Belfast Harbour

Port Master Plan

20-30 Year Period
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Executive Summary

Port Master Plans are designed to set out a port’s medium to long term development plans for consultation in order to inform stakeholders and assist local and regional planning authorities to prepare and revise their own plans.

Belfast Harbour (BHC) plays an essential role in the local economy of Belfast and regional economy of Northern Ireland. The Northern Ireland economy is largely dependent on seaborne trade and BHC handles 60% of this trade and 25% for the Island of Ireland.

Belfast Harbour directly and indirectly supports approximately 33% of Northern Ireland’s Gross Value Added (GVA) and 27% of employment. The Harbour Estate, extending to almost 2,000 acres, is home to over 650 businesses employing circa 17,000 people.

Belfast Harbour is Northern Ireland’s only multi-modal port, operating in all five of the traditional port trade sectors: Containers, also known as “Lift on/Lift off” (LLO), RoRo, also known as “Roll on/Roll off” (RoRo), Liquid Bulk, which includes oil and chemicals, Dry Bulk, which includes commodities such as grain and coal, and Break Bulk, which includes commodities such as timber, paper and steel.

Forecasts for Belfast Harbour, shown in Table 1 below, indicate a potential growth in port tonnage of circa 68% from 17.6 million tonnes in the base year (2012) to 29.3 million tonnes in 2030. This represents a Compound Annual Growth Rate (CAGR) of 2.8%.

Such forecasts have a considerable impact upon the Port's infrastructure and land and it is important that Belfast Harbour can adequately provide for the necessary capacity to avoid becoming a brake on Northern Ireland’s economic growth potential.

The analysis to determine the infrastructure and land requirements to serve the growth in tonnage must also take into consideration the needs of other complementary sectors such as Sustainable Energy Projects (“ClimateTech”), Port-centric Logistics Solutions and Cruise Ships.

The capacity analysis and resulting infrastructure and land strategy indicates that, to accommodate the projected tonnage of 29.3 million tonnes as shown in Table 1, an additional 60 acres of land must be created through reclamation. The infrastructure and land strategy includes a significant increase in the intensification of use of the current facilities through the redevelopment of existing infrastructure.

Such intensification mitigates the need to reclaim new land beyond the aforementioned 60 acres. It is recognised that this is important not only from a cost perspective but also due to environmental considerations as any new land reclamation may impact upon environmentally sensitive areas.

Belfast Harbour is committed to sustainable development and responsible environmental management and is accredited by the Carbon Trust and certified to ISO 14001. When contemplating port developments Belfast Harbour considers a range of environmental aspects including: water, air, land, waste, biodiversity, noise, heritage, flooding and energy efficiency. Within the master planning process it is not possible to address in detail the specific environmental impacts that may result from future developments. Instead the Port Master Plan identifies those aspects that may need to be considered at the detail planning phase of each development and addresses in broad terms the mitigations that may be appropriate.

The Port Master Plan is not an application for planning permission; it is a framework document which seeks to inform interested parties of Belfast Harbour’s perception of the medium and long term port traffic growth and the resulting infrastructural needs. In doing so it is hoped that the information contained within the Port Master Plan will contribute to an efficient and effective planning application and approval process and will help inform other agencies in their strategic planning activities.
Belfast Harbour Commissioners (BHC) is a Statutory Corporation established by Act of Parliament to operate, maintain and improve Belfast Harbour. BHC is independent of government and is required to fund all of its activities from its own resources.

Belfast Harbour plays an essential role in the local economy of Belfast and regional economy of Northern Ireland. The Northern Ireland economy is largely dependent on seaborne trade and BHC handles 60% of this trade and 20% for the island of Ireland.

In the last 20 years Belfast Harbour has facilitated projects with a gross development value of £1.5bn.

The Harbour Estate covers almost 2,000 acres; the reclamation from the seabed of this land during the course of the last two centuries was funded by the Harbour without recourse to the public purse.

Belfast Harbour is home to over 650 businesses employing circa 17,000 people; directly and indirectly supports approximately 31% of Northern Ireland’s GVA and 27% of NI employment.

The primary role of BHC is to operate, maintain and improve Belfast Harbour and by virtue of this, BHC has significant economic and other impacts. In the past 10 years BHC has funded £180m of capital projects, all without recourse to public or other external funds.

The purpose of the Port Master Plan, following guidance set out by the Department of Regional Development (DRD), is to:

- clarify the Port’s own strategic planning for the medium to long term (20-30 years)
- assist planning authorities, at both regional and local level, and Roads Service in the preparation and revision of their own strategies and plans
- inform port users, employees and local communities as to how they can expect to see the Port develop over the coming years

The Port Master Plan addresses such matters by:

- setting out the Harbour’s view of how traditional port tonnages might grow in the period 2012 to 2030
- exploring how complementary port sectors such as sustainable energy projects (“Cleantech”) and Port-centric Logistics might contribute to port growth
- defining the infrastructure and land resources necessary to support future growth
- exploring how environmental considerations will be addressed
- identifying how consultation will be conducted

Introduction
The Port Master Plan is not an application for Planning Permission; it describes how Belfast Harbour is expected to develop over the next eighteen years to ensure that the needs of the economy continue to be supported. Any development resulting from the master planning process will be subject to the normal requirements for Planning Permission except where such developments fall within the scope of the Harbour’s permitted development powers.

In addition to the planning authorities mentioned above, it is Belfast Harbour’s expectation that this Port Master Plan will inform and be informed by:

- further developments in River Basin Management Plans
- any planning arising from the Northern Ireland Marine Bill
- the designation of Marine Conservation Zones
- the provisioning of electrical infrastructure by the Northern Ireland Authority for Utility Regulation
- Belfast Metropolitan Area Plan
The Marketplace

OVERVIEW
This chapter describes the current mix of commodities and trade sectors handled at Belfast Harbour and offers growth projections, based on locally commissioned independent economic analysis, in conjunction with the Port’s own assessment of sectoral growth, across the period 2012 – 2030.

These growth forecasts will impact on the spare capacity of Belfast Harbour’s existing physical infrastructure and land bank and the implications of this are explored in the next chapter.

In the base year for the trade forecasts, 2011, Belfast Harbour handled 17.6 million tonnes, making it the largest port in Northern Ireland (NI) handling circa 60% of all NI port traffic and circa 20% of all tonnage handled through all Irish ports.

In this chapter commentary will be provided on the key commodities associated with each of the Port’s five key trade sectors and analysis provided on anticipated growth rates for each sector for the period to 2030.

TRADE SECTORS
Belfast Harbour is NI’s only multi modal port, operating in all five of the port trade sectors. The port industry commonly groups goods and commodities into these five sectors as they have similar properties from a port’s perspective in terms of handling requirements. As such, the five sectors below represent an “industry standard” classification.

In addition to the above five traditional trade sectors, assessments of the Sustainable Energy (Cleantech), Cruise and the Port-centric Logistics sectors and their respective future potential growth will be undertaken. Such sectors have significant land and infrastructure requirements which must be factored in to any comprehensive port master planning process.

FORECASTING METHODOLOGY
THE PROCESS
The forecasting of port traffic levels at both a UK national and local level has only recently been developed by government in the UK.

