity of the proposed development site would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely. Impacts on fish species are likely to be significant at the local geographic scale.

6.9.2 Mitigation Measures

243 The mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application to prevent habitat degradation as a result of hydrological impacts arising from the proposed development will mitigate the effects of surface water pollution on fish species and their prey availability.

6.9.3 Significance of Residual Effects

244 In the absence of mitigation, hydrological impacts arising from the proposed development have potential to result in significant impacts on fish species at the local geographic scale. With the implementation of the mitigation measures outlined above in Section 6.1.2, and in the CEMP accompanying this planning application, the proposed development does not pose the risk of adversely affecting fish species, either alone or in combination with other plans or projects. Therefore, the proposed development will not have significant residual effects on fish species at any geographic scale.

7 Conclusions

245 The proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of any European site, either alone or in combination with any other plans or projects.

246 The proposed development has the potential to result in temporary disturbance impacts on fauna populations associated with national sites during the construction phase. It is considered that disturbance impacts could have temporary effects on local fauna populations. However, such disturbance impacts on populations these pNHAs, which are already habituated to ongoing disturbance due to the urban nature of the surrounding area, will not result in long-term effects on the population size or viability of species associated with these national sites. Therefore, disturbance associated with the proposed development will not affect the integrity of any national sites and no residual effects are predicted. In the absence of mitigation, the proposed development has the potential to affect the surface water quality of the Dalkey Coastal Zone and Killiney Hill pNHA, South Dublin Bay pNHA, Booterstown Marsh pNHA, North Dublin Bay pNHA, Dolphins, Dublin Docks pNHA, Howth Head pNHA and Lambay Island pNHA. The implementation of the mitigation measures outlined in Section 6.1.2 will ensure there are no significant effects on aquatic habitat quality of any pNHA or associated fauna species.

247 Habitat loss as a result of the proposed development will not to result in significant effects at any geographic scale. Littoral rock habitats which have been classified as being of local importance (lower value) will be temporarily lost as a result of the proposed development. As rocky shore communities typically re-establish in 2-10 years, there will be no permanent loss of habitats and flora associated with the proposed development. Therefore, there are no residual effects predicted on habitats at any geographic scale.

248 The proposed development has the potential to result in temporary impacts on bat populations at the local geographic scale. Increased lighting during the construction stage of the proposed development may result in temporary impacts on bats however, following the implementation of the mitigation measures proposed, it is not anticipated that the proposed development will result in any long-term effects on the size or viability of local bat populations. As the conservation status of local bat populations will not be affected as a result of the proposed development, the proposed development will not have significant residual effects on bats at any geographic scale.

249 The proposed development has the potential to result in temporary impacts on otter populations at the local geographic scale. Increased lighting during the construction stage of the proposed development may result in temporary impacts on otter however, following the implementation of the mitigation measures proposed, it is not anticipated that the proposed development will result in any long-term effects on the size or viability of local otter populations. In the absence of mitigation, the proposed development has the potential to affect the surface water quality of the receiving coastal environment and has the potential to affect otter in Dublin Bay by direct contact with pollutants and indirect effects on their food supply or supporting habitats. The implementation of the mitigation measures outlined in Section 6.1.2 will ensure there are no significant effects on aquatic habitat quality of Coliemore Harbour and Dublin Bay. As the conservation status of local otter populations will not be affected as a result of the proposed development, there are no residual effects predicted.

250 The proposed development has the potential to result in temporary impacts on marine mammal populations at the county to international geographic scale. Increased noise and vibration during the construction stage of the proposed development may result in temporary impacts on marine mammals however, given the extent of the works, it is not anticipated that the proposed development will result in any effects on marine mammal populations. In the absence of mitigation, the proposed development has the potential to affect the surface water quality of the receiving coastal environment and has the potential to affect marine mammals in Coliemore Harbour and Dublin Bay by direct contact with pollutants and indirect effects on their food supply or supporting habitats. The implementation of the mitigation measures outlined in Section 6.1.2 will ensure there are no significant effects on aquatic habitat quality of Coliemore Harbour and Dublin Bay. As the conservation status of marine mammal populations will not be affected as a result of the proposed development, there are no residual effects predicted.

251 In the absence of mitigation, the proposed development has the potential to result in mortality impacts on black guillemot populations at the county geographic scale. The implementation of the mitigation measures outlined in Section 6.7.2 will ensure there are no mortality effects on populations of black guillemot. Increased noise and vibration during the construction stage of the proposed development may result in temporary impacts on breeding birds at the local geographic scale, however, given the extent of the works, it is not anticipated that the proposed development will result in any long-term effects on any breeding bird populations. In the absence of mitigation, the proposed development has the potential to affect the surface water quality of the receiving coastal environment and has the potential to affect breeding waterbirds in Dublin Bay by direct contact with pollutants and indirect effects on their food supply or supporting habitats. The implementation of the mitigation measures outlined in Section 6.1.2 will ensure there are no significant effects on aquatic habitat quality of Coliemore Harbour and Dublin Bay. As the conservation status of local breeding waterbird populations will not be affected as a result of the proposed development, there are no residual effects predicted.

252 Increased noise and vibration during the construction stage of the proposed development may result in temporary impacts on wintering birds at the local geographic scale, however, given the extent of the works, it is not anticipated that the proposed development will result in any long-term effects on any wintering bird populations. In the absence of mitigation, the proposed development has the potential to affect the surface water quality of the receiving coastal environment and has the potential to affect wintering waterbirds in Dublin Bay by direct contact with pollutants and indirect effects on their food supply or supporting habitats. The implementation of the mitigation measures outlined in Section 6.1.2 will ensure there are no significant effects on aquatic habitat quality of Coliemore Harbour and Dublin Bay. As the conservation status of local wintering waterbird populations will not be affected as a result of the proposed development, there are no residual effects predicted.

253 In the absence of mitigation, hydrological impacts arising from the proposed development have potential to result in significant impacts on fish species at the local geographic scale. The implementation of the mitigation measures outlined in Section 6.1.2 will ensure there are no significant effects on fish species. Therefore, there are no residual effects predicted

254 The proposed development adheres to the policies and objectives outlined in the Dún Laoghaire-Rathdown Development Plan 2016-2022 (Dún Laoghaire-Rathdown County Council, 2016). See Appendix V for details.

