2 Non-Technical Summary

2.1 General

This section represents a summary of the EIS in non-technical language as is required by the EU Directive, to ensure the public's awareness of any environmental implications. This Non-Technical Summary should however be read in conjunction with the remainder of this EIS.

2.2 Introduction

The EU Directive requires the production of a non-technical summary as part of the production of an EIS. The non-technical summary ensures that the public is made aware of the environmental implications of any decisions about whether to allow new developments to take place. The non-technical summary is laid out in a similar, but summarized format to the main EIS, describing the project, existing environment, impacts and mitigation measures.

Assessments have been conducted in an integrated, collaborative and analytical process in accordance with the Guidelines on various aspects of the environment in relation to potential significant adverse impacts of the proposed development. The overall finding of these studies is that, provided the specified ameliorative, remedial or reductive measures are implemented, the likely effects of the proposed development on the environment during both the construction and operational stages will not be significant.

2.3 Context for EIS

The Environmental Impact Statement contains the statutory planning context and an independent assessment of the impact of the proposal and suggests any necessary mitigation measures.

This application is being made in accordance with the Seventh Schedule of the Planning and Development (Strategic Infrastructure) Act, 2006 as the proposal in this instance comprises a transport project involving the construction of a quay in excess of 100 metres. As a result, An Bord Pleanála has confirmed the project in question as constituting 'strategic infrastructure' and therefore, an Environmental Impact Statement is required to accompany the planning application for this development as a result.

2.3.1 Screening Exercise for EIS

At the outset of any EIS process it is worth determining whether or not a project would in fact require an EIS to be prepared. This is referred to as a Screening Exercise. This is normally done primarily by reference to the thresholds and criteria set down in the national legislation.

The requirement to prepare an EIS for this planning application in this instance arises due to the inclusion of development of the nature proposed under the Seventh Schedule of the Planning & Development (Strategic Infrastructure) Act, 2006. Section 37A of the Act specifies circumstances where a proposal can be determined strategic infrastructure, in this particular instance the Seventh Schedule includes under 'Transport Infrastructure' the following type of development:-

> *A harbour or port installation (which may include facilities in the form of loading or unloading areas, vehicle queuing and parking areas, ship repair areas, areas for berthing or dry docking of ships, areas for the weighing, handling or transport*

of goods or the movement or transport of passengers (including customs or passport control facilities), associated administrative offices or other similar facilities directly related to and forming an integral part of the installation)—

(a) where the area or additional area of water enclosed would be 20 hectares or more, or

(b) which would involve the reclamation of 5 hectares or more of land, or

(c) which would involve the construction of one or more quays which or each of which would exceed 100 metres in length, or

(d) which would enable a vessel of over 1350 tonnes to enter within it.

Consequently, the development having been deemed Strategic Infrastructure through pre-application consultation with An Bord Pleanála, as falling within the threshold of the Seventh Schedule of the Act and the relevant criteria, requires Environmental Impact Assessment. The preparation and submission with the application of an Environmental Impact Statement is therefore a mandatory requirement.

2.4 Scoping Exercise for EIS

Prior to commencing with the process of preparing an EIS, the EIS team undertook a review of the project with a view to identifying where the most likely impacts on the environment were likely to arise.

The topics examined at this stage of the EIS process were:

- Human Beings
- Flora and Fauna
- Soils & Geology
- Coastal Processes
- Water
- Air
- Climate
- Landscape and Visual Impact
- Material Assets
- Archaeological Heritage
- Architectural Heritage

2.5 EIS Structure

The formation of an Environmental Impact Statement necessitates the co-ordination and collation of associated, yet diverse specialised areas of assessment. The grouped format approach has been adopted in the preparation of this EIS. This approach involved the individual examination of each environmental topic, describing the existing environment, the subject proposal, its likely impacts pertaining to that environmental topic and mitigation measures.

The topics examined in this EIS are:

- Human Beings
- Flora and Fauna
- Soils & Geology
- Coastal Processes
- Water
- Air (Noise and Vibration)
- Climate (Air Quality)
- Landscape and Visual Impact
- Material Assets (Waste & Transportation)
- Archaeological Heritage
- Architectural Heritage

This process has been administered through a schematic structure in order to provide coherent documentation of the varied aspects of the environment considered. The Grouped Format structure of the Environmental Impact Statement is outlined below with a brief description of each specific stage.

The impact of the proposal is considered for both the construction and operational phases of the development.

This EIS examines the proposed development under the following headings:

1) Receiving Environment

A comprehensive description of the specific environment into which the proposal will fit, taking account of other developments likely to occur. The particular aspects of the environment are discussed in terms of their context, character, significance and sensitivity. Each environmental topic is addressed in terms of context, significance, and sensitivity.

2) Characteristics of the Proposal

This outlines the specific aspects of a proposal paying particular attention to those aspects that would be most relevant to the particular environmental aspect in question.

3) Potential Impact of the Proposal

a) The potential impact of the proposal also includes a general description of the possible types of impacts which proposals of this kind would be likely to produce.

b) This includes a consideration of the 'Do-Nothing' impact. The 'Do- Nothing' impact describes the environment, as it would be in the future if no development of any kind were carried out.

4) Ameliorative, Remedial or Reductive Measures

A description of any specified remedial or reductive measures considered necessary resulting from the assessment of potential impacts described at (3a) above.

A description of any post development monitoring of effects on the environment which might be necessary, covering the monitoring methods and the agencies responsible for their implementation.

Where required, a description of reinstatement measures and the agencies responsible for their implementation is included.

5) Predicted Impact of the Proposal

This section comprises an assessment of the specific impacts of the subject proposal on the environment as found by an expert analysis and judgment having regard to the receiving environment, the potential impacts, and the characteristics of the proposal. The predicted impacts are assessed having regard to their character, magnitude, duration, consequences and significance.

A 'Worst Case' impact is also considered for both the construction and operational phases of the development and as such a range of environmental topics are taken into account. These are outlined in the 'Guidelines on the Information to be contained in Environmental Impact Statements, 2002'.

2.6 EIS Study Team

This Environmental Impact Statement has been prepared by a team which has been led by Stephen Little and Associates, Chartered Town Planners & Development Consultants.

Stephen Little and Associates were responsible for the preparation of socio-economic and planning and development context, as well as the overall management and coordination of the assessment. The other members of the study team and their respective inputs are outlined below:

Table 2.6.1 EIS Study Team

Consultant	Specialism	Relevant EIS Section
Stephen Little & Associates	Chartered Town Planners	Non-Technical Summary
Stephen Little & Associates/ Waterman Moylan	Chartered Town Planners / Consulting Engineers	Description of Proposed Development (including a consideration of alternatives)
Stephen Little & Associates	Chartered Town Planners	Planning & Development Context
Stephen Little & Associates	Chartered Town Planners	Human Beings
Scott Cawley	Environmental Consultants	Flora and Fauna
Waterman Moylan	Consulting Engineers	Soils & Geology
Waterman Moylan	Consulting Engineers	Coastal Processes
Waterman Moylan / AWN Consulting	Consulting Engineers / Environmental Consultants	Water, Flood Risk and Water Quality
AWN Consulting	Environmental Consultants	Air (Noise and Vibration)
AWN Consulting	Environmental Consultants	Climate (including Air Quality)
Mitchell & Associates / Modelworks	Visual Impact Consultants / CGI Consultants	Landscape and Visual Impact
Waterman Moylan	Consulting Engineers	Material Assets - Transportation
AWN Consulting	Environmental Consultants	Material Assets - Waste
Irish Archaeology Consultancy	Archaeological Consultants	Archaeological Heritage
Shaffrey Associates Architects	Conservation Architects	Architectural Heritage
Stephen Little & Associates	Chartered Town Planners	Effects resulting from the existence of the proposed development
Stephen Little & Associates	Chartered Town Planners	Effects resulting from use of natural resources
Stephen Little & Associates	Chartered Town Planners	Direct and indirect effects resulting from the emission of pollutants, creation of nuisances and elimination of waste
Stephen Little & Associates	Chartered Town Planners	Forecasting methods used to assess the effects on the environment
Stephen Little & Associates	Chartered Town Planners	Inter-relationships

Stephen Little & Associates	Chartered Town Planners	Difficulties Encountered
Stephen Little & Associates	Chartered Town Planners	Overall Co-ordination and Management of the EIS
Stephen Little & Associates	Chartered Town Planners	Editorial Responsibility for EIS

Source: SLA

2.7 Consultation

The proposed development put forward for consideration has been informed by extensive consultation with various statutory bodies, non-statutory bodies, stakeholders, harbour users and the general public, including:

An Bord Pleanála

Six pre-application consultation meetings were held between An Bord Pleanála and the applicant between May 2013 and February 2015. The pre-application consultation process was formally closed in April 2015. On foot of the Board's advice, this planning application has taken into consideration the issues raised in other port related SID applications.

Dun Laoghaire-Rathdown County Council

Three presentations have been made to Dun Laoghaire-Rathdown County Council in respect of the proposed project in July 2013, January 2015 and March 2015. Consultations were also undertaken with various departments within Dun Laoghaire-Rathdown County Council in the preparation of this planning application including:

- Planning Department
- Water Services Department
- Transportation Department
- Heritage Officer
- Conservation Officer
- Parks Department (telephone conversation)

A pre-application meeting was also held between An Bord Pleanála and Dun Laoghaire-Rathdown County Council in September 2013 in respect of this project.

EIS Consultation

The following bodies have also been consulted regarding the proposed development and associated Environmental Impact Assessment / Statement:

- Dun Laoghaire Harbour Company
- National Parks and Wildlife Service:
    - Research Branch
    - Marine Ecology (Galway)

  - Terrestrial Ecology (Dublin)
  - Local Rangers
- BirdWatch Ireland
- Bat Conservation Ireland
- Irish Whale & Dolphin Group
- Botanical Society of Britain and Ireland (BSBI)
- Biodiversity Officer of Fingal County Council
- Environmental Protection Agency
- Marine Institute
- Harbourmaster, Dublin Port
- Heritage Officers of Dublin City Council and Fingal County Council
- Department of Arts, Heritage and the Gaeltacht (Development Applications Unit)
- Department of Arts, Heritage and The Gaeltacht, Underwater Unit, Heritage Division
- Department of Arts Heritage and the Gaeltacht - Architectural Heritage Advisory Unit
- Department of Transport, Tourism and Sport – Marine Survey Office
- Department of Environment, Community and Local Government – Foreshore Section

Pre-Application Public Consultation

In preparing this planning application, the applicant decided to canvass the views of local stakeholders and harbour users. A page on the Dun Laoghaire Harbour Company's (DLHC) website was set up which included a presentation about the project, together with accompanying maps of the harbour, along with responses to FAQ's. Meetings were also arranged with key stakeholders/harbour users. This consultation happened over a three-week period with key stakeholder / harbour users meetings held in the first week and consultation with the general public in week 2 and 3.