In 2006, the Department for Transport (DfT) commissioned MDS Transmodal to develop forecasts of UK port traffic to 2030 to assist the UK Government in its review of ports’ policy and ensure it had the right basis for the sustainable development of UK ports. The quality of this forecasting, as it pertained to Northern Ireland port traffic, was questionable and hence in 2011, Belfast Harbour commissioned its own independent economic analysis to determine the extent of the relationship between NI port tonnage and NI economic activity and also to provide short term and long term growth projections for NI port tonnage.

As a leading local economic forecaster, and the only firm which produces NI Gross Value Add (GVA) forecasts at a NI economic sectoral level, Oxford Economics was selected to carry out the analysis.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Examples</th>
<th>% of BHC Port Traffic (based on 2011 traffic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoRo</td>
<td>Ferry traffic carrying HGVs, passengers, and passenger cars</td>
<td>50%</td>
</tr>
<tr>
<td>LoLo</td>
<td>Containerised cargo traffic</td>
<td>13%</td>
</tr>
<tr>
<td>Liquid Bulk</td>
<td>Kerosene, Diesel</td>
<td>12%</td>
</tr>
<tr>
<td>Dry Bulk</td>
<td>Grain, Animal Feeds, Coal</td>
<td>23%</td>
</tr>
<tr>
<td>Break Bulk</td>
<td>Timber, Steel, Paper, Project Cargo</td>
<td>2%</td>
</tr>
</tbody>
</table>

Table 2: Breakdown by Percentage of Port Tonnage in 2011
Belfast Harbour provided Oxford Economics with historical port traffic data from 1978 onwards which enabled it to investigate and establish which economic variables bore the strongest relationships with specific port trade sectors, e.g. Crude Oil Prices and Liquid Bulk Tonnes.

Using its widely respected Economic Modelling Suite (used by Northern Bank, Ernst & Young and DETI), Oxford Economics was able to establish that a close correlation exists between Northern Ireland port traffic and NI economic activity in general, a finding which concurred with similar studies in other regions and economies around the world.

Oxford Economics was also able to identify a large number of economic variables which had strong statistical relationships with specific port cargo types. By utilising these relationships, Oxford Economics was able to create a best-fit model of economic variables for forecasting total port tonnage at a NI level, and at a Belfast Harbour level, and for the individual trade sector tonnages at a Belfast Harbour level.

In order to demonstrate the accuracy of the relationships identified, Oxford Economics recreated the total NI port tonnage figures for the period 1983-2008 using its regression model, and then compared the results against actual NI port tonnage for that period. Graph 1 illustrates the very close correlation between Oxford Economics’ projections based on its identified relationships and actual NI Total Port Tonnage.

As well as carrying out the economic modelling work at an aggregated port tonnage level, Oxford Economics also carried out modelling at the individual trade sector level with a similar aim of identifying relationships between economic variables and the tonnage levels of each individual trade sector.

In addition to the “pure” economic modelling, BHC provided Oxford Economics with market specific information (which would not be picked up by pure economic analysis) to inform their assessment of future tonnages. For example, allowance for the future receipt of Kilroot Power Station coal tonnages to Belfast Harbour.

This created a set of output figures of future forecast tonnages by sector through to 2030 which were informed by both wider macroeconomic data and other market specific events or data provided by BHC.

Oxford Economics was also asked to prepare an upper forecast to provide a set of port tonnage figures which might be expected should the economy experience higher levels of economic growth over the plan period. Such a scenario might prevail in the event of a change to the level of corporation tax payable in NI, or if NI made substantial progress in its attempt to reach GVA per capita parity with the UK average (presently NI GVA per capita is 80% of the UK average).

The other core element of the forecast takes the benefit of local market knowledge, competitive analysis, customer feedback, and accounting for government legislative impacts.

ASSESSMENT OF THE INDIVIDUAL TRADE SECTORS

RORO

Presently, three RoRo ferry services operate from Belfast Harbour linking the Port with the west coast of Scotland at Loch Ryan, and the North West of England through Liverpool and Heysham. A smaller, seasonal, passenger only service operates to the Isle of Man during the summer months.

In 2011, Belfast Harbour handled 357,000 Freight Vehicles, 272,000 passenger cars and 1.24 million passengers and when translated to tonnage terms, the RoRo sector is the Port’s largest trade sector representing almost half of the Port’s total tonnage handled in 2011 at 8.6mT.

Outlook to 2030

In the context of what is a currently stagnant NI RoRo Freight market, the main dynamic in the sector is consolidation of services and associated market share changes. Belfast Harbour stands to benefit from this process as it strengthens its position as Northern Ireland’s principal transport hub.

This market consolidation, coupled with BHC’s investment in the modern VT4 terminal for Stena Line, Stena Line’s own investment at Old House Point at Loch Ryan and the introduction of larger vessels on the Loch Ryan route in late 2011 has provided additional capacity and improved the service offering. As a result, strong levels

<table>
<thead>
<tr>
<th>2011 Total Freight Vehicles by Route (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liverpool</td>
</tr>
<tr>
<td>45%</td>
</tr>
</tbody>
</table>

Chart 1: Belfast Harbour 2011 RoRo Freight Vehicle volume split by route
of growth in Belfast’s RoRo volumes are projected notwithstanding the stagnant market conditions.

Stena’s recent acquisition from DFDS of the two Belfast based routes to Heysham and Liverpool also provides further opportunities for market share gains as the number of players in the market declines and the market focuses on island’s two main economic hubs, Belfast and Dublin.

In addition to the above analysis, consideration must be given to the economic environment and to this end, Oxford Economics’ market research identified that the best fit model for predicting RoRo traffic is as per the table below: Considering all of the above factors, strong service offerings, structural market changes favouring major ports like Belfast, and slow long term modal shift, the forecast scenario is as per the table below:

Table 3: RoRo forecasts

<table>
<thead>
<tr>
<th>Forecast</th>
<th>2030 Tonnage</th>
<th>CAGR (2011-30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>13.6mT</td>
<td>2.4%</td>
</tr>
<tr>
<td>Upper</td>
<td>15.1mT</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

The Outlook to 2030

The outlook for the LoLo shipping sector reflects the stagnant economy in the short term and ongoing consolidation within the container shipping industry where operators are seeking to reduce the number of port calls made in Ireland and sharing vessels where possible. It is expected that this consolidation will favour the larger Irish ports of Cork, Dublin and Belfast. Ship sharing arrangements between lines will result in larger ships being introduced into the Irish market in order to generate economies of scale. As a result Belfast’s share of the Irish LoLo market is expected to increase.

Belfast’s market share gain must be set against a fairly flat LoLo market as moderately strong performance in the manufacturing sector (which drives both imports and exports) is offset by weak consumer demand which is a driver of imports of large consumer goods (e.g. white goods, furnishings). A strong recovery in consumer demand in the short term is not forecast, however over the period to 2030, consumer demand is expected to recover and increase.

Oxford Economics’ research identified that the best fit model for predicting LoLo traffic levels was based on NI GVA Manufacturing performance.

