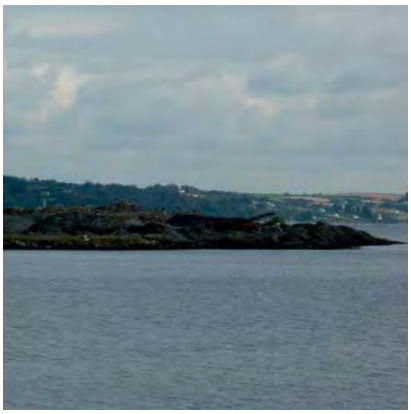
East Tip Remediation Project, Haulbowline, Co Cork

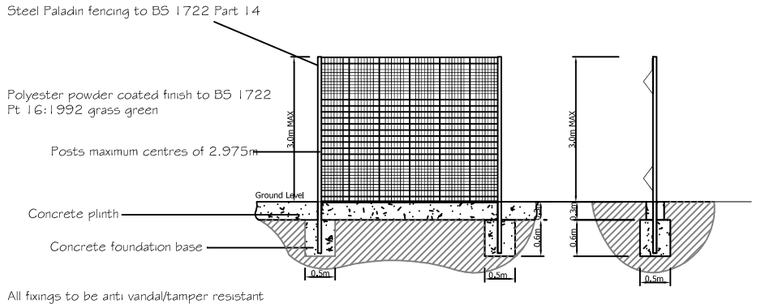
Volume 2 Environmental Impact Statement (EIS)



October 2013

PÁIRC ÁINEASA INIS SIONNACH
LANDSCAPE MASTERPLAN

Proposed Security Fence maximum 3.0m high paladin powder coated light green fence to Football/ GAA pitch with gate



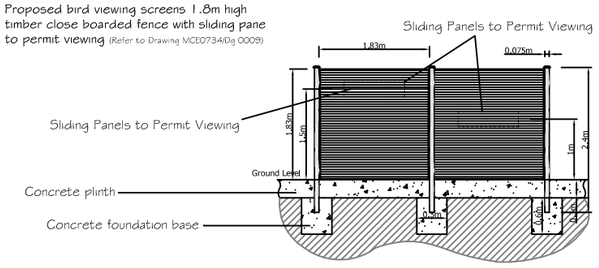
Security Fence 3.0m max high to Playing Pitch Boundary and Naval Base
Scale 1:50

Proposed Cycle Stands - Sheffield Type Cycle Stand
Cycle Stands Not To Scale

Example of Corten Steel sign

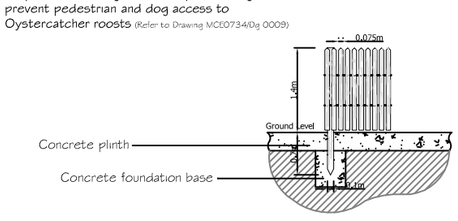
Concept: Entrance features in Corten Steel to reflect nautical and industrial working history of Páirc Áineasa Inis Sionnach

Proposed bird viewing screens 1.8m high timber close boarded fence with sliding pane to permit viewing (Refer to Drawing MCE0734/Dg 0009)

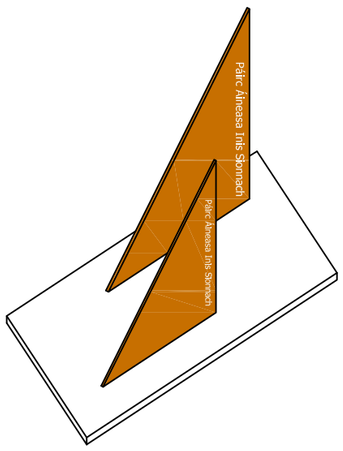


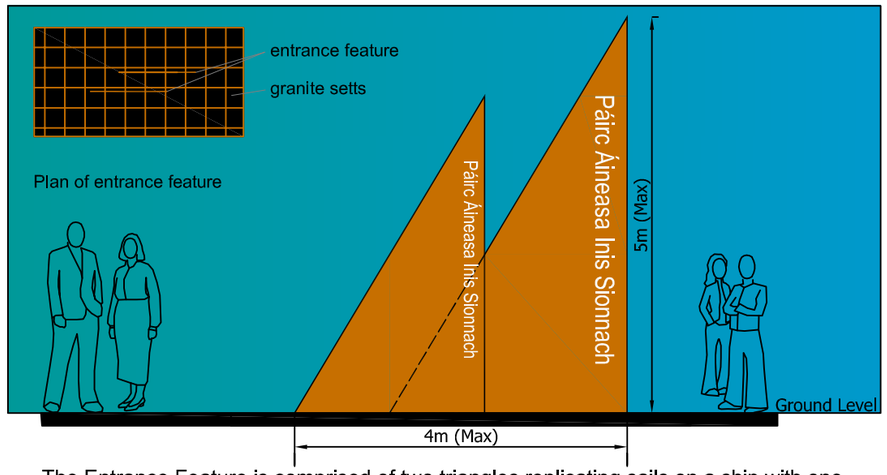
Bird Viewing Screens 1.8m High
Scale 1:50

Proposed 1.4m high chestnut pale fencing to prevent pedestrian and dog access to Oystercatcher roosts (Refer to Drawing MCE0734/Dg 0009)



Chestnut Pale Fence 1.4m High
Scale 1:50





The Entrance Feature is comprised of two triangles replicating sails on a ship with one larger than the other and staggered back. The name of the park *Páirc Áineasa Inis Sionnach* is cut out of the steel. As the steel ages it gains a rust like appearance. The entrance feature is to be surrounded by granite setts to complement and also act as a hard surface for gathering visitors to the park.

Entrance Feature Not To Scale

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Read in conjunction with
Páirc Áineasa Inis Sionnach
Landscape Masterplan
Drawing No. MCE0734
Figure 5.7 Rev F01

Title
LANDSCAPE CONSTRUCTION DETAILS (Sheet 1 of 5.7)

N.T.S.

File Ref : MCE0734(Sheet 1 of 5.7)
Date : April 2013 Rev : F01

East Tip Remediation Project

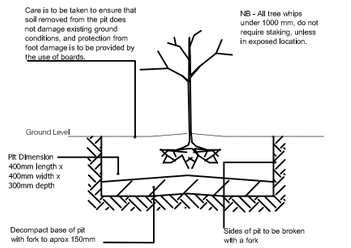
EAST TIP REMEDIATION PROJECT

RPS

PÁIRC ÁINEASA INIS SIONNACH
LANDSCAPE MASTERPLAN

NATIVE AND ORNAMENTAL PLANTING
Bare Roots

PLANTING SEASON: Forestry transplants other than evergreens may be planted between November and March inclusive. Evergreens may be planted in October or in April/May. Planting shall normally be carried out during the period from November to Inclusive March in suitable open weather. Bare Root Plants shall be of the minimum size specified on drawing nr MCE0734/Dg 0009



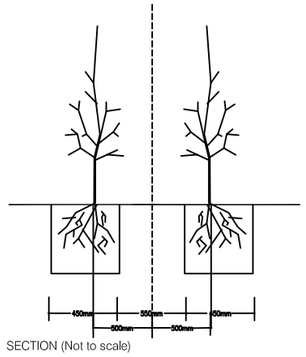
SECTION (not to scale)

NOTES

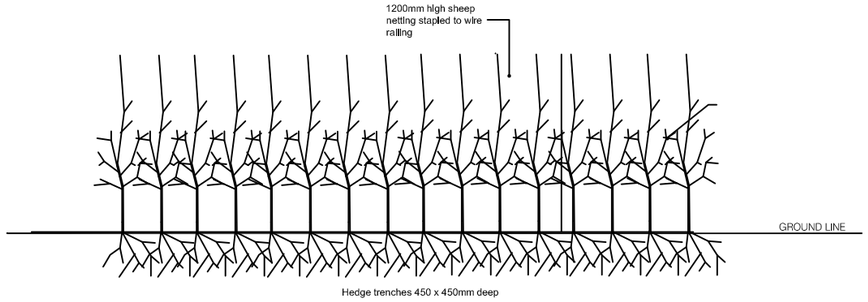
1. Prior to planting all broken roots must be carefully pruned back and any snags to the crown carefully cut back. Bad bruising or abrasion of their cambium must be treated with "Tree Three" or equal and approved tree paint. Roots must be kept well moistened before planting in the prepared pit.
2. The tree pit should be excavated to allow adequate clearance between the root ends (when fully spread) and the side of the pit.
3. The planting pocket should be 400mm x 400mm x 300mm deep. Add the following ameliorant's to the excavated material (calculated as applied to the area of the pocket), cultivate and incorporate evenly-
   Organic manure: 100mm layer over area of pit
   Fertilizer 0:10:10: 35g
   Fertilizer I.B.D.U: 35g
4. Partly backfil pocket with topsoil to BS 3882:2007 and dug soil
5. Place tree in pocket at same depth as in the nursery, gently spreading out roots to their natural configuration.
6. Backfill pocket carefully in layers of 125-250mm layers, shaking tree to ensure close contact with roots and elimination of air pockets, firming soil around roots, and firm thoroughly on completion.
7. Finished level to be at 30mm above surrounding level to allow for settlement.

STAGGERED DOUBLE HEDGE PLANT

HEDGES: to BS 3936: Part 1: Excavate a planting trench, to receive the plants at the same depth as in the nursery. Set out plants in a double row staggered as specified, in the hedge trench, evenly spaced at centres indicated. Backfill carefully incorporating 100 mm deep layer of compost into excavated material, consolidating the soil carefully around the roots, and leaving the plants vertical and in line. Cut back plants before or after planting as scheduled. Hedge plants shall be of the minimum size specified in the schedules on drawing nr MCE0734/Dg 0009



SECTION (Not to scale)

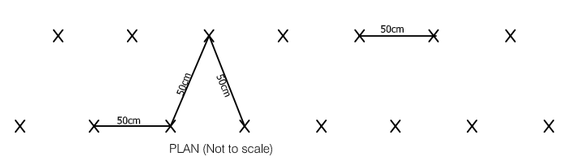


Hedge trenches 450 x 450mm deep

ELEVATION (Not To Scale)

NOTES

1. Prior to planting all broken roots must be carefully pruned back and any snags to the crown carefully cut back. Bad brusing or abrasion of their cambium must be treated with "Tree Three" or equal and approved tree paint. Roots must be kept well moistened before planting in the prepared pit.
2. The hedge planting is to be carried out in a double trench each dug 450 wide x 450mm and to the required length.
3. Mix the dug soil with a slow release fertiliser and the following ameliorants to the excavated material (calculated as applied to the area of the pocket), cultivate and incorporate evenly-
   Organic manure: 100mm layer over area of pit
   Fertiliser 0:10:10: 35g
   Fertiliser I.D.D.U: 35g
4. Place tree in pocket at same depth as in the nursery mark, spreading out roots to their natural configuration
5. Partly backfill pocket with topsoil to BS 3882:2007 and dug soil
6. Backfill the trench to half its depth and firm by treading. Continue planting the trench.
7. Once planted, backfill with the remaining soil and firm as before.

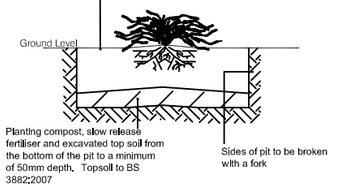


PLAN (Not to scale)

ORNAMENTAL AND NATIVE PLANTING
Root Balled

CONTAINER GROWN SHRUBS: to BS 3936: Part 1; Container grown shrubs shall conform to the above British Standards. Shrubs shall be of the minimum size specified in the schedules on drawing nr MCE0734/Dg 0009 with several stems originating from or near ground level and of reasonable bushiness, healthy well grown, and with a good root system. Plants shall not be pot bound, nor with roots deformed or restricted. Bare root material will only be accepted where specified.

Care is to be taken to ensure that soil removed from the pit does not damage existing ground conditions, and protection from foot damage is to be provided by the use of boards.



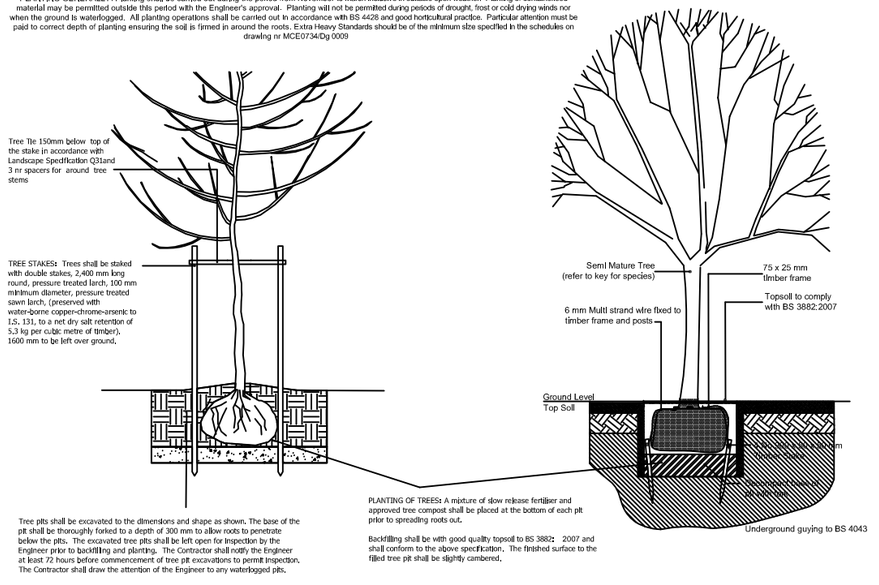
SECTION (not to scale)

NOTES

1. Before planting, remove any non-perishable containers and carefully prune any badly damaged roots.
2. Plant upright and well balanced with best side to front.
3. Carefully return excavated top soil, packing around evenly spread roots or root ball and heel well in without damaging the roots
4. Water plants thoroughly immediately after planting, using a fine rose.
5. Immediately after planting shrubs, carefully cut back any damaged, dead or diseased branches and remove any weak, thin or malformed growth.
6. Where and to the extent appropriate for the species, cut back to encourage growth.
7. Apply 30g per shrub of fertiliser (N 8%, P 20%, K 16%) and lightly rake in around base of shrub.
8. After planting, fork and/or rake soil to a fine tilth with agreed cambers and no hollows.
9. Finished level to be at original soil mark on shrubs and 30mm above surrounding level to allow for settlement.
10. Water plants thoroughly immediately after planting, using a fine rose

EXTRA HEAVY STANDARDS & SEMI MATURE

PLANTING GENERALLY: Planting shall be carried out during the period from November to March inclusive in suitable open weather. Planting of containerised material may be permitted outside this period with the Engineer's approval. Planting will not be permitted during periods of drought, frost or cold drying winds nor when the ground is waterlogged. All planting operations shall be carried out in accordance with BS 4428 and good horticultural practice. Particular attention must be paid to correct depth of planting ensuring the soil is firmed in around the roots. Extra Heavy Standards should be of the minimum size specified in the schedules on drawing nr MCE0734/Dg 0009



Tree pits shall be excavated to the dimensions and shape as shown. The base of the pit shall be thoroughly forked to a depth of 300 mm to allow roots to penetrate below the pits. The excavated tree pits shall be left open for inspection by the Engineer prior to backfilling and planting. The Contractor shall notify the Engineer at least 72 hours before commencement of tree pit excavations to permit inspection. The Contractor shall draw the attention of the Engineer to any waterlogged pits.

PLANTING OF TREES: A mixture of slow release fertiliser and approved tree compost shall be placed at the bottom of each pit prior to spreading roots out.

Backfilling shall be with good quality topsoil to BS 3882: 2007 and shall conform to the above specification. The finished surface to the filled tree pit shall be slightly cambered.

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Páirc Áineasa Inis Sionnach
Landscape Masterplan
Drawing No. MCE0734
Figure 5.7 Rev F01

Title
LANDSCAPE CONSTRUCTION DETAILS (Sheet 2 of 5.7)

N.T.S.