A formal response to issues raised following the public consultation was prepared by the applicant and issued to the various stakeholders / harbour users. A copy of this response was also made available on the DLHC's website.

Formal Planning Application Consultation

This planning application is subject to a full seven week consultation period, during which time observations to An Bord Pleanála may be made. This allows interested parties a further opportunity to comment on the final scheme put forward for consideration.

2.8 Description of Proposed Development

A summary description of the proposed development is provided below. A more comprehensive description is provided in Chapter 3 of this EIS.

The proposed development generally comprises of the construction of a new quay, berth and access causeway; the dredging of a navigation channel; and associated landside accommodation works.

2.8.1 Development Rationale

Dun Laoghaire is already an established destination for cruise ships and currently provides berthing arrangements for cruise ships. The existing berthing facilities at Dun Laoghaire Harbour are not capable of catering for the c. 340m long next generation cruise ships and a new facility is required so as to attract these ships to Dun Laoghaire Harbour. The absence of a harbour in Dublin Bay with the capacity to handle the 340m next generation cruise liners has been identified as a serious inhibitor to growing Ireland's market share in this sector. Dun Laoghaire Harbour offers a large, sheltered harbour, that is largely a leisure and recreation harbour.

There are a number of policy documents that support the development of Dun Laoghaire Harbour for niche uses such as cruise shipping, including:

- The National Ports Policy 2013
- Destination Dublin - A Collective Strategy for Tourism Growth to 2020
- Regional Planning Guidelines for the Greater Dublin Area 2010-2022
- Dun Laoghaire – Rathdown County Development Plan 2010-2016
- Dun Laoghaire Harbour Masterplan 2011-2030
- Draft Dun Laoghaire Rathdown County Development Plan 2016 – 2022

In relation to economic feasibility, an economic impact assessment has been prepared by DKM Economic Consultants and is included in this planning application. In summary, the report advises that the following economic benefits would arise from the proposed development:

- The construction of the proposed cruise berth could contribute approximately €21 million to the national economy.
- Approximately 200 FTE jobs will be provided by the construction phase of the cruise berth, taking direct, indirect and induced impacts into account.
- The economic impacts for Dun Laoghaire are considerable and are estimated to lie between €16 million and €41 million after twenty years (Cumulative Net Present Value), depending on the number of vessels coming into Dublin Bay.
- After twenty years, it is estimated that the number of permanent jobs created in Dun Laoghaire as a result of the project will be between 70 and 250, based on the expenditure of the cruise passengers and crew under the scenarios described in this Economic Impact Assessment.

This indicates that the proposed development would contribute to the national, regional and local economy and would also assist in the making Dun Laoghaire Harbour a financially viable harbour.

2.8.2 General Description of Proposed Works

This section of the EIS relates and summarises the main maritime and landside elements of the proposed new cruise berth at Dun Laoghaire Harbour (DLH).

The development as illustrated on the planning drawings comprises of the following maritime elements:

- An approach navigation channel 120m clear width, approximately 1,150m long situated beyond the existing Harbour breakwaters
- A vessel turning circle approximately 500m diameter, situated outside the existing Harbour breakwaters
- An inner navigation channel up to 145m clear width, approximately 850m long within the existing Harbour breakwaters
- A new berth approximately 435m overall length constructed in the west of the harbour water body comprising a new quay 120m x 20m on plan, a new access causeway 180m long by 9.1m wide linking the new quay to the Eastern Breakwater, and 8 new large diameter stand-alone mooring dolphins connected by a new trussed walkway for stevedore operational use.
- Three new navigation buoys/ lights – two buoys situated outside the Harbour breakwaters, and one light inside attached to the outer mooring dolphin. The outer buoys will be provided in addition to a new system of virtual buoys.
- New underwater scour protection to the Eastern Breakwater locally where it adjoins the proposed access causeway.
- Local adjustments to the Eastern Breakwater locally where it adjoins the new access causeway, however no significant change in breakwater level is anticipated

The dredged channel is proposed to be excavated down to -10.5m Chart Datum equivalent to -13.01m Ordnance Datum Malin.

The configuration of the new cruise berth facility summarised above is intended to provide access to the Harbour at all states of the tide for the anticipated 340m long Freedom Class cruise vessels. The proposals are based on the results of a navigational analysis by specialist maritime engineers using computer simulated vessel manoeuvres.

All the new proposed berth structures described here have been designed to be suspended concrete platforms supported by discrete steel piling with a certain freeboard above high tide level.

The development as illustrated on the planning drawings comprises of the following landside elements:

- Demolition of the existing concrete boundary wall, construction of a new coach drop off/ pick up area, and construction of a shared use pedestrian access zone complete with high quality concrete surfaces, all adjoining the HSS Marshalling Yard.

- A new pedestrian boardwalk parallel to the existing Marina public access route, which will be suspended on piles above water level complete with hand railing
- A new pedestrian footpath along Harbour Road providing linkage with the existing Terminal Plaza, complete with high quality concrete surfaces.
- A new coach overflow holding area placed within Accommodation Walk, plus associated masonry wall adjustments adjacent to the Old Quay car park, all located to the west of the Harbour.
- The landside elements will be provided with new lighting, watermain and buried utilities normal to Harbour usage.

The scheme allows for public access and use of the proposed boardwalk, the shared access route and the connecting footpaths. The existing public access to the Marina Eastern Breakwater will be reinstated on completion of the cruise facility.

2.8.3 Site Layout and Form

This chapter of the EIS is divided for simplicity into the two broad harbour usages, namely maritime and landside, and describes the intended features of the proposed cruise berth facility.

It is proposed to dredge a new approach channel within the seabed from deep water in Dublin Bay to the proposed new berth within Dun Laoghaire Harbour to a level of -10.5m Chart Datum (CD) (equivalent to -13.01m Ordnance Datum Malin). Chart Datum is the reference level on Admiralty Charts.

A dredge level of -10.5mCD will allow cruise ships up to the selected Freedom Class up to 8.5m draught to access the Harbour at all states of the tide via the 120m channel width (minimum).

The outer approach channel will be on an east-west alignment to optimise the transit to and from deep water for cruise ships and to avoid excessive dredging.

A dredged turning circle 500m in diameter is proposed outside the Harbour breakwater to allow cruise vessels to manoeuvre safely into the Harbour, either bow or stern first depending on conditions. Cruise vessels would therefore transit straight to and from the proposed new berth without the need for difficult turning manoeuvres inside the harbour.

The proposed inner berth access channel will be positioned approximately 120m to the west of and parallel to St Michael's Pier, but oriented NNE to align with the Harbour Mouth.

The overall dredge channel comprising the outer approach channel, the turning circle and the inner access channel will yield an overall navigation distance from deep water in the bay of 2.5km. The associated plan configuration provides the optimum transit distance for cruise ships which it is intended will not normally require tug assistance.

The proposed new berth, termed Berth 6 in this EIS, would be positioned to the west of the berth access channel providing quayside access to the adjoining Eastern Breakwater. (The examination of alternative berth locations has been described separately in EIS Chapter 3.6).

Two new additional visible navigation aids are proposed outside the harbour to mark the entrance to the approach channel. In addition it is intended that larger vessels will navigate the approach channel and turning circle using a system of virtual buoys. A new navigation

light will be added to the outermost part of the proposed berth structure.

Simulated navigation studies have been undertaken on the proposed access channels and turning circle. Based on available data, only average hourly wind speeds exceeding 25 knots are likely to significantly affect ship access - which has a very low probability of exceedance at Dun Laoghaire. (See also EIS Chapter 3.2 reference to manoeuvring computer simulations by Moffatt & Nichol 2014).

The dredged channel will include side slopes of approximately 12 degrees (or 1 vertical to 5 horizontal), scour protection below the waterline locally at the eastern breakwater, and localised widening where the channels meet the turning circle. The associated dredge volume is approximately 710,000 cubic metres.

There are three distinct elements to the berthing structure, namely an access causeway, a working quay and a series of eight mooring dolphins.

Cruise ships will berth and moor using a combination of new fenders and bollards attached to the dolphins and the new working quay. Cruise passengers will get on/off the cruise ships at the working quay, and then transit to the landside via the access causeway.

The mooring dolphins will consist of 3m diameter concrete filled steel monopiles installed through the seabed, arranged in a line on plan. The outer dolphin would be approximately 435m NNE from the Eastern Breakwater. The innermost dolphin would approximately align on plan with the end of St Michael's Pier. All dolphinss would have operative only access via suspended walkways over water.

Parallel to the inner four dolphins a suspended access causeway of length 180m will connect the Eastern Breakwater to the proposed working quay.

The working quay is intended primarily for the embarkation/ disembarkation of cruise passengers and attending on ships, and will be 120m long by 20m wide on plan.

The quay structure and access causeway are 'open quay structures' and would be supported on an arrangement of concrete filled steel tubular piles up to 1m in diameter.

The deck surface level of all quayside structures would be set at a level of +6.9m Chart Datum (+4.39m Ordnance Datum Malin) which is approximately the same as the existing Eastern Breakwater. The quayside structures would therefore exhibit freeboard above tide levels ranging from 2.8m to 6.1m height relative to mean spring tides, a minimum of 1.35m freeboard in extreme weather events.

All cruise facilities have been designed on a port-of-call basis therefore full terminal facilities are not envisaged. Cruise passengers transiting to/from the vessel will first be subject to security checks at the point where the access causeway linking the quay to the shore meets the Eastern Breakwater. A small new kiosk and office building will be positioned on the Eastern Breakwater adjacent to a security gate at the end of the access causeway for this purpose.

A selection of transports are envisaged for transferring passengers between the quay and the landside transport infrastructure including shuttle bus, shuttle cars, pedestrian, with onward journeys being made via coaches, DART, or public transport all available at Crofton Road.

Connecting the Eastern Breakwater with Harbour Road will be a north-south access corridor. Attention has been made to making the pedestrian experience as user friendly as possible. A boardwalk is proposed parallel to the Marina complete with tiered seating and envisaged as a new destination within the public realm foreseen by the Dun Laoghaire Harbour Masterplan.

A 7m wide high-quality finished footpath/ shared surface has been designed to connect pedestrian passengers between the vessel and the existing Terminal Plaza on Harbour Road. This feature would be a clear uninterrupted access way complete with architectural feature lighting plus landscaping and is intended to help provide way-finding and connectivity for passengers wishing to access Dun Laoghaire Town and the readily available public transport infrastructure at Crofton Road.