Table 4 Summary of the significant residual ecological effects of the proposed development

Ecological Receptor	Ecological Valuation	Impacts with Potentially Significant Effects	Potential Significance of Effects	Mitigation Measures	Significance of Residual Effects
Designated Sites					
Rockabill to Dalkey Island SAC	International	Potential for habitat degradation as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None
Dalkey Islands SPA	International	Potential for habitat degradation as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None
South Dublin Bay SAC	International	Potential for habitat degradation as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None
North Dublin Bay SAC	International	Potential for habitat degradation as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None
South Dublin Bay and River Tolka Estuary SPA	International	Potential for habitat degradation as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None
North Bull Island SPA	International	Potential for habitat degradation as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None
Howth Head Coast SPA	International	Potential for habitat degradation as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None
Baldoyle Bay SPA	International	Potential for habitat degradation as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None
Ireland's Eye SPA	International	Potential for habitat degradation as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None

Dalkey Coastal Zone and Killiney Hill pNHA	National	Potential for disturbance and displacement impacts on fauna	National	None	None
		Potential for habitat degradation as a result of hydrological impacts		Water quality protection (Section 6.1.2)	None
South Dublin Bay pNHA	National	Potential for disturbance and displacement impacts on fauna	National	None	None
		Potential for habitat degradation as a result of hydrological impacts		Water quality protection (Section 6.1.2)	None
Booterstown Marsh pNHA	National	Potential for disturbance and displacement impacts on fauna	National	None	None
		Potential for habitat degradation as a result of hydrological impacts		Water quality protection (Section 6.1.2)	None
North Dublin Bay pNHA	National	Potential for disturbance and displacement impacts on fauna	National	None	None
		Potential for habitat degradation as a result of hydrological impacts		Water quality protection (Section 6.1.2)	None
Dolphins, Dublin Docks pNHA	National	Potential for disturbance and displacement impacts on fauna	National	None	None
		Potential for habitat degradation as a result of hydrological impacts		Water quality protection (Section 6.1.2)	None
Howth Head pNHA	National	Potential for disturbance and displacement impacts on fauna	National	None	None

		Potential for habitat degradation as a result of hydrological impacts		Water quality protection (Section 6.1.2)	None
Lambay Island pNHA	National	Potential for disturbance and displacement impacts on fauna	National	None	None
		Potential for habitat degradation as a result of hydrological impacts		Water quality protection (Section 6.1.2)	None
Fauna Species					
Bats	Local importance (higher value)	Potential for disturbance effects on bats as a result of artificial lighting at the construction stage	Local	Measures to control light spill during construction (Section 6.4.2)	None
Otter	County importance	Potential for effects on otter as a result of hydrological impacts	County	Water quality protection (Section 6.1.2)	None
		Potential for disturbance effects on otter as a result of artificial lighting at the construction stage		Measures to control light spill during construction (Section 6.4.2)	None
Harbour porpoise (QI of Rockabill to Dalkey Island SAC	International	Potential for effects on harbour porpoise as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None
Common and harbour seal (QIs of Lambay Island SAC)	International	Potential for effects on harbour and grey seal as a result of hydrological impacts	International	Water quality protection (Section 6.1.2)	None
Other marine mammals	County importance	Potential for effects on other marine mammals as a result of hydrological impacts	County	Water quality protection (Section 6.1.2)	None
Breeding birds (SCI species)	International importance	Potential for effects on SCI waterbird species as a result of hydrological impacts. No	International	Water quality protection (Section 6.1.2)	None

		impacts on terrestrial breeding bird species.			
Breeding black guillemot	County importance	Potential for mortality effects on black guillemot	County	Measures to prevent mortality of black guillemot (Section 6.7.2)	None
		Potential for effects on SCI waterbird species as a result of hydrological impacts. No impacts on terrestrial SCI breeding bird species.		Water quality protection (Section 6.1.2)	None
Breeding birds (non-SCI species)	Local importance (higher value)	Potential for effects on non-SCI waterbird species as a result of hydrological impacts. No impacts on terrestrial non-SCI breeding bird species.	Local	Water quality protection (Section 6.1.2)	None
Wintering birds (SCI species)	International importance	Potential for effects on SCI waterbird species as a result of hydrological impacts. No impacts on terrestrial breeding bird species.	International	Water quality protection (Section 6.1.2)	None
		Potential for disturbance and displacement impacts on SCI wintering bird species		None	None
Wintering birds (non-SCI species)	Local importance (higher value)	Potential for effects on non-SCI waterbird species as a result of hydrological impacts. No impacts on terrestrial breeding bird species.	Local	Water quality protection (Section 6.1.2)	None
		Potential for disturbance and displacement impacts on non-SCI wintering bird species		None	None

Fish	Local importance (higher value)	Potential for effects on fish as a result of hydrological impacts	Local	Water quality protection (Section 6.1.2)	None

References

ARUP (2020) *Coliemore Harbour Collapse Assessment & Options Study. Environmental Constraints Report*

ARUP (2021) *Coliemore Harbour Permanent Remedial Works. Environmental Impact Assessment Screening Report.*

ARUP (2021) *Coliemore Harbour Permanent Remedial Works. Construction Environmental Management Plan*

CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland*. Chartered Institute of Ecology and Environmental Management, Winchester, UK.

Connor, D.W., Allen, J.H., Golding, N., Howell, K. L., Lieberknecht, L. M., Northen, K. O. & Reker, J. B. (2004) *The Marine Habitat Classification for Britain and Ireland Version* 04.05. JNCC, Peterborough ISBN 1 861 07561 8 (internet version) www.jncc.gov.uk/MarineHabitatClassification.

Gilbert, G., Stanbury, A. & Lewis, L. (2021) Birds of Conservation Concern in Ireland 4: 2020-2026. *Irish Birds* **43**: 1-22.

FitzGerald, A. (2019) *Dalkey Island Rare Plant Survey*. Report for Dun Laoghaire-Rathdown County Council.