File Ref : MCE0734(Sheet 2 of 5.7)
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

RPS

Title
FINAL CONTOURS

Figure 5.8

File Ref : MCE0736 Figure 5.8
Date : April 2013 Rev: F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

RPS

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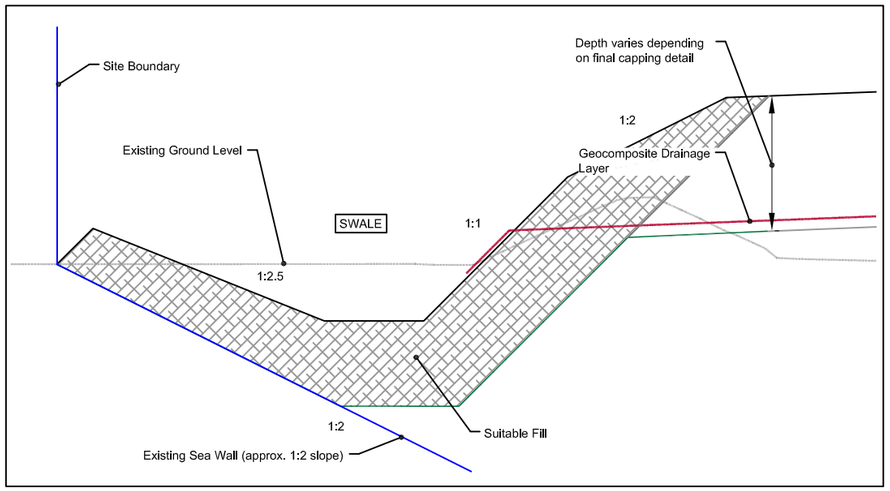
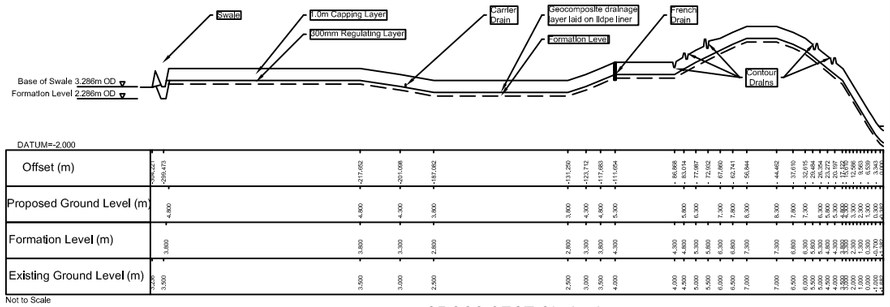


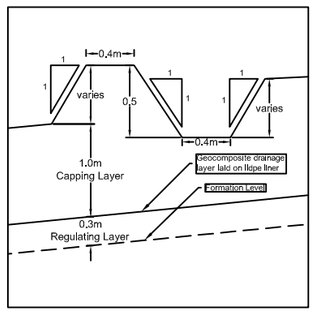
SWALE CROSS SECTION B - B
NTS @ A1



CROSS SECTION A - A

KEY

- Carrier Drain
- Contour Drain
- French Drain
- Swale
- Manhole / Access Chamber
- Headwall



Title
PRELIMINARY
SURFACE WATER
DRAINAGE

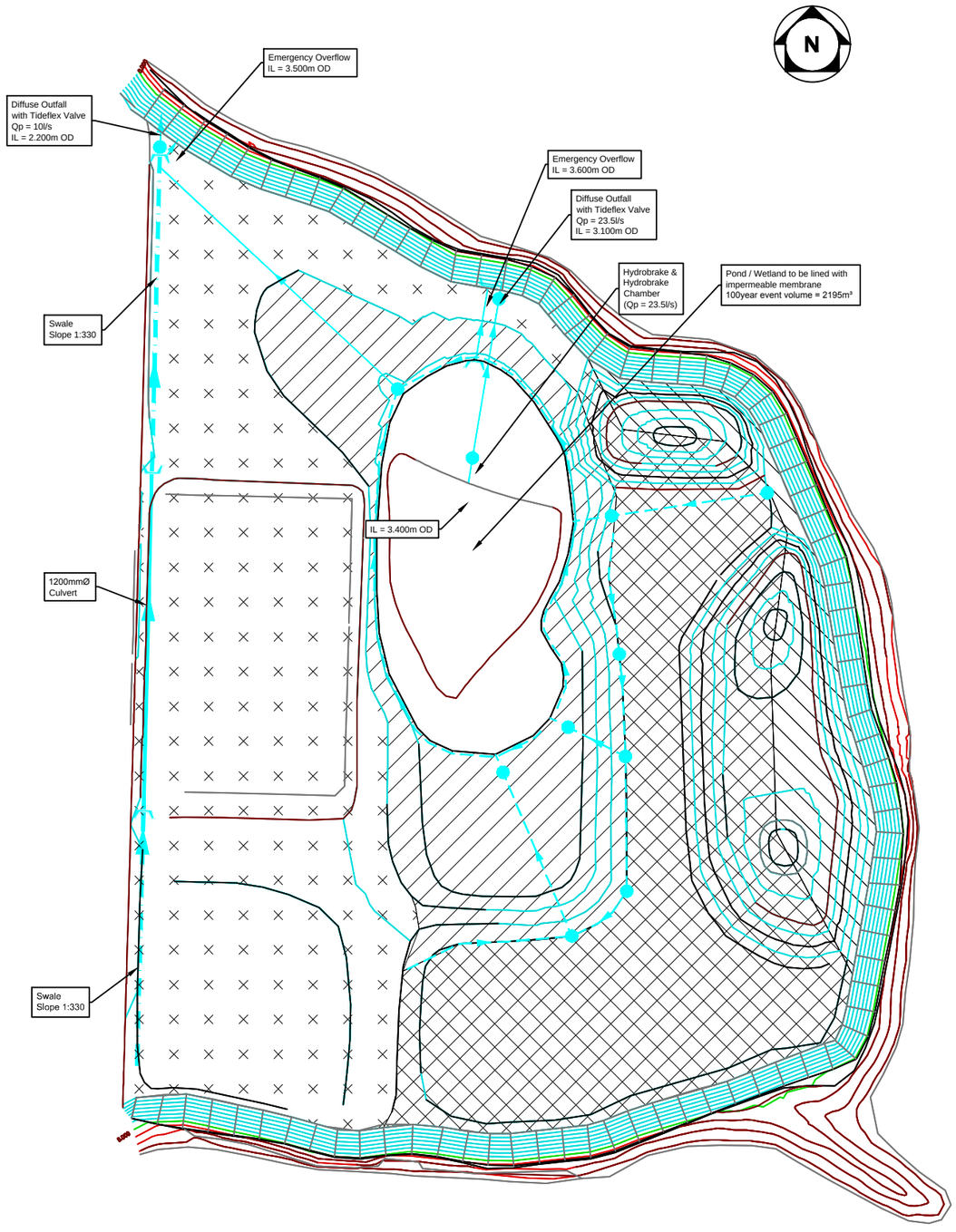
Figure 5.9

File Ref : MCE0736 Figure 5.9
Date : April 2013 Rev: F01

East Tip Remediation Project

EAST TIP
REMEDIATION
PROJECT

RPS



KEY

- Drains directly to PES via geocomposite drainage layer
- Drains to Swale via geocomposite drainage layer and carrier pipe
- Drains to Pond via geocomposite drainage layer and carrier pipe
- Drains to Swale via geocomposite drainage layer

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Title
PRELIMINARY
SUB-SURFACE
WATER DRAINAGE

Figure 5.10

File Ref : MCE0736 Figure 5.10
Date : October 2013 Rev: F02

East Tip Remediation Project

EAST TIP
REMEDIATION
PROJECT

RPS

5 PROJECT DESCRIPTION

5.1 INTRODUCTION

This chapter describes the main features of the proposed development including maintenance and aftercare requirements for the proposed end-use (see Section 5.6). It should be noted that the details as presented in this chapter are the result of the outline design stage only and refinements in relation to the proposed development will be further defined at detail design stage. However, sufficient design detail has been provided to ensure that comprehensive impact assessments have been completed and documented in this EIS. Assessments of the 'worst case' scenario have been undertaken where detailed design may consider a number of options, A description of the activities required to construct the proposed development including temporary works is provided in Chapter 6 'Project Construction'. Decommissioning is not addressed in this EIS as it is not anticipated that the end-use (including remedial system) proposed for the East Tip will be required to be taken out of use. A description of the existing site is provided in Section 5.2 and the long term future development potential of the East Tip is provided in Section 5.7.

The following are the main features associated with the proposed development as described further in Section 5.3:-

1. Remediation solution consisting of an engineered capping system over the surface of the East Tip and a Perimeter Engineered Structure (PES) around the perimeter of the East Tip(see Section 5.3.1).

2. Recreational public-park including a car park, playing pitch (owned by the Navy) and other elements on top of the engineered capping system (see Section 5.3.2).

3. Upgraded access road on Haulbowline Island between the bridge and the entrance to the East Tip (see Section 5.3.4).

4. Improved pathways from the public road (L2545) to and along the access road to the East Tip (see Section 5.3.5).

5. Preliminary drainage details for the remediated site and access roads (See Section 5.3.1.4 and 5.3.4).

Items 2 and 3 are outlined on Figure 1.2, 5.3 & 5.7, while Figure 5.6 shows existing and proposed footpaths (Item 4). Figures 5.1 and Figure 5.2 provide illustrative outline details of the engineered capping system and the Perimeter Engineered Structure (Item 1 referred to above). Item 5 drainage details are outlined on Figure 5.9, Figure 5.10 and Figure 5.4 (road drainage).

Section 5.4 outlines the materials required to be imported for the construction of the proposed development. All materials imported to the East Tip site will meet the requirements for remediation, end-use, maintenance and aftercare. Section 5.5 provides a description of existing waste materials at the East Tip that will be recovered or disposed of as part of the proposed development.

5.2 DESCRIPTION OF THE EAST TIP

Figure 1.1 (Chapter 1) indicates the location and extent of the East Tip on Haulbowline Island. The East Tip is an area of land, approximately 9 hectares in size, reclaimed from the sea by infilling with waste and by-products from the former Ispat steelworks (see Chapter 1 'Introduction' to this EIS for further details on the background and history of the East Tip).The headquarters of the Irish Naval Service is situated on the western portion of Haulbowline Island and the Naval Dockyard is located directly west of the East Tip site. The site of the former Irish Ispat Steelworks is located between the

Naval Dockyard and the Naval Headquarters. There are no occupied dwellings on Haulbowline Island, but approximately 120 naval recruits reside at the Naval Base during term time (location of their residence is indicated on Figure 1.1). There is currently limited public access for pedestrians or vehicles to Haulbowline Island. Access to Haulbowline Island is controlled by means of a single security barrier controlled by the Navy, at the northern end of the Haulbowline access bridge. The East Tip is bordered to the north, south and east by Cork Harbour. The coastal perimeter of the site measures approximately 900m in length.

Access to the East Tip is provided by a road that runs to the south of the former Ispat site and the Naval Dockyard (see Chapter 8 'Traffic and Transport' for details on the description of the road). The existing access road will be improved as part of the proposed works (see Section 5.3.4). A gantry crane, steel frames, machinery and a modern office building are located close to the site entrance (see Figure 6.3 and Appendix G: Inventory of Structures to be Demolished). A football pitch exists on the western side of the site directly adjacent to the Naval Dockyard. A large shed is located just south of the football pitch. There are 10 stockpiles/ mounds of waste material (ranging in volume from 400m^3 to 10,000m^3) located mostly in the eastern half of the site. The position of the stockpiles create an undulating topography and the ground profile across the site is generally irregular (see Chapter 11 'Landscape and Visual' for further information on the Landscape of the East Tip). A low lying area in the north of the site is subject to ponding. It appears that this ponding is a result of the ground level of the area being lower than the high tide level and therefore, given the permeable nature of the material deposited at East Tip, the area becomes surcharged relative to high tide levels on any given day. It should be noted that this is not as a result of overtopping of the perimeter boundary.

The mid-nineteenth century (1865) sea wall forms the western boundary of the site, (refer to Figure 1.4) but this was covered by deposited material that forms the East Tip. A perimeter security fence exists along this western boundary. It should be noted that this perimeter fence does not follow the line of deposition and therefore as part of the remediation works this fence will be removed and then re-instated along the appropriate line. The curving sea wall is visible along the access road that leads to the entrance to the East Tip.

The East Tip comprises wastes that were largely associated with the steel making process. A description of the waste types and their characteristics is provided in Section 5.2.1 below and in Chapter 1 'Introduction'. The waste depth varies across the site from approximately 11m in the north to 7m in the centre and south of the site. Shallower depths of waste are found in the western part of the site with depths of waste typically increasing towards the eastern part of the site. A full description of the geology of the site is included in Chapter 13 'Soils, Geology and Hydrogeology' and in the DQRA in Appendix A:DQRA. The East Tip is visible from viewpoints in Cobh and from the harbour area and surrounding landscape. A full description of the landscape and visual assessment of the site is provided in Chapter 11 'Landscape and Visual'.

A full description of the access road and bridge leading to Haulbowline Island is outlined in Chapter 8 'Traffic and Transport'.

Chapters 7 to 15 provide detailed descriptions on the existing environment in relation to community, traffic, air quality, noise environment, landscape, material assets, ecology, soils, geology and hydrogeology, archaeology and cultural heritage, respectively.

5.2.1 Waste Quantities, Extent, Types and Characteristics

There is no definitive data on the quantity of waste disposed of at the East Tip, although estimates of waste quantities produced at the steel works site gives an indication of the proportions of waste disposed of at the East Tip. To give an indication on the volumes of waste disposed to the East Tip, it is reported that from 1998 to June 2001 the East Tip grew by 1.4 hectares, which equates to 80,000 to 90,000$m^3$of material being deposited during that time (*East Tip Haulbowline - Factual Report, Cork Co. Co., March, 2012*). In addition to this in 2013 Murphy Global Consulting Surveyors estimated, though the use of 3d modeling of borehole data, geophysics and historical data that approximately 650,000$m^3$of material has been deposited at Haulbowline East Tip.

The estimated extent of wastes at East Tip is based on site investigations completed in January 2013. The site investigations have identified waste in the foreshore of the East Tip which, in some locations extends into the sub-tidal zone.

Table 1.2 and Figure 1.6 in Chapter 1 'Introduction' provides an overview of the estimated quantities of the different waste types encountered at the site.

With respect to the slag component of the waste, RPS carried out a waste classification assessment using the EPA's Paper Tool of the Procedure for *the Identification of the Hazardous Components of Waste, 2004*. Slag produced during iron and steel manufacture is accepted as non-hazardous. This study recognises that the slag waste as it exited the steel manufacturing process on-site was non-hazardous, and that a portion or portions of it may have become cross contaminated during uncontrolled tipping alongside hazardous wastes such as flue dust. The purpose of this study was to highlight the non-hazardous nature of ferrous slag, and to demonstrate that a significant portion of the slag deposited in the East Tip is non-hazardous. The report concludes that a significant proportion of the waste body is non-hazardous, and furthermore that the majority of the slag waste is non-hazardous. The full report is contained in Appendix C: *East Tip Remediation Classification of Slag Waste (RPS, 2013).*

5.3 MAIN FEATURES OF PROPOSED DEVELOPMENT

5.3.1 Outline Preliminary Remediation Solution

The DQRA includes a generic recommendation for the requirements to remediate the East Tip and address the source-pathway-receptor linkages (see Section 7 of DQRA in Appendix A). Taking into consideration a number of site factors, the generic remediation option is the provision of an engineered capping system to break the pathway associated with risks to human health by preventing direct contact with contaminants of concern and also by reducing the infiltration of rain water. The outline remediation solution also includes for the installation of a Perimeter Engineered Structure which will lower groundwater contamination movement and prevent the erosion of waste material into Cork Harbour. The PES will have a maximum permeability of $1x10^{-5}$ m/sec, which would reduce the theoretical impact of dissolved phase contaminant discharges into Cork Harbour to negligible levels. Further details on the modeling and sensitivity analysis undertaken in the DQRA are provided in the Chapter 13 'Soils, Geology & Hydrogeology' and Appendix A (DQRA).

The remediation solution will comprise the following main elements:-

1. Removal of existing structures and scrap from the site – it should be noted that some of the scrap may be removed in advance of the main remediation works. (Section 5.5).

2. Re-profiling of the site to achieve the formation level contours (Section 5.3.1.1).

3. A Perimeter Engineered Structure (PES) will be installed around the perimeter of the East –Tip at the location as identified on Figure 1.2 (Section 5.3.1.2). The PES is planned to extend into the foreshore of the Haulbowline East Tip along the northern, southern and eastern boundaries of the site. On the western boundary, the location of the PES has been selected in order to limit any potential impact on the nineteenth century sea wall. The overall purpose of the PES is to reduce and control the flow of seawater through the site and flow of leachate out of the site on the outgoing tide in order to lower groundwater contaminant movement and prevent erosion of bulk waste material into Cork Harbour (see Chapter 13 'Soils, Geology and Hydrogeology' for further details on the control of leachate from the site).

4. The installation of an engineered capping system over the re-profiled surface of the waste. The exact make-up of the engineered capping system will be determined at detailed design stage e.g. 600mm clay layer or equivalent such as geosynthetic clay liner. The primary purpose of the capping system is to provide separation for future users of the site as an amenity from contaminants in the waste body. The secondary function is to limit infiltration of surface water into the waste and underlying groundwater (Section 5.3.1.3).

5. Installation of a surface water drainage system across the surface of the capping system to allow controlled discharge of surface water to Cork Harbour (Section 5.3.1.4). The surface water drainage system will allow for the inclusion of a number of Sustainable Urban Drainage Systems (SUDS) design solutions to attenuate surface water flows and limit the release of sediments to the Cork Harbour. These solutions may include:-

    - French drain systems
    - Swales
    - Contour drains
    - Wetland area – to provide attenuation and also a beneficial ecological habitat.

In addition to this surface collection system, the surface water drainage system will include a sub-surface drainage network to collect water from the immediate surface of the low permeability capping system.

Where possible, it is intended to use diffuse discharge to Cork Harbour as opposed to a single point discharge.

Once constructed, the proposed remediation solution will not require any active systems to operate. Pollution control systems are also not required for the end-use, aftercare and maintenance stage (see Section 5.6). Therefore, there will be no energy requirements for the operation of the remediation solution and no waste materials produced during its operation. The remediation solution will be subject to ongoing visual checks to ensure it remains intact, however no ongoing maintenance is anticipated, unless the system becomes damaged for some reason.

In addition post construction monitoring for the end-use, aftercare and maintenance phase of the project are summarised in Chapter 17 'Summary of Mitigation and Monitoring'.

5.3.1.1 Re-Profiling of the Site to Achieve Formation Level Contours

As described in Section 5.2, the East Tip is currently an undulating site consisting of several stockpiles an irregular ground profile and a significant depression in the north of the site. It is proposed to re-profile the existing site to create a landform more suitable for the placement of the capping system, the integration of the drainage systems and creation of a recreational area. The preliminary design of the formation level contours has resulted in a landform which has optimised the cut-fill balance in order to ensure that the amount of cut to be undertaken is broadly equivalent to the amount of fill required to achieve the formation level contours (refer to Figure 5.8 for finished level contours and Section 5.4.2).

In addition to this, the intention when developing the formation level contours and also the final landscape plan as outlined in Chapter 11 'Landscape and Visual', was to work as far as was reasonably practicable with the existing landform in order to minimise the movement of material on site and to avoid importation of any large quantities of additional fill material. Further details on the regrading of the site are outlined in Chapter 6 'Project Construction'.

5.3.1.2 Perimeter Engineered Structure (PES)

The design options and method of construction of the PES will be determined at detailed design and Tender Award Stage. The minimum requirements of the PES as set out below:

The PES will most likely consist of an engineered berm or wedge or trench or a combination of these elements constructed of engineering fill which will surround the East Tip to such an extent as is required to effectively reduce the potential contaminant flux from the waste body to the Cork Harbour. Based on the conclusions and recommendations of the DQRA this can be achieved with a PES, when constructed, with a maximum permeability of 1x10-5m/s. Based on an engineering assessment the recommended minimum thickness of the PES is 0.5m. However based on a number of factors, including constructability, it is recommended that the PES has a minimum thickness of 1m.