A segregated 6.0m wide pedestrian way for coach tour pick up / drop off with a chevron herringbone bus parking arrangement has been devised using part of the existing HSS Yard. A screen wall will separate the north-south shared access corridor and the coach park area. To cater for these new arrangements demolition of the existing boundary wall, a suspended canopy structure, trees (removal and replacement), and an administration building is required.

Overflow coach parking is proposed at the existing Accommodation Walk, requiring local adjustments to a masonry boundary wall at the Old Quay car park.

The newly configured landside pavement areas and the maritime structures will each be provided with the normally associated buried drainage, utilities apparatus plus pillars, overhead lighting, but also including a watermain extension from Harbour Road to the quayside.

2.8.4 Construction and Phasing

The marine construction works comprise two elements: the dredging of the 2.5km long approach channel needed to provide sufficient depth of water for the cruise ships to approach the harbour, and the construction of the new berth.

The capital dredging work will involve the removal of approximately 710,000m^3 of material from the seabed, material that will then be deposited at the Burford Bank Licensed Marine Disposal Ground, approximately 4 nautical miles distant. The use of the Burford Bank for this purpose will be subject to a separate Dumping at Sea licence. It is noted that this volume of excavation represents just over 10% of dredging proposed for Dublin Port.

Ground investigations have shown that the material to be dredged is almost entirely unconsolidated sand, with a small amount of silt close to the existing high speed ferry berth. These materials are suitable for excavation using trailer dredging methods. A trailing suction hopper (or storage tank) dredger (TSHD) is a sea-going ship equipped with one or two suction pipes designed to hang along the sides of the vessel. The lower end of the pipe is fitted with a drag-head which during the operation of the dredger is trailed along the seabed. Suction is provided by a pump which lifts the sand and silt from the bed and discharges it into a hopper within the ship. The dredge is controlled by GPS and regular surveys of the sea bed to eliminate high spots, and to limit over dredging.

In places the side slopes of dredged channel will be protected with a concrete mat. This will be used where the slopes need to be steeper, or where they will be subject to propeller wash from vessels moving on and off the berth. There are several ways these mats can be installed, usually using a barge mounted crane working together with divers on the sea floor.

The new berth will comprise of a concrete deck supported over the water on piles. Larger independent piles will also be installed to accommodate the mooring loads of the cruise ships beyond the central berth area. The piles will comprise of steel tubes filled with reinforced concrete. The steel tubes will be brought to site by barge, and will be installed into the ground to the correct depth using a combination of pile driving and drilling techniques. The tube will then be filled with reinforced concrete, using techniques that ensure the concrete is

not spilled into the harbour.

The concrete deck of the main quay and approach causeway will maximise the use of concrete beams and other elements manufactured on land and then lifted into position on the piles using a heavy duty barge mounted crane. Once all the pre-cast concrete elements are fixed in position a reinforced concrete slab will be poured across the whole deck area. This is normal construction practice that will be well understood by the contractors carrying out the work. Following construction and curing of the concrete, the bollards, fenders, and other berth furniture will be lifted into position and bolted to the deck.

Local repair of a small number of dislodged masonry blocks from the West Pier Roundhead will be carried out. The contractor for the works will be tasked to include in the construction management plan (a) pre- and post- condition surveys of the most proximate extents of the Roundheads and locally part of each adjacent pier, and (b) monitoring surveys of a series of monitoring stations.

Many of the maritime construction tasks require the use of barges and other vessels, supported by tugs, work boats and service vessels. In the event of severe weather warnings the barges and vessels will cease work and will relocate to pre-determined sheltered areas within the harbour.

The landside works will comprise the following distinct elements: a proposed coach drop-off/pickup parking area (off Harbour Road), a proposed 150m long shared use access route (off Harbour Road), a proposed suspended boardwalk adjacent to the Marina, a remote overflow coach park utilising the existing Accommodation Walk (adjacent to the Old Quay) is envisaged, and an associated local remodelling of a masonry wall adjacent to the Old Quay car park.

The shared north-south access corridor will require demolition of approximately 125m of the existing concrete boundary wall requiring large circular saw equipment and mobile rockbreakers.

Removal of two of the existing port corchere tented structures would be that of reverse construction starting with controlled un-stressing of the stressed skin canopy and guy-wires, followed by fabric removal all utilising a large mobile crane.

Once the buried concrete boundary wall foundation has been removed a new road pavement would be constructed to occupy the void created. This will comprise of imported granular material delivered by road compacted in layers. The new concrete surface would be achieved using either onsite mixed or ready-mixed concrete with all materials being delivered by road via Harbour Road.

The proposed suspended boardwalk will be constructed over water utilising a small floating work access barge with materials delivered by road placed in position by a medium sized crane. Small sections of the existing rock armour would be removed temporarily to allow access for local steel pile foundations inserted using a mobile piling rig standing on the existing ground – following such pile insertion the rock armour would be replaced. The boardwalk would then be completed using relatively short steel members with a timber walkway surface.

Erection of a new screen wall along the new perimeter would utilise a metal framed structure clad in an appropriate timber constructed using small plant.

Temporary local modification of the Eastern Breakwater is required to allow insertion of new piled supports for the proposed new causeway structure. Pile supports are envisaged using a mobile piling rig. The breakwater would then be reinstated on completion.

Work on the breakwater would be expedited using a temporary closure of public walkway access, reinstated on completion of the project.

Two temporary site compounds have been proposed to cater for construction vehicles, deliveries of materials, site offices, welfare facilities and potentially a concrete casting yard. One compound is envisaged with the site footprint off Harbour Road, and another within an existing carpark off Accommodation Road. A temporary traffic management plan shall be devised by the successful contractor to limit the impact of heavy vehicle deliveries.

Demolition of a short localised length of masonry wall on Accommodation Road requires no special techniques apart from the already mentioned mobile rock-breakers.

2.8.5 Off-Season Uses / Community Gains

During the off-season period, the proposed cruise berth has the potential to be used to berth other ships. The cruise berth has the ability to take visiting naval ships, tall ships, and any other type of vessel that might be seeking a temporary berth in the Dublin Bay area. The size of the berth and depth of water means it will allow Dun Laoghaire Harbour to facilitate bigger visiting ships than can currently be accommodated on the Carlisle Pier or St Michaels Pier. The proposed cruise berth can also be used for boat storage during the off-season winter months. These alternative off-seasons uses can be viewed as a public gain to the Dun Laoghaire Harbour community.

Other community gains include the significant upgrades to the pedestrian network and public realm improvements in the harbour area as a result of this project. Particularly the proposal provides for upgraded pedestrian linkages from Dun Laoghaire Harbour to nearby public transport links (including the DART Station and Dublin Bus Stop) and to Dun Laoghaire town centre. These pedestrian routes will be available to both cruise passengers and the general public. The scheme allows for public access and use of the proposed boardwalk, the shared access route and the connecting footpaths.

2.8.6 Main Alternatives Considered

This section of the EIS considers and summarises the existing berth availability at Dun Laoghaire Harbour, the operational needs for berthing large cruise vessels, the sensitivities of waterfront locations at the harbour, alternative positions and orientation of a cruise berth, the likely effects of deep dredging on key heritage structures, the likely visual effects of alternative berth locations, continuity of harbour operations post construction, and the likely construction impacts of alternatives. These are first considered individually to highlight the berth selection rationale, followed by an overall comparative assessment to suggest an optimum balanced solution.

Dun Laoghaire Harbour Company propose a dedicated cruise berth previously highlighted in the Harbour Masterplan in 2011, composed mainly of infrastructure works, namely i) deepening of the fairway and approach to DLH to increase the available water depth to -10.5m below Chart Datum (CD) equivalent to -13.01m below Ordnance Datum Malin (ODM) to accommodate cruise vessels, and ii) works at the proposed berth location including construction of a new quay structure, an access causeway, new piled mooring dolphins, and

scour protection to an existing breakwater.

The cruise vessel considered in this EIS is a Freedom Class overall length 340m, with vessel water draught up to 8.8m.

The heritage waterfronts stated in the Dun Laoghaire Masterplan 2011 are described, are located pictorially, and their potential for constraint on the position of a new berth assessed. These waterfronts are named The Carlisle Heritage Waterfront, The Ferry Waterfront, The Marina Waterfront and the Old Quay Waterfront. Due to physical constrictions of the existing infrastructure the latter two locations have been eliminated. In principle the available remaining locations are in water space at the East Pier, the Carlisle Pier, St Michael's Pier, and a new proposed location at the Ferry Waterfront (tentatively named Berth 6 in this application).

Berth configuration plans for each potential location are presented conceptually in this section of the EIS, with plan alignments orientated either towards the Harbour Mouth or along the alignments of existing berth structures.

The physical constraints to dredging a deep navigation channel within the harbour have been identified. These include potentially undermining the existing berth structures by dredging in close proximity, and the additional piling protection works required to ensure their ongoing integrity and stability. The minimum of 710,000 cubic meters volume of dredge material to be removed (for large cruise ship access at all tide stages) can be achieved by concentrating berth dredging towards the west of the Harbour. A shorter dredging programme would also be achieved compared to areas with deeper bed deposits to the east of the Harbour.

The key ship operational requirements are a) straight transit path to/ from berth which does not require complicated turning manoeuvres, and b) ability to enter/ leave harbour without tug assistance particularly when the wind is up. It is clear that transit paths to berths in the east of the harbour would be highly complicated probably beyond the ability of large cruise ships to manoeuver safely.

Various means of visually integrating the proposed berth structures in the harbour have been considered, including position and plan orientation towards the Harbour mouth. Scope for significantly reducing the overall structure length is limited by the design needs of berthing and mooring large cruise vessels 340m in length. In collaboration with the project Architect, measures have been incorporated to mitigate the visual impact of the berth structure by reducing its apparent depth and providing a more transparent open piled structures suspended above water. By virtue of masking by St Michael's Pier, the proposed Berth 6 location to the west would not be directly inter-visible from the Carlisle Heritage Waterfront on the east, and viewing distance from the East Pier would exceed 400m. Berth locations towards the east of the Harbour are considered to be more visually intrusive.

The present economic model of Dun Laoghaire Harbour is based on the ongoing availability of the existing five berths either for berthing or other uses. In summary, locating the cruise facility at any of the berths to the east of the harbour could entail reduced income to the Harbour Company due to reduced continuity of use. The addition of a cruise facility at the proposed Berth 6 location further west would allow all current berths to continue unrestricted in use and be available for alternative vessel market opportunities.