Macklin, R., Brazier, B. & Sleeman, P. (2019). *Dublin City otter survey. Report prepared by Triturus Environmental Ltd. for Dublin City Council as an action of the Dublin City Biodiversity Action Plan 2015-2020.*

Nelson, B., Cummins, S., Fay, L., Jeffrey, R., Kelly, S., Kingston, N., Lockhart, N., Marnell, F., Tierney, D. and Wyse Jackson, M. (2019) *Irish Wildlife Manuals No. 116, Checklists of Protected and Threatened Species in Ireland. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.*

Scott Cawley Ltd. (2022a) *Appropriate Assessment Screening Report. Coliemore Harbour Permanent Remedial Works.*

Scott Cawley Ltd. (2022b) *Natura Impact Statement. Coliemore Harbour Permanent Remedial Works.*

Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) *Ireland Red List No. 10: Vascular Plants*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

Appendix I

Protected Sites for Nature Conservation in the Vicinity of the Proposed Development

European sites in the vicinity of the proposed development are listed below in **Table 1**, along with their qualifying/special conservation interests, reference to the most recent conservation objectives document, and their location relative to the proposed development site.

Other nationally protected sites for nature conservation in the vicinity of the proposed development are listed below in **Table 2**, along with the nature conservation interests for which they are designated, and their location relative to the proposed development site