The PES will be made up of two different sections which will comprise the PES at the boundary with Cork Harbour and the PES at the boundary with the Navy. The outer most line of the PES is as detailed on Figure 1.2. This line has been selected in order to encapsulate the majority of the material in the East Tip and to minimise the mobilization of sediments (as raised during the stakeholder consultation process (refer to Chapter 3 'Consultation'), whilst also having due cognisance of issues pertaining to constructability and potential impacts during the construction stage (considered further in Chapter 4 'Assessment of Alternatives'). At all locations there is a minimum of 5m between the outermost line of the PES and the mean Low Water Mark (LWM) and a minimum of 10m between the outermost line of the PES and the top of the old 19th century sea wall. This is further clarified in the PES Navy Boundary section below.

PES – Cork Harbour Boundary

From the selected outermost line of the PES along the boundary with Cork Harbour a side slope of 1:3 has been projected up to a level of 3.5m OD. This is the selected top level of the PES. This level has been selected based on the predicted high tide level plus future proofing against predicted sea level rises (see Section 5.3.1.5 for further details on flood protection). The 1:3 side slope has been selected as it was the average side slope on the existing East Tip. The gradient of the side slope may vary at detailed design stage; however the top height of 3.5m OD will remain a requirement. This is the top height prior to the integration of the engineered capping system into the PES and prior to the application of rock amour as discussed below. The base of the PES will key into the lower permeability alluvium layer which underlies the East Tip.

Rock armour will be placed on the foreshore side slope of the PES to provide protection against long term coastal erosion. The rock armour will generally be placed at the same gradient as the final side slope of the PES and will extend to such a depth so as to ensure the stability of the rockarmour key stone and, as a consequence, the overall rock armour structure.

The maximum proposed extent of the PES in the Cork Harbour area, including rock armour is detailed on Figure 1.2. In addition to this the development boundary for the planning approval application takes into account the maximum extent of works including the predicted working area (see Section 1.6.1 and Figure 1.7 for further details on application boundaries). In order to fully assess the impact of the PES, the maximum extent (i.e. PES with 1:3 side slope), maximum height of the PES plus capping system and rock armour and the maximum working area has been considered in the assessments completed for this EIS.

Approximately 35,000 tonnes of rock armour and 45,000m^3 of inert, engineered fill material are required for the construction of the PES. Where possible rock armour will be sourced locally. As outlined in Section 5.5.1.1 below, it is proposed to retain the option to reuse the slag material on site as an inert fill in the construction of the PES. Further details on the testing and validation requirements to demonstrate that the slag material is suitable from an engineering perspective and also from an environmental and human health risk perspective are outlined in Appendix C: *East Tip Remediation Classification of Slag Waste (RPS, 2013)* of this EIS and in Chapter 6 "Project Construction" of this EIS.

PES – Navy Boundary

The line of the PES along the boundary with the Navy has been selected so as to limit impact on the old 19th century sea wall. This wall extends for the majority of the boundary with the exception of a break where the old causeway is located. As described in previous sections, this is the area where filling of the East Tip began.

The line of the PES has been selected at an offset of 10m from the top of the old sea wall. The side slope of the old sea wall is approximately 1:2 and locating the PES at this location will ensure that the construction of the PES will not impact the old sea wall.

The top height of the PES will be located between 2.5mOD and 3mOD which are the preliminary design formation levels along the line of the PES. The height will increase to a level of 3.5m prior to connecting into the PES at the boundary with Cork Harbour. The PES may consist of a 1m wide trench which will extend to a level which will be defined at detailed design stage. It is expected that this trench will be a minimum of 4m deep from formation level. As with the PES at the boundary with Cork Harbour, it is proposed that the trench will be filled with engineered fill to achieve a maximum permeability of 1x10^{-5} m/s.

5.3.1.3 Engineered Capping System

The design of the capping systems will focus on the remediation of the site and the severance of any source, pathway and receptor linkages.

It is envisaged that the engineered capping system will consist of the placement of four layers of material over the surface of the waste (approximately 9 hectares) in the following order (see Figure 5.2):-

- 300mm regulation layer of fine material (sand, silt or clay) – to provide an even surface for the placement of the barrier layer.
- Barrier Layer - 600mm of clay or a low permeability liner such as LLDPE or a geo-composite clay layer – to act as a separation layer for future site users and to limit the infiltration of rainwater into the waste body.
- Geocomposite drainage layer to manage sub-surface water flow immediately above the low permeability cap (or equivalent 300mm drainage stone) including a network of field drains where drainage augmentation is required.
- A minimum of 1m of subsoil and topsoil (topsoil depths will range from 150mm to 300mm) – to act as a separation layer and to support the landscape end-use option. A warning tape to alert any future workers of the capping system will be placed beneath the 1m subsoil/topsoil layer.

The above layers of materials require a capping system depth between 1.3m and 2.2m. For the purposes of developing the final contours for the site a 1.9m depth of capping has been applied. It should be noted that for outline drainage design purposes a 1.3m deep cap has been applied as this is the worst case scenario from a drainage perspective. Where appropriate, the layers will be placed in an anchor trench around the edge of the site while the drainage layer will feed into drains to take away surface water drainage from the 1m subsoil/topsoil material i.e. rainwater collected within the capping system (see Section 5.3.1.4 below). The topsoil will be landscaped in accordance with the Landscaping Plan (see Section 5.3.3). Details on the material requirements for the construction of the remediation solution are provided in Section 5.4 below.

It should be noted that there is no provision from a gas management perspective in the engineered capping system as no prutrescible waste is present on the East Tip. Naturally occurring methane has been recorded in the alluvium layers however it is not of a quantity which will require active management. It is expected that any naturally occurring gas which is generated on site will passively vent through the perimeter engineered structure.

5.3.1.4 Surface Water Drainage

There will be two aspects to the surface water drainage on the remediated East Tip site the sub-surface drainage system and the top of cap surface water drainage system. These systems are explained in more detail below.

Sub-Surface Drainage System

The purpose of the sub-surface drainage system will be to collect surface water which percolates through the top 1m of soil capping layer and reaches the low permeability barrier layer. This sub-surface drainage system will take this water away from the low permeability barrier layer and will ensure that the soil capping layer remains relatively free draining. The subsurface drainage systems will consist of the following elements:-

- A geo-composite drainage layer or equivalent 300mm drainage stone layer. The minimum conveyance of these layers will be equivalent to the maximum permeability of the subsoil capping layer.
- Field drains – given the nature of the East Tip site and the naturally low lying areas that will remain following the re-profiling of the site the subsurface drainage system may need additional augmentation through the use of field drains.

It is the intention that the sub-surface drainage system will discharge, for the most part, to the top of cap surface water drainage system prior to discharge to the Cork Harbour. There may be some instances to the East of the site where it may be necessary for the sub-surface drainage to discharge directly to the Cork Harbour via a diffuse drainage channel.

'Top of Cap' Surface Water Drainage System

The purpose of the top of cap surface water drainage system will be to collect surface water from the surface areas, attenuate the flow and reduce sediments where necessary prior to discharge.

It is proposed that the top of cap surface water drainage system will include a number of SUDS such as:-

- French drain systems;
- Swales;
- Contour drains; and
- Wetland area – to provide attenuation and also a beneficial ecological habitat.

Depending on the nature of the surface water system (active drainage – French drains or flow + attenuation – swale, contour drains and wetland area) the surface water drainage system will be designed for a 1 in 2 year short duration high intensity storm or 1 in 100 year return period storm. Attenuation will be designed to limit outflow to green field run-off rates.

It should be noted that, while the top capping layer is underlain by a low permeability liner, the surface of the remediated site will not act like a low permeability surface. The top 1m soil capping layer will allow a portion of the precipitation that falls on the East Tip to naturally percolate through this soil layer prior to being collected by the sub-surface drainage system. In addition to this the top 1m of the soil capping layer will be vegetated allowing evapotranspiration at normal rates and an element of sediment removal.

The majority of the surface water flow generated on site will discharge initially to the Wetland area. A portion will also discharge to the Swale. Following attenuation in the swale and wetland, surface water collected on the site will discharge to the Cork Harbour area via diffuse drainage channels where possible. It will also be necessary to have some point discharges which will operate as an emergency overflow to the drainage systems during exceedances of the design return period.

5.3.1.5 Flooding

This section assesses the potential flood risk at the remediated site on Haulbowline Island.

The proposed site as described in this Environmental Impact Statement is generally a reclaimed area located on the eastern side of Haulbowline Island. There are no watercourses through the site however the site has, in the past been, subject to tidal inundation the most extreme event being the flood of 1962 were a maximum water level of +3.54mOD (Malin Head) was reported by Cork County Council.

It is not envisaged to construct permanent structures on the remediated site and the proposed remediation plan will result in a landscaped parkland area that will serve as a public amenity. Therefore the proposed end use development is considered to have a low vulnerability to flood risks[1]. Access to this parkland will be controlled by lockable access gates.

[1] Open Space and Amenity Uses are classified as Water Compatible Development according to the Flood Risk Management Guidelines for Planning Authorities, 2009

Flood Risk

The following sources of flooding are considered to be the most relevant to flood risk assessment at the proposed site:-

- Coastal flooding; and
- Local surface flooding

Coastal Flooding

Coastal Flood Risk generally results from tidal inundation into low lying lands. Therefore in order to assess the risk of coastal flooding at this East Tip site resulting from tidal inundation RPS initially reviewed the results of detailed hydrodynamic modelling completed as part of the *Irish Coastal Protection Strategy Study (ICPSS)* undertaken on behalf of the Office of Public Works in 2011.

This study derived instantaneous extreme coastal water levels around Ireland's coastline using the Irish Seas Tidal and Surge Model (ISTSM). Based on this study a present day 0.5% AEP (Annual Exceedence Probability) event, i.e. approx equivalent to a 1:200 year Return Period event, water level of +2.73mOD (Malin Head) was identified in the vicinity of Haulbowline Island (*ICPSS Phase 3 South Coast Carnsore Point to Bantry Bay– Final Technical Report, May 2011*).

The Lee CFRAM Study completed on behalf of the Office of Public Works (OPW) also estimated extreme water levels based on extreme surges and extreme astronomical tides using joint probability methods. This study estimated the 0.5%AEP water levels to be between 2.57mOD and 2.68mOD (Lee CFRAMS Hydraulics Report, 2012). This is consistent with the RPS ICPSS estimates.

Future extreme water level estimates also include allowances for sea level rise due to Climate Change and isostatic land movements (100 year horizon). Due to the uncertainty associated with Climate Change predictions the OPW recommends sea level rise allowances of 0.5m and 1.0m for the Mid Range Future Scenario (MRFS) and High End Future Scenario (HEFS) respectively. These allowances combined with the downward land movement for south of Ireland of 0.5mm/yr increases the present day extreme Still Water Levels by 0.55m and 1.05m respectively.

Therefore the future scenario 0.5%AEP water level is estimated to be +3.28mOD and +3.78mOD for the MRFS and HEFS, respectively.

It is also noted that the An Bord Pleanala decision on an appeal (ref Pl.04.214319) to the grant planning application (05/4080) for the Crematorium on Rocky Island adjacent to Haulbowline accepted a design sea level of approximately +2.7mOD noting that a sea wall flood defence could be provided if required at a future date. Furthermore, the recent (2011) planning application by UCC for the Ringaskiddy Research Building which is located in the general vicinity of Haulbowline indicated a 200-year flood level of +2.66mOD based on draft Lee CFRAMS reports.

The design of the Perimeter Engineered Structure around the East Tip as described in this EIS is based on a sloped rock armour protection to a level +3.5mOD. In addition a minimum depth of approximately 1.3m of capping and topsoil will be placed over this rock armour level. Therefore the minimum height of the finished ground level around the perimeter of the East Tip will be at least +4.8mOD. This is more that 1m above the future predicted 0.5%AEP sea levels and is considered to be appropriate to minimise any flood risk.

The approach road from the access bridge onto Haulbowline Island and the East Tip site will have a minimum finished level of +3.5mOD. This is in excess of the predicted 0.5%AEP sea level allowing for mid-range future climate change increases and is considered to be appropriate given the existing level of other roads on Haulbowline Island.

Local Surface Water Flooding

Local surface water flooding may arise from rainwater falling onto a site where there is poor infiltration or where the finished ground levels do not facilitate runoff into Cork Harbour. It is proposed that surface water flooding will be managed through the design and construction of an engineered drainage system both within the remediated area and along the access roadway. A general description for this drainage system is presented in this EIS (See Section 5.3.1.4 above). The detailed design and construction will be in accordance with best engineering practice. Therefore the risk of surface water flooding on the site is considered to be minimised to an acceptable level.

Reports on previous planning applications in the area (Indaver and IMERC) have included discussions on local surface water flooding on the L2545 on the mainland and therefore, while this area is not identified on current flood risk mapping as being located in Flood Risk Zones A or B the potential for flood events to cut off vehicular access to the East Tip has been taken into account (see section below on Residual Risk).

Residual Risk

Notwithstanding the proposed flood risk management measures that will be included in the design of this project and the low vulnerability to flooding of the proposed development there will remain a low residual flood risk at the site.

This residual flood risk will be managed as follows:-

- Access to the public parkland amenity will be controlled by means of a lockable gate located at the entrance to the island. The location of this gate is indicated on Figure 5.3. It is recommended that during periods of extreme tidal water levels that public access to the parkland be restricted to further minimise flood risk.

- Furthermore it is noted that the Defence Forces have agreed with Cork County Council that in the event of an emergency that they will provide a safe egress from the parkland (See letter in Appendix H: Naval Service Support in Event of Flooding).

In conclusion the proposed remediation project for Haulbowline Island has been reviewed and Flood Risk has been assessed by RPS. Based on this assessment it is concluded that appropriate mitigation measures are included within the proposed design to minimise flood risk to an acceptable level.

5.3.1.6 Long-Term Stability & Settlement

In order to ensure the integrity of the proposed capping system the maximum side slope proposed for the re-profiled East Tip is 1:2.5 and then only in localised areas. Where there are concerns about the stability of the steeper slopes a geo-grid can be incorporated into the capping layers in order to ensure there is no risk of a soil slippage on these slopes.

As detailed in section 5.1.3.1 a sub-surface drainage system is to be integrated into the capping system in order to ensure that the soil capping layer of the remediated East Tip remains free draining. Excessive water logging could result in deterioration of the surface capping system and this will be avoided through the addition of field drains where it is deemed that the subsurface drainage system needs to be augmented. In addition to this it is proposed to use contour drains on side slopes to ensure that the flow from the elevated areas is retarded. This will limit erosion of the soil capping layer on the remediated site either on the side slopes themselves or at the base of the slopes.

In addition to this the material selected for remediation purposes will be appropriate to the proposed end-use.

Due cognisance should also be made of the nature of the waste at the East Tip. It is non-prutrescible and in some instances has a rock like structure with much of the slag having been fused through weathering processes. Therefore, once remediated, the site is not expected to undergo the levels of settlement that would be expected at a conventional landfill site as settlements within the waste will be minimal. Some further secondary consolidation of the alluvium below the existing bulk waste is anticipated however this should be minimal given that the waste has been in place for at least 12 years and much of it for significantly longer than this. Any residual secondary consolidation is not expected to cause any issues for the capping system or surface water drainage system as differential settlements will be minimal. However this will need to be verified at detailed design stage through additional testing. Similarly there is the possibility of some long term settlement below the PES and rock armour after construction and this will be accommodated in the design during detailed design stage.

5.3.2 Final Contours Based on Preliminary Cut-Fill Balancing

The final contours have been developed by applying the depth of the capping system to the formation level contours. As detailed in section 5.3.1.2 the depth of the capping system will range from 1.3m to 2.2m. In addition to this additional build-up has been incorporated including a number of landscaping mounds as part of the development of the landform for the recreational area as discussed in the following section. Consideration has also been given to the drainage requirements as discussed in the preceding section in developing the final contours. A plan of the proposed final contours is provided on Figure 5.8.

5.3.3 Recreational Area

Once the remediation solution has been implemented at the East Tip, it is proposed to create a recreational area at the site for use as a public amenity (including sporting, cultural and leisure activities).

Design Recommendations

The design evolution of the proposed end-use for the site has been undertaken to enable incorporation of the following design recommendations:-

- Sensitive use of local materials for constructed elements (hardstands, buildings, fences, etc);
- Careful integration of constructed elements with existing elements such as, access tracks and temporary construction areas, etc;
- Careful regrading and reinstatement proposals that reduces the need for transportation of materials around the site reducing double handling;
- Appropriate materials and colour of security fencing;and
- High quality of finish to access roads, gates, fences and general site housekeeping designed to complement local styles and materials.

A series of options were considered for the regrading and profiling of the site but it was concluded the option proposed in the outline Landscape Masterplan (Figure 5.7) was the optimum option as it maximises the existing location of stockpiles reducing the volumes that require double handling or transportation around the site and requirements for importing additional material for landscaping purposes. Further, the current plans have located the higher profiles on the north, east and south of the East Tip from where the harshest winds are generated and therefore this affords greatest shelter for future site users.

The path network has been designed to maximise visitors stay at the site by offering points of interest, maximising the length of path network and offering panoramic viewpoints of the Harbour. The path network has been cognisant of the wildlife sensitivities in the area and will encourage observation of wildlife by visitors from the paths. Potential for disturbance has been minimised by use of screen planting and fences.

The biodiversity at the East Tip site will be significantly increased through the use of extensive native woodland and scrub with wildflower meadows and a wetland habitat. Further, measures for bird enhancement have also been considered including a bird roosting ledge along the eastern boundary, the final location of which will be confirmed with NPWS prior to construction.

The overall objectives of the landscape plan are to:-

- Physically and visually integrate the proposed scheme and associated features into the surrounding landscape; and
- To create an attractive new parkland setting.