The sources of direct construction impacts on harbour users arises from the presence of dredging vessels, piling support vessels, imposition of temporary navigation exclusion zone, and the length of time required to construct the berth and dredge the channel. Construction access to sites to the east of the harbour will be more disruptive. In summary, berth locations towards the east of the harbour are estimated to take 4 to 6 months longer to expedite compared to some other locations. The associated temporary environmental impacts would also be greater.

An overall comparative assessment of the various alternative berth locations identified has been prepared.

The proposed new Berth 6 location towards the west of the harbour is concluded and brought forward for detailed assessment within the remainder of this EIS.

This berth location has been selected to provide an optimum solution to attract more frequent large cruise ship calls to Dun Laoghaire Harbour yet having the overall optimum impact on the harbour, its environment, and its users.

2.9 Aspects of the Environment Considered

2.9.1 Human Beings

Stephen Little & Associates, Chartered Town Planners, have prepared the Section on Human Beings. This section of the EIS investigates the impact of the proposal on human beings for the subject area. A particular emphasis is placed on examining:

- The population of the area
- Employment in the area
- Local Community (Harbour Users)

In producing this section of the EIS, reference was had to the Census of Population 1996, 2002, 2006 and 2011. In addition, Live Register figures for April 2014 and April 2015 are also referenced.

In line with the three themes addressed in the Human Beings Section (population, employment and community aspects), the predicted impacts of the proposed development are addressed in section 5.1.

Population

The construction phase of the proposed development is unlikely to generate any significant adverse impact on the demography of the area. It is anticipated that construction workers employed during the construction phase will travel from their existing residence rather than taking temporary accommodation in the area. A short term, transient increase in the local working population on-site will be generated by construction employment.

The operational phase is unlikely to have any significant adverse impact on the working population within the harbour or for the population living in the harbour environs area. The influx of persons to Dun Laoghaire as a result of the proposal will be temporary as these persons will be tourists / visitors and accommodation / facilities will be provided on the cruise ship for these people. As the predicted job increase (70-250 jobs) would happen over a 20-year period, it is anticapted that the local services and housing supply can cope with this increase over this time period, noting that the predicted job creation would increase the revenue available to Dun Laoghaire for local services.

Employment

It is anticipated that the construction of the new cruise berth will take approximately 15 months to complete. It is estimated that approximately 200 FTE jobs will be provided by the construction phase of the cruise berth, taking direct, indirect and induced impacts into account. The predicted impact for employment is expected to be temporary and positive during the construction phase. No remedial or reductive measures are therefore necessary.

Once operational, it is predicted that the proposed cruise berth facility will create employment opportunities and generate revenue, which would have a positive impact on employment. It is anticipated that the economic impacts for Dun Laoghaire as result of the proposal are considerable and are estimated to lie between €16 million and €41 million after twenty years and the number of permanent jobs created in Dun Laoghaire as a result of the project will be between 70 and 250. The proposed development is likely to have a positive impact on employment by creating jobs and generating revenue. As such, no remedial or reductive measures are therefore considered necessary.

Community (Harbour Users)

In preparing this section of the Environmental Impact Statement, the Applicant has availed of the expertise, knowledge and understanding of the Harbour and how it works of the following people:-

1. Tim Ryan - Operations Manager, Dun Laoghaire Harbour Company
2. Simon Coate - Dun Laoghaire Harbourmaster
3. Alistair Rumball - Irish National Sailing School

The assessment considers the impact on the ability of harbour users to continue to avail of the harbour and what mitigation measures, if any, are required to mitigate or ameliorate any impact identified. This assessment should be read in conjunction with the Navigation Impact Assessment which is included at Appendix 5.1.1. of this EIS.

The following users can be found in Dun Laoghaire Harbour:-

1. Ferry Service
2. Commissioner of Irish Lights
3. Naval Service
4. RNLI
5. Sail Training Vessels
6. Freight Vessels
7. Marine Activity Centre
8. Dublin Bay Cruises
9. Sea Scouts
10. Rowing and Diving Clubs
11. Public Boatyard and Slipway
12. Fishermen
13. Dun Laoghaire Marina
14. Yacht Clubs
15. Walkers

Construction Phase

Having regard to the potential impacts and the proposed avoidance, remedial or reductive measures, there is no significant adverse impact envisaged for the harbour users during the construction phase.

There will be a temporary slight adverse impact on the ability of the rowing club to train in the east to west direction across the southern portion of the harbour during the construction phase. There does however remain a substantial quantum of water available in the harbour for training purposes – approx. 37.8Ha. The bay remains available for both training purposes and racing for the rowing club.

A short term, temporary slight impact is predicted during the construction phase on the users of the marina arising from the inconvenience of a slightly longer travel time between the Yacht Clubs and the Marina by motor launch on the 3 days a week this sailing occurs.

It is worth noting that these impacts will be short-term due to the temporary nature of the construciton phase.

Operational Phase

Having regard to the potential impacts and the proposed avoidance, remedial or reductive measures, there is no significant adverse impact envisaged for the harbour users during the operational phase.

A permanent slight adverse impact is predicted during the operational phase on the rowing club, as the proposal will impact the ability of the club to train in the east to west direction across the southern portion of the harbour during the operational phase. There does however remain substantial water available in the harbour for training purposes – approx. 37.8Ha. The bay also remains available for both training purposes and racing for the rowing club.

The inclusion of an underpass beneath the access causeway, provides for motor launches to travel to and from the marina and the clubs during the majority of tidal conditions (but not when cruise ships are berthed).

Whilst the presence of the cruise berth in the harbour will cause a change to the travel patterns between the Designated Recreational Area and the Clubs; other users of this area for training purposes; and the race courses of certain users; this is not predicted to be a significant impact. It will remain possible to continue to use the remaining harbour area.

In the periods when a cruise ship is berthed coincides with a time sailing / training / racing occurs, any 'wind shadow' effect caused by the cruise ship will not prevent the sailing, training activity or racing from occurring either in parts of the harbour with greater, or lesser wind, depending on the users needs. Alternatively sailing, racing or training can take place outside the harbour, in the bay.

In relation to races including the Frostbite Series, September Series, Regattas and other competitions, it is considered that the water body available would still be capable of accommodating such events. The alternative of the bay for racing would also remain.

In relation to walkers, a positive impact is predicted during the operational phase arising from the enhanced extent and quality of public realm accessible in the harbour following the completion of the project in the harbour.

2.9.2 Flora & Fauna

2.9.2.1 Marine Ecology

Introduction

BEC Consultants has carried out the marine Ecological Impact Assessment (EcIA) and prepared the Marine Ecology chapter in the EIS, in relation to the construction and operation of a proposed berth for cruise liners in Dun Laoghaire Harbour, Co. Dublin.

Methodology

Data on the marine ecology of the study area was collected via a field survey, focussed on the benthic habitats of the seabed within Dún Laoghaire Harbour and its immediate surroundings, and a desk study.

The field survey involved taking benthic samples from 12 sample stations within and outside Dún Laoghaire Harbour using a 0.1 m2 Van Veen grab. Samples were analysed for fauna and granulometry and used to identify the biotope present at each station.

The National Parks & Wildlife Service were consulted in relation to the proposed project.

Existing Environment

The benthic habitat in and adjacent to Dún Laoghaire Harbour is mainly sandy in nature and supports an *Abra alba*-dominated community, indicating a stable benthic community in the greater Dublin Bay area. The benthos of the spoil dump site at the Burford Bank supports a community defined by polychaete worms and bivalves. Numerous fish species have been recorded utilising the waters of Dublin Bay at various life stages and some of these are targeted by sea anglers from Dún Laoghaire Harbour.

Of particular note in terms of the marine ecology of the study area is the presence of marine mammals, in particular harbour porpoises and grey seals. Dún Laoghaire Harbour is located approximately 2.5 km from the boundary of the Rockabill to Dalkey Island SAC, which is designated for the protection of harbour porpoise. Grey seals frequent the study area and haul out on Dalkey Island and other areas, with Lambay Island the closest site designated for their protection. Other species of marine mammal are occasionally recorded in the Dublin Bay area, but due to their low frequency they are not considered in detail.

Potential Impacts

The construction of the cruise berth has the potential to impact on the marine environment in a number of ways, such as noise generated by piling, dredging and dredge spoil disposal, disturbance to habitats due to piling and dredging, and the risk of water quality impacts. None of the likely impacts are deemed to be significant and mitigation measures are recommended to further reduce any impact on the marine ecology of the study area.

Once operational, potential impacts include the noise generated by the visiting cruise liners, the effects of maintenance dredging and the risk of water pollution. None of the likely impacts are deemed to be significant and mitigation measures are recommended to further reduce any impact on the marine ecology of the study area.

Mitigation measures

Mitigation measures to be implemented include the implementation of the *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* (with some adaptation to expedite the dredging which is in part in order to minimise the duration of disturbance to marine mammals in the area), the use of bubble curtains or cofferdams for noise attenuation, and the implementation of procedures to minimise the risk of water pollution.

Cumulative Impacts

No significant cumulative impacts are likely taking into account other nearby projects including the Alexandra Basin Redevelopment and the Dublin Array wind farm in terms of piling and dredging noise and dredge spoil disposal. This assessment of no significant cumulative impacts is based on the timing of the relevant works across the three projects, with the Dublin Array unlikely to overlap with the Dún Laoghaire Harbour cruise berth works, while the dredging for the Alexandra Basin Redevelopment is limited to the period October – March for a period of six years which will result in little or no overlap with the dredging of the Dún Laoghaire Harbour cruise berth works. The scale of the piling and dredge spoil disposal required for the Dún Laoghaire Harbour cruise berth (710,000m^3 of dredge spoil) is minor when compared to that of the Alexandra Basin Redevelopment (5,900,000m^3 of dredge spoil), leading to the conclusion that there will be no significant cumulative effect on marine ecology should the proposed projects be granted consent.

2.9.2.2 Terrestrial Ecology and Ornithology

Scott Cawley Ltd. was commissioned to undertake an Ecological (Terrestrial Ecology and Ornithology) Impact Assessment (EcIA) in relation to a proposed berth for cruise liners in Dun Laoghaire Harbour, Co. Dublin.

Methodology

A desktop study was carried out to gather existing data on the ecology of the area, as well as information on European sites and proposed Natural Heritage Areas.

A number of specialist field surveys were carried out to establish the baseline terrestrial ecology and ornithology within the zone of influence of the proposed development. This included habitat surveys, bat surveys, Otter surveys, winter and breeding bird surveys.