Table 1 European sites in the vicinity of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	**Location Relative to the Proposed Development Site**
Special Area of Conservation (SAC)	
Rockabill to Dalkey Island SAC [003000] 1170 Reefs 1351 Harbour porpoise *Phocoena phocaena* *S.I. No. 94/2019 - European Union Habitats (Rockabill To Dalkey Island Special Area Of Conservation 003000) Regulations 2019* NPWS (2013) *Conservation Objectives: Rockabill to Dalkey Island SAC 003000.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Approximately 183m east of the proposed development
South Dublin Bay SAC [000210] 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 *Salicornia* and other annuals colonising mud and sand 2110 Embryonic shifting dunes *S.I. No. 525/2019 - European Union Habitats (South Dublin Bay Special Area of Conservation 000210) Regulations 2019* NPWS (2013) *Conservation Objectives: South Dublin Bay SAC 000210.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Approximately 4.6km northwest of the proposed development
North Dublin Bay SAC [000206] 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 *Salicornia* and other annuals colonising mud and sand 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) 1395 Petalwort *Petalophyllum ralfsii* 1410 Mediterranean salt meadows (*Juncetalia maritimi*) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) 2190 Humid dune slacks	Approximately 8.7km north of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
S.I. No. 524/2019 - European Union Habitats (North Dublin Bay Special Area of Conservation 000206) Regulations 2019 NPWS (2013) *Conservation Objectives: North Dublin Bay SAC 000206.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
Bray Head SAC [000714] 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths *S.I. No. 620/2017 - European Union Habitats (Bray Head Special Area of Conservation 000714) Regulations 2017* NPWS (2017) *Conservation Objectives: Bray Head SAC 000714.* Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.	Approximately 8.7km south of the proposed development
Ballyman Glen SAC [000713] 7220 Petrifying springs with tufa formation (Cratoneurion)* 7230 Alkaline fens *S.I. No. 92/2019 - European Union Habitats (Ballyman Glen Special Area Of Conservation 000713) Regulations 2019* NPWS (2019) *Conservation Objectives: Ballyman Glen SAC 000713.* Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.	Approximately 8.7km southwest of the proposed development
Howth Head SAC [000202] 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths *S.I. No. 524/2021 - European Union Habitats (Howth Head Special Area of Conservation 000202) Regulations 2021* NPWS (2016) *Conservation Objectives: Howth Head SAC 000202.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	Approximately 9.5km north of the proposed development
Knocksink Wood SAC [000725] 7220 Petrifying springs with tufa formation (Cratoneurion)* 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)* *S.I. No. 93/2019 - European Union Habitats (Knocksink Wood Special Area Of Conservation 000725) Regulations 2019* NPWS (2021) *Conservation objectives for Knocksink Wood SAC [000725].* Generic Version 8.0. Department of Housing, Local Government and Heritage.	Approximately 9.9km southwest of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Wicklow Mountains SAC [002122] 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) 3160 Natural dystrophic lakes and ponds 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 4060 Alpine and Boreal heaths 6130 *Calaminarian* grasslands of the *Violetalia calaminariae* 6230 Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) 7130 Blanket bogs (* if active bog) 8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) 8210 Calcareous rocky slopes with chasmophytic vegetation 8220 Siliceous rocky slopes with chasmophytic vegetation 91A0 Old sessile oak woods with *Ilex* and Blechnum in the British Isles 1355 *Lutra lutra* (Otter) NPWS (2017) *Conservation Objectives: Wicklow Mountains SAC 002122.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	Approximately 12km southwest of the proposed development
Baldoyle Bay SAC [000199] 1140 Mudflats and sandflats not covered by seawater at low tide 1310 Salicornia and other annuals colonizing mud and sand 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) 1410 Mediterranean salt meadows (*Juncetalia maritimi*) *S.I. No. 472/2021 - European Union Habitats (Baldoyle Bay Special Area of Conservation 000199) Regulations 2021* NPWS (2012) *Conservation Objectives: Baldoyle Bay SAC 000199.* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht	Approximately 12.8km north of the proposed development
Ireland's Eye SAC [002193] 1220 Perennial vegetation of stony banks 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts *S.I. No. 501/2017 - European Union Habitats (Ireland's Eye Special Area of Conservation 002193) Regulations 2017* NPWS (2017) *Conservation Objectives: Ireland's Eye SAC 002193.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	Approximately 14km north of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Glen of the Downs SAC [000719] 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles *S.I. No. 526/2019 - European Union Habitats (Glen of the Downs Special Area of Conservation 000719) Regulations 2019* NPWS (2020) *Conservation Objectives: Glen of the Downs SAC 000719*. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.	Approximately 14.7km southwest of the proposed development
Lambay Island SAC [000204] 1170 Reefs 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 1364 Grey seal *Halichoerus grypus* 1365 Harbour seal *Phoca vitulina* S.I. No. 294/2019 - European Union Habitats (Lambay Island Special Area Of Conservation 000204) Regulations 2019 NPWS (2013) Conservation Objectives: Lambay Island SAC 000204. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht	Approximately 23.4km north of the proposed development
Special Protection Area (SPA)	
Dalkey Islands SPA [004172] A192 Roseate Tern *Sterna dougallii* A193 Common Tern *Sterna hirundo* A194 Arctic Tern *Sterna paradisaea* *S.I. No. 238/2010 - European Communities (Conservation of Wild Birds (Dalkey Islands Special Protection Area 004172)) Regulations 2010.* NPWS (2022) *Conservation objectives for Dalkey Islands SPA [004172].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	Approximately 93m east of the proposed development
South Dublin Bay and River Tolka Estuary SPA [004024] A046 Light-bellied Brent Goose *Branta bernicla hrota* A130 Oystercatcher *Haematopus ostralegus* A137 Ringed Plover *Charadrius hiaticula* A141 Grey Plover *Pluvialis squatarola* A143 Knot *Calidris canutus* A144 Sanderling *Calidris alba* A149 Dunlin *Calidris alpina* A157 Bar-tailed Godwit *Limosa lapponica* A162 Redshank *Tringa totanus* A179 Black-headed Gull *Chroicocephalus ridibundus* A192 Roseate Tern *Sterna dougallii* A193 Common Tern *Sterna hirundo*	Approximately 4.0km northwest of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
A194 Arctic Tern *Sterna paradisaea* A999 Wetland and Waterbirds *S.I. No. 212/2010 - European Communities (Conservation of Wild Birds (South Dublin Bay and River Tolka Estuary Special Protection Area 004024)) Regulations 2010.* NPWS (2015) *Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
North Bull Island SPA [004006] A046 Light-bellied Brent Goose *Branta bernicla hrota* A048 Shelduck *Tadorna tadorna* A052 Teal *Anas crecca* A054 Pintail *Anas acuta* A056 Shoveler *Anas clypeata* A130 Oystercatcher *Haematopus ostralegus* A140 Golden Plover *Pluvialis apricaria* A141 Grey Plover *Pluvialis squatarola* A143 Knot *Calidris canutus* A144 Sanderling *Calidris alba* A149 Dunlin *Calidris alpina* A156 Black-tailed Godwit *Limosa limosa* A157 Bar-tailed Godwit *Limosa lapponica* A160 Curlew *Numenius arquata* A162 Redshank *Tringa totanus* A169 Turnstone *Arenaria interpres* A179 Black-headed Gull *Chroicocephalus ridibundus* A999 Wetlands & Waterbirds *S.I. No. 211/2010 - European Communities (Conservation of Wild Birds (North Bull Island Special Protection Area 004006)) Regulations 2010.* NPWS (2015) *Conservation Objectives: North Bull Island SPA 004006.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Approximately 8.6km north of the proposed development
Howth Head Coast SPA [004113] A188 Kittiwake *Rissa tridactyla* *S.I. No. 185/2012 - European Communities (Conservation of Wild Birds (Howth Head Coast Special Protection Area 004113)) Regulations 2012.* NPWS (2022) *Conservation objectives for Howth Head Coast SPA [004113].* Generic Version9.0. Department of Housing, Local Government and Heritage.	Approximately 9.8km northeast of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Wicklow Mountains SPA [004040] A098 Merlin *Falco columbarius* A103 Peregrine *Falco peregrinus* *S.I. No. 586/2012 - European Communities (Conservation of Wild Birds (Wicklow Mountains Special Protection Area 004040)) Regulations 2012.* NPWS (2022) *Conservation objectives for Wicklow Mountains SPA [004040].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	Approximately 12.0km southwest of the proposed development
Baldoyle Bay SPA [004016] A046 Light-bellied Brent Goose *Branta bernicla hrota* A048 Shelduck *Tadorna tadorna* A137 Ringed Plover *Charadrius hiaticula* A140 Golden Plover *Pluvialis apricaria* A141 Grey Plover *Pluvialis squatarola* A157 Bar-tailed Godwit *Limosa lapponica* A999 Wetland and Waterbirds *S.I. No. 275/2010 - European Communities (Conservation of Wild Birds (Baldoyle Bay Special Protection Area 004016)) Regulations 2010.* NPWS (2013) *Conservation Objectives: Baldoyle Bay SPA 004016. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Approximately 13.0km north of the proposed development
Ireland's Eye SPA [004117] A017 Cormorant *Phalacrocorax carbo* A184 Herring Gull *Larus argentatus* A188 Kittiwake *Rissa tridactyla* A199 Guillemot *Uria aalge* A200 Razorbill *Alca torda* *S.I. No. 240/2010 - European Communities (Conservation of Wild Birds (Ireland's Eye Special Protection Area 004117)) Regulations 2010.* NPWS (2022) *Conservation objectives for Ireland's Eye SPA [004117].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	Approximately 13.6km north of the proposed development
Malahide Estuary SPA [004025] A005 Great Crested Grebe *Podiceps cristatus* A046 Light-bellied Brent Goose *Branta bernicla hrota* A048 Shelduck *Tadorna tadorna* A054 Pintail *Anas acuta* A067 Goldeneye *Bucephala clangula* A069 Red-breasted Merganser *Mergus serrator* A130 Oystercatcher *Haematopus ostralegus* A140 Golden Plover *Pluvialis apricaria* A141 Grey Plover *Pluvialis squatarola*	Approximately 18.5km north of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
A143 Knot *Calidris canutus* A149 Dunlin *Calidris alpina* A156 Black-tailed Godwit *Limosa limosa* A157 Bar-tailed Godwit *Limosa lapponica* A162 Redshank *Tringa totanus* A999 Wetland and Waterbirds *S.I. No. 285/2011 - European Communities (Conservation of Wild Birds (Malahide Estuary Special Protection Area 004025)) Regulations 2011.* NPWS (2013) *Conservation Objectives: Malahide Estuary SPA 004025. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
The Murrough SPA [004186] A001 Red-throated Diver *Gavia stellata* A043 Greylag Goose *Anser anser* A046 Light-bellied Brent Goose *Branta bernicla hrota* A050 Wigeon *Anas penelope* A052 Teal *Anas crecca* A179 Black-headed Gull *Chroicocephalus ridibundus* A184 Herring Gull *Larus argentatus* A195 Little Tern *Sterna albifrons* A999 Wetland and Waterbirds *S.I. No. 298/2011 - European Communities (Conservation of Wild Birds (The Murrough Special Protection Area 004186)) Regulations 2011.* NPWS (2022) *Conservation objectives for The Murrough SPA [004186].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	Approximately 19km south of the proposed development
Lambay Island SPA [004069] A009 Fulmar *Fulmarus glacialis* A017 Cormorant *Phalacrocorax carbo* A018 Shag *Phalacrocorax aristotelis* A043 Greylag Goose *Anser anser* A183 Lesser Black-backed Gull *Larus fuscus* A184 Herring Gull *Larus argentatus* A188 Kittiwake *Rissa tridactyla* A199 Guillemot *Uria aalge* *S.I. No. 242/2010 - European Communities (Conservation of Wild Birds (Lambay Island Special Protection Area 004069)) Regulations 2010.* NPWS (2022) *Conservation objectives for Lambay Island SPA [004069].* Generic Version 9.0. Department of Housing, Local Government and Heritage.	Approximately 23.2km north of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Rogerstown Estuary SPA [004015] A043 Greylag Goose Anser anser A046 Brent Goose Branta bernicla hrota A048 Shelduck Tadorna tadorna A056 Shoveler Anas clypeata A130 Oystercatcher Haematopus ostralegus A137 Ringed Plover Charadrius hiaticula A141 Grey Plover Pluvialis squatarola A143 Knot Calidris canutus A149 Dunlin Calidris alpina alpina A156 Black-tailed Godwit Limosa limosa A162 Redshank Tringa totanus A999 Wetlands *S.I. No. 271/2010 - European Communities (Conservation of Wild Birds (Rogerstown Estuary Special Protection Area 004015)) Regulations 2010.* NPWS (2013) *Conservation Objectives: Rogerstown Estuary SPA 004015. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Approximately 23.8km north of the proposed development