This overall objective will be achieved through the following measures:-

- Provision of wetland, grassland, scrub and woodland habitats suitable for nature conservation and biodiversity enhancement purposes.
- Strategic use of screen fences and woodland to avoid disturbance on coastal birds and wildlife.
- Hedge planting along car park areas to break up visibility of vehicles.
- Introduction of new ground modelling to create shelter and framed views out to the surrounding harbour landscape.
- Creation of a quality woodland landscape setting using species suitable for an exposed coastal location.
- Provision of focal points within the park that reflect the maritime/industrial heritage of the Harbour area.
- Use of native species.
- Selection of green coloured finishes to facades of new fences.
- A native woodland planting framework will be created on the site to provide an attractive environment within the site and to blend it within the harbour landscape. Species will be native, suitable for an exposed coastal location and reflect those found in adjacent harbour landscapes.

Considering the above objectives and design considerations, a landscape master plan was developed by RPS for the East Tip, which includes the following elements, which are indicated on Figure 5.7:-

- New entrance features in steelwork with park name and reflecting the history of the island. The maximum height of this structure will be 2m.
- Refurbished existing vehicular entrance with street lighting.
- Public walkways laid out in resin bound gravel surfaces that reflect the stone shoreline.
- Main car park for approximately 54 spaces (including 4 mobility impaired spaces and bicycle spaces) laid out in asphalt with concrete kerbs.
- Area set aside for future overflow car park set in reinforced grass.
- A surface water and wetland area to consist of wet grassland species.
- Native and ornamental tree, shrub and hedge planting (see Chapter 14 'Ecology' for further details).
- Wildlife viewpoints located at the south of the island to permit controlled viewing access to the shoreline. Viewpoints, which will consist of 1.8m high timber close boarded fence with sliding panels, to permit telescope or binocular viewing will be provided. Viewpoints will allow for disabled access.
- Bird enhancement area to attract roosting birds (see Chapter 14 'Ecology' for further details).
- Football/GAA pitch located at the west side of the East Tip, which will be fenced off with access only from the Naval Base. 2.4m high green security fence will be provided on three sides with the existing chain link fence on the Navy boundary side replaced. A gate suitable for vehicular access will be provided along the Navy boundary fence.
- Security fencing along the western boundary of the East Tip (adjacent to Naval Dockyard).

It is anticipated that it will take the landscaping of the site approximately 5 years to establish.

5.3.4 Upgrade of Access Road on Haulbowline Island

From the access bridge on Haulbowline Island, it is proposed to provide 2 x 2-lane carriageways, one leading to the East Tip and the other leading to the Naval Dockyard (as indicated on Figure 5.3). This will allow 2-way traffic flow to the East Tip and Naval Dockyard and the roads will be separated by a security fence. Two footpaths will be also be provided, one for Navy use and one for Public use. Two additional lockable security gates will also be provided (as shown on Figure 5.3), one at the end of the bridge (in vicinity of existing barrier) and the other at the start of the road to the East Tip. The former is to facilitate the lock down of the Island by the Navy if a security situation were to arise. The location of the latter gate at the entrance roundabout will allow any cars traversing the bridge to turn around if necessary. Footpaths will also be provided as shown on Figure 5.6. It is not proposed to intensify the existing public lighting along this improved access road. However, an existing lighting column may need to be moved or replaced.

Adequate surface water drainage will be provided as indicated on Figure 5.4. As kerbs are being provided to each footpath and along the security fence between the Navy and public roads a kerb and gully drainage system is proposed. A number of different options were considered in terms of surface water discharge:

- Single point discharge (outfall) to Cork Harbour;
- Diffuse discharge to Cork Harbour as opposed to a single point discharge; and
- Soakaway.

Diffuse discharge is preferred to a single point discharge and will be explored at detailed design. In some locations difficulties can sometimes be experienced in finding a convenient outfall to which a roadway can be drained. In such circumstances it may be possible, if the subsoil conditions are appropriate, to dispose of run-off water to a soakaway. Soakaways should only be used in free-draining granular soils such as gravel or sand; in this instance given that the land either side of the proposed road is likely to comprise made ground, soakaways are unlikely to be a suitable option for surface water drainage. Further site investigation would also be required during detailed design to determine if the underlying soil in the vicinity of the access road is suitable for a soakaway if this option were to be explored further.

Therefore, the surface water from the proposed upgraded roadway is likely to be disposed of via diffuse or single point discharge. The exact nature of the discharge will be confirmed at the detailed design stage, however indicative locations of potential outfalls are provided on Figure 5.4. Petrol interceptors will also be provided to service run-off from this area. A petrol interceptor is a trap used to filter out hydrocarbon pollutants from rainwater runoff. It prevents fuel contamination of watercourses carrying away the runoff.

An overlay surface will suffice along some of the access road but full pavement reconstruction will be required where the new footprint is outside the existing footprint (i.e. the widened section) and where the existing footprint is deemed to be of particularly poor quality that an overlay would not suffice. Pavement overlay will involve the cold milling (planing) of the upper layer(s) of the existing surface to a predetermined depth (generally 100mm – 200mm) and replacing with an appropriate regulating layer (50 – 150mm) and surface layer (50mm). Further details on the proposed access road widening are provided in Chapter 8 ‘Traffic and Transport’.

5.3.5 Footpath Improvements

To improve pedestrian access to the East Tip, it is proposed to upgrade existing footpaths and provide new footpaths as detailed on Figure 5.6 and Chapter 8 ‘Traffic and Transport’.

Under this application a new footpath will be provided from the existing public car park to the southern end of the access bridge to Haulbowline Island (along the private road depicted in blue on Figure 5.6). The footpath will have a maximum width of 2.0m (minimum width of 1.5m). An uncontrolled pedestrian crossing will be provided to link this public car park to this new footpath (See Figure 5.6). A low wall across the road from the public car park (located where the road turns north towards Haulbowline Island) will also be partly removed to accommodate the footpath. The existing kerb along this private road, from the car park to the southern end of the bridge, is in very poor condition and will be replaced.

Footpaths will also be provided along the new access road from the security gates (at the northern end of the bridge) to the East Tip site entrance (See Figure 5.3).

A new footpath will be provided along the public road (L2545) under IMERC contributions between the National Maritime College of Ireland (NCMI) entrance and the start of the private access road to Haulbowline Island and Rocky Island (depicted as yellow on Figure 5.6) and proposals within this application will link with same.

The improvements outlined above will provide continuous safe access for pedestrians from the L2545 as far as the East Tip site. Uncontrolled crossing points will include dropped kerbs and tactile paving and will be located so to be visible to oncoming traffic.

5.3.6 Pre-Construction Access Road Improvements

It is also proposed that sections of the road between the NCMI and the access bridge to Haulbowline Island will be subject to remedial works prior to the commencement of the main remediation works. An assessment of the pavement prior to and during construction will be required to monitor any changes to the condition of the road and as the various stages of the construction phase progress. Such remedial works will typically be in areas which begin showing signs of significant distress as a result of construction traffic. Remedial works could involve the cold milling (planing) of some sections (or strips) of the existing surface and relaying with an appropriate bound material as described in section 5.3.4.

5.4 RAW MATERIAL REQUIREMENTS & SOURCING

Materials will be imported to the East Tip for the following:-

- The engineered capping system, which will be required to cover approximately 9 hectares of waste and associated surface water drainage works and anchor trenches.
- The PES, which will extend around the coastal perimeter of the site for approximately 900m.
- The PES at western boundary of the site – approx 350m long.
- Landscaping works.
- Road and pathway improvements.

All materials imported to the East Tip site will meet the requirements of remediation, end-use, maintenance and aftercare.

Table 5.1 outlines the quantities of materials required for the construction of the above elements. It should be noted that a worst case scenario has been assessed from a materials import perspective.

Table 5.1: Estimated Quantities and Types of Materials Required for Construction of Remediation Solution, Access Road and Landscaping of the East Tip

	Dimensions	Estimated Quantities	Notes
Engineered Capping System:			
Regulation Layer	0.3mx90,000m^2	27,000m^3	Stone/inert material.
Clay Layer	0.6mx90,000m^2	54,000m^3	Or equivalent, e.g., geosynthetic clay liner (approximately 60 rolls).
1mm LLDPE Liner	Roll 237.7m x 6.8m = 1616.36m^2	Approx. 60 rolls	Includes additional rolls for anchor trenches (Roll widths may vary).
Drainage Layer (Stone)	0.3mx90,000m^2	27,000m^3	Or 90,000m^2 of geocomposite (equivalent to 60 rolls).
Subsoil + Topsoil	1m x 90,000m^2	90,000m^3	700-850mm subsoil - general landscape fill - Class 4 in accordance with NRA manual of Contract Documents for Road works, Specification, table 6/1: Acceptable Earthworks Materials & 150mm-300mm topsoil - General Purpose Grade conforming to BS 3882
Fill for Anchor Trenches	0.3m x 1,200m x 0.9m	324m^3	Inert engineering fill if imported.
Surface Water Drains	-	500m^3	Drainage stone.
Perimeter Engineered Structure:			
Engineering Fill material (max. permeability 1x10^{-5} m/s): If 1:3 Slope constructed If 1:1.5 Slope constructed	-	 35,000m^3 45,000m^3	Maximum quantities of 45,000m^3 have been assumed in assessments. Inert engineering fill material if imported.
Rock Armour: 1:3 Slope 1:1.5 Slope	-	 35,000t 25,000t	Maximum quantities of 35,000t have been assumed in assessments. Large rocks, locally sourced if possible.
PES Western Boundary of the Navy site			
Engineering Fill material (max. permeability 1x10^{-5} m/s)		1,750m^3	Inert Engineering Fill material if imported
Landscaping (excluding subsoil and topsoil)			
Landscape Mounds	-	12,000m^3	Subsoil - general landscape fill - Class 4 in accordance with NRA manual of Contract Documents for Road works, Specification, table 6/1: Acceptable Earthworks Materials&topsoil - General Purpose Grade conforming to BS 3882.
Footpaths and Walkways	-	100m^3	Stone.
Road & Pathway Improvements			
Access Road Widening Car Park	-	7,000m^3	Stone, surface layer materials, etc.

	Dimensions	Estimated Quantities	Notes
Access road improvements Footpath improvements			
Drainage fill	-	2,500m^3	Drainage stone.

All materials will be sourced as close to the East Tip as is practically possible. However, at this stage of the project, the sources for such materials are unknown (see Chapter 8 'Traffic and Transport'). In addition, the Contractor appointed to complete the proposed development will be required to ensure that where relevant, materials will be sourced only from appropriately authorised sites and/or quarries and brought to the East Tip by appropriatelylicensed vehicles. Furthermore, the Contractor will be required to ensure that all materials are sourced in accordance with the proposed Environmental Management Plan for the works (see Chapter 6 'Project Construction') and to update the Traffic Management Plan once the source of materials is identified.

A marine transport route with docking and unloading at the Naval Dockyard or former steel works site may also be considered for transportation of materials to site in order to reduce traffic movements in the local roads. It is anticipated that any materials brought to Haulbowline by sea would be unloaded and transported directly to the East Tip, thereby avoiding storage of materials outside the East Tip. Again, the sources of material are currently unknown (and similar to the road transport options), departure ports at the time of making this application and preparing the EIS are unknown. However, in the event that sea transport is a feasible option, then the importation of material by sea will be undertaken in accordance with recommendations of the proposed Environmental Management Plan (See Chapter 6 ' Project Construction') and proposed Traffic Management Plan (see Chapter 8 'Traffic and Transport') and best practice.

5.5 WASTE RECOVERY & DISPOSAL

It is estimated that there may be the potential to collect approximately 10,000 tonnes of scrap metal of various different grades and different levels of recoverability from the East Tip as part of the remediation works. This tonnage has been estimated based on a 5T/m^3 density rate. The level of recovery will depend on a number of factors including market value at the time of the proposed works and the grade of the scrap. Material arising from the demolition of the existing buildings and gantry crane (as outlined in Appendix G: Inventory of Structures to be Demolished) will also be recovered as much as possible. Some of this recovery may occur separately outside of the remit of this project. Similarly, options for the recovery of an existing stockpile of mill scale (estimated volumes of 400m^3) will also be explored, again which will be dependent on market value and demand at the time of the proposed works.

It is not anticipated that other existing waste materials at the East Tip will require off-site recovery or disposal. However, in the event that the construction works uncover a waste type that requires off-site disposal, then measures to remove and dispose/recover such materials will be undertaken in accordance with the Environmental Management Plan (see Chapter 6 'Project Construction'). Section 6.4.2 of Chapter 6 'Project Construction' provides an overview of procedures to be followed during the construction phase in the event that a waste material of particular concern is encountered during the construction works.

5.5.1.1 Re-Use of Slag Material

It is proposed that slag material at the East Tip can be processed on site for the purposes of providing engineering fill for the construction of the PES and used as part of the drainage system for the remediated site. The reuse of slag material will reduce the quantities of materials (see Section 5.4 above) required to be imported and therefore the traffic impact on the surrounding community (see Chapter 8 'Traffic and Transport'. The Traffic Impact Assessment has assumed a 'worst case' scenario, which assesses the importation of all materials by road and no reuse of slag material in the proposed remediation solution. The processing of slag material will require the use of on-site crushers and screeners to process the material to an engineering grade suitable for reuse. Further details on the processing methods and details on the classification of the slag material and further testing requirements are provided in Chapter 6 'Project Construction'.

5.6 END-USE, AFTERCARE AND MAINTENANCE

5.6.1 Waste Licence Compliance & Programme for Aftercare

Although the end-use proposal for the site is an amenity area the East Tip will still be operated under a Waste Licence granted by the EPA. However, unlike other landfill facilities in which waste licences set conditions for the operation of an active landfill for the acceptance and disposal of waste, the Waste Licence for the East Tip will instead set conditions and emission limits for the ongoing aftercare of the end-use for the site. The licencee must adhere to these conditions to minimise potential environmental impacts from the facility.Therefore there will be an ongoing requirement for access to monitoring wells on the site and to take water samples from the surrounding marine environment. Such monitoring and aftercare requirements will remain in place until as such time as the EPA agree that they are no longer required.

A Landscape Management Plan will be developed to address landscaping over 2-5 years (See Chapter 11 'Landscape and Visual'.

5.6.2 Management of the Recreational Area

As discussed above the East Tip will be open to the public for use as a recreational area during daylight hours only. It is proposed that the Irish State will retain ownership of the East Tip (including access road and bridge) and have overall responsibility for managing the site. Full details of the mechanisms of how the Irish State intend to manage the end-use will be decided by the Irish State in due course. It is proposed that the playing pitch will be managed by the Navy.

5.6.2.1 Health & Safety of Visitors

The recreational end use has considered the health and safety of visitors by incorporating the following elements into the design:-

- In the event that the East Tip or the access roads to same is subject to coastal flooding during opening hours, an agreement has been made with the Navy, that they would assist any visitors stranded at the East Tip by providing them with an alternative marine route to depart Haulbowline. A copy of this letter is included in Appendix H: Naval Service Support in Event of Flooding.

- The facility will open during daylight hours only. At all other times, the facility will be closed off by locking entrance gates.

- The existing access road to the site will be upgraded to allow 2-way flow of traffic. A separate access road will be provided for the Navy so there will be a designated traffic route for visitors only to the East Tip.
- Footpaths will be provided to allow pedestrians to safely gain access to the site from the L2545.
- Suitable signage will be placed around the East Tip, warning visitors of deep water. A number of life buoys will be provided around the perimeter of the facility.
- All monitoring wells with be fitted with lockable covers.

5.6.3 Maintenance

Once the remediation solution is constructed there will be no requirement for active pollution control systems at the East Tip. However, there will be ongoing checks required to ensure the integrity of the capping system, the PES and any monitoring infrastructure along with maintenance requirements for the upkeep of recreational areas. These will include litter management, landscaping and general upkeep requirements.

Maintenance of the landscape works will be an integral part of the on-going site management. This will include a defects liability period during which any defective plant material is to be replaced. Litter picking and weed control will be carefully monitored during the early growing seasons of the landscape maintenance contract. Contractors will comply with all health and safety standards, in particular with regard to maintenance works during the operational phase of the scheme.

5.6.3.1 Long Term Settlement

Given the nature of the material which has been deposited it is expected that there will be minimal if any long term settlement of the waste at the East Tip. Therefore it is not expected that there will be any impacts resulting from settlement that would alter the surface water drainage pattern of the site. In any case, it is recommended that the surface water drainage system be examined on an annual basis and cleaned or drainage stone replaced where required.

5.6.4 Resource Requirements

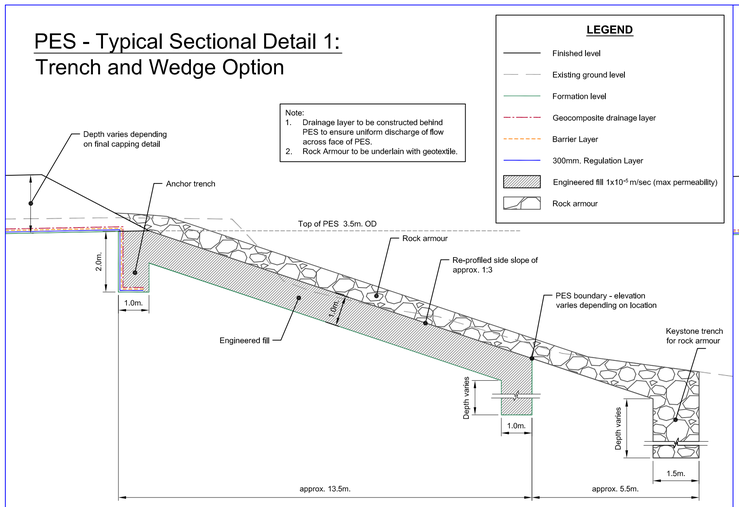
Other than electricity to power existing lighting along the access road (10kV), no other resource requirements are required for the operation of the East Tip as a recreational area. The site will only remain open during daylight hours and therefore no additional lighting will be required. Renewable technologies for lighting the access road will be explored at the detailed design stage, if required.