Having considered all of the above, BHC forecasts a moderate rate of growth in LoLo tonnage over the period as shown in the table below:

Table 4: LoLo forecasts

<table>
<thead>
<tr>
<th>Forecast</th>
<th>2030 Tonnage</th>
<th>CAGR (2011-30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>3.5mT</td>
<td>2.4%</td>
</tr>
<tr>
<td>Upper</td>
<td>3.9mT</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

The Liquid Bulk sector has not materially changed in product composition terms in recent years save for the increased use of natural gas as a domestic and commercial heating source resulting in reduced kerosene tonnages over recent years with no reason to suggest that this will not continue.

For the other major component of Liquid Bulk tonnage, road transport fuels, the increasing use of diesel engine cars means that road diesel imports are projected to increase over the period but at the expense of petrol imports as product substitution occurs. Indeed ever improving engine efficiency, driven by both legislation and economics, will continue to put downward pressure on consumption as the average mpg of the national car fleet continues to rise.

<table>
<thead>
<tr>
<th>Commodity</th>
<th>2011 Liquid Bulk Tonnage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerosene</td>
<td>10%</td>
</tr>
<tr>
<td>Diesel</td>
<td>35%</td>
</tr>
<tr>
<td>Petrol</td>
<td>30%</td>
</tr>
<tr>
<td>Bitumen</td>
<td>5%</td>
</tr>
<tr>
<td>LPG</td>
<td>5%</td>
</tr>
<tr>
<td>Acid</td>
<td>5%</td>
</tr>
<tr>
<td>Molasses</td>
<td>5%</td>
</tr>
</tbody>
</table>
The anticipated emergence of biodiesel production facilities and/or importation has not materialised and is not expected to realise significant volumes during the Plan term. In any case, a substitution effect would more than likely occur if any volumes were to materialise during the Plan period. Other smaller volume products such as bitumen and molasses are forecast to remain broadly flat over the Plan with no significant growth factors identified.

Oxford Economics’ research identified that the best fit model for predicting Liquid Bulk traffic levels was based on the following three economic variables:

- NI Manufacturing GVA
- Exchange Rate £/US$
- Oil Price, Real terms, Index 2000=100

Having considered the above macroeconomic and local market factors, Belfast Harbour anticipates stagnation in annual tonnages in the short term with marginal levels of growth in the mid to long term through to 2030. The Central and Upper Forecasts are shown in the table below.

Table 5: Liquid Bulk forecasts

<table>
<thead>
<tr>
<th>Forecast</th>
<th>2030 Tonnage (2012-30)</th>
<th>CAGR (2012-30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>2.2mT</td>
<td>0.2%</td>
</tr>
<tr>
<td>Upper</td>
<td>2.5mT</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

The economic research carried out by Oxford Economics identified that the best fit model for predicting Belfast’s Dry Bulk traffic levels was based on the following economic variables:

- NI GVA Agriculture, Forestry & Fishing
- NI GVA Manufacturing of Food Products, Beverages & Tobacco

The economic modelling, coupled with BHC’s own assessment of the foregoing market factors, leads to an expectation of continued increases in the Port’s Dry Bulk tonnage through to 2030. The overall growth figure is made up of varying levels of growth at an individual commodity level, includes capture of market share from other ports as a result of BHC’s continued investment in deeper water facilities, and includes new business opportunities being realised in areas such as biomass. The forecast is as per below:

Table 6: Dry Bulk forecasts

<table>
<thead>
<tr>
<th></th>
<th>2030 Tonnage (2012-30)</th>
<th>CAGR (2012-30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>6.4mT</td>
<td>2.5%</td>
</tr>
<tr>
<td>Upper</td>
<td>7.0mT</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

Forecasts are shown in the table below.

2011 Dry Bulk Tonnage by Commodity (%)

- Primary agriculture alone accounts for 2.2% of Gross Value Added in the NI economy compared with just 0.8% in the UK. The importance of the sector to the Port’s Dry Bulk sector (where grain and animal feeds make up over 50% of the total Dry Bulk tonnage) is illustrated by the fact that cattle and milk production makes up 60% of NI’s gross agricultural output compared with 29% in the UK.

- The predominance of livestock farming in Northern Ireland compared with the rest of the UK is further illustrated by the fact that only 4% of NI’s agricultural output comes from crops compared to a UK figure of 23%.

- As a result, NI’s agricultural sector is more dependent on feedstuffs to supply livestock and imported grains for production of breads and other foodstuffs. There is also a proportionately larger export business for the finished products arising from this sector, such as milk powder, beef and poultry products.

- In a global context, the opportunity exists for the NI agriculture sector to benefit from a growing world economy and in particular as the fast-growing economies of Asia developed “western diets” consuming more dairy and meat products. As a major exporter of these products, moderate levels of economic growth are forecast to continue in this sector over the medium to long term, with corresponding increases in related tonnages for the Port.

- The other main commodities in tonnage terms in the Dry Bulk sector are aggregates, coal and scrap.

- The NI aggregates industry supplies substantial volumes of product into mainland UK for use in road construction and maintenance projects. Although tonnages are contract/project led, local businesses are becoming increasingly successful in the GB market and a moderate level of growth is expected for the period to 2030.

- Opportunities also exist in the coal trade, with local importers increasingly seeking to increase market share in an all-Ireland context, particularly in industrial coal, and further, seeking cargo export opportunities for valued added industrial coal products such as petcoke.

- Recent facility investments by both existing scrap exporters and new market entrants give confidence to BHC that this market also has the potential to enjoy moderate growth in the period to 2030.

- Finally, opportunities exist for Belfast Harbour to grow Dry Bulk tonnage levels through importation of feedstock for the emerging biomass energy industry. The Port is well positioned to serve the biomass sector with the site of the former Belfast West Power Station (BWPS) (part of Belfast Harbour’s land bank) extremely well suited for use as a biomass power station. A biomass power station at BWPS could be expected to handle annual tonnages of up to 600kT. Timescales for such a development would suggest a commencement date for imports of 2017 at the earliest.

- Other smaller scale biomass opportunities also exist, with annual tonnage requirements of up to 150kT of feedstock material.

- It should be noted, however, that like many renewable energy opportunities, risk remains in whether or not government support (typically in the form of subsidies) is at the appropriate level and duration so as to attract the necessary investment from the private sector.
**BREAK BULK / PROJECT CARGOES**

In 2011 Belfast Harbour handled 332kT of Break Bulk / Project Cargo commodities which included Timber, Steel, Paper and various project cargoes including a substantial tonnage of offshore wind turbine components for a single offshore wind farm project.

**Outlook to 2030**

Although the smallest of the main trade sectors in volume terms, the Break Bulk / Project Cargo sector has been the most adversely affected by the recent recession. In particular, those commodities associated with the construction industry such as structural steel and timber have declined year on year by 50% for a period of 4 years.

The prospects for growth remain poor as long as economic factors persist which suggest ongoing depressed demand for new housing and large scale infrastructure projects.

Another major component of the Port’s Break Bulk tonnages is paper which has also suffered declining tonnages due to reduced packaging requirements from manufacturers and depressed newspaper sales. Despite declining tonnages, Belfast’s investment in purpose built facilities for this sector, should ultimately pay dividends as economies of scale and market consolidation take place thereby increasing Belfast’s market share in paper tonnage.