Table 2 Nationally protected sites in the vicinity of the proposed development

Designated Site Name [Code] and its nature conservation features	Location Relative to the Proposed Development Site
proposed Natural Heritage Area (pNHA)	
Dalkey Coastal Zone and Killiney Hill pNHA [001206] The site possesses diversity of coastal system with habitats ranging from the sub-littoral to coastal heath and has a geological importance. The flora is well developed and includes some scarce species. The islands are important bird sites – *see also Rockabill to Dalkey Island SAC and Dalkey Islands SPA in Table 1 above*	The proposed development overlaps slightly with the pNHA boundary along Coliemore Harbour
South Dublin Bay pNHA [000210] Diversity of coastal, estuarine, intertidal and marine habitats, and the flora and fauna species they support – *see also South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA in Table 1 above*	Approximately 4.3km northwest of the proposed development
Booterstown Marsh pNHA [001205] Diversity of coastal, estuarine, and the flora and fauna species they support. Particular interest is for saltmarsh habitat that has protected plant Borrer's saltmarshgrass (*Puccinellia fasciculata*) and is a valuable habitat for bird species associated the SPA – *see also South Dublin Bay and River Tolka Estuary SPA in Table 1 above*	Approximately 7.8km northwest of the proposed development

Designated Site Name [Code] and its nature conservation features	Location Relative to the Proposed Development Site
North Dublin Bay pNHA [000206] Diversity of coastal, estuarine, intertidal and marine habitats, and the flora and fauna species they support – *see also North Dublin Bay SAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA in Table 1 above*	Approximately 8.6km north of the proposed development
Dolphins, Dublin Docks pNHA [000201] Nesting common terns – *see also South Dublin Bay and River Tolka Estuary SPA in Table 1 above*	Approximately 9.9km northwest of the proposed development
Howth Head pNHA [000202] Diversity of heathland and dry grassland habitats mixed above vegetated sea cliffs and the flora and fauna species they support – *see also Howth Head SAC and Howth Head Coast SPA in Table 1 above*	Approximately 9.5km north of the proposed development
Lambay Island pNHA [000204] Diversity of coastal habitats which is of Annex I quality that includes vegetated sea cliffs and reefs. The site is important for grey seal, common seal and populations of seabirds – *see also Lambay Island SAC and Lambay Island SPA in Table 1 above*	Approximately 23.6km north of the proposed development

Appendix II

Desk Study Flora and Fauna Records

Desktop records of invasive plant species are listed below in **Table 1**. These are flora and fauna species which are listed under the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations, 2011* (as amended).

Table 1 Records of Third Schedule invasives flora and fauna species recorded from the desk study in the vicinity of the study area

Common Name/ Scientific name	**Flora or Fauna**	**Source**
Wireweed *Sargassum muticum*	Flora (alga)	NBDC online database record (O22T)
Giant hogweed *Heracleum mantegazzianum*	Flora (flowering plant)	NBDC online database record (O22T)
Hottentot-fig *Carpobrotus edulis*	Flora (flowering plant)	NBDC online database record (O22T)
Three-cornered garlic *Allium triquetrum*	Flora (flowering plant)	NBDC online database record (O22T)
Harlequin ladybird *Harmonia axyridis*	Fauna (invertebrate)	NBDC online database record (O22T)
Grey squirrel *Sciurus carolinensis*	Fauna (terrestrial mammal)	NBDC online database record (O22T)

Desktop records of protected, rare, or other notable fauna species are listed below in **Table 2**. In relation to amphibian, reptile and mammal species those which are protected under the Wildlife Acts, the Habitats Directive and/or are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red Lists are included. In the case of bird species, only those species listed in Annex I of the Birds Directive or on the Birds of Conservation Concern in Ireland (BoCCI) Red List are included in the table below. For invertebrate species, those which are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red List are included.