Further details on utilities such as electricity, diesel and water are discussed in detail in Chapter 12 ‘Material Assets’ for the construction and the end-use, aftercare and maintenance stages.

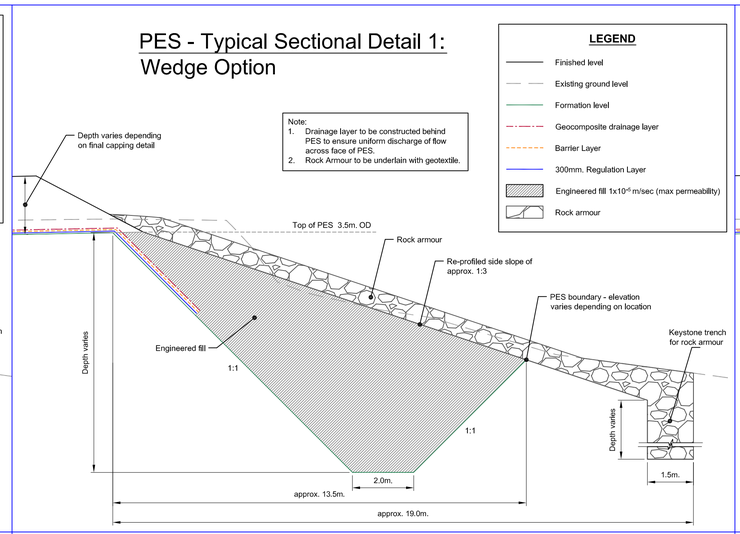
5.7 FUTURE DEVELOPMENT

At this stage no future phases to expand the East Tip as a recreational area are proposed. However, as outlined in Chapter 2 'Legislative and Policy Context', a Masterplan for the redevelopment of Spike Island as a major tourism, heritage and amenity facility was approved in November 2012 by Cork County Council. The current proposal does not preclude the future implementation of any aspects of the Spike Island Masterplan.

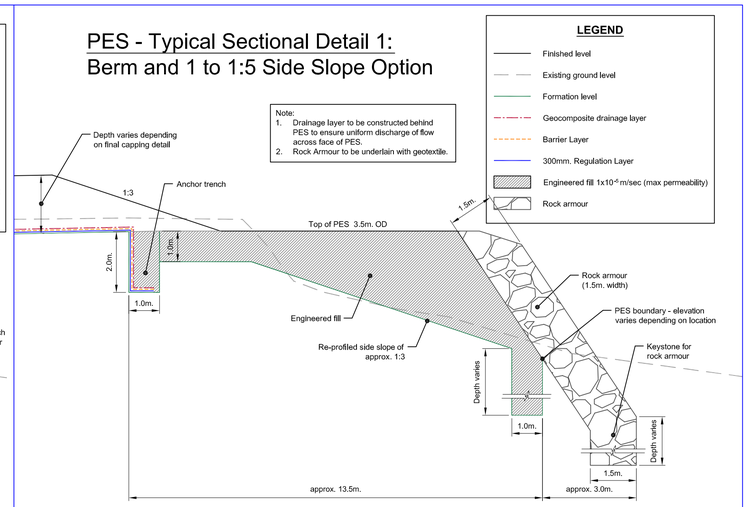
PES - Typical Sectional Detail 1: Trench and Wedge Option



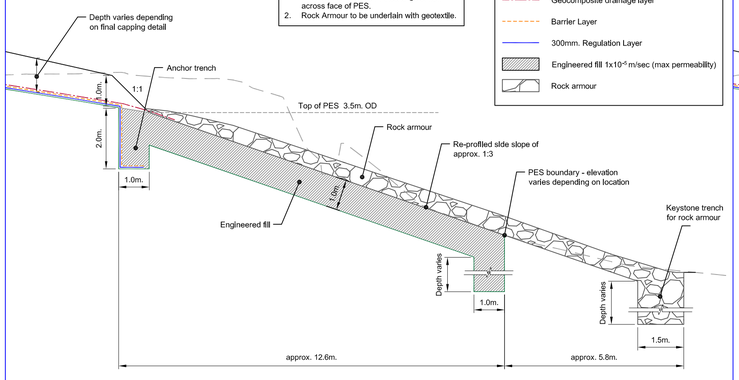
PES - Typical Sectional Detail 1: Wedge Option



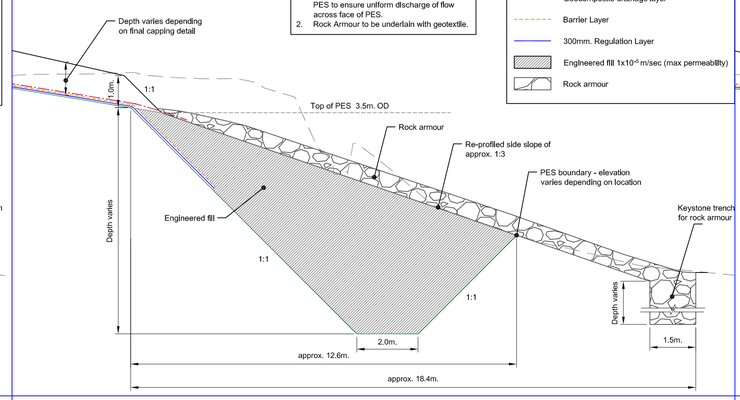
PES - Typical Sectional Detail 1: Berm and 1 to 1:5 Side Slope Option



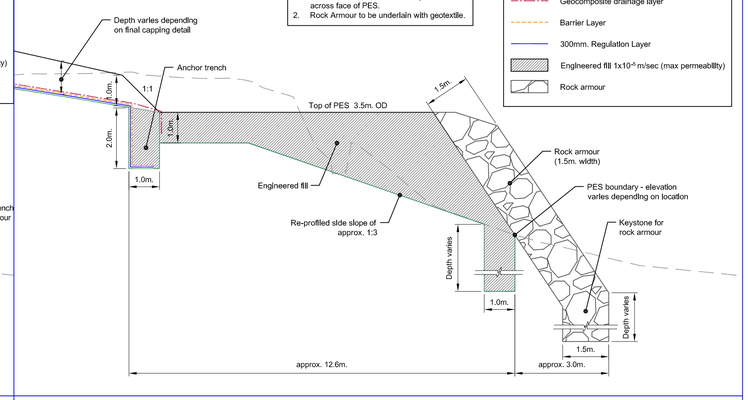
PES - Typical Sectional Detail 2: Trench and Wedge Option



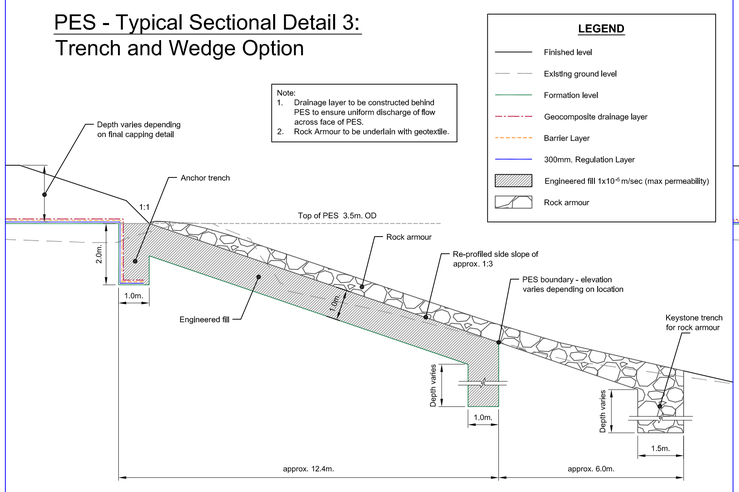
PES - Typical Sectional Detail 2: Wedge Option



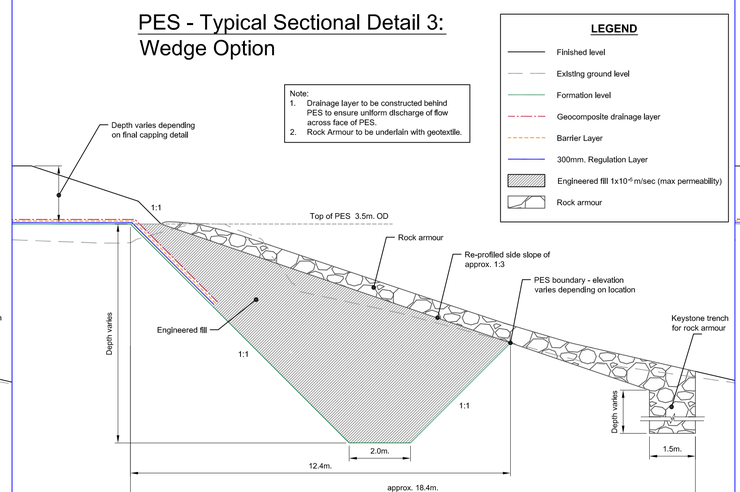
PES - Typical Sectional Detail 2: Berm and 1 to 1:5 Side Slope Option



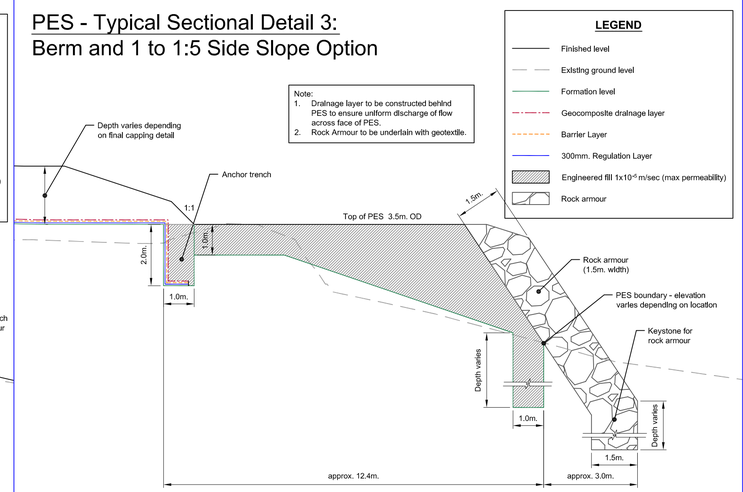
PES - Typical Sectional Detail 3: Trench and Wedge Option



PES - Typical Sectional Detail 3: Wedge Option



PES - Typical Sectional Detail 3: Berm and 1 to 1:5 Side Slope Option



Title
PES - TYPICAL SECTIONAL DETAILS AT NORTHERN, EASTERN AND SOUTHERN BOUNDARIES

Figure 5.1

Scale 1:100 @ A1

File Ref :MCE0736 Figure 5.1
Date : April 2013 Rev : F01

East Tip Remediation Project

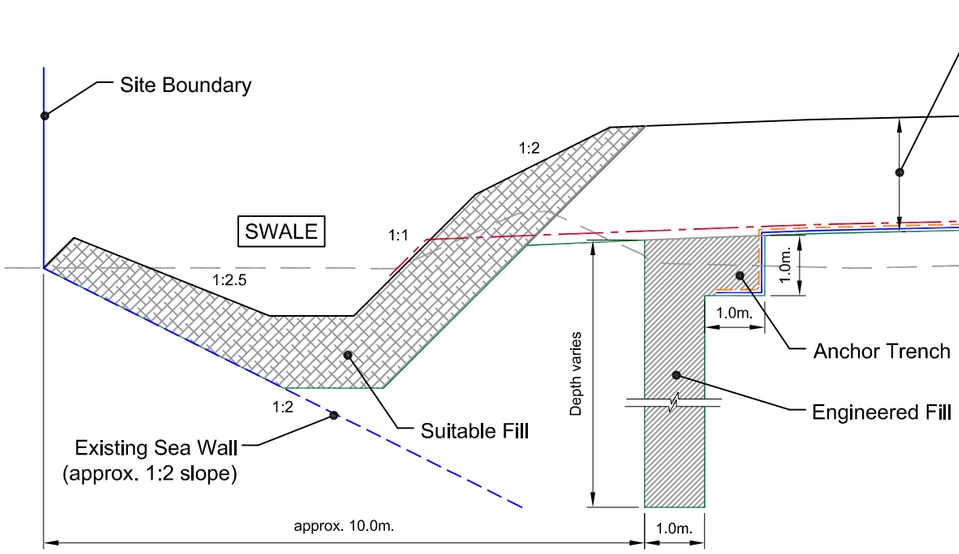
EAST TIP REMEDIATION PROJECT

RPS

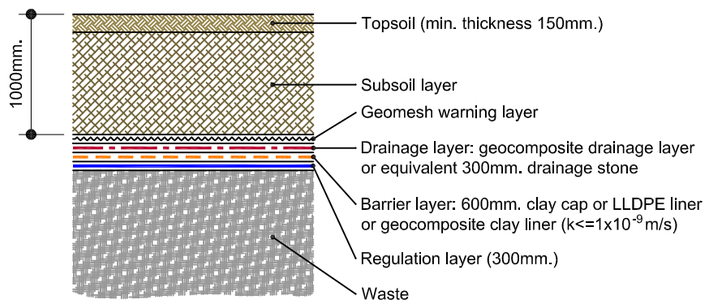
LEGEND

- Finished level
- Existing ground level
- Formation level
- Geocomposite drainage layer
- Barrier Layer
- 300mm. Regulation Layer
- Engineered fill $1x10^{-5}$ m/sec (max permeability)

Note:
1. Drainage layer to be constructed behind PES to ensure uniform discharge of flow across face of PES.



PES - Typical Sectional Detail 4:
Western Boundary of Site
Scale 1:100



Contaminated Land Remediation
Typical Capping Detail
Scale 1:50

Title
TYPICAL SECTION THROUGH PES & SWALE ON WESTERN BOUNDARY & TYPICAL CAPPING DETAILS

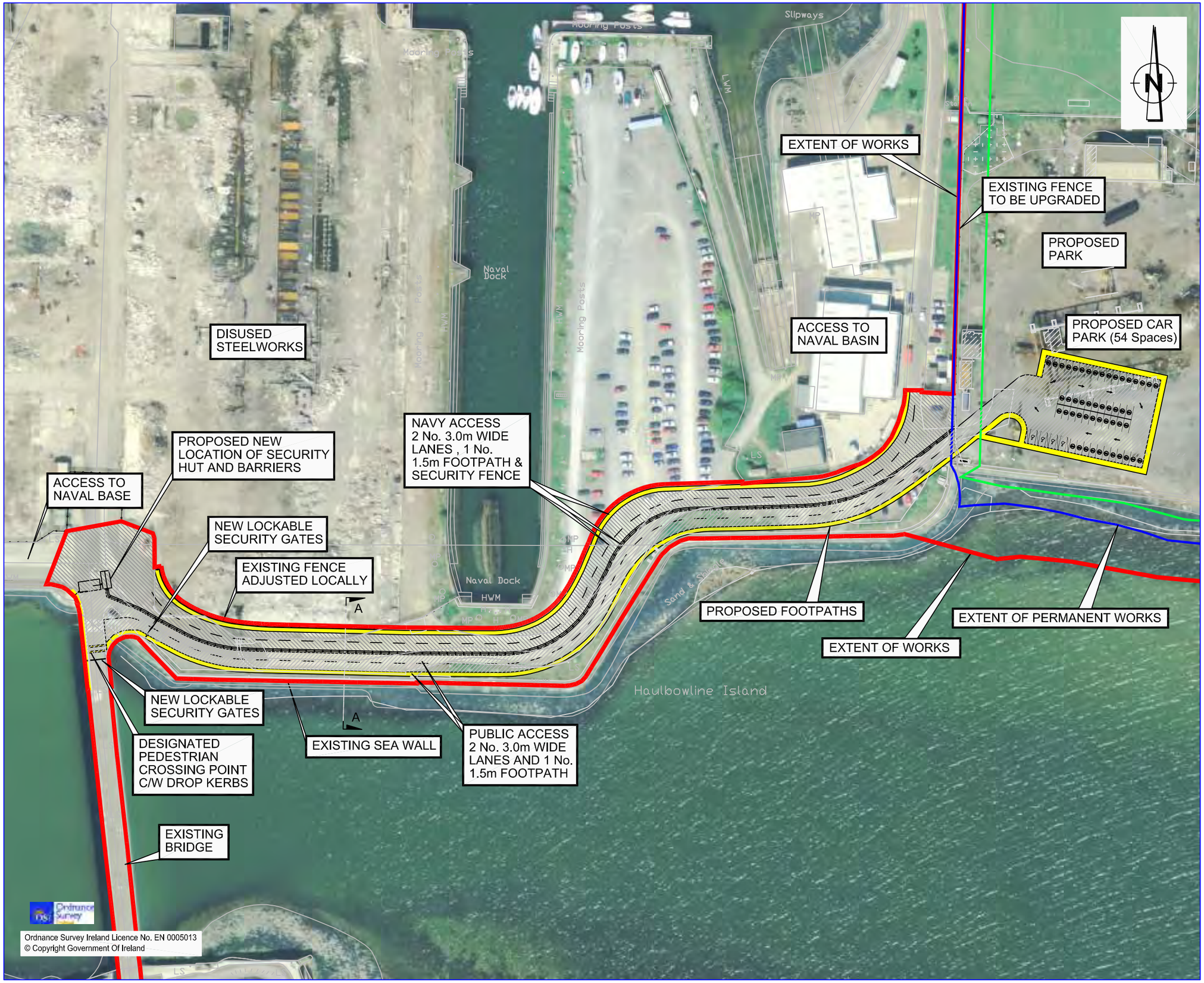
Figure 5.2

File Ref : MCE0736 Figure 5.2
Date : April 2013 Rev: F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