The key opportunity for growth in the sector is from the offshore renewable energy sector (offshore wind, wave and tidal energy), with the Port’s recent announcement of the creation of port facilities for use by DONG Energy, the world’s leading developer of offshore wind farms, being a case in point. As a result, the majority of the anticipated growth in the Break Bulk sector is expected to come from renewable energy projects. The most important factor to consider in relation to offshore wind energy developments is the land hungry nature of the sector.

At the macroeconomic level, Oxford Economics’ research identified that the best fit model for predicting Belfast’s Break Bulk traffic levels was based on NI GVA Construction and NI House Prices. The output of the Oxford Economics model was considered alongside the relevant market insights and the following forecasts were made:

<table>
<thead>
<tr>
<th>Sector</th>
<th>Central Forecast (million tonnes)</th>
<th>Upper Forecast (million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoRo</td>
<td>13.6</td>
<td>15.1</td>
</tr>
<tr>
<td>LoLo</td>
<td>3.5</td>
<td>3.9</td>
</tr>
<tr>
<td>Liquid Bulk</td>
<td>2.2</td>
<td>2.5</td>
</tr>
<tr>
<td>Dry Bulk</td>
<td>6.4</td>
<td>7.0</td>
</tr>
<tr>
<td>Break Bulk</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>Total Tonnage</td>
<td>26.4</td>
<td>29.3</td>
</tr>
</tbody>
</table>

**PORT-CENTRIC LOGISTICS WAREHOUSING**

In recent years, many ports have developed their logistics warehousing offer in response to demand from retailers, manufacturers and logistics providers to realise supply chain efficiencies through provision of port-centric logistics solutions.

These high quality warehouse facilities, with 8m plus eaves heights, dock leveller access, and high quality offices, provide occupants with the opportunity to realise logistics cost savings through efficient storage methods and locating adjacent to import/export nodes (RoRo ferry and container terminals) to eliminate “dead leg” transport costs. The Port also benefits from the development of the warehousing solution from the increase in RoRo or LoLo volumes associated with that particular customer or logistics provider.

Over the last 15 years, Belfast Harbour has developed over 500,000 sq ft of modern logistics warehousing for a range of retailers and logistics providers. However, in recent years, the development of warehousing has slowed as a result of the recession. In the medium to long term, a lack of new, purpose built, accommodation in the market will start to build supply pressure such that new opportunities are expected to be realised.

The remaining 15 acres of land at A5A, beside the Port’s RoRo and LoLo terminals, has thus been allocated for port-centric logistics warehousing.

**CRUISE SHIPS**

Cruise Ships has been a growing sector for Belfast Harbour during the last few years. Belfast is principally a ‘port of call’ for cruise ships and is only very rarely required to play the role of ‘turnaround port’ i.e. supporting the embarkation and disembarkation of passengers at the beginning and ending of their cruise.

The sector makes a valuable contribution to the local tourism economy and, with the opening of Titanic Belfast, has demonstrated the potential for considerable growth: in 2011 Belfast Harbour hosted 30 cruise ships; in 2013, 55 cruise calls are expected.

It is anticipated that the sector will demonstrate some further growth to circa 60 calls and that this higher volume will be sustained for the foreseeable future.

**The Marketplace**
Infrastructure and land use

This chapter outlines Belfast Harbours’ strategy to provide the additional capacity necessary to support the projected throughput identified in the preceding chapter.

Given the importance of the Port to the regional economy and given the lead time associated with the reclamation of new land it is important that Belfast Harbour does not become a brake on economic growth by under-provisioning capacity. For that reason the Upper Forecast has been selected for the purpose of capacity planning.

In addition to volume forecasts a number of other factors must be considered when capacity planning. Such factors include: vessel size; the ‘zoning’ of port facilities to particular commodities; and intensification of use of existing facilities.

Vessel Size

The draft, beam and capacity of vessels visiting Belfast Harbour have continued to increase over recent years as ship and cargo owners have sought to enhance their competitive positions. Indeed when one considers the size of new vessels currently being commissioned there is an evident trend towards significantly larger vessels. Such changes impact upon port infrastructure in terms of berth lengths and depths and channel depths.

The trend towards larger vessels has been accounted for in the analysis of deep-water Dry Bulk and Break Bulk capacity requirements and whilst the existing deep water facilities should adequately support the larger vessels some deepening to the outer channel may be required.

For LoLo, whilst the trend towards larger vessels is very evident in this sector, it has been assumed that the market will continue to provide sufficient numbers of the appropriately sized vessels to avoid rendering the existing facilities obsolete. Whilst this assumption does not pose any undue risk, any new LoLo facility must cater for larger vessels.
For Liquid Bulk, it has been assumed that the market will continue to provide sufficient numbers of the appropriately sized vessels to avoid rendering the existing facilities obsolete.

**PORT ZONING**

Port Zoning is the practice of allocating commodities to certain geographical locations within the Port. Zoning decisions may result from: inland connectivity requirements; the need to access deep water; environmental considerations; or cargo compatibility.

Zoning at a macro level often aligns with the classification of the cargoes into their modal types (i.e. Dry Bulk, LoLo etc.) due to the similarity of infrastructure and superstructure needs within each mode.

**INTENSIFICATION**

In assessing the land take requirements for each of the commodity sectors attention has been given to how the utilisation of existing land. The remaining 60 acres is required to be reclaimed.

The analysis is summarised in Table 10 and is explored in more detail for each of the cargo modes in the following subsections.

### Table 10: Summary of Additional Land Requirements (acres)

<table>
<thead>
<tr>
<th>Sector</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoRo</td>
<td>30</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LoLo</td>
<td>30</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid Bulk</td>
<td>22</td>
<td>22</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>Break Bulk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Total</td>
<td>22</td>
<td>52</td>
<td>82</td>
<td>82</td>
</tr>
</tbody>
</table>
on the County Antrim side of the Port thereby providing easy access to the road network via Dargan Road.

It is necessary to reclaim an additional 30 acres of land for the construction of this new LoLo terminal.

- **Liquid Bulk**
  Liquid Bulk requires medium to deep water berths equipped with pumping and fire fighting facilities. As the commodity can be piped the tank farms need not be immediately adjacent to the berths.

  The throughput forecast presented in the previous chapter indicates that the current Liquid Bulk capacity will suffice until at least 2030.

- **Dry Bulk**
  Dry Bulk facilities require deep water quayside with reasonable access to the road network and/or adjacent storage areas. The latter can be covered or open storage dependent on the commodity.

  Efficient utilisation of the berth facilities can be achieved through investment in high capacity bulk handling cranes. The efficient utilisation of the adjacent storage is the accountability of the Port User but can be influenced to a degree by Belfast Harbour through appropriate pricing mechanisms.

  The throughput forecast in the preceding chapter indicates that one additional deep water berth of circa 400m and additional storage space of 10 acres covered storage and 12 acre open storage will be required.

  It is planned that the additional capacity required can be accommodated by the reorganisation and redevelopment of existing port capacity adjacent to the current facilities on the County Antrim side of the Port without the need to reclaim additional land.

- **Break Bulk**
  Break Bulk requires medium to deep water quayside adjacent to on-quay and/or covered storage dependent on commodity. Belfast Harbour can generally manage the efficiency of utilisation of such facilities through appropriate pricing mechanisms.