A number of organisations with relevance to ecology were consulted including: The National Parks & Wildlife Service (NPWS), Irish Whale and Dolphin Group, BirdWatch Ireland, Bat Conservation Ireland, Botanical Society of Britain and Ireland and the Heritage/Biodiversity Officers of Dún Laoghaire-Rathdown County Council, Dublin City Council and Fingal County Council.

Impact assessment was undertaken with reference to a number of guidance documents including CIEEM *Guidelines for Ecological Impact Assessment in the United Kingdom* (IEEM, 2006) and EPA *Guidelines on the information to be contained in Environmental Impact Statement* (2002).

Existing Environment

The terrestrial habitats within the development footprint were mainly characterised by built ground, with all habitats being of low or negligible ecological importance. Otter activity was recorded widely in the harbour and surrounding area, however no breeding or resting places were confirmed. A large number of winter bird species were recorded utilising the harbour and surrounding areas. 18 of these species were Special Conservation Interest species for nearby

European sites. Nine pairs of Black Guillemots (which are not a Special Conservation Interest for any relevant European site) were recorded nesting within the harbour in harbour structures.

Potential Impacts

The construction of the proposed development, including dredging and piling activities, has the potential to impact on terrestrial ecology and ornithology in a number of ways including noise and disturbance impacts to species and risk of water quality impacts. The operation of the proposed development has the potential to impact on terrestrial ecology and ornithology through disturbance to species from shipping movements, risk of accidental water pollution incidents and release of non-native invasive species to receiving coastal waters. Similar potential impacts on European sites have also been identified and are discussed and mitigation measures proposed in the Natura Impact Statement for the proposed development. Mitigation measures for all other potential impacts have been recommended in the EIS to reduce any impacts predicted.

Mitigation measures

Mitigation measures proposed to reduce predicted impacts during construction include; production of a Construction Environmental Management Plan (CEMP) that will be formulated to consider best international practice, guidance in relation to lighting levels and pre-construction Otter surveys. Mitigation measures proposed in relation to the operation of the proposed development include; operation of ships being subject to an Environmental Management Plan (EMP), surface water being discharged via a petrol interceptor, no planting of non-native invasive species in landscaped areas, guidance in relation to lighting levels and enhancement of breeding bird habitat via installation of Black Guillemot nest boxes.

Following implementation of mitigation measures proposed it is considered that the proposed development will not result in any significant negative residual impacts or any potential adverse effects to the integrity of Europeans sites.

A Natura Impact Statement (NIS) has been prepared to assess potential adverse effects to the integrity of SACs and SPAs. It concludes that there will be no risk of the proposed development, with mitigation measures in place, to result in adverse effects on European sites, their Qualifying Interests/Special Conservation Interests or their conservation objectives, either alone or in-combination with other plans or projects.

2.9.3 Soils & Geology

Waterman Moylan, Engineering Consultants, have prepared the section of the EIS on soils and geology. The potential impacts of the proposed development are assessed and the mitigation measures to minimise the impact of the development on soils are proposed.

Maritime

The geology underlying Dun Laoghaire Harbour has been investigated by the project engineers. A study of existing records was undertaken, and ground investigations were commissioned as part of this project. An understanding of the solid geology at depth, and the superficial soils above (termed drift), is required in order to provide a draft design for the berth and dredged navigation channel, and also to gain a greater understanding of the likely effect of the construction phase.

The sea bed inside the harbour features a deeper area in the vicinity of the existing high speed ferry terminal. This deep area is thought to have resulted from the scour effect of the jets of the high speed ferry. A comparison of historic charts with the recent charts otherwise shows little change in the bed level, and consequently little deposition of sediment in the harbour.

The geology, in descending sequence from the sea bed, may be considered to comprise soft marine silty / sandy sediments, stiff boulder clays, and granite bedrock. The boulder clays and bedrock lie entirely below the depth of the proposed dredged navigation channel. The sediment material to be dredged is almost entirely (approximately 90%) unconsolidated sands with a small volume of silt close to the high speed ferry berth. These materials are suitable for dredging using the proposed dredging technique.

The berth and mooring dolphins incorporate large diameter piles which, where possible, will be taken down to bedrock. The bedrock horizon was only encountered in one borehole during the ground investigations (the borehole closest to land). It is intended to undertake further ground investigations to establish the depth of the bedrock horizon over a more extensive area during a later stage of design development.

As part of the environmental impact assessment chemical analysis of samples of the soft marine silty / sandy sediments were taken within the area to be dredged as part of the development within Dun Laoghaire Harbour. Sampling and analysis was undertaken in accordance with the Marine Institute Guidelines 2006, which included 10No. surface 'grab' samples completed by Hydrographic surveys Ltd in November 2013 and 12No. boreholes extracting samples from between - 6.6m CD to -13.0m CD completed by IGSL Ltd between May and June 2014, and 13 No. surface 'grab' samples completed by Hydrographic surveys Ltd in January 2015.

In order to determine the suitability of dredged sediments for disposal at sea, the results were compared against the Class 1 – 3 Screening assessment, where Class 1 concentrations are not considered significant, Class 2 considered marginally contaminated and class 3 are considered heavily contaminated, as outlined in the Marine Institute Guidelines for the Assessment of Dredging Material for Disposal in Irish Waters. Results showed some isolated elevated concentrations of contaminants to be present, the majority within sediments at depth.

The effect of sediment mixing during the dredging process will likely result in the majority of these isolated elevated concentrations becoming diluted and therefore the overall average concentration will become significantly reduced prior to depositing at sea. The dredging process will act further to combine the sediment matrix. For this reason, the contaminant concentrations from the varying sample locations and depths have been averaged for the purpose of highlighting this point and identifying the contaminants of concern.

The average results for cadmium; Mercury; Arsenic; Chromium; Copper; Lead; Nickel; Zinc and DDE are all shown to fall within the Class 1 concentration range. However out of the total 26No. samples analysed for DDT, a single very minor elevation of DDT was identified, (1.977 micrograms per litre (µg/l) against the Class 1 threshold of 1.6 µg/l). it should be noted that the remaining No.25 samples were shown to be below the detectable limit for DDT.

The Marine Institute Guidelines 2006 specifies a single (Level 1) guideline value for Total PAH (sum of 16) of 4.0 mg/kg. While several samples showed a presence of PAH contamination (most notably sample M5 which contained 1.65 mg/kg), all results were shown to be safely below the Level 1 guideline value.

Therefore, based on the average results the dredging and deposition of the harbour sediments at sea is considered to have a minor impact at Burford Bank.

Landside

A review of the investigation of sub-soil conditions at Dun Laoghaire Harbour prepared by the Department of the Marine in 1991 was carried out as part of the base line studies for this EIS.

The trial pits excavated in the vicinity of the proposed landside development established subsurface conditions consisting of tarmac overlaying a grey silty stoney sand with cobbles. Each trial pit was excavated to refusal at various depths ranging from the depth of 0.38m to the depth of 2.1m. Refusal was described as concrete slab or possible rock.

Chemical analysis was carried out on disturbed samples from the trial pits to establish sulphate content and acidity. Low sulphate concentrations and near neutral pH were recorded.

The bedrock underlying the Dun Laoghaire harbour area consists of Leinster Granite.

The area of the land side facility is therefore located entirely on made ground with concrete slabs and underlaid by Wicklow Granite.

The proposed pedestrian and coach facilities works will consist of excavations for roads and services within the existing fill and no direct impact is anticipated on the groundwater, subsoils or bedrock as no deep excavations are envisaged. The proposed landside development however may result in a potential risk of soil contamination from spillage of fluids from vehicles during the construction and operational phase.

The measures to reduce impact the development will have on the soil during construction and operational phase of the development will include implementation of a Construction and Demolition Management Plan, bunding of any fuel or chemical stored on site, all refuelling of equipment and vehicles will be carried out on a suitable bunded impermeable hardstanding and all surface water runoff will be collected in a sealed drain system and will discharge to a suitable light liquid separator.

As a result of these remedial measures there are no significant adverse impacts envisaged on the surrounding soil environment resulting from the landside development.

2.9.4 Coastal Processes

An assessment has been undertaken by ABP Marine Environmental Research (ABPmer) to study the effects that the proposed new berth and mooring dolphins in Dun Laoghaire Harbour might have on tide and wave climate. The assessment also reviews the extent of suspended sediment (the sediment plume) likely to arise from the dredging activities during the construction phase. The ABPmer assessment is included in full as an appendix to the EIS, and is summarised in Chapter 5.4. Both chapter 5.4 and this non-technical summary have been prepared by the project engineers.

ABPmer created a computer model of the Dublin Bay area in order to arrive at their conclusions, using a study area large enough to ensure a robust assessment. They concluded that the creation of a deeper navigation channel will have a small impact on the local tide and wave conditions. They also concluded that there will be no measurable impact on the tide or wave conditions resulting from the proposed piles or mooring dolphins.

The effects on the tidal currents are predicted to take the form of a reduction in local flow speed immediately outside the harbour entrance. The effect is likely to be caused by the relative increase in water depth, which will increase the cross section through which the currents may flow. The changes in flow speed are however predicted to be very small, and

will cause no significant change in the orientation of flow outside of the harbour, or to the patterns of recirculation inside the harbour.

The increased water depth of the navigation channel is predicted to affect patterns of wave refraction both inside and outside the harbour, but only when unusually large offshore waves are approaching from the north through to south easterly directions. This means that the proposal will have no impact on wave height during the predominant wind or wave conditions.

Under the rarer storm conditions where changes in wave height are predicted, there will be a small reduction in wave heights in the western side and a small increase in wave heights in the eastern side of the harbour.

During the construction phase the dredging of the navigation channel will result in a temporary short duration plume of sediment both within the harbour, locally outside the harbour and, at very low concentrations, across a wider area of Dublin bay. A summary of the predicted sediment plume is included in Chapter 5.4, so that the impact of this plume, if any, can be considered in other chapters of the EIS.

The majority of the material to be dredged is sand, which will be re-deposited to the seabed within minutes of entering suspension. More disperse plumes result from dredging in locations where silt is present. The quantity of silt to be dredged is proportionally small and the resulting plumes represent a low level of suspended sediment. The silt in these plumes will also re-deposit on the seabed, generally resulting in a very thin layer of silt deposition. A thin layer of silt or fine sediment is expected to be naturally present throughout most of the harbour, so this deposition will not change the seabed texture or sedimentary characteristics.

In conclusion the proposed scheme was found to have no effect, or an effect limited both in terms of scale and the conditions under which it might occur, on sediment deposition, tidal flow and wave conditions. No remedial measures are proposed.