RPS



LEGEND:-

- FOOTPATH
- NAVAL AREA
- PUBLIC AREA

Title
PROPOSED ACCESS ROAD LAYOUT AND CAR PARK - PLAN

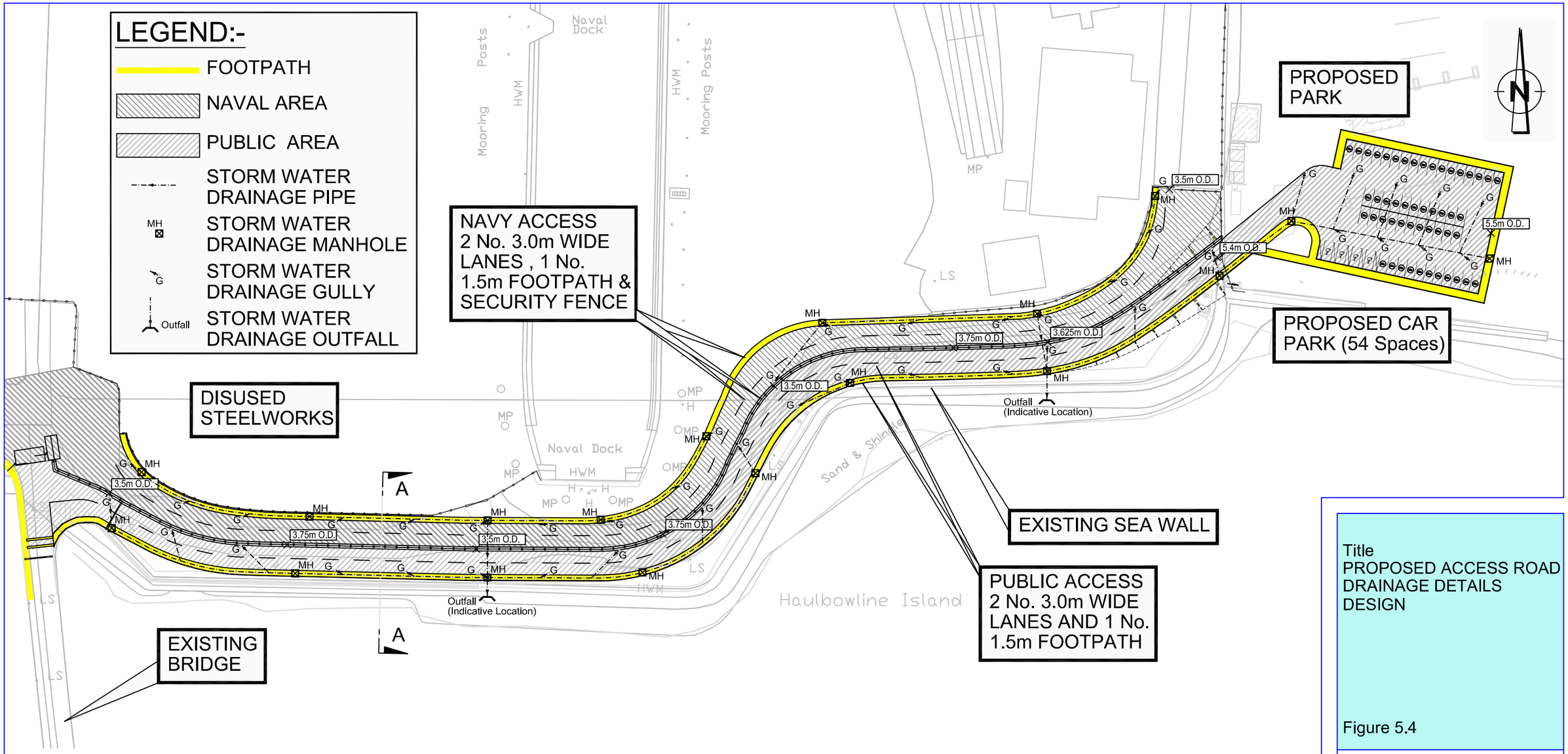
Figure 5.3

File Ref : MCE0734 Figure 5.3
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

RPS



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Title
PROPOSED ACCESS ROAD DRAINAGE DETAILS DESIGN

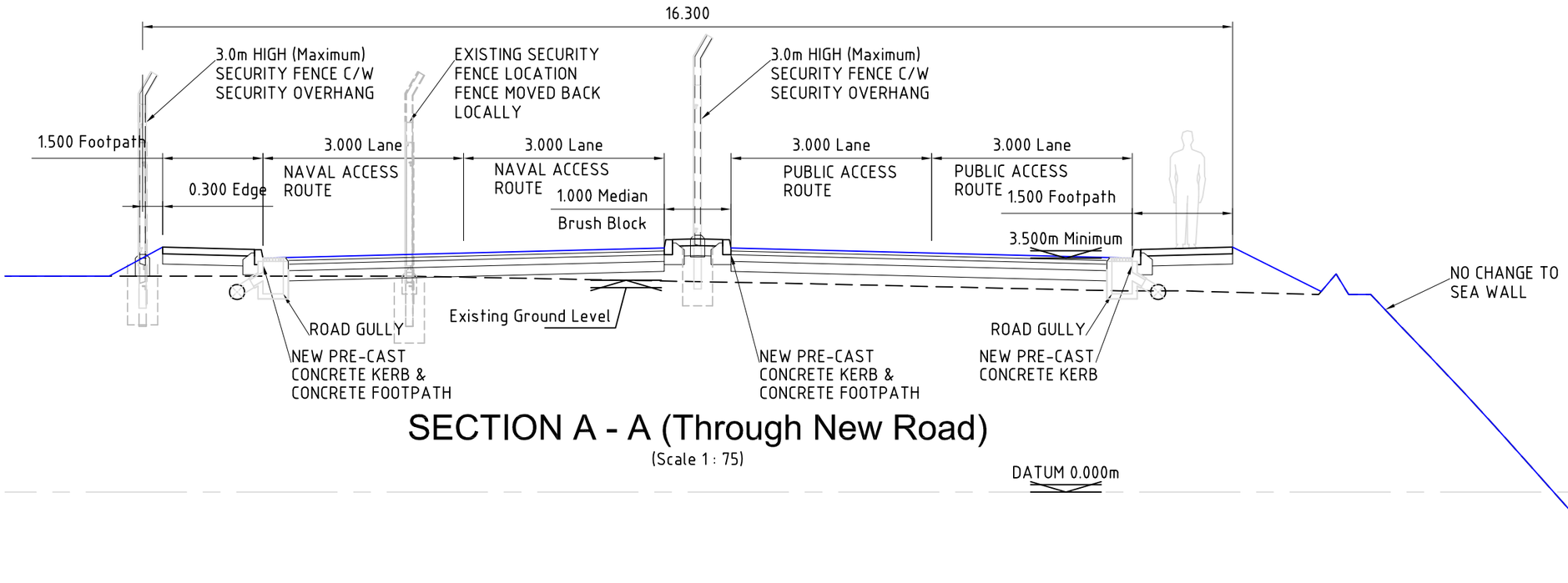
Figure 5.4

File Ref : MCE0734 Figure 5.4
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

RPS



SECTION A - A (Through New Road)

(Scale 1 : 75)

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Title
PROPOSED ACCESS ROAD
- TYPICAL
CROSS SECTION

Figure 5.5

File Ref : MCE0734 Figure 5.5
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP
REMEDIATION
PROJECT

RPS

FIGURE 1

FIGURE 2

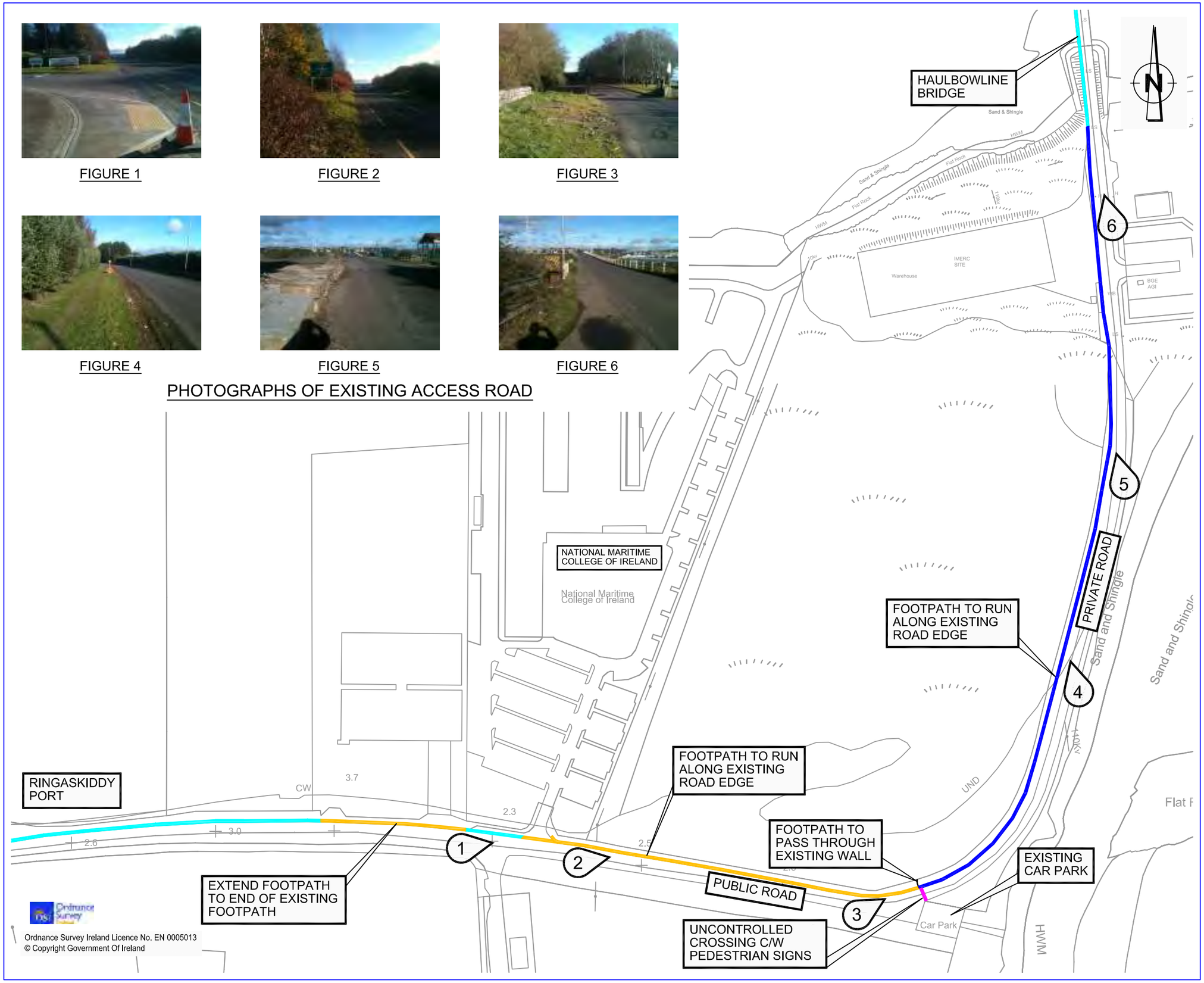
FIGURE 3

FIGURE 4

FIGURE 5

FIGURE 6

PHOTOGRAPHS OF EXISTING ACCESS ROAD



LEGEND

- PROPOSED FOOTPATH
- EXISTING FOOTPATH
- PROPOSED PEDESTRIAN IMPROVEMENTS (IMERC)
- PROPOSED PEDESTRIAN CROSSING
- 2 PHOTOGRAPHIC REFERENCE POINT

Title
PROPOSED FOOTPATH LAYOUT - FOR ACCESS TO THE SITE

Figure 5.6

File Ref : MCE0734 Figure 5.6
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

RPS

4 ASSESSMENT OF ALTERNATIVES

4.1 INTRODUCTION

This chapter describes the main alternative options considered for the remediation of the East Tip and the main reasons these options were not brought forward for further consideration as part of the outline design proposal (Chapter 5 'Project Description'). This chapter also describes the alternative design options (Section 4.2) and alternative construction methods (Section 4.3) that were considered. This review took into account technical aspects and possible likely environmental impacts associated with the various options, to ensure that design options and construction methods proposed for the remediation of the East Tip result in the least environmental impact and comply with relevant BAT (Best Available Techniques).

The overall aim of the remediation of East Tip is to achieve regularisation through planning consent and waste licensing to comply with the outstanding European Court of Justice Judgement against Ireland (Case C 494/01-Commission V Ireland, 26th April 2005).

A description of the 'no development' or 'do nothing' scenario is also outlined.

4.2 ALTERNATIVE REMEDIAL DESIGN SOLUTIONS

A Detailed Quantitative Risk Assessment (DQRA) to evaluate the significance of the risks to human and environmental receptors has been undertaken with respect to the East Tip, Haulbowline Co. Cork. Section 7 of the DQRA (See Appendix A: DQRA) outlines that 'the primary aim of any remediation will be to mitigate risks to human health and reduce the contaminant flux to the Cork Harbour waters and secondly to prevent erosion of the waste material into Cork Harbour. Therefore, it was necessary to consider a number of alternative remedial technologies to determine the best solution for the East Tip. The DQRA outlined a number of factors which had to be taken into consideration in reviewing potential technologies:-

1. The site is located on an island, any technology that is employed will have to be brought to the island or if waste is produced it must be removed from the island.

2. Asbestos contamination is not limited to a single location, it is widespread across the site, thus any ex-situ remedial technology employed will require H&S precautions be taken to manage any risks.

3. In places where the waste is described as massive or monolithic, any attempt to excavate or mix in a treatment will require the use of rock cutting augers (please refer to Appendix BB (of DQRA) which presents the Geotechnical Assessment).

4. Thickness of the waste and impacted soil would require dewatering and waste water management for any ex-situ technology.

5. Haulbowline is an island where the groundwater within the natural strata is in direct continuity with the waters of Cork Harbour.

6. Waste material from the site extends onto the foreshore and therefore forms the flood defences which are subject to erosion with eroded waste visible on the foreshore.

Considering the above factors, a number of ex-situ (removal off site) and in-situ (remaining on site) remedial technologies were reviewed, the details of which are presented in Table 4.1 along with the main environmental and technical aspects associated with each of the options.

Table 4.1: Alternative Solutions

Item	Option	Description	Environmental Considerations	Technical Considerations
1	Do Nothing	Leave site in its current state.	Risk to human health through direct contact and ingestion of waste. Potential for contaminants to leach from the waste and enter the water as the Harbour water is flowing through the site resulting in a theoretical impact in the immediate vicinity of the East Tip (i.e. within 50m). It should be noted that this impact has not been recorded as part of the surface water monitoring programme of the waters surrounding the East Tip Potential for erosion of the East Tip and contaminant release.	Remediation required to avoid risks to human health through direct and indirect (air and water) pathways.
Available Ex-Situ Remedial Technologies				
1	Removal of materials off site –no treatment.	Removal of all materials and disposal off site and no treatment of the material.	Significant volumes of haulage traffic associated with this option potentially resulting in significant impacts to the community including impacts from Traffic congestion, noise and air pollution. Significant risk to marine environment due to the nature of construction works that would be required, particularly when excavating waste down to original sea bed level. Requirement to identify suitable site(s) for disposal. Unlikely that such a site currently exists in RoI. Possible requirement to import significant volumes of material from a fill. replacement perspective. Health and safety risks for workers. Risk posed by the site as presented in the DQRA does not warrant this level of remediation.	Lengthy programme. Nature of waste would be difficult to excavate. Waste would have to be excavated down to original ground which because of settlement is several metres lower than it was prior to filling. Would require extensive temporary works. Controls required in marine environment. Constraints (technical and economic) associated with securing suitable disposal site(s) for the volume and nature of material present at the East Tip.

Item	Option	Description	Environmental Considerations	Technical Considerations
2	Removal of all materials and off site – treatment	Removal of all materials off site and ex-situ treatment of all materials.	General environmental considerations as outlined for point 1 above. Transferance of risks to another site. Risk posed by the site as presented in the DQRA does not warrant this level of remediation.	In addition to those outlined for point 1 for this option the end-use or outlet for treated waste would be needed.
In-Situ Remedial Technologies				
1	In-situ treatment of waste using Stabilisation/Solidification techniques.	The addition of a binder or additive to lock up the contaminants.	The level of excavation required in order to execute these works would be significant and therefore could present a potentially significant impact from a noise, air, surface water, groundwater and marine perspective. Health and safety concerns associated with the works. Potential to change physical characteristics of materials on site with unknown long term consequences. Risk posed by the site as presented in the DQRA does not warrant a remediation solution of this nature	Stabilisation and solidification techniques would require the use of chemical additives which would have to be appropriately managed on site but which may increase the risk of a spillage incident. And other similar considerations as included in point 1 of the ex-situ remediation technology.
2	Remediation of East Tip using low permeability* capping and low permeability* perimeter system.	The use of a low permeability perimeter system to either cut off the pathway of groundwater flow or to reduce contaminant loading as it passes through the perimeter system.	Meets requirements of remedial solution outlined in DQRA. However, the risk posed by the site as presented in the DQRA does not warrant a remediation solution of this nature. Could result in a change in the current groundwater flow beneath the site. Potential increase in (contaminated groundwater) levels within the waste. Use of such highly engineered system is not proportionate to risks highlighted in DQRA.	Could result in rise in leachate levels within the waste in short term which would require ongoing maintenance systems for leachate management (pumping and treatment) and bowsers/ tankers to remove leachate from the site for treatment at an appropriate waste water treatment plant.

Item	Option	Description	Environmental Considerations	Technical Considerations
3	Remediation of East Tip using low permeability* capping and reactive barrier.	As above but with the use of a low permeability capping and a reactive barrier.	Meets requirements of remedial solution outlined in DQRA. Use of such highly engineered system not proportionate to risks highlighted in DQRA.	Maintenance systems required including leachate management and ongoing requirement for replacement and disposal of reactive barrier material.
4	Remediation of East Tip using low permeability* capping and permeable perimeter system (The Perimeter Engineered Structure).	Capping and PES	Meets requirements of remedial solution outlined in DQRA. Protection of human health.	Meets requirements of remedial solution outlined in DQRA.