  The throughput forecast presented in the previous chapter indicates that the current Break Bulk capacity will suffice through to at least 2030.

- **Cruise Ships**
  Cruise Ships require up to 350m of medium to deep water quayside coupled with circa 2 acres of quay area for the marshalling of coaches and other transport.

  Even with the increased projection of 60 vessels the number of Cruise Ships calling at Belfast would not sustain a dedicated cruise facility. Belfast Harbour has traditionally serviced this sector at its Bulk handling facilities.

  For the purposes of capacity planning it is important not only to determine how the expected volumes of cruise vessels are to be accommodated but also to understand the impact of such vessels on the Port’s Bulk handling capacity. Each cruise ship call consumes the equivalent of circa 11,000 tonnes of capacity and therefore the forecast of 60 cruise ships is equivalent to 660,000 tonnes. Whilst this quantity will never be included in port tonnages it is important to consider its impact.

- **Clean Technology**
  Typically new ‘Clean-tech’ industries such as Offshore wind farms and Tidal Energy require deep water quayside facilities with adjacent space of 20-30 acres for logistics activities.

Belfast Harbour has allocated the two areas of waterfront land, known as D1 and D3, on the County Down side of the Port to this industry sector.
Inland Connectivity

Belfast Harbour handles over 60% of Northern Ireland’s sea-borne trade and 20% for the island of Ireland. Aside from a small but growing portion of transhipment all movement of goods to and from the Port is achieved by road.

The Port has five main access points to the national road network. These are Dargan Road, Dock Street Odyssey/ M3, Dee Street, and Tillysburn.

**IMPACT OF PORT DEVELOPMENTS ON TRAFFIC VOLUMES**

Given the long term and strategic nature of master planning it is not possible to identify accurately the traffic volumes and associated impacts resulting from future developments until more detailed design parameters are established. Such design parameters will be determined during the design phase in the months prior to construction. The sub-sections below comment in general qualitative terms on the impact of port developments on traffic volumes at each access point.

**DARGAN ROAD**
The main port access point for goods is the Dargan Road entrance which connects directly to the M2 at the Fortwilliam Roundabout. This entrance services all of the Port’s container and ferry traffic and today accounts for circa 64% of the traffic volume directly associated with port freight. In addition to cargo, the Dargan Road entrance services other vehicle traffic related to business premises on the West Bank, Edgewater and Dargan Roads and also caters for the private and business traffic associated with the Duncrue Industrial Estate.

The increased traffic volumes associated with the forecast growth in port tonnages will mainly be catered for via the Dargan Road entrance. Such road was ‘dualled’ in 2009 and has the capacity to cope with the forecast increase in volume.

**DOCK STREET**
The majority of the Dry Bulk and Break Bulk trade in the Port uses the access points at Dock Street and Dufferin Road (exit only). Such access points account for circa 25% of today’s port freight traffic volume. Given that circa 66% of the projected Dry Bulk tonnage increase will be handled by transhipment, the increased traffic volume is unlikely to create a capacity issue at this access point.

**ODYSSEY/M3**
The Odyssey/M3 slip road is not a major access point for port freight traffic.

**TILLYSBURN AND DEE STREET**
The Liquid Bulk and Cleantech sectors are mainly based on the County Down side of the Port. Liquid Bulk primarily utilises the Tillysburn access, with some use of Dee Street, and accounts for approximately 11% of the traffic volume directly associated with port freight. The Cleantech sector makes little or no contribution to port traffic volumes.

Given that the forecast growth for Liquid Bulk through to 2030 is only circa 10% and given that port developments on the County Down side of the Port are planned to be ‘Clean Tech’, which is likely to involve transhipment, as opposed to land based transportation, it is not anticipated that there will be any significant changes in the utilisation of these access points.
Security

SECURITY
Established in 1847, the Belfast Harbour Police (BHP) is one of a number of Home Office approved independent police services in the United Kingdom.

Belfast Harbour Police has full constabulary powers, along with special powers granted through Belfast Harbour Commissioners’ by-laws. BHP provides 24-hour cover responding promptly to incidents and requests for assistance throughout the 2,000 acre Harbour Estate.

BHP’s aim is to provide an effective and efficient policing service for the Belfast Harbour Estate and Port community with a clear focus on crime prevention and detection to provide a safe and secure environment for all.

In addition to uniformed police, BHP employs the services of a number of security firms to provide perimeter and cruise ship security.

Security within all United Kingdom ports is regulated by TRANSEC (Department for Transport) through the International Ship and Port Security Code 2004 (ISPS) and where enacted the Ports Security Directive.

Under ISPS BHP is responsible to TRANSEC for the preparation and operation of a Port Facility Security Plan (PFSP) for all general user facilities which have a ship to shore interface. In addition, plans are required for all port facilities under the direct control of third parties e.g. ferry terminals and oil berths. The aforementioned third parties are directly responsible to TRANSEC for the preparation and operation of these ISPS plans.

The Port Security Regulations (2009) will come into effect for Belfast when a designation order is passed by Westminster. Such designation order will establish a Belfast Port Security Authority (PSA) comprised of representatives of Belfast Harbour and all third parties with ISPS responsibilities within the Port. Once formally established the PSA will be responsible to TRANSEC for the development of a security plan for the entire port area.

All new developments within the Harbour Estate will be included in the ISPS plan where applicable and will be assessed under the Port Security Regulations during the detailed design phase of the development project.

Notwithstanding such regulatory requirements Belfast Harbour continues to work with other agencies such as the PSNI, CPNI, NFRS and Belfast Resilience to develop risk assessments and security plans for certain key facilities within the Harbour Estate.
Safety & Security

Port Master Plan: 20-30 Year Period

Safety and the Environment
Safety and the Environment

Belfast Harbour Estate is home to a broad range of businesses and activities each of which is governed by safety legislation. The safety considerations associated with new developments may include safety during construction; safety during operations; and public safety. Each of these considerations will be addressed in accordance with prevailing legislation by the relevant party during the design phase of new developments.

Belfast Harbour Commissioners recognise that good Health, Safety & Environmental Management Systems and performance are fundamental to business success.

BHC considers it a priority to reduce the health and safety risks to its stakeholders to a level as low as reasonably practical, to prevent pollution and to minimize the environmental impact of its activities.

In order to achieve this we will:

- Comply with all relevant Health, Safety and Environmental legislation and other requirements to which we subscribe including:
  - The Port Marine Safety Code
  - The European Sea Ports Organisation (ESPO) Environmental Code of Practice
  - Endeavour to prevent injury, ill health and pollution
  - Adopt the principles of sustainable development
  - Protect biodiversity consistent with our duties as a Harbour Authority
  - Systematically identify and assess Health, Safety and Environmental risks associated with our activities
  - Mitigate and control identified risks in order to conduct our activities safely and in an environmentally responsible manner
  - Develop, maintain and test emergency plans and procedures
  - Involve and consult employees and other stakeholders on Health, Safety and Environmental issues where appropriate
  - Set measurable Health, Safety and Environmental objectives and targets supported by a management programme that reviews effectiveness and evaluates compliance
  - Ensure that employees are competent to carry out their work and understand the impact their actions and behaviour may have on health, safety and the environment
  - Provide our employees (and where appropriate) contractors and suppliers with adequate information, training and supervision to enable them to understand and discharge their responsibilities for compliance with this policy
  - Communicate this policy to all persons working for or on behalf of Belfast Harbour Commissioners.
  - Strive to continuously improve our Health, Safety and Environmental management systems and performance.
Impact on the Environment
This chapter explores Belfast Harbour’s environmental policy and approach to protecting the environment in the context of developments within the Harbour Estate.