Table 2 Records of protected, red-listed or notable fauna from the desktop study in the vicinity of the study area

Common Name/ Scientific Name	Legal Status[1]	Red List Status[2]	Source
Amphibians			
Common frog *Rana temporaria*	HD_V, WA	Least concern	NBDC online database record (O22T)
Mammals (Marine)			
Grey seal *Halichoerus grypus*	HD_II & IV, WA	n/a	NBDC online database record (O22T)
Common seal *Phoca vitulina*	HD_II & IV, WA	n/a	NBDC online database record (O22T)
Common porpoise *Phocoena phocoena*	HD_II & IV, WA	Threatened under OSPAR Convention	NBDC online database record (O22T)
Bottle-nosed dolphin *Tursiops truncatus*	HD_II & IV, WA	n/a	NBDC online database record (O22T)
Mammals (Terrestrial)			
Badger	WA	Least concern	NBDC online database record (O22T)
Otter *Lutra lutra*	HD_II & IV, WA	Least concern	NBDC online database record (O22T)

[1] HD_II/IV/V = Habitats Directive Annexes II/IV/V; WA = Wildlife Acts; BD_I/II/III = Birds Directive Annex I/II/III; OSPAR = Convention for the protection of the marine environment of the North-east Atlantic 1992

[2] Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

Birds from Gilbert, G., Stanbury, A. & Lewis, L. (2021) Birds of Conservation Concern in Ireland 4: 2020-2026. *Irish Birds* 43: 1-22.

Amphibians, reptiles and fish from King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., Fitzpatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011) Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish.

Non-Marine Molluscs from Byrne, A., Moorkens, E.A., Anderson, R., Killeen, I.J. & Regan, E.C. (2009) *Ireland Red List No. 2 – Non-Marine Molluscs*.

Butterflies from Regan, E.C., Nelson, B., Aldwell, B., Bertrand, C., Bond, K., Harding, J., Nash, D., Nixon, D., & Wilson, C.J. (2010) Ireland Red List No. 4 – Butterflies.

Moths from Allen, D., O'Donnell, M., Nelson, B., Tyner, A., Bond, K.G.M., Bryant, T., Crory, A., Mellon, C., O'Boyle, J., O'Donnell, E., Rolston, T., Sheppard, R., Strickland, P., Fitzpatrick, U., & Regan, E. (2016) *Ireland Red List No. 9: Macro-moths (Lepidoptera).*

Damselflies and dragonflies from Nelson, B., Ronayne, C. & Thompson, R. (2011) *Ireland Red List No.6: Damselflies & Dragonflies (Odonata).*

Water beetles from Foster, G. N., Nelson, B. H. & O Connor, Á. (2009) *Ireland Red List No. 1 – Water beetles.*

Common Name/ Scientific Name	Legal Status[1]	Red List Status[2]	Source
Leisler's bat *Nyctalus leisleri*	HD_IV, WA	Least concern	NBDC online database record (O22T)
Soprano pipistrelle *Pipistrellus pygmaeus*	HD_IV, WA	Least concern	NBDC online database record (O22T)
Common pipistrelle *Pipistrellus pipistrellus*	HD_IV, WA	Least concern	NBDC online database record (O22T)
Irish hare *Lepus timidus subsp. hibernicus*	HD_V, WA	Least concern	NBDC online database record (O22T)
Red squirrel *Sciurus vulgaris*	WA	Least concern	NBDC online database record (O22T)
Pygmy shrew *Sorex minutus*	WA	Least concern	NBDC online database record (O22T)
Birds			
Arctic tern *Sterna paradisaea*	BD_I, WA	Amber	NBDC online database record (O22T)
Balearic shearwater *Puffinus mauretanicus*	BD_I, WA	Red	NBDC online database record (O22T)
Barn swallow *Hirundo rustica*	WA	Amber	NBDC online database record (O22T)
Black guillemot *Cepphus grylle*	WA	Amber	NBDC online database record (O22T)
Black-headed gull *Larus ridibundus*	WA	Amber	NBDC online database record (O22T)
Black-legged kittiwake *Rissa tridactyla*	WA	Red	NBDC online database record (O22T)
Light-bellied brent goose *Branta bernicla subsp. hrota*	WA	Amber	NBDC online database record (O22T)
Common guillemot *Uria aalge*	WA	Amber	NBDC online database record (O22T)
Common gull *Larus canus*	WA	Amber	NBDC online database record (O22T)
Common linnet *Carduelis cannabina*	WA	Amber	NBDC online database record (O22T)
Common redshank *Tringa totanus*	WA	Red	NBDC online database record (O22T)
Common sandpiper *Actitis hypoleucos*	WA	Amber	NBDC online database record (O22T)
Common scoter *Melanitta nigra*	BD_II (II), III (III)	Red	NBDC online database record (O22T)

Common Name/ Scientific Name	Legal Status[1]	Red List Status[2]	Source
Common shelduck *Tadorna tadorna*	WA	Amber	NBDC online database record (O22T)
Common starling *Sturnus vulgaris*	WA	Amber	NBDC online database record (O22T)
Common swift *Apus apus*	WA	Red	NBDC online database record (O22T)
Common tern *Sterna hirundo*	BD_I, WA	Red	NBDC online database record (O22T)
Common wood pigeon *Columba palumbus*	BD_II (I), III (I), WA		NBDC online database record (O22T)
Cormorant *Phalacrocorax carbo*	WA	Amber	NBDC online database record (O22T)
Dunlin *Calidris alpina*	BD_I, WA	Red	NBDC online database record (O22T)
Eurasian curlew *Numenius arquata*	BD_II (II), WA	Red	NBDC online database record (O22T)
Eurasian oystercatcher *Haematopus ostralegus*	WA	Red	NBDC online database record (O22T)
European greenfinch *Carduelis chloris*	WA	Amber	NBDC online database record (O22T)
European shag *Phalacrocorax aristotelis*	WA	Amber	NBDC online database record (O22T)
European storm-petrel *Hydrobates pelagicus*	BD_I, WA	Amber	NBDC online database record (O22T)
Goldcrest *Regulus regulus*	WA	Amber	NBDC online database record (O22T)
Grey wagtail *Motacilla cinerea*	WA	Red	NBDC online database record (O22T)
Herring gull *Larus argentatus*	WA	Amber	NBDC online database record (O22T)
House martin *Delichon urbicum*	WA	Amber	NBDC online database record (O22T)
House sparrow *Passer domesticus*	WA	Amber	NBDC online database record (O22T)
Lapwing *Vanellus vanellus*	BD_II (II), WA	Red	NBDC online database record (O22T)
Little egret *Egretta garzetta*	BD_I, WA	Green	NBDC online database record (O22T)