**Note – for the purposes of this EIS the term low permeability is defined as a maximum permeability of $1x10^{-9}$m/s*

The DQRA recommended a preferred possible approach of pathway management involving the use of a capping or cover system across the top of the site and installation of a perimeter engineered structure around the whole of the site. Due to the unique setting of the East Tip i.e. an island of waste within Cork Harbour, ex-situ treatment approaches were not considered further due to the environmental and technical difficulties associated with such technologies as outlined in Table 4.1 above and also the significant costs that would be associated with these works with limited and possibly no long term environmental benefits and probably higher environmental risks in the short term. Similarly, in-situ treatment of waste was not considered further due to the risks associated with this method which could include potential impacts to sensitive receptors from noise and dust and potential impacts to surface, ground and marine waters. Use of low permeability or reactive barriers as part of the perimeter system, although they would still meet the aims of remediation, were not considered further due to the requirements for ongoing pollution control and maintenance systems and the additional costs associated with the installation and management of these systems when the risk posed by the East Tip, as outlined in the DQRA, does not warrant this level of remediation.

4.3 DO NOTHING AND EX SITU OPTIONS

4.3.1 'Do Nothing'/'No Development' Scenario

As noted previously the DQRA evaluated the significance of the risks from the East Tip to human and environmental receptors. The results of the investigation determined that, in its current condition, there is a risk to human health through direct contact and ingestion of the waste should humans access the East Tip site. With respect to water, it was determined that the majority of flow contribution to the East Tip site was as a result of tidal ingress at high water and the majority of flow out of the site was a result of tidal outflow at low water. This flux from the site when modelled is indicating no theoretical impact from the majority of constituents of concern and is indicating a theoretical impact from Manganese and Chromium VI in the area immediately surrounding the East Tip (i.e. within 50m[1]).

[1] It should be noted that elevated levels of Manganese and Chromium VI have not been measured in the Cork Harbour waters either within this zone or outside of it.

Actual sampling of harbour waters around the tip for potential contaminants has not identified any impact.

The DQRA concluded that remediation should be undertaken in order to cut off these pathways through the provision of a capping layer to isolate the waste from the site users and through the use of a Perimeter Engineered Structure to reduce potential contaminant movement into the harbour. Therefore the do nothing option has not been assessed further.

4.3.2 Removal of Waste Material off-Site- No Treatment

The East Tip has been reclaimed from the sea by infilling with processing waste from the former Ispat steelworks on the Island. The approximate volume of waste deposited at East Tip is estimated to be of the order of 650,000 m^3. This figure has been estimated through the use of 3d ground modelling of boreholes, geophysical tools and historical information about the site. The waste at the East Tip extends into the foreshore and, in some instances, into the sub-tidal zone.

The removal of waste off site was therefore not considered a realistic alternative given the quantum of waste on the island. Access to the site is controlled by a single security barrier at the northern end of the Haulbowline access bridge.

Removal of waste offsite could result in significant traffic and associated nuisance impacts to the local road users and local community. A suitable site for the disposal of the waste would also be required. Given the heterogeneous nature of the waste at Haulbowline East Tip a singular disposal site would not be possible and it is unlikely that suitable disposal sites would be available within the vicinity of the East Tip or potentially Cork County and, with respect to certain waste, disposal outside of the Republic of Ireland may be required. This would result in possible significant travel distances between the East Tip and the designated disposal facility and represents an unsustainable option.

In addition to this, the waste at the East Tip has been described as massive or monolithic in locations. Therefore the excavation works would require rock breakers to be utilised. These works would result in impacts from a dust and noise perspective. Small quantities of asbestos have been identified in the waste. A construction risk assessment has been prepared with respect to regrading of the waste at the East Tip. This risk assessment has set out a number of requirements for the re-grading works which include the use of water to douse the excavation area to limit the risk to construction workers. The quantities of water which would be required to facilitate the bulk excavation of the waste material on the East Tip would be significant and may result in an impact from a surface water, groundwater and marine ecology perspective.

Removal of all waste from the East Tip would mean excavating down to the original sea bed which is now, because of settlement of the soft alluvial soils, several metres lower than it was when filling commenced. The maximum depth of waste on site as identified as part of the detailed site investigations is 11m below ground level. The excavation would also have to be undertaken, in large part, in a tidal area as the level of waste being excavated becomes progressively lower and extended below high tide. This would necessitate very extensive and costly temporary works to enable the excavation to progress which in turn could have significant impact on the marine environment.

Finally this option would incur significant costs from a capital expenditure perspective with no reciprocal long term environmental benefit.

Therefore, given that the risk presented by the East Tip as outlined in the DQRA does not warrant wholesale removal of the waste from the site this option has not been assessed further.

4.3.3 Removal of All Materials and Ex-Situ Treatment of All Waste

The impacts associated with this option would be the same as those outlined in Section 4.3.2 above, however it would include the ex-situ treatment of all waste. Treatment would typically include processing, washing, thermal treatment, stabilisation and solidification. As with the no treatment (disposal) option it would be difficult to find a treatment facility suitable for accepting the waste from the East Tip. In addition to this it would be difficult to find an outlet/ disposal facility for the treated waste.

This option is not a realistic option for the reasons as outlined in Section 4.3.2 above and therefore the option has not been assessed further.

4.4 ALTERNATIVE REMEDIAL SOLUTIONS- IN-SITU TECHNOLOGIES

4.4.1 In-Situ Treatment of Waste Using Stabilisation, Solidification or Washing Techniques

Given the nature of the waste within the East Tip, highly heterogeneous and in some cases rock like in structure, in-situ treatment of the waste using stabilisation/solidification techniques is not suitable for all the waste. In addition, for the waste that it is considered suitable for, it is not warranted or needed based on the risk posed by the waste at the East Tip as presented in the DQRA (see Appendix A:DQRA).

Application of washing techniques for all of the tipped materials would result in significant quantities of leachate from the “washed” waste. Given the nature of the washing activity this leachate could have elevated concentrations of certain contaminants which have the potential to impact groundwater, surface water and the marine environment. This leachate would have to be tankered off site and disposed of at an appropriate waste water treatment facility. This would result in increase traffic volumes and a requirement for a significant management plan to reduce the risk of this leachate discharging directly to the Cork Harbour area.

Stabilisation/solidification techniques require the use of chemical additives. These additives would have to be transported to the site and stored on site appropriately. The storage of these additives and the application of same would require a significant management plan in order to ensure there was no risk of spillages and associated impacts to the surrounding environment.

Whilst it is accepted that material washing and/or solidification or stabilisation techniques may be an option for dealing with localised hot spots if uncovered or may be used to facilitate the re-use of slag material in the PES if necessary, wholesale washing, solidification or stabilisation techniques are not required based on the risk posed by the East Tip as outlined in the DQRA (Appendix A:DQRA) and in addition to the impacts as outlined above, would result in significant additional costs from a capital expenditure perspective.

Therefore this option has not been assessed further in the context of the remediation of the East Tip.

4.4.2 Engineered Capping System

The DQRA has concluded that a low permeability capping system is required on the horizontal surface of the East Tip. The DQRA states that “*The capping system will break the pathway associated with risks to human health by preventing direct contact with the identified lead, arsenic and asbestos for future site users, and secondly it will reduce infiltration of rainwater and therefore contaminant leaching to groundwater and migration to the Cork Harbour”*(Refer to Appendix A:DQRA).

A Waste Characterisation study has been conducted, the results of which are presented in Appendix C: East Tip Remediation Classification of Slag Waste (RPS, 2013). This study has demonstrated that

the majority of the waste deposited at East Tip is non-hazardous however a fraction of the waste is hazardous. As such it has been determined based on the presence of hazardous waste, albeit in small quantities, that it is appropriate that a hazardous waste licence application is made for the remediation of the site. The EU Landfill Directive on Waste sets out specific requirements with respect to the capping of hazardous waste landfills and these requirements have been transposed into the EPA Landfill Site Design Manual. These requirements provide a prescriptive solution to the risks posed by hazardous waste sites which include risks to human health, surface water and groundwater from the contaminants within the wastes. The remediation of the site will be carried out under a hazardous Waste Licence and this is the statutory mechanism used to ensure that the proposed works and the methods to achieve the same are appropriately regulated and carried out. This project is however a remediation project rather than a landfill project and therefore whilst the Design Manual and the EPA Landfill BAT guidance note can be used as guidance, they do not have to prescribe the proposed capping system for this site. It is more appropriate that the detailed design for the capping system at Haulbowline East Tip is undertaken having regard to CIRIA Special Publication 106 - Remedial Treatment for Contaminated Land - Volume VI: Containment and hydraulic measures and other associated CIRIA documents where relevant.

Therefore the proposed capping system design will be based on the particular risks and generic recommendations as set out in the DQRA. Based on this and the proposals for the end-use the proposed capping system should contain a subsoil and topsoil layer to provide support for landscaping and vegetation. It should also contain a sub-surface drainage layer and alternatives include a geocomposite drainage layer or drainage stone, either of which is acceptable. A barrier layer is also required to act as a separation layer between the future public users and the contaminants in the underlying waste. It is considered that a low permeability layer such as LLDPE, a 600mm low permeability clay layer or a geosynthetic clay liner are appropriate barriers. Given that the waste deposited at East Tip is non-putrescible and is not producing gas it is considered that a gas collection layer is not required.

On the basis of the above it is considered that there are limited alternative options that can be considered in relation to the capping system required for the East Tip. The capping system proposed above meets the requirements of the recommendations in the DQRA and will enable the site to be converted to amenity use as a public park. It is commensurate with the level of risk posed by the site and appropriately breaks the source-pathway-receptor linkages. On this basis it is considered that the proposed capping system constitutes use of ‘Best Available Techniques’ (BAT). A typical detail of the capping system for the remediation of contaminated land is detailed on Figure 5.2 and is described in Chapter 5‘Project Description’ of this EIS.

4.4.3 Remediation of East Tip Using Capping and Low Permeability Perimeter System

The use of a capping layer has been discussed in section 4.4.2 above.

The installation of a low permeability perimeter system would result in a number of impacts. They are as follows:-

- Change in the current groundwater flow pattern under the East Tip. This potential alteration would require detailed modelling in order to ensure that this, in its own right, did not create a long term impact.

- Result in the requirement to actively monitor and manage leachate on site in order to ensure that levels of leachate within the site did not exceed required levels. This management may require active long term pumping of leachate from a number of abstraction wells on site and the discharge of this leachate to a storage tank on site.

- Tankering of leachate off-site to a suitable wastewater treatment facility. Ensuring long term availability of discharge can be difficult due to capacity issues at local treatment facilities and

also due to the constituents of the leachate. There may be a requirement to provide some level of on-site treatment prior to off site tankering.

The installation of a low permeability perimeter system would incur significant initial capital expenditure when compared with the permeable perimeter system option. In addition to this the leachate management system and the ongoing management requirement associated with the leachate abstraction, treatment and disposal would result in significant initial capital expenditure and operational cost in the long term.

Furthermore, the risk presented by the East Tip site as outlined in the DQRA does not warrant the installation of a low permeability perimeter system given that the DQRA states that "*….the sensitivity analysis indicated that decreasing the lateral hydraulic conductivity to 10^{-5}m/s would be sufficient to reduce the theoretical impact of dissolved phase contaminant discharge into the harbour". .* On this basis and for the reasons outlined above the installation of a low permeability perimeter system has not been assessed further.

4.4.4 Remediation of the East Tip Using Capping and a Reactive Barrier

The capping layer has been discussed in Section 4.4.2.

The installation of a reactive barrier would meet the requirements of the DQRA. However, a reactive barrier would require ongoing maintenance including removal of the reactive material and replacement of same at intervals as specified by the designer. The exhausted reactive material could not be re-used and would have to be disposed at an appropriately licensed facility. It is estimated based upon the predicted trench size for the reactive barrier that approximately 5,000m^3 of reactive material would be required to be disposed of during routine replacement. The frequency of replacement would depend on the nature of the material employed.

The installation of a reactive barrier system would incur significant capital expenditure when compared with the permeable system option. In addition to this the maintenance program associated with the reactive barrier would incur significant ongoing cost in the long term.

The risk presented by the East Tip site as outlined in the DQRA does not warrant the installation of a reactive barrier. The DQRA states that "*….the sensitivity analysis indicated that decreasing the lateral hydraulic conductivity to 10^{-5}m/s would be sufficient to reduce the theoretical impact of dissolved phase contaminant discharge into the harbour".* Therefore installation of a reactive barrier is not an environmentally sustainable remediation solution and is not required and as such a reactive barrier has not been assessed further.

4.4.5 Remediation of East Tip Using Capping and Permeable Perimeter System

The capping layer has been discussed in Section 4.4.2.

As described in Chapter 5' Project Description' a permeable perimeter system is proposed to remediate the East Tip site in conjunction with the engineered capping system. A permeable perimeter system - perimeter engineered structure (PES) - will be installed around the perimeter of the East –Tip at the location as identified on Figure 1.2 (Section 5.3.1.3). The overall purpose of the PES is to reduce and control the flow of seawater through the site and potential flow of leachate out of the site on the outgoing tide in order to lower groundwater contamination movement and prevent erosion of bulk waste material into Cork Harbour (see Chapter 14 'Ecology' for further details on the control of leachate from the site). The PES will have a maximum permeability of $1x10^{-5}$ m/s.

The DQRA states that "*….the sensitivity analysis indicated that decreasing the lateral hydraulic conductivity to 10^{-5}m/s would be sufficient to reduce the theoretical impact of dissolved phase contaminant discharge into the harbour".* Therefore the installation of the PES with the proposed maximum permeability of $1x10^{-5}$ m/s meets the requirements of the DQRA and the sensitivity analysis conducted therein.

The installation of a permeable PES will remove the requirement to actively manage leachate generated within the East Tip site. Therefore, the permeable solution represents a more environmentally sustainable solution and a more cost effective solution than a low permeability perimeter system.

The PES will require routine inspection and maintenance however this will be insignificant when compared to the maintenance requirements which would be associated with the reactive barrier.

The potential for the re-use of processed slag as outlined in Chapter 6 'Project Construction' of this EIS as part of the PES presents an opportunity to minimise the impact of the importation of the fill required to create the PES. Should the re-use of slag to form the perimeter system be approved this will further support the environmentally sustainable nature of the proposed PES.

It is on this basis that the installation of a permeable PES is considered use of BAT for the remediation of Haulbowline East Tip and as such the impacts associated with the installation of a permeable PES have been assessed as part of the preparation of this EIS.

4.4.5.1 Proposed PES

Full details of the proposed PES are provided in Chapter 5 'Project Description' of this EIS and the proposed construction of same is provided in Chapter 6 'Project Construction'.

4.4.5.2 Position of the PES

As described in Chapters 5 'Project Description' and Chapter 6 'Project Construction' the position of the PES has been selected in order to encapsulate the majority of the material in the East Tip whilst also having due cognisance of issues pertaining to constructability and potential impacts during the construction stage. At all locations there is a minimum of 5m between the outer most line of the PES and the mean Low Water Mark (LWM) and, along the western boundary, a minimum of 10m between the outermost line of the PES and the top of the old 19thcentury sea wall. It is estimated, based on site investigations undertaken to date, that approximately 5% of the waste deposited at the East Tip site will remain permanently outside the proposed PES.

In addition to this an average side slope of 1:3 has been selected as the average side slope of the finished PES along the boundary with the Cork Harbour (please refer to Figures 5.1 and 5.2 for typical sectional details of the PES). This is the current average side slope around the perimeter of the East Tip and has been selected in order to minimize the amount of regrading that will be required in order to facilitate the installation of the PES. It is accepted that this gradient may change at detailed design stage and for this reason a typical detail showing a 1:1.5 side slope has been included on Figure 5.1 in Chapter 5 'Project Description'.

4.4.5.3 Alternatives to the Creation/Construction of a PES

There are a number of different alternatives that may be selected at detailed design or at Tender stage for the construction of the PES. These alternatives are as detailed in Chapter 6 'Project Construction' of this EIS. The list of alternatives detailed in Chapter 6 'Project Construction' is not exhaustive and whilst the specifics may alter at detailed design or at Tender Stage the impacts associated with the possible alternatives have been assessed as part of this EIS.

Based on an engineering assessment the recommended minimum thickness of the PES is 0.5m. However based on a number of factors, including constructability, it is recommended that the PES has a minimum thickness of 1m. As detailed in Chapter 5 'Project Description' this can be provided through the construction of an engineered berm or wedge or trench or a combination of these elements constructed of engineering fill. Three options for the creation of the PES have been provided in Figure 5.1.

4.4.5.4 Materials for Construction of PES

The materials required for the construction of the PES are outlined in Chapter 5 'Project Description' and Chapter 6 'Project Construction'.

4.4.6 Residual Waste to remain permanently outside the Perimeter System

It should be noted that for all the in-situ technologies as detailed in Table 4.1, with the exception of the stabilisation/solidification of the waste, but including the recommended solution of an engineered capping system and a permeable perimeter engineered structure, it is intended that a small portion of waste will remain permanently outside the final remediation solution. This portion will be located between:-

a. The perimeter system and the Western site boundary (Old Sea Wall); and,

b. The perimeter system and Low Water Mark Spring Tides along the Northern, Eastern and Southern boundaries.

Site Investigations in the foreshore of the Haulbowline East Tip have indicated that waste potentially extends beyond the mean low water mark in some locations. Samples were taken of the material which is present in the foreshore and sent for appropriate testing. The results of this testing are presented in Appendix A of this EIS in the Addendum (WYG, October 2013) to the DQRA. The line of the PES has been selected on the basis as outlined in Chapter 5 'Project Description' and Chapter 6 'Project Construction' of this EIS. Any waste that will remain outside the PES has been weathered and, in some places, has been covered by natural sediments. In addition to this, it is expected that the majority of the waste which will remain outside the PES will be covered by rock armour. As demonstrated in the Addendum (WYG, October 2013) to the DQRA (Appendix A) there is no significant risk posed to either the Cork Harbour waters or to human health as a result of leaving this waste in place. Removing this waste would require extensive works in the foreshore and in the sub-tidal area of the East Tip. These works could present a significant impact to the environment which is unnecessary given that leaving the waste in-situ does not present a risk as demonstrated in the Addendum to the DQRA and does not pose a significant environmental risk to the aquatic environment (refer to Chapter 14 'Ecology').