INTRODUCTION
Given the long term and strategic nature of master planning it is not possible to identify specific environmental impacts resulting from future developments until initial design parameters have been established. Such design parameters will be determined during the detail design phase in the months prior to construction.

This chapter therefore identifies the typical environmental aspects that are likely to be relevant to such developments and explores the general approaches to mitigation.

ENVIRONMENTAL CONTEXT
Belfast Harbour is located at the head of Belfast Lough and is comprised of approximately 2,000 acres of land and 1000 acres of water. The Harbour contains and is adjacent to areas of special scientific interest and European designated special protection areas. (see Figure 1)

The Harbour is home to approximately 650 businesses including manufacturing, chemical, oil and gas companies, and retail and leisure organisations. Circa 17,000 people travel to work in the Harbour Estate each day.

Belfast Harbour has conducted an extensive environmental assessment and has identified the following environmental aspects are likely to require consideration at the detail design phase of future developments:

- Water and sediment quality
- Air quality
- Waste management
- Biodiversity
- Land quality
- Noise and vibration
- Visual Impact
- Heritage
- Flood Risk
- Energy Efficiency

Figure 1: Designated Nature Conservation Areas
Environmental Impacts
An Overview

ENVIRONMENTAL MANAGEMENT
Belfast Harbour operates a formal environmental management system (EMS) which is certified to the internationally recognised ISO 14001:2004 standard. The EMS has 3 main components consisting of environmental policy; governance and operational controls.

Belfast Harbour's Environmental Policy recognises that good environmental management is fundamental and that prevention of pollution and minimizing the environmental impact of the Harbour's activities are organisational priorities.

Key elements of the policy are:

• Compliance with all relevant Environmental legislation
• Conformance to the standards laid down by the European Sea Ports Organisation (ESPO)
• Adoption of the principles of sustainable development.
• Protection of biodiversity consistent with our duties as a Harbour Authority
• Continuous improvement of our Environmental management systems and performance.

A number of specific policies support this environmental policy. Such policies cover: Energy; Procurement; Sustainability; and Biodiversity. Full details of these policies can be found on our website.

Belfast Harbour’s environmental performance is governed at the corporate level by a Board sub-committee comprising members of the Board supported by the executive management team. The committee oversees the Harbour’s performance in respect of statutory obligations and the Port’s own environmental objectives and targets.

SUSTAINABLE OPERATIONS
As a major port operator and landlord Belfast Harbour recognises the importance of environmentally sustainable operations and are committed to working closely with all of our stakeholders to understand and improve environmental performance. For those activities which are directly under the control of Belfast Harbour environmental risk assessments are conducted in order to develop the controls necessary to deliver robust environmental performance.

The Harbour’s environmental performance is reported annually on the Belfast Harbour website.

SUSTAINABLE DEVELOPMENT
Previous chapters have identified the general developments and infrastructure that are likely to be required through to 2030 to support regional economic growth.

Such developments include:

• Development of Berth, Quay and Hinterland at D3 to support Cleantech projects
• Land reclamation at A5 to facilitate RoRo and LoLo capacity needs
• Channel Deepening

Belfast Harbour is committed to the principles of sustainable development and the following sections address the main environmental aspects that may require to be considered as each development project is progressed.

The table above lists the environmental aspects that have been identified as being likely to require consideration at the detailed design phase of each construction project.

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<tbody>
<tr>
<td>Development of Berth, Quay and Hinterland at D3 to support Cleantech projects</td>
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<tr>
<td>Land reclamation at A5 to facilitate RoRo and LoLo capacity needs</td>
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<td>Channel Deepening</td>
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Table 11: Environmental aspects likely to require consideration
Environmental Impacts
Water & Sediment

The following sections will address each of the environmental aspects in turn and will comment on the potential environmental considerations that may require to be addressed during the detailed design phase of each development project.

WATER AND SEDIMENT QUALITY

Sea water is important as a social and economic resource and therefore water quality and avoidance of pollution are key environmental objectives for Belfast Harbour.

The most significant regulation governing water and sediment quality is the Water Framework Directive (WFD) which places an obligation on European Member States to improve water quality standards through the development and implementation of River Basin Management Plans (RBMP).

Water quality within Belfast Harbour is addressed within the North Eastern River Basin Management Plan. Such plan recognises that Belfast Harbour is a Heavily Modified Water Body (HMWB) and as such should not be required to achieve pristine status but over the period of the plan should attain “Good Ecological Potential” (GEP).

Attainment of GEP requires that the chemical and biological status of the water body meets defined quality standards.

Water Quality within Belfast Harbour can be affected by activities such as:

- Upstream discharges outside the control of Belfast Harbour e.g. agricultural runoff into the River Lagan. The Northern Ireland Environment Agency (NIEA) is responsible for the regulatory control of such discharges. The RBMP acknowledges that the pollution from such sources is currently the most significant issue for water quality in the Harbour.
- Discharges resulting from the activities of Port tenants and operators. It is the responsibility of such parties to ensure that their own activities are conducted in accordance with relevant regulations and conform to the requirements of the RBMP. Again, the Northern Ireland Environment Agency (NIEA) is responsible for regulatory oversight.
- Discharges resulting from activities which are directly or indirectly controlled by Belfast Harbour. The RBMP requires Belfast Harbour to maintain appropriate controls for the effective management of such discharges under its control and to retain the capability to react effectively to any spills within the Harbour.

Water Quality may also be impacted by the development of new facilities and infrastructure. The RBMP acknowledges that port development is required and has the potential to positively or negatively affect water and sediment quality.

The water and sediments considerations associated with such development are set out in the table overleaf:
Environmental Impacts
Water & Sediment

<table>
<thead>
<tr>
<th>Potential issues</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of Berth, Quay and Hinterland at D3 to support Cleantech projects</td>
<td>– Disturbance of contaminated land</td>
</tr>
<tr>
<td></td>
<td>– Potential mobilisation of contaminated sediment during dredging</td>
</tr>
<tr>
<td></td>
<td>– Temporary turbidity from dredging</td>
</tr>
<tr>
<td></td>
<td>– Spillage of oils, chemical and other pollutants during construction and use</td>
</tr>
<tr>
<td></td>
<td>– Temporary turbidity from storm water run-off</td>
</tr>
<tr>
<td></td>
<td>– Storage of oils and chemicals in compliance with Pollution Prevention Guidelines</td>
</tr>
<tr>
<td></td>
<td>– Installation of drainage interceptors</td>
</tr>
<tr>
<td></td>
<td>– Effective spill response</td>
</tr>
<tr>
<td></td>
<td>– Site assessment and adoption of appropriate control measures</td>
</tr>
<tr>
<td></td>
<td>– Use of recognised good practice during dredging and construction</td>
</tr>
<tr>
<td>Land reclamation at A5 to facilitate RoRo and LoLo capacity needs</td>
<td>– Site assessment and adoption of appropriate site containment and control measures</td>
</tr>
<tr>
<td></td>
<td>– Use of inert material</td>
</tr>
<tr>
<td>Channel Deepening</td>
<td>– Potential mobilisation of contaminated sediment during dredging and spoil disposal</td>
</tr>
<tr>
<td></td>
<td>– Temporary turbidity from dredging and spoil disposal</td>
</tr>
<tr>
<td></td>
<td>– Temporary turbidity from storm water run-off</td>
</tr>
<tr>
<td></td>
<td>– Sediment assessment and adoption of appropriate control measures during dredging and spoil disposal</td>
</tr>
</tbody>
</table>