Common Name/ Scientific Name	Legal Status[1]	Red List Status[2]	Source
Little gull *Larus minutus*	BD_I, WA	Amber	NBDC online database record (O22T)
Mallard *Anas platyrhynchos*	BD_II (I), III (I), WA	Amber	NBDC online database record (O22T)
Manx shearwater *Puffinus puffinus*	WA	Amber	NBDC online database record (O22T)
Meadow pipit *Anthus pratensis*	WA	Red	NBDC online database record (O22T)
Mediterranean gull *Larus melanocephalus*	BD_I, WA	Amber	NBDC online database record (O22T)
Mute swan *Cygnus olor*	WA	Amber	NBDC online database record (O22T)
Northern fulmar *Fulmarus glacialis*	WA	Amber	NBDC online database record (O22T)
Northern gannet *Morus bassanus*	WA	Amber	NBDC online database record (O22T)
Northern wheatear *Oenanthe oenanthe*	BD_I, WA	Amber	NBDC online database record (O22T)
Peregrine falcon *Falco peregrinus*	BD_I, WA	Amber	NBDC online database record (O22T)
Purple sandpiper *Calidris maritima*	WA	Red	NBDC online database record (O22T)
Razorbill *Alca torda*	WA	Red	NBDC online database record (O22T)
Red-throated diver *Gavia stellata*	BD_I, WA	Amber	NBDC online database record (O22T)
Redwing *Turdus iliacus*	BD_II(I), III(I)	Red	NBDC online database record (O22T)
Rock pigeon *Columba livia*	BD_II(I), WA	Green	NBDC online database record (O22T)
Roseate tern *Sterna dougallii*	BD_I, WA	Amber	NBDC online database record (O22T)
Ruddy turnstone *Arenaria interpres*	WA	Amber	NBDC online database record (O22T)
Sand martin *Riparia riparia*	WA	Amber	NBDC online database record (O22T)
Sandwich tern *Sterna sandvicensis*	BD_I, WA	Amber	NBDC online database record (O22T)
Invertebrates			

Common Name/ Scientific Name	Legal Status[1]	Red List Status[2]	Source
Large red tailed bumble bee *Bombus (Melanobombus) lapidarius*	none	Near threatened	NBDC online database record (O22T)
Marine Molluscs			
Dog whelk *Nucella lapillus*	none	Threatened under OSPAR Convention	NBDC online database record (O22T)

Appendix III

Examples of Valuing Important Ecological Features

International Importance:

- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Proposed Special Protection Area (pSPA).
- Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.[1]
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- Resident or regularly occurring populations (assessed to be important at the national level)[2] of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe.
- European Diploma Site under the Council of Europe.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 1988).[3]

[1] See Articles 3 and 10 of the Habitats Directive

[2] It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

[3] Note that such waters are designated based on these waters' capabilities of supporting salmon (Salmo salar), trout (Salmo trutta), char (Salvelinus) and whitefish (Coregonus)

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level)[4] of the following:
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing 'viable areas'[5] of the habitat types listed in Annex I of the Habitats Directive

County Importance:

- Area of Special Amenity.[6]
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level)[7] of
- the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.

[4] It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

[5] A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

[6] It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

[7] It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan, if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level)[8] of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

[8] It is suggested that, in general, 1% of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

Appendix IV

Construction Noise Calculation

Prepared by Arup (2021).

1 Schedule of Noise-Generating Equipment[9]

Equipment	Sound Pressure L_{Aeq} dB at 10m	Comment
Hand-held pneumatic breaker	95	
Hand-held pneumatic rock drill	90	
Compressor	86	
Mobile telescopic crane 80t	84	
Water pump	81	
Grout mixer and pump	80	
3kW Hand-held circular saw	79	May be used if additional prep of rock-face needed
167kW concrete mixer	76	
Mini piling rig (worst case)	76	
45kW compressor for mini piling	75	
Lorry	70	
Concrete pump	67	
Diesel generator	59	

2 Noise Calculation

The noisiest piece of equipment (hand-held pneumatic breaker) will generate a sound pressure level of up to 95dBA at 10m for relatively brief periods of time. In operation, this will effectively mask noise generated by other equipment with sound pressure levels more than 10dB lower. The four noisiest

[9] Data from BS 5228-1:2009+A1:2014

pieces of equipment (which range in sound pressure levels of 95dBA down to 84dBA at 10m) which may operate simultaneously were therefore selected for modelling. This is a worst-case scenario, and there is no potential for more than one of any of these four pieces of equipment to be in operation at the same time.

Applying the following formula:

Total sound pressure level (SPL_{Total}) = {sum of $10^{((SPL1+SPL2+...)/10)}$} dB.

Simultaneous operation of equipment with sound pressure levels of 95+90+86+84dBA logarithmically sums to a total equivalent sound pressure level of 97dBA at 10m from the construction activity.

Sound attenuates by 6dB for each doubling of distance assuming point source propagation (which is reasonable in this case), so at 100m, the sound pressure level will be 77dBA, and at 300m, the sound pressure level will be 68dBA.

3 Noise Impact Assessment

The closest identified sensitive ecological receptor is a Tern nesting site at Lamb's Island, which is approximately 300m from the site of the proposed works. The consulting ecologist has identified that there is a risk of impact on nesting terns if noise levels exceed 70dB at the nesting location.

The highest noise levels modelled in this assessment will only occur for relatively short periods of time, as the hand-held pneumatic breaker breaks through the outer face of the rock, for each of the piles (conservatively assumed to be a 30-minute period for each pile).