2.9.5 Water

Water Quality

AWN Consulting Ltd. has assessed the impact of the proposed DLHC Cruise development at Dun Laoghaire harbour, Dublin on the existing water environment.

The legislative context surrounding the proposed development is defined by the Water Framework Directive (WFD). The WFD requires that Member States shall implement the necessary measures to prevent deterioration of the status of all waterbodies, and shall protect, enhance and restore all bodies of waterbodies with the aim of achieving good status by 2015.

The receiving waterbody is identified as Dublin Bay which is a coastal waterbody. The current water status of Dublin Bay under the WFD is classified as 'moderate' ecological status due to biological quality elements. Water quality analysis was undertaken by the EPA 2009 in Dublin as part of the WFD monitoring programme. The EPA monitoring results were assessed against the EPA's Trophic Status Assessment Scheme. The results achieved a 'Pass' against all the criteria and received an overall 'Unpolluted' status.

Furthermore, sampling was undertaken within Dun Laoghaire harbour by ARUP in 2013. The ARUP water quality results were compared against the relevant surface water regulations and Shellfish Directive EQS standards. None of the parameters exceeded the available EQS

standards. Overall the water quality in Dun Laoghaire harbour was found to be unpolluted with no contamination issues.

Sediment quality analysis was undertaken by Hydrographic Surveys during 2013 and 2015 and by IGLS in July 2014. The samples were tested for heavy metals and a range of pesticides and hydrocarbons. The results were compared against the OSPAR Ecotoxicological Assessment Criteria (EAC). The sediment is of relatively good quality with some slight exceedences of Arsenic, Chromium, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Fluoranthene and Pyrene in relation to the OSPAR standards. Furthermore, as part of IGSL assessment the sediment samples were assessed against the Guidelines for the Assessment of Dredge Material for Disposal in Irish Waters, Marine Institute 2006. The results confirm that the sediments meet the standards for disposal.

During construction the primary likely impacts (if not adequately mitigated) are soil disturbance during dredging of the navigation approach, disposal of dredged soil, construction of a new quay and if not adequately mitigated run-off containing silt/alkaline/hydrocarbons as a result of construction and demolition works on land.

Mitigation measures to manage silty or contaminated run-off from onsite construction works are incorporated in the scheme design. No specific mitigation measures are required during the dredging and disposal processes due to the limited impact on water quality. Sediment modelling indicates only a localised and short term impact on water quality.

Provided that mitigation measures outlined above are implemented, no significant impacts are expected during the construction phase of the proposed development on the water quality. Overall the impact during the construction phase will be Short term- Imperceptible with a neutral impact on quality.

Provided that mitigation measures outlined above are implemented, in particular maintenance of the drainage system on land and proper operation procedures for the cruise ships, no significant impacts are expected during the operational phase on water quality. Overall the impact during the operational phase will be Long term- Imperceptible with a neutral impact on quality.

Foul water, surface water, water supply

This section of the EIS has been prepared by Waterman Moylan to assess the impact of the proposed development on existing water supply, waste water and surface water within the proposed development and surrounding environment. The potential impacts of the proposed development are assessed and the mitigation measures to minimise the impact of the development on the water supply, waste water and surface water environment are proposed.

There is an existing foul water drainage, surface water drainage and water supply system which serves the site. The proposed development will not involve any significant adjustments to the existing drainage or water supply system.

The construction works for the proposed landside facility development will involve the resurfacing of certain areas of the public walkways and the existing vehicle standing area, the relocation of some gullies in the vicinity of the Boardwalk and the alteration of some local drainage systems. The function of the existing drainage systems will be retained. In terms of the water supply a new metered watermain will be constructed along the proposed pedestrian route. The existing supply to the Motorists Building will be diverted to connect to the new metered watermain.

The potential impacts of the proposed development on the existing water environment during construction phase include accidental spillages of contaminants discharging to the harbour waters and damage or contamination of the existing supply or existing drainage.

Mitigation measures proposed for the construction and operational phases of the development include inspection of new and existing drains, monitoring of existing light liquid separators, implementing construction standards and best practices, supervision of construction works and plan for pollution emergencies to prevent damage to the drainage and water supply.

As a result of the design and remedial measures proposed there are no significant adverse impacts envisaged on the surrounding water environment resulting from the development.

Flood Risk

This section of the EIS has been prepared by Waterman Moylan to assess the flood risk from the proposed cruise development.

The proposed development is located on the eastern coastline with site gradients sloping generally to the sea.

Reference was made in a desk top study to The Irish Coastal Protection Strategy Study (ICPSS), OPW 2010; flood level probability data abstracted from Dun Laoghaire Harbour Masterplan Flood Risk Assessment, July 2011;together with wave data contained in Cruise Berth, Dun Laoghaire Harbour: Wave, Tide and Sediment Plume Modelling by ABP Marine Environmental Research Ltd. 2014.

The main source of flooding for the proposed development is coastal flooding. An assessment of coastal water levels during extreme events, which includes climate change, shows that there is sufficient freeboard available and that the water levels will not be expected to rise to the level of the proposed landside development.

Given that the proposed development is located on the coastline, and that the site itself is generally sloping to the sea and that there will be no change to the existing levels, the proposed development will not increase the flood risk in the harbour area and therefore have no impact on the existing flooding conditions.

Further to the above, a Justification Test of the proposed development in terms of flooding (based on Section 3 of the 2009 DEHLG/OPW guidelines) was conducted. This test classified the development as being appropriate from a flood risk perspective.

There will be no change to existing levels as a result of the proposed landside development and therefore the flood risk will not increase as a result of the proposed development. Similarly the risk of overtopping, in for example the south-east of the harbour, will remain.

2.9.6 Air

AWN Consulting Limited has been commissioned to conduct an assessment into the likely air quality and climate impact associated with the proposed development.

In terms of the existing air quality environment, baseline data and data available from similar environments indicates that levels of nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$) and benzene are generally well below the National and European Union (EU) ambient air quality standards.

The operational impact of the development was assessed for the pollutants NO_2, PM_{10}, $PM_{2.5}$, CO and benzene using the UK DMRB screening model which is a recommended screening model for assessing the impact of traffic on air quality. The inputs to the air dispersion model consist of information on road layouts, receptor locations, annual average daily traffic movements (e.g. AADT), annual average traffic speeds and background concentrations.

Modelling of "do nothing" conditions indicates that concentrations will be significantly within the EU ambient air quality standards under all scenarios and all five pollutants assessed. In addition, the impact of the traffic from the proposed development will account for at most 4.2% of the respective EU limit values for the pollutants. Cumulatively, levels will still be significantly within the ambient air quality limit values under all scenarios. Levels of all five pollutants, with the proposed development in place, range from 20 - 61% of the respective limit values in 2017 and 2032. In summary, levels of traffic-derived air pollutants will not exceed the ambient air quality standards with the proposed development in place. Based on the DMRB modelling results, the impact of the development in terms of ambient levels of NO_2, PM_{10}, $PM_{2.5}$, CO and benzene is deemed negligible.

The impact of NO_x (i.e. NO and NO_2) emissions resulting from development traffic at the South Dublin Bay SPA was assessed. The NRA guidelines (NRA 2011) state that as the potential impact of a scheme / development is limited to a local level, detailed consideration need only be given to roads where there is a significant change to traffic flows (>5%) and the designated site lies within 200m of the road centre line. Two roads, West Pier Road and Harbour Road are predicted to have a 5% increase in traffic as a result of the development and are within 200m of the South Dublin Bay SPA. Dispersion modelling and prediction was carried out at typical traffic speeds at this location. The operational traffic emissions as a result of the proposed development will not cause significant air quality impacts on the Dublin Bay SPA.

Air emissions from the proposed docked cruise ships were modelled using the USEPA approved AERSCREEN air dispersion model. Results from the screening dispersion model show that worst-case predicted NO_2 concentrations will be significantly below the annual mean and 1-hour maximum limit values at the worst-case sensitive receptors. The predicted concentrations will reach 4% and 9% of the annual and maximum one-hour limit values, respectively, for NO_2.

Due to the nature and scale of development, the impact of the proposed development on climate and Ireland's obligations under the Kyoto Protocol is not significant.

Mitigation measures in relation to traffic-derived pollutants have focused on improvements in both engine technology and fuel quality with vehicles over recent years significantly cleaner than those prior to this period. In terms of the construction phase, a dust minimisation plan will be formulated as construction activities are likely to generate some dust emissions.

2.9.7 Climate

AWN Consulting Limited has been commissioned to conduct an assessment into the likely air quality and climate impact associated with the proposed development.

In terms of the existing air quality environment, baseline data and data available from similar environments indicates that levels of nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$) and benzene are generally well below the National and European Union (EU) ambient air quality standards.

The operational impact of the development was assessed for the pollutants NO_2, PM_{10}, $PM_{2.5}$, CO and benzene using the UK DMRB screening model which is a recommended screening model for assessing the impact of traffic on air quality. The inputs to the air dispersion model consist of information on road layouts, receptor locations, annual average daily traffic movements (e.g. AADT), annual average traffic speeds and background concentrations.

Modelling of "do nothing" conditions indicates that concentrations will be significantly within the EU ambient air quality standards under all scenarios and all five pollutants assessed. In addition, the impact of the traffic from the proposed development will account for at most 4.2% of the respective EU limit values for the pollutants. Cumulatively, levels will still be significantly within the ambient air quality limit values under all scenarios. Levels of all five pollutants, with the proposed development in place, range from 20 - 61% of the respective limit values in 2017 and 2032. In summary, levels of traffic-derived air pollutants will not exceed the ambient air quality standards with the proposed development in place. Based on the DMRB modelling results, the impact of the development in terms of ambient levels of NO_2, PM_{10}, $PM_{2.5}$, CO and benzene is deemed negligible.

The impact of NO_x (i.e. NO and NO_2) emissions resulting from development traffic at the South Dublin Bay SPA was assessed. The NRA guidelines (NRA 2011) state that as the potential impact of a scheme / development is limited to a local level, detailed consideration need only be given to roads where there is a significant change to traffic flows (>5%) and the designated site lies within 200m of the road centre line. Two roads, West Pier Road and Harbour Road are predicted to have a 5% increase in traffic as a result of the development and are within 200m of the South Dublin Bay SPA. Dispersion modelling and prediction was carried out at typical traffic speeds at this location. Modelling took place whereby the AADT was increased incrementally to determine the level of traffic required to exceed the limit value for NO_x for the protection of vegetation of 30 $\mu g/m^3$. AADT would need to be in excess of 100000 on each road in order for the limit value to be exceeded. As this level of daily traffic would be confined to motorways and not urban areas such as this, it can be stated that the operational traffic emissions as a result of the proposed development will not cause significant air quality impacts on the Dublin Bay SPA.