Table 12: Water and Sediment

Environmental Impacts
Air Quality

AIR QUALITY
Local air quality is important to the health of the people who work and live in and adjacent to the Harbour Estate. Port activity can affect air quality in a number of ways:

- Emissions from ships
- Emissions from equipment and vehicles operating within the Port
- Dust from Dry Bulk operations
- Emissions from buildings
- Construction activities associated with development projects

EMISSIONS FROM SHIPS
Belfast Harbour lies within an emissions control area. Vessels operating in this area are required under the Sulphur Content of Fuel Directive to either use low sulphur fuel or be fitted with an exhaust cleaning system. Ships’ compliance with such regulations is policed and enforced by the MCA.

There are discussions at an international level regarding the use of ‘cold ironing’ (supply of shore-side power to vessels) and the UK Government has made a policy statement that all new port developments must ‘consider’ the provision of shore-side power.

Whilst shore-side power to vessels is considered during the design phase of all relevant Belfast Harbour development, it is widely recognised within the port industry that clearly defined standards are required if cold ironing is to be practical.

EMISSIONS FROM PORT EQUIPMENT AND VEHICLES
The majority of vehicles involved in port operational activity are owned and operated by third parties. Such vehicles are subject to prevailing environmental regulations as enforced by the Department of Environment.

For its part Belfast Harbour seeks to employ low carbon and energy efficient solutions when selecting new plant and vehicles.

DUST FROM DRY BULK OPERATIONS
The emission of dust from Dry Bulk cargoes, e.g. coal, is regulated by Integrated Pollution Prevention Control (IPPC) licences. IPPC is managed by Belfast City Council through the granting of licences and the policing of operational compliance. IPPC licences may be granted to port operators and tenants for operations conducted within leased premises or to Belfast Harbour for operations conducted on general-user quays.

On general-user quays Belfast Harbour seeks to minimise the impact of dust emissions through compliance with the IPPC licence requirements and by segregating such activities though port zoning where possible.
Environmental Impacts

Air Quality

**EMISSIONS FROM BUILDINGS**

Such emissions include any potential emissions from industrial processes and any emissions from heating and ventilation systems. The former are controlled by the appropriate regulatory authority. For the latter, in the case where Belfast Harbour acts in the role of developer, building design will be conducted in accordance with prevailing regulation and Belfast Harbour’s policy on Sustainability which can be found on Belfast Harbour’s website.

**DEVELOPMENT PROJECTS**

New developments have the potential to impact local air quality and contribute to climate change. The considerations associated with such developments are set out in the table below:

<table>
<thead>
<tr>
<th>Development of Berth, Quay and Hinterland at D3 to support Cleantech projects</th>
<th>Potential issues</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Potential dust and emissions during construction activities</td>
<td>- Adoption of appropriate controls and working practices during construction</td>
<td></td>
</tr>
<tr>
<td>- Potential emissions during operations</td>
<td>- Compliance with IPPC licence conditions during operation where appropriate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Compliance with prevailing Planning and Building regulations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Adoption where appropriate of Belfast Harbour’s Sustainability Policy</td>
<td></td>
</tr>
</tbody>
</table>

**Table 13: Air Quality**

**WASTE**

Waste is generated from a number of sources. Such sources include:

- Activities under the control of Port Tenants and Operators
- Activities directly under the control of Belfast Harbour
- Ships’ waste and cargo residues
- Waste generated during the construction phase of development projects

The appropriate disposal of waste from Port Tenants and Operators is entirely the responsibility of the third party.

In managing waste generated from its own activities Belfast Harbour has adopted the waste hierarchy to minimise generation at source and to optimise the reuse and recycling of waste residues. The waste hierarchy is incorporated into Belfast Harbour’s waste management policies, procedures and contracts.

Waste generated by vessels and cargo residues are managed in accordance with the Port Waste Management Plan which incorporates the waste hierarchy and has been approved by the MCA.

New developments have the potential to create new challenges and opportunities for waste management. The considerations associated with the developments identified in the Master Plan are addressed in the table below:

<table>
<thead>
<tr>
<th>Development of Berth, Quay and Hinterland at D3 to support Cleantech projects</th>
<th>Potential issues</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Dredging spoil</td>
<td>- Assessment of sediment, beneficial reuse where appropriate, otherwise disposal in accordance with licence conditions</td>
<td></td>
</tr>
<tr>
<td>- Waste from construction phase</td>
<td>- Disposal of construction waste in accordance with licence conditions and Site Waste Management Plan</td>
<td></td>
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<tr>
<td>- Waste from operations</td>
<td>- Disposal of waste from operations in accordance with prevailing waste hierarchy and regulations</td>
<td></td>
</tr>
<tr>
<td>- Ships’ waste</td>
<td>- Disposal of ships’ waste in accordance with Port Waste Management Plan</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Channel Deepening</th>
<th>Potential issues</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Dredging spoil</td>
<td>- Assessment of sediment, beneficial reuse where appropriate, otherwise disposal in accordance with licence conditions</td>
<td></td>
</tr>
</tbody>
</table>

**Table 14: Waste**
Biodiversity

Belfast Harbour Estate is located at the head of Belfast Lough in an estuarine environment that encompasses a number of sites of significance to wildlife and nature conservation.

Belfast Harbour recognises that its activities have the potential to impact on biodiversity and during 2010 Belfast Harbour, in partnership with Ulster Wildlife Trust, conducted an inventory of habitats and species throughout the Harbour Estate and developed a Biodiversity Action Plan.

The potential impact of future developments on biodiversity is considered in the table below:

<table>
<thead>
<tr>
<th>Potential issues</th>
<th>Approach</th>
</tr>
</thead>
</table>
| Development of Berth, Quay and Hinterland at D3 to support Cleantech projects | - Disturbance during dredging  
- Disturbance during construction or operation  
- Potential removal or impairment of habitat  
- Compliance with existing marine licences (BHC is currently working with the NIEA and DRD to develop a dredging protocol which will take account of biodiversity and the requirements of the Habitats and Birds Directives)  
- Due to the proximity of an SPA, an Appropriate Assessment will be conducted in accordance with the Habitats and Birds Directives and the resulting site specific controls implemented.  
- Liaison with RSPB to assist with the assessment process |
| Land reclamation at A5 to facilitate RoRo and LoLo capacity needs | - Disturbance during construction  
- Potential removal or impairment of habitat  
- Compliance with marine licence requirements  
- Due to the proximity of an SPA, an Appropriate Assessment will be conducted in accordance with the Habitats and Birds Directives and the resulting site specific controls implemented.  
- Liaison with RSPB to assist with the assessment process |
| Channel Deepening | - Disturbance during dredging  
- Potential removal or impairment of habitat  
- Compliance with existing marine licences  
- Due to the proximity of an SPA, an Appropriate Assessment will be conducted in accordance with the Habitats and Birds Directives and the resulting site specific controls implemented.  
- Liaison with RSPB to assist with the assessment process |

Table 15: Biodiversity

Land Quality

Belfast Harbour comprises 2000 acres of land and is home to a number of commercial and industrial activities. Key objectives associated with land management include: the prevention of pollution from illegal dumping and accidental spillages to land; and the provision of effective response measures in the event of any incident.