During these periods, noise levels of up to 68dB attributable to the construction activities may be experienced at Lamb's Island. This is a worst-case assessment, and below the identified threshold of 70dB for adverse effects on nesting terns, and therefore no impact is predicted at the identified ecological sensitive receptor.

Appendix V

Plans and Policies Relevant to the Proposed Development

Dún Laoghaire-Rathdown County Development Plan 2022-2028	Compliant?
Policy Objective GIB18: Protection of Natural Heritage and the Environment It is a Policy Objective to protect and conserve the environment including, in particular, the natural heritage of the County and to conserve and manage Nationally and Internationally important and EU designated sites - such as Special Protection Areas (SPAs), Special Areas of Conservations (SACs), proposed Natural Heritage Areas (pNHAs) and Ramsar sites (wetlands) - as well as non-designated areas of high nature conservation value known as locally important areas which also serve as 'Stepping Stones' for the purposes of Article 10 of the Habitats Directive	Yes
Policy Objective GIB19: Habitats Directive It is a Policy Objective to ensure the protection of natural heritage and biodiversity, including European Sites that form part of the Natura 2000 network, in accordance with relevant EU Environmental Directives and applicable National Legislation, Policies, Plans and Guidelines.	Yes
Policy Objective GIB21: Designated Sites It is a Policy Objective to protect and preserve areas designated as proposed Natural Heritage Areas, Special Areas of Conservation, and Special Protection Areas. It is Council policy to promote the maintenance and as appropriate, delivery of 'favourable' conservation status of habitats and species within these areas.	Yes
Policy Objective GIB22: Non-Designated Areas of Biodiversity Importance It is a Policy Objective to protect and promote the conservation of biodiversity in areas of natural heritage importance outside Designated Areas and to ensure that notable sites, habitats and features of biodiversity importance - including species protected under the Wildlife Acts 1976 and 2000, the Birds Directive 1979, the Habitats Directive 1992, Flora (Protection) Order, 2015, Annex I habitats, local important areas, wildlife corridors and rare species - are adequately protected. Ecological assessments will be carried out for all developments in areas that support, or have potential to support, features of biodiversity importance or rare and protected species and appropriate mitigation/ avoidance measures will be implemented. In implementing this policy, regard shall be had to the Ecological Network, including the forthcoming DLR Wildlife Corridor Plan, and the recommendations and objectives of the Green City Guidelines (2008) and 'Ecological Guidance Notes for Local Authorities and Developers' (Dún Laoghaire-Rathdown Version 2014)	Yes
Policy Objective GIB23: County-Wide Ecological Network It is a Policy Objective to protect the Ecological Network which will be integrated into the updated Green Infrastructure Strategy and will align with the DLR County Biodiversity Action Plan. Creating this network throughout the County will also improve the ecological coherence of the Natura 2000 network in accordance with Article 10 of the Habitats Directive. The network will also include non-designated sites.	Yes
Policy Objective GIB8: Coastline Parks and Harbours It is a Policy Objective to continue to upgrade recreational and tourism-related amenities in the public parks and harbours along the coastline, including improved accessibility by the general public.	Yes
Policy Objective GIB12: Access to Natural Heritage	Yes

It is a Policy Objective to promote, protect and enhance sustainable and appropriate access to the natural heritage of the County, where practicable, in a balanced way while protecting the natural heritage of the County.	
Policy Objective OSR11: Water-Based Sports It is a Policy Objective to support and encourage water-based sports and maritime leisure activities along the coast subject to Council Bye-Laws, and the Habitats and Birds Directives. The County features seventeen kilometres of coastline, which is a valuable asset. If utilised to its full potential it can contribute to the health and well-being of the residents of, and workers, in the County and will increase sport and physical activity participation levels locally. These activities can also offer significant potential for tourism growth.	Yes
Policy Objective HER24: Protection of Coastline Heritage It is a Policy Objective to: i. Encourage and promote the retention of features of the County's coastal heritage where these contribute to the character of the area. ii. Have regard to those items identified in the Coastal Architecture Heritage Survey when assessing any development proposals.	Yes
Dún Laoghaire-Rathdown County Development Plan 2016-2022	**Compliant?**
Policy LHB1: Access to Natural Heritage It is Council policy to promote, protect and enhance sustainable and appropriate access to the natural heritage of the County.	Yes
Policy LHB9: Coastline Parks and Harbours It is Council policy to continue to upgrade recreational and tourism-related amenities in the public parks and harbours along the coastline including improved accessibility by the general public.	Yes
Policy LHB19: Protection of Natural Heritage and the Environment It is Council policy to protect and conserve the environment including, in particular, the natural heritage of the County and to conserve and manage Nationally and Internationally important and EU designated sites - such as Special Protection Areas, candidate Special Areas of Conservation, proposed Natural Heritage Areas and Ramsar sites - as well as non-designated areas of high nature conservation value which serve as 'Stepping Stones' for the purposes of Article 10 of the Habitats Directive.	Yes
Policy LHB20: Habitats Directive It is Council policy to ensure the protection of natural heritage and biodiversity, including European sites that form part of the Natura 2000 network, in accordance with relevant EU Environmental Directives and applicable National Legislation, Policies, Plans and Guidelines.	Yes
Policy LHB22: Designated Sites It is Council policy to protect and preserve areas designated as proposed Natural Heritage Areas, candidate Special Areas of Conservation, and Special Protection Areas. It is Council policy to promote the maintenance and as appropriate, delivery of 'favourable' conservation status of habitats and species within these areas.	Yes
Policy OSR12: Water-Based Sports It is Council policy to support and encourage waterbased sports and maritime leisure activities along the coast subject to Council Bye-Laws. The County features seventeen kilometres of coastline, which is a valuable asset. If utilised to its full potential it can contribute to the health and well being of the residents of, and workers, in the County and can also offer significant potential for tourism growth	Yes
Policy AR10: Protection of Coastline Heritage	Yes

It is Council policy to: Encourage and promote the retention of features of the County's coastal heritage where these contribute to the character of the area. ii. Have regard to those items identified in the Coastal Architecture Heritage Survey when assessing any development proposals.	