Air emissions from the proposed docked cruise ships were modelled using the USEPA approved AERSCREEN air dispersion model. Results from the screening dispersion model show that worst-case predicted NO_2 concentrations will be significantly below the annual mean and 1-hour maximum limit values at the worst-case sensitive receptors. The predicted concentrations will reach 4% and 9% of the annual and maximum one-hour limit values, respectively, for NO_2.

Due to the nature and scale of development, the impact of the proposed development on climate and Ireland's obligations under the Kyoto Protocol is not significant.

Mitigation measures in relation to traffic-derived pollutants have focused on improvements in both engine technology and fuel quality with vehicles over recent years significantly cleaner than those prior to this period. In terms of the construction phase, a dust minimisation plan will be formulated as construction activities are likely to generate some dust emissions.

2.9.8 Landscape and Visual Impact

This assessment describes the landscape character of the Cruise Berth subject site, its environs and its hinterland, together with the visibility of the site from significant viewpoints in the locality, around the environs of the site and from afar. An analysis of the methodology utilised to assess the impacts, the receiving environment and the potential impacts of the development are described. Mitigation measures introduced to ameliorate or offset impacts are also considered.

The methodology adopted and criteria used for preparation of the assessment, was that normally used in the preparation of the landscape and visual impact assessment of an Environmental Impact Statement.

Two main aspects of impact are included in the assessment: Landscape Character Impact and Visual Impact. Both make reference to comparative (existing and proposed) photomontages prepared in accordance with current best practice. The viewpoints are selected to illustrate the most representative and greatest visual impact.

The proposed development involves: the construction and operation of a new berth facility which will accommodate large, new generation cruise liners. The work comprises two main aspects:

- The Maritime works, including: dredging of approach and navigation channels; the new 435m long quay (including piling) and; the periodic berthing of cruise ships
- The landside works which will include: the access ways and infrastructure required to handle passengers transferring to and from the cruise ships once they have arrived off the vessel at berth.

Predicted impacts of the proposal include:

- Construction Impacts, including; significant negative impacts within the harbour area over the period of construction. There will also be slight and negative amenity impacts within the harbour area during the works. These are of temporary to short term duration
- Landscape Character Impacts, including; The new berth structure will be initially noticeable when viewed from within the harbour area. Despite being slightly visible from higher ground behind the town, it will not be generally discernible from outside the harbour area. The berthing facility is in keeping with the general nature of harbour structures so would not be considered to be inherently negative.
- The arrival into the harbour of a large cruise ship will have a significant impact on all existing views towards the harbour. A proportion of existing harbour users may consider the sheer scale of the docked ship to be negative given that the vast majority of other vessels using the harbour are small by comparison. However, such a vessel would not be out of character, particularly within such an expansive water body. Its presence also affirms the purpose of the harbour. The scale and finish of the cruise ships provided for is impressive and could not generally be considered negative. The experience of the general public from the public accessible areas is likely to be rather positive.
- Visual Impacts: For each photomontage view, the magnitude and quality are assessed and summarised as follows; the predicted impacts for the development itself (i.e., the physical, constructed and long term/permanent elements) are assessed for half of the views as slight and neutral and for the other half as no impact The periodic/temporary

introduction into the harbour of a cruise ship, creates impacts which range from slight to significant and which are assessed as positive in nearly all of the views.

Broadly therefore, the longer term impacts are at worst, slight and neutral – the nature of the proposed development being in keeping with the existing harbour context. The arrival of large cruise ships on a temporary 'visiting' basis is on balance assessed as a positive impact.

The design life of the structure (in excess of 60 years) means that all visual impacts are assessed as 'permanent', however they may realistically be considered as 'long term' impacts.

2.9.9 Material Assets (Waste and Transportation)

Waste

A comprehensive, site specific Construction and Demolition Waste Management Plan (C&D WMP) has been prepared for the construction and demolition phase of the proposed cruise berth facility. A preliminary Operational Waste Management Plan has been prepared for the operational phase of the proposed development. (DLHC currently operate the existing Harbour facilities in accordance with their Port Waste Management Plan, 2010). It is likely that the Port Waste Management plan will be revised by DLHC subject to the evolving needs of the development). This will ensure the sustainable management of wastes arising at the development, in accordance with current best practice and legislative standards.

Given the nature of the proposed project, the greatest potential impact of the proposed development (in terms of waste) is from the inappropriate disposal of wastes generated during construction and operation. The quantity of dredging waste anticipated during construction represents a significant quantity of wastes (710,000m^3). Comparatively the volumes of other wastes generated by the construction and demolition works will be small.

Based on our review of the design and operation of the proposed facility as a Port of Call facility only, limited storage space is required for the management of wastes (i) arising directly from Cruise ships and (ii) from passengers using landside reception/café/washroom facilities.

International Maritime Organisation estimates indicate that typical waste generation rates of 3.5kg/passenger per day can be expected. This amounts to 50-70 tonnes of waste per week for a cruise ship of 3000 passengers. Modern cruise ships have on board facilities for the incineration of up to 75-80% of the solid wastes generated on board.

A designated waste setdown area of 20m^2 will be located on the quay close to the berth so that waste can be easily transferred from cruise ships. This storage area will be large enough to receive up to 1 days typical waste generation from a large cruise ship pending transfer to the waste collection point at the landside reception/cafe building. A similar area of 20m^2 is required at this building (please refer to operational waste management plan). It is unlikely that the DLHC berth facility will be required to accept this volume of waste on a regular basis. Nevertheless capacity has been provided to deal with any such scenario should it arise. Waste contractors may also be engaged directly by cruise ships to collect wastes directly from the cruise ships on a need only basis. The location of the designated waste storage area is shown on the drawings accompanying the application.

Transportation

This section of the EIS has been prepared by Waterman Moylan to assess the transportation impacts of the proposed Cruise Terminal on the transportation infrastructure in the vicinity of Dun Laoghaire Harbour.

The assessment area of the traffic impact of the proposed development includes two harbour getaway junctions specifically Crofton Bridge / Crofton Road junction and Crofton Road / Marine Road / Queens Road/Harbour Access junction and includes Crofton Road and Harbour Road.

All analysis within this chapter considers the upper estimates of the proposal demand on the harbour transport infrastructure and were based on concurrent arrival of a 340m Freedom class vessel at the proposed berth and a 200m cruise ship at one of the existing harbour berths. Possible reintroduction of a ferry service to Dun Laoghaire is also considered.

The predicted trips to / from the development are based on information collected during the previous arrivals of cruise vessels and information obtained from coach tour operators contracted by the cruise lines. NRA Link-Based Growth Factors were applied to the traffic flows to estimate the likely background traffic for the opening year of 2017 and the design year of 2032.

The proposed development will result in an impact on the junctions assessed but will be of insufficient magnitude to cause significant congestion. It also was estimated that the number of trips generated by the proposed development will be less than the observed number of trips generated by the Stena Ferry during its service.

The arrival of vessels will result in increased demand on the existing pedestrian facilities. As part of the proposed development the pedestrian facilities will be improved and existing hazards as identified by the Stage 1 road safety audit removed. As a result the proposed development will have a positive impact on the pedestrian facilities in the area.

Dun Laoghaire Harbour Company already has experience in the management of pedestrian and vehicular traffic resulting from the arrival of a cruise ship at Dun Laoghaire Harbour, and has prepared and implemented transport management plans to accommodate the traffic generated by these cruise calls. Given that a transport management plan will be implemented, the existing pedestrian facilities improved and the proposed overflow carpark provided there will be no significant impact from the proposed development on traffic in the vicinity of the Harbour.

2.9.10 Archaeological Heritage

Irish Archaeological Consultancy Ltd has prepared this assessment to study the impact, if any, on the archaeological resource of the proposed construction of a new berth and mooring dolphins in Dun Laoghaire Harbour, which will be able to facilitate the docking of large scale cruise ships (OS Sheet 23). The assessment was undertaken by Faith Bailey of IAC Ltd with the underwater elements carried by Geomara Ltd and ADCO Ltd on behalf of IAC Ltd.

The most sensitive archaeological resource associated with the proposed development area is that of marine archaeological remains, which for the most part, consist of the wrecks of ships. There are 165 ships recorded as sinking within or in close proximity to Dun Laoghaire Harbour that do not have a recorded location. Five further wrecks are recorded within the harbour with precise co-ordinates. There are additional recorded ship wrecks in Dublin Bay, with no

reference to the harbour but which may be within vicinity of the turning circle and channel of the proposed development.

Of the 165 ships, 23 ships recorded as sinking at the entrance to the harbour or close to the piers or heads of the piers; although locational information is not precise. A further 11 ships are recorded as sinking within a mile of the harbour entrance or else having been wrecked on the breakwaters of the pier outside of the harbour. There are two recorded wrecks within the harbour that possess location references, which are either within or in close proximity to the proposed dredge channel and turning circle. These consist of Wreck W01966 – discovered by Marlin Sub Aqua Club in harbour entrance and Wreck W01967 identified during national sea bed survey inside of harbour entrance.

As part of the environmental impact assessment detailed marine geophysical surveys, dive inspections and marine archaeological testing was carried out in order to define the nature and extent of the two sites, along with the aim to identify any previously unknown remains. The remains of wreck W01966 were successfully identified c. 85m east of the charted position and well outside of the area of the proposed development. Although potentially identified in initial dive work, wreck W01967 was not found to be present in or within the vicinity of the charted position. In addition, no recorded landward archaeological sites are located within the vicinity of the proposed development area.

Recorded wreck site W01966 has been identified c. 85m east of the edge of the proposed dredge channel and at the foot of the east pier rock armour. No direct impact is predicted upon the remains as a result of the proposed development. However, it is possible that after the establishment of the new dredged channel, that boat wash, and thus secondary erosion, associated with the passage of vessels may impact on the remains of wreck W01966. It is therefore recommended that a dive inspection of wreck site W01966, along with its charted position, is carried out 12 months post the dredging of the new channel, in order to monitor the condition of the remains and whether changes in the sea bed are having an adverse impact on either site. This should be carried out by a qualified marine archaeologist under licence to the Department of Arts, Heritage and the Gaeltacht.

Recorded wreck site W01967 was not found to be present during the phases of underwater archaeological investigation that was carried out as part of this assessment. As such no direct impact is predicted as a result of the proposed development. No further archaeological mitigation is deemed to be necessary in relation to this site.