Due to the reclaimed and in-filled nature of the most of the Harbour Estate and due to previous industrial activities areas of contamination exist. Analysis indicates that such contamination is not likely to migrate if undisturbed.

New developments however have the potential to mobilise existing contamination and appropriate measures will be required for each development project. The projects which are considered most likely to be affected are shown in the table below:

<table>
<thead>
<tr>
<th>Potential issues</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of Berth, Quay and Hinterland at D3 to support Cleantech projects</td>
<td>- Land may contain historical contaminants</td>
</tr>
</tbody>
</table>
| Land reclamation at A5 to facilitate RoRo and LoLo capacity needs | - Development of Berth, Quay and Hinterland at D3 to support Cleantech projects  
- Land reclamation at A5 to facilitate RoRo and LoLo capacity needs |

Table 16: Land Quality
NOISE AND VIBRATION
Belfast Harbour, like all major ports, is required to operate 24 hours per day, 7 days per week to provide the services necessary to support the needs of its customers. The Harbour Estate is home to a range of industrial and transport activities which have the potential to cause noise and vibration. Belfast Harbour seeks to mitigate the impact of such factors by the design and location of facilities and through the implementation of operating procedures.

The impact of noise and vibration arising from current operational activities is generally assessed to be minimal and controls are in place to investigate and address any emergent issues.

There is a greater potential for disturbance from noise and vibration as a result of the construction associated with new developments.

The noise and vibration considerations for such new developments are set out in the table below:

<table>
<thead>
<tr>
<th>Potential issues</th>
<th>Approach</th>
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</thead>
<tbody>
<tr>
<td>Development of Berth, Quay and Hinterland at D3 to support Cleantech projects</td>
<td>- Disturbance to local communities during construction and operations phases</td>
</tr>
<tr>
<td></td>
<td>- Project assessment will be conducted in accordance with prevailing regulations and standards to determine the potential impact of noise and vibration. Such analysis will inform the design of control measures where required</td>
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<tr>
<td></td>
<td>- Due to the proximity of an SPA an Appropriate Assessment will be conducted in accordance with the Habitats and Birds Directives and the resulting site specific controls implemented.</td>
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<tr>
<td></td>
<td>- Liaison with RSPB to assist with the assessment process</td>
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</tbody>
</table>

Table 17: Noise and Vibration

The visual impact considerations for such new developments are set out in the table below:

<table>
<thead>
<tr>
<th>Potential issues</th>
<th>Approach</th>
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</thead>
<tbody>
<tr>
<td>Development of Berth, Quay and Hinterland at D3 to support Cleantech projects</td>
<td>- Visual impact will depend on the type of operation which is likely to include cranes, quay lighting and associated buildings</td>
</tr>
<tr>
<td>Land reclamation at A5 to facilitate RoRo and LoLo capacity needs</td>
<td>- Lighting will be designed to minimise any potential impact outside of the development footprint</td>
</tr>
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<td></td>
<td>- Assessment of potentially significant visual impacts will be conducted as part of the development process</td>
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</table>

Table 18: Visual Impact
Environmental Impacts

Heritage

**Heritage**
Previous developments by Belfast Harbour have incorporated any existing heritage features into their design.

The Port of Belfast is home to a rich industrial and maritime heritage. The Harbour Estate contains a number of listed buildings and docks. These are predominantly within the areas of Clarendon and the lands previously occupied by Harland & Wolff.

Heritage considerations associated with the Master Plan developments are set out in the table below:

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<tr>
<th>Potential issues</th>
<th>Approach</th>
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<tbody>
<tr>
<td>Development of Berth, Quay and Hinterland at D3 to support Cleantech projects</td>
<td>Whilst unlikely it is possible that capital dredging may encounter archaeological remains</td>
</tr>
<tr>
<td>Land reclamation at A5 to facilitate RoRo and LoLo capacity needs</td>
<td>Controls are in place to ensure that any archaeological artefacts captured during capital dredging are identified and assessed</td>
</tr>
</tbody>
</table>

Table 19: Heritage

Environmental Impacts

Flood Risk

**Flood Risk**
Current climate change projections indicate a general rise in sea level and storm surges and given their location, sea ports such as Belfast are exposed to an increased risk of flooding.

Flooding may also arise from localized heavy rainfall.

Older areas of the Harbour Estate are relatively low-lying and are therefore exposed to greater risk.

More recent developments have been constructed on a higher elevation and incorporate increased resilience to flooding events in their design.

Belfast Harbour is working closely with other agencies such as the Department of Agriculture and Rural Development (DARD) and Belfast City Council to better understand the potential local impacts of flooding and to identify appropriate responses.

The flood risk considerations of new developments are set out in the table below:

<table>
<thead>
<tr>
<th>Potential issues</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of Berth, Quay and Hinterland at D3 to support Cleantech projects</td>
<td>Flood risk due to sea level rise, fluvial and pluvial flooding, and increased storm surge intensity</td>
</tr>
<tr>
<td></td>
<td>BHC is working with Department of Agriculture and Rural Development (DARD), Belfast City Council and other stakeholders to develop Local Flood Risk Management Plans</td>
</tr>
<tr>
<td></td>
<td>Design of new developments take account of sea level change projections and prevailing planning guidance</td>
</tr>
</tbody>
</table>

Table 20: Flood Risk
**Energy Efficiency**

Belfast Harbour is committed to good energy management and has achieved the Carbon Trust Standard which recognizes year on year improvements in energy management and performance.

New developments are likely to create a demand for additional energy. Such developments present an opportunity to incorporate energy efficiency measures at the design phase.

The energy efficiency considerations of new developments are set out in the table below:

<table>
<thead>
<tr>
<th>Development of Berth, Quay and Hinterland at D3 to support Cleantech projects</th>
<th>Potential issues</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>– New developments will create a requirement for additional energy</td>
<td>– The design of new developments will comply with prevailing regulations on energy management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– New developments under the direct control of Belfast Harbour will where appropriate conform to the Belfast Harbour policies on Energy and Emissions</td>
</tr>
</tbody>
</table>

Table 21: Energy Efficiency
The masterplan will be available online for review at www.belfast-harbour.co.uk and is available for download. Stakeholders are invited to provide feedback in writing or electronically to:

Belfast Harbour Commissioners
Plan Consultation
Harbour Office
Corporation Square
Belfast
Northern Ireland
BT1 3AL

or

masterplan@belfast-harbour.co.uk