It is possible that boring through the sea bed as part of the construction of the proposed new berth, and disturbances associated with the dredging of the new channel and turning circle, may have a direct adverse impact on the buried remains of ship wrecks and/ or archaeological artefacts that have the potential to survive in and within the vicinity of Dun Laoghaire harbour. It is therefore recommended that all marine boring and dredging works be subject to full time archaeological monitoring. This should be carried out by a qualified marine archaeologist under licence to the Department of Arts, Heritage and the Gaeltacht. Full financial and programming provision should be made for the resolution of any archaeological remains that may be discovered, if that is deemed to be the most appropriate manner in which to proceed.

Whilst no major ground disturbances are anticipated in association with the landward site of the development, it is possible that any significant ground disturbances may have a direct adverse impact archaeological features or deposits that survive beneath the reclaimed area with no surface expression. This includes the area surrounding the recorded site of a promontory fort and Martello tower (DU023-052001/3). It is therefore recommended that should any landward ground disturbances exceed 0.4m in depth that archaeological monitoring be carried out. This should be undertaken by a suitably qualified archaeologist. Full financial and programming provision should be made for the resolution of any archaeological

remains that maybe discovered, if that is deemed to be the most appropriate manner in which to proceed.

2.9.11 Architectural Heritage

Shaffrey Associates Architects has undertaken the Architectural Heritage Impact Assessment in relation to a proposed berth for cruise liners in Dun Laoghaire Harbour, Co. Dublin

Existing Environment

Dun Laoghaire Harbour was built between the years 1817 and 1842. It was built as an asylum harbour to give safe refuge to ships on their way to Dublin stranded at sea during bad weather or poor tide conditions. The Harbour, and the railway that was built to service it, transformed the character of the small fishing village then known as Dunleary and, in a very short period a suburban town of considerable scale developed. The mail boat service that was transferred from Howth to Dun Laoghaire in 1826 gave added significance and importance to the town, while the railway which serviced the mail boat, also made it possible for great numbers of civil servants, bank officials, merchants and tradesmen to commute daily into Dublin while retiring in the evening to the pleasant environs of the sea.

The Harbour developed throughout the nineteenth century as an important international port with a number of pier structures constructed to serve a range of Harbour uses (Victoria Wharf, Carlisle Pier, Traders Wharf). Alongside this primary port function there developed a strong leisure tradition of walking, fishing and sailing (the Harbour is today home to 4 sailing clubs with other marine leisure activities well supported). The development of Dun Laoghaire Harbour continued throughout the twentieth century with expansion of St. Michaels' Wharf, the large complex of the Commissioners of Irish Lights and, at the latter end of the twentieth century the development of the Marina near the Royal Irish Yacht Club. The establishment of Dun Laoghaire Harbour Company in 1994 put the Harbour under a statutory footing with a dedicated body fully responsible for financing the ongoing maintenance and development of the Harbour, amongst other responsibilities. The recent suspension of a ferry service to/from Dun Laoghaire marks a significant change in the status of the Harbour.

Dun Laoghaire Harbour is a structure of international importance due to its scale, the quality of its construction, including the collection of significant buildings, monuments, industrial (marine) heritage artefacts and, its remarkable history1. It is also an area of beauty, of maritime history, a cultural centre of numerous water and land-based recreational activities, a transport hub; it is, and has been, a place of work, of play and of relaxation, around which the Victorian town of Dun Laoghaire developed. It is important both in its role as a repository of historical information and cultural memory, in addition to continuing to form a fundamental component of the town of Dun Laoghaire. Its historic importance as an international, working, port remains a contributory factor to the Harbour's cultural value and special character.

Potential Impacts

The potential impacts of the proposed cruise facility have been assessed with regard to architectural heritage (architectural heritage in this regard includes architectural, historic, archaeological, artistic, cultural, scientific, social and technical aspects, as defined in the Department of Arts, Heritage and The Gaeltacts' Architectural Heritage Protection Guidelines,

[1] The Harbour is not, as a single entity, designated as a protected structure within the Dun Laoghaire-Rathdown County Development Plan 2010-2016. However, there are 29 protected structures within the Harbour and Dun Laoghaire Harbour is designated as a candidate Architectural Conservation Area in the County Development Plan.

2011). It can be noted that this assessment addresses the industrial heritage of the Harbour while the impacts on Archaeological heritage are addressed in Section 5.10 of the EIS.

The potential impacts identified are primarily visual relating to the proposed new jetty structure and the temporary visual impacts when the cruise ships are berthed in the Harbour. There are no anticipated physical impacts on the historic structures. The proposed landside impacts will overall be positive in expanding and enhancing the public realm within the Harbour and improving public access to the water's edge. There may be some disruption to the traditional harbour water uses (which form part of the cultural heritage of the Harbour), during construction although no loss of access or capacity is predicted.

Mitigation Measures

The mitigation measures proposed to address the potential impacts include minor and precautionary advance repairs to the West Pier roundhead; monitoring of movement/change in the historic Pier structures within the vicinity of the works during construction and interim inspections during operation; high quality detailed design, specification and construction of the proposed jetty and landside facilities and, management of harbour use during construction and operation.

Subject to implementation of mitigation measures the impacts of the proposed development can be managed in a manner which prevents any significant adverse impact.

2.10 Effects Resulting from the Existence of the Proposed Development

The predicted impacts of the proposed development are set out in detail in sections 5.1 to 5.11 of this EIS. The proposed development will impact on the immediate area around Dun Laoghaire Harbour and is mostly likely to impact on harbour users, the local population and marine ecology.

Impacts during the construction phase will be both positive and negative and will be temporary in nature. Potential temporary negative impacts include generation of construction traffic, noise, waste and dust and impacts associated with dredging, piling and dredge spoil disposal. It is considered that these impacts can be appropriately mitigated and controlled within acceptable levels. Likely positive impacts during the construction phase will be the creation of construction related employment and economic spin off within the local area.

In relation to the operational phase of the development, there are no significant adverse impacts envisaged, subject to adherence to the mitigation measures outlined in this EIS. The proposed development accords with national, regional and local policy and will have positive economic benefits.

The proposed development does not prejudice the future development of Dun Laoghaire Harbour. The proposed development is one element of the wider redevelopment of Dun Laoghaire Harbour, as detailed in the Dun Laoghaire Harbour Masterplan 2011-2030. The cumulative impact of the wider harbour redevelopment has been considered under the context of this masterplan.

2.11 Direct and Indirect Effects of the use of Natural Resources

The direct and indirect effects of the proposal are discussed throughout the EIS.

The proposed development provides for harbour-related infrastructure within an existing harbour. The natural resources that are likely to be impacted by the proposal include water (tide and wave climate) and land (geology and soils), both of which are examined in Section 5.4 and 5.3 of respectively.

The likely significant direct and indirect effects on the environment of the proposed development, which may result from the use of natural resources in this case, are such as not to be of a concern in respect of the matters set in Schedule 6 of the Planning & Development Regulations.

2.12 Direct and Indirect Effects of Pollutants, Nuisances and the Emission of Wastes

There will be an amount of excavation material and construction waste that will be disposed of in the appropriate manner. A Construction and Demolition Management Plan is included with this EIS. The disposal of the dredging spoil will require statutory consent from the EPA which will ensure there will be no adverse impact from the deposition of the dredging spoil at the dumping site.

It is considered unlikely that there will be any significant quantity of hazardous wastes generated by the construction and demolition activities.

Compliance will be maintained with all relevant ambient air quality standards and guideline values.

Details of emissions arising from the development together with any direct and indirect effects resulting from same have been comprehensively assessed and are outlined in the relevant sub-sections of Section 5.0 above. There will be no significant direct or indirect effects arising from these sources.

2.13 Forecasting Methods

The methods employed to forecast the effects on the various aspects of the environment are standard techniques used by each of the particular individual disciplines. The general format followed was to identify the receiving environment, to add to that a projection of the loading placed on the various aspects of the environment by the development, to put forward amelioration measures, to lessen or remove an impact and thereby arrive at a net predicted impact.

2.14 Interrelationships

This section of the EIS examines the elements most likely to produce interrelationships in terms of their potential impacts on the environment.

The primary inter-relationships between the various sections of this EIS are outlined below.

Human Beings / Coastal Processes

In terms of tide and wave patterns and impact on harbour users, the proposed scheme has been found to have no effect, or an effect limited both in terms of scale and the conditions under which it might occur, on sediment deposition, tidal flow and wave conditions.

Human Beings / Air and Climate

Some short-term negative impacts would occur during the construction and dredging period due to noise and dust. However, these will be localised, of limited duration, and can be mitigated through adherence to controls. A dust minimisation plan will be formulated for the construction phase of the project, to mitigate any impact.

During the operational phase, potential causes of disturbance are considered to be limited to engine and generator noise from ships as well as increased road traffic noise on the surrounding road network. However, any additional noise or vibration impact associated with the proposed development will be not significant.

Human Beings / Traffic

The construction phase will generate some additional traffic flows in the surrounding road network. However, controlled construction operations will mitigate against potential impacts to human beings.

In relation to the operational phase, given that a transport management plan will be implemented, the existing pedestrian facilities improved and an overflow car park provided; there will be no significant impact from the proposed development on traffic in the vicinity of the harbour.

Human Beings / Landscape and Visual Impact

The local community including harbour users will be aware of change from within and outside the harbour.

Negative visual impacts within the harbour during the construction phase will be for a temporary, short-term duration.

Once constructed, the new berth structure will not be generally discernible form outside the harbour area. The proposed berthing facility is in keeping with the general nature of the harbour structures and therefore would not be considered to be inherently negative.

In relation to the berthed cruise ships, the experience of the general public from the public accessible areas is likely to be rather positive. The arrival of large cruise ships on a temporary 'visiting' basis is on balance assessed as a positive impact.

Soil & Geology / Climate

The construction activities may generate quantities of dust. A dust minimisation plan will be formulated for the construction phase of the project, to mitigate any impact.

Soil & Geology / Water

Good management practice and adherence to environmental codes and practices can mitigate the risk of water and sediment quality impacts associated with construction operations.

2.15 Difficulties in Compiling any Specified Information

No particular difficulties, such as technical deficiencies or lack of knowledge, were encountered in compiling any of the specified information contained in this statement. Where appropriate, published sources of information are acknowledged and specifically commissioned surveys and studies undertaken especially for the purposes of assessing the proposed development project, have been referred to.

2.16 Conclusion

It is considered that given the parameters, timeframe, and availability of data, the study represents a robust consideration of potential and possible significant impacts on the local environment arising from the subject proposal. In addition, all expert consultants have endeavored to present reasonable and effective mitigation measures where appropriate.