The material in the foreshore is consolidated waste from the site, and the removal of this material was considered in the lower shore and shallow subtidal area. The majority of the material is oxidised, relatively inert and have been colonised by fucoids and foreshore biotopes. The main risk of impact from the works is the re-suspension of material from the foreshore into the water column and the distribution and therefore exposure from this material if it was spread by prevailing currents.

Coastal Process modelling (see Appendix N) was undertaken in order to define the potential impact, if any, associated with the bulk excavation of waste from the foreshore and to also define any impact associated with the preferred remediation solution of leaving waste in-situ.

4.4.6.1 Coastal Processes Modelling

Bulk Excavation and Removal of Material from the Foreshore Area

A detailed hydrodynamic and sediment model has been developed to represent the bulk excavation works that would be associated with the removal of this material (Model Scenario B as represented in the Coastal Processes Study in Appendix N of This EIS). For the purposes of the model no sediment protection was incorporated and losses of 5% of the material excavated were assumed. The results of this modelling demonstrate that these works may present an impact from a sediment mobilisation and a sediment deposition perspective. The modelling shows in the event of bulk waste removal from the foreshore, in a worst case scenario without further sediment abatement mitigation, that sediments would be distributed over the local estuarine area. Suspended sediments in the vicinity of the site and deposition would result in highly localised smothering of marine organisms in the immediate vicinity of the East Tip site. Small amounts of suspended sediments (<0.1mg/kg) would be distributed across the Cork Harbour area. Even in a worst case scenario, the suspended and deposited sediments would be minor and not of significant impact outside the environs of the East Tip site. However, there would be the potential for small concentrations of suspended material to enter the Monkstown Creek area. Whilst below detectable limits, this has been determined as an unacceptable risk given the conservational interest in this area. In addition this proposal would result in the loss of a larger area of foreshore habitat in the vicinity of the site due to removal and the potential for smothering. The material in situ is already exposed and inert, and is part of the habitat matrix of the area and is supporting marine faunal communities.

The removal of this material would also incur significant risk of re-suspension of material, and exposure of unoxidised material from the site which may include higher levels of potential chemicals of concern, i.e. heavy metals. The concern is related not only to the material associated with the East Tip, but also with the surrounding sediments in Cork Harbour which have elevated levels of contaminants. Where possible any subtidal works should be avoided to limit the risk of the redistribution of these sediments. Areas such as Monkstown Creek are already under pressure from the input of such material from elsewhere in the Cork Harbour region due to natural and anthropogenic activities. As a result the risk of this material contributing to a cumulative impact to these habitats, however minor, is not deemed acceptable. The removal of these subtidal sediments, even if contained within the proposed mitigation presents an unacceptable risk of redistribution of this material into areas of sensitivity. As a result the most environmentally sound option is to leave the portion of waste which is proposed to remain outside the PES in situ.

Waste Material, as Assessed in the Addendum to the DQRA (WYG, October 2013), to Remain In-Situ

A detailed hydrodynamic and sediment model has been developed to represent the works associated with the construction of the preferred remediation solution of the PES as defined in Chapter 5 'Project Description' of this EIS (the outer extent of the PES is shown on Figure 1.2). This model was a conservative model which assumed that excavation for the rock armour trench would be the first activity executed as part of the construction of the PES and assumed that this excavation activity was conducted from a protection berm located on the landward side of that trench. In addition to this the model assumed 10% loss of excavated material from the excavation activity and that all works were conducted over a 1 month period. The results of this modelling are presented in the Coastal Processes Study in Appendix N of this EIS (Model Scenario A). These results show that the proposed works will not affect the overall sediment transport regime in the Harbour and has concluded that the works will not have a significant impact on the coastal processes of the harbour. Impacts from these works from a sediment suspension and deposition perspective are minimal. Re-suspension of material from these works, in a worst case scenario, would be redistributed locally within the site environs. Small volumes below detectable limits may be suspended in the water column and distributed and deposited in the Cork Harbour area. There is minimal risk of any interaction of these sediments with Natura 2000 areas. This material in situ has been colonised by marine flora and fauna and is comparable to the surrounding sediments. There are no elevated contaminate levels in this material above those detected in the surrounding area. None are above the effects range-median (ERM) or threshold effects levels (TEL) (Cronin et al, 2004).

Therefore, on the basis of the risk presented by leaving the waste material in-situ as addressed in the Addendum to the DQRA (Appendix A of this EIS), in Chapter 14 "Ecology" and Chapter 13 'Soils, Geology and Hydrogeology' of this EIS, and in the NIS contained in Volume 4 versus the risk presented by the removal of this material, as outlined in the preceding sections, the option for the bulk excavation of waste has not been assessed further.

4.5 ALTERNATIVE CONSTRUCTION METHODS

Given the nature of the Haulbowline East Tip and the issues associated with the construction of the PES, particularly along the boundary with the Cork Harbour area a technical dialogue process was undertaken and is still ongoing at the time of writing this EIS. This process involved engaging with a number of specialist contractors in the areas of marine works, contaminated land remediation and general earthworks. A summary of the Technical Dialogue is provided in Appendix F: Technical Dialogue Report. The Technical Dialogue demonstrated that there are a range of alternative and proven construction methods that could be utilised to facilitate the construction of the PES and to manage the potential environmental and technical challenges associated with the construction of the various options. The possible alternative construction methods have therefore been considered to take into account the environmental and technical implications. The final chosen option will be decided on with Cork Co. Co. and the appointed Contractor with consideration of all mitigation measures set out in this EIS and any conditions associated with permissions for approval (i.e. Waste Licence). Consequently, the assessments included in this EIS have considered the worst case scenario for the various potential impacts.

The alternative construction methods as outlined in Chapter 6 'Project Construction' of this report have been informed by the technical dialogue process.

4.6 CONSIDERATION OF ALTERNATIVE END USES

4.6.1 Post Remediation Uses

As outlined in Chapter 2' Legislative and Policy Context' of this EIS which sets out the policy context for the proposed development, a number of alternative end-uses have been identified at strategic and local policy levels for Haulbowline Island including the East Tip site.

The *Cork Area Strategic Plan 2001 – 2010* put forward that in the event that present industry installations at Haulbowline Island were to close, then major medium to high density mixed-use redevelopment, perhaps including high quality workplaces, apartments and cultural projects could be pursued.

However, in the more recently published Middleton Electoral Area Local Area Plan 2011 (LAP) (Section 34.3.4.) these end-uses are not supported due to a lack of public infrastructure including wastewater, water supply, public services (i.e., shops and community facilities) and public transportation where vehicular access to the island is also quite limited.

The LAP also recognises that the contamination on the eastern part of the island and the presence of subterranean structures in the vicinity of the old steel mill may also create uncertainty for investors. It also recognises security issues that may arise between multiple civilian users in such close proximity to the naval base. Given the difficulties outlined, the potential for redevelopment of Haulbowline Island for employment or residential uses is considered limited.

The LAP also sets out that historic uses on site such as the island's naval function would be more appropriate from a planning context and also suggests that the Island has potential for heritage/ cultural development, particularly given the location of the island in the heart of Cork Harbour and the potential to create linkages with similar maritime heritage and cultural projects based around Spike Island and Fort Camden amongst others.

Further, the Draft Cork Harbour Study – April 2011 with reference to the East Tip site, suggests that the site could have a 'passive amenity function', particularly in relation to Cobh. In the longer term it states that if a satisfactory containment strategy was in place to allow building foundations to be placed on it, for instance a small-medium stand-alone industrial site could be located on the site.

Table 4.2: Summary of Alternative End Use Options

Options	Description	Environmental Considerations	Planning Considerations
1. Major medium to high density mixed-use redevelopment.	Employment, residential and cultural projects could be included.	Landscape and Visual. Wastewater treatment capacity. Water supply inadequate. Traffic and Transport impacts. Water quality impacts. Impacts to Natura 2000 sites.	Security issues for naval service. Traffic issues, having regard to single bridge access. Uncertainty for investors due to historic waste on site. Limited commercial interest in new residential and employment related uses in the current economic climate. Costs associated with development of such a site.
2. Historic uses on site.	Naval Service uses including education.	As existing.	As existing.
	Industrial.	Landscape and Visual. Wastewater treatment capacity. Water supply inadequate. Traffic and transport impacts. Water quality impacts. Impacts to Natura 2000 sites.	Limited access. Uncertainty for investors due to historic waste on site. Costs associated with development of such a site.
3. Passive amenity function.	Landscaped park and playing pitch for Navy.	No requirement for waste water treatment or water supply. Visual enhancement of the area.	No access issues. No security issues for naval service. Community gain.
4. Doming of the landform.	Domed Cap (i.e. laying of waste and/or cover material above original ground contours).	Landscape and visual impacts. Noise and Air impacts.	Reduced landscape and visual value for end users and Reduce level of amenity for end users

Option 3 emerged as the preferred option largely due to improved landscape and visual impacts, provision of an amenity site for the local community and enhancing the overall area.

4.6.1.1 Landscape Plan

A series of options were considered for the regrading and profiling of the site and for the proposed optimal location for trees, playing pitch, viewing areas, walkways, higher ground etc. It was concluded the option proposed in the landscape masterplan (Figure 5.7) was the optimum option as it aimed to:-

- Maximise the existing location of stockpiles reducing the volumes that require double handling or transportation around the site;
- Maximise the existing location of stockpiles minimising the need to import material onto the site for landscaping purposes;
- Locate the higher profiles to the north, east and south of the East Tip improving shelter within the site for walkers, bird watchers, etc;
- Avoid use of paths along the edge of the island which not only reduces impacts to wildlife but avoids potential impacts from a health and safety aspect with respect to the public from accessing water and intertidal areas. Further the path networks was has been designed to:-
    - Maximise visitors stay at the site by offering points of interest, maximising the length of path network and offering panoramic viewpoints of the Harbour.
    - Allow opportunities for local community and navy staff to use the paths for walking and running.
    - Take cognisant of the wildlife sensitivities in the area and will encourage observation of wildlife by visitors from the paths. Potential for disturbance has been minimised by use of screen planting and fences.

The biodiversity at the East Tip site will be significantly increased through the use of extensive native woodland and scrub with wildflower meadows and a wetland habitat rather than the alternatives of ornamental or non-native species.

Further, measures for bird enhancement have also been considered including a bird roosting ledge which will be created on the eastern side of the island.

4.6.2 Access and Road Widening Alternatives

Alternative access routes to the East Tip site are limited. A single bridge connects the Island to the mainland to the south. The relocation of this bridge or construction of a new bridge would be very costly and therefore was not considered as part of this proposal. Upgrading the existing bridge prior to any works has however been considered (See Chapter 5 ‘Project Description’).

From the Haulbowline Bridge to the site there is a single access road and the general location of this roadway is constrained due to the location of the naval base to the north and the foreshore to the south. Therefore alternatives in respect of the access route were based on design and layout rather than alternative locations.

In relation to the design of the roadway from the end of the bridge into the site three alternative options were considered. Detailed consultation and discussion took place with respect to these options with Cork County Council and the Naval Base. Figure 4.1 (a-c) illustrates the three Alternative Access Options considered.

4.6.2.1 Option 1 –Widen the Existing Road

Widen the existing roadway to facilitate two-way traffic with a footpath on one side. This improved roadway could be used by both the Navy and the public to a point where a ‘spur’ to navy property is provided (barrier could be relocated to this ‘spur’). This would minimise the amount of reclamation required.

This option was not considered feasible by the navy due to security issues associated with a shared access. The naval service was also keen to keep access separate to ensure ease of access in the event of an emergency.

4.6.2.2 Option 2 – Construct a New 2-Way Access Road

Construct a completely new 2-way access road with a footpath on one side which is totally independent of the existing road. The existing road will be used exclusively by the Navy and the new road by the public. This would mean reclamation of some of the harbour and may be expensive with knock-on environmental impacts.

4.6.2.3 Option 3- Construct a New 1 Way Access Road

Construct a new 1-way access road to the north of the existing road which will be exclusively for Navy use. Then widen the existing road to facilitate 2-way traffic with a footpath on one side to be used exclusively by the public. This would minimise the amount of reclamation required.

The Naval service's security and ease of access issues as identified in respect of Option 1 also apply to Option 3.

4.6.2.4 Preferred Alternative for Road Access

On review of the various layout and design options as set out above, Option 2appears to be the most favourable in meeting the development criteria requirements and therefore this option has been progressed as the preferred alternative as part of the design for the subject scheme.

However, the location of the actual proposed roadway was moved further northwards from that originally proposed as Option 2 so that land reclamation would not be required in the foreshore to the south to facilitate this roadway and thus avoid any potential environmental impacts associated with land reclamation.

This option was largely chosen to ensure security and ease of access for the naval base.

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Title
PROPOSED ACCESS ROAD LAYOUT ALTERNATIVES OPTION 1

Figure 4.1a

File Ref : MCE0734 Figure 4.1
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

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PROPOSED ACCESS ROAD LAYOUT ALTERNATIVES OPTION 2

Figure 4.1b

File Ref : MCE0734 Figure 4.1
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

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PROPOSED ACCESS ROAD LAYOUT ALTERNATIVES OPTION 3

Figure 4.1c

File Ref : MCE0734 Figure 4.1
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

RPS

3 STAKEHOLDER CONSULTATION

The purpose of this chapter is to describe the consultation process (see Section 3.1) carried out in relation to the proposed East Tip remediation and end-use proposals and to outline the key issues raised during the various stages of the EIA (see Sections 3.2 to 3.4). Consultation feedback to the design and EIA process is summarised in Section 3.5. Proposed ongoing consultation activities associated with the application processes for the proposed development are also outlined (see Section 3.6).

Consultation forms an essential part in the preparation of an EIS. The early involvement of the public and other stakeholders helps to ensure that the views of various groups or individuals are taken into consideration throughout the preparation of this EIS.

Prior to the consultation undertaken as part of the EIS consultation was also undertaken through the following initiatives:-

- A Technical Group was set up in August 2011 which comprised Cork County Council, the Department of Agriculture, Fisheries and the Marine, the Department of Environment, Community and Local Government, the Offices of Public Works, , and the Department of Defence. [1]

- Representatives of Cork County Council, the Environmental Protection Agency[2] and the Department of Environment, Community and Local Government attended a number of meetings (September 2011, May 2012 and November 2012) with the European Commission at the offices of the Compliance Promotion, Governance & Legal Issues Unit in Brussels.

- In September 2011 The Department of Agriculture, Fisheries and the Marine set up a Project Steering Group. In addition Cork County Council established a Project Website (http://www.corkcoco.ie/haulbowline), which they currently maintain (refer to Section 3.2.3). Members of the Project Steering Group comprise the Minister for Agriculture, Food and the Marine Mr. Simon Coveney, representatives of Cork County Council, Department of Environment, Community and Local Government, Office of Public Works, Department of Defence and Department of Jobs, Enterprise & Innovation, Naval Service, Port of Cork, National Maritime College, Cork Harbour Alliance for a Safe Environment and local representatives[3].

3.1 CONSULTATION PROCESS

The consultation process to inform stakeholders of the proposed development was developed and led by RPS and Cork County Council. The aim of the process was to:-

- Engage stakeholders as early as possible on the project and encourage feedback;

- Provide an open and transparent process for members of the public to participate in the project;

[1] The EPA attended meetings of the technical group on 19th August and 28th October 2011.

[2] The EPA attended the meeting in September only.

[3] The EPA attended meetings of the Steering Group on the 19th of August and the 28th of October 2011.

- Seek input from the public and from relevant stakeholders with respect to the proposed solution for remediation and measures to reduce impacts during the construction phase;

- Provide opportunities for the public and stakeholders to provide baseline and other information with respect to the potential impacts that could arise as a result of implementing the project; and

- Keep the public informed of the remediation project as it progresses.

The consultation process involved two elements; public consultation (including public meetings) and consultation with various consultees through the EIS scoping process as described in Section 3.2 and Section 3.3 respectively. In addition, RPS also undertook a 'technical dialogue' process with contractors who are specifically experienced with working in the marine environment and on remediation sites. The purpose of this method of consultation was to understand the types of construction techniques that could be undertaken, the range of emerging technologies that could be of benefit to the project and the potential measures to mitigate against environmental impacts. The 'technical dialogue' process was facilitated through a prior information notice (PIN) which was published on e-Tenders in the 10th of August 2012. The notice was also published on the Official Journal of European Union website (OJEU) (See Appendix F: Technical Dialogue Report for further information on the technical dialogue process).

This method of consultation is very useful in informing the design process and in understanding the construction methods and any resulting potential impact on the environment. The key results of this process are provided in Section 3.4.

3.2 PUBLIC CONSULTATION

A number of approaches were undertaken to inform the public consultation process as outlined below.

3.2.1 Correspondence

As part of the EIS, Cork County Council and RPS began consultation in August, 2012 with the identification of key members of the public with an interest in the proposed development. RPS firstly undertook an audit to identify the key non-statutory consultees, which included stakeholders and interested groups in the proposed development as follows:-

- People living and working in the area;
- Local community groups;
- Local business and tourism groups;
- Users of the Harbour;
- Local environmental groups;
- Local public representatives; and
- Locals who expressed an interest in the project.

RPS then issued consultation letters in September 2012 and January 2013 to the identified stakeholders to inform them of the project, to provide details on the proposed remediation solution and to invite them to the public consultation evenings (see details below in Section 3.2.2.1 and 3.2.2.2). In addition Cork County Council contacted key representatives of the community to inform them of the public events. The letter templates issued and the list of local stakeholder groups contacted are included in Appendix E: Consultation.

A dedicated email address haulbowline@rpsgroup.ie and postal address allowed any interested parties the opportunity to provide feedback/comment on the project. Details of the feedback received through this approach is summarised in Table 3.1. Where required, a member of the RPS or Cork County Council team responded or contacted those who submitted feedback on the project.

3.2.2 Public Meetings

Public meetings were held in Cobh and Ringaskiddy to inform stakeholders about the proposed development and invite comments (See Section 3.2.2.1 and 3.2.2.2 below).

3.2.2.1 First Public Meeting (11th October and 19th November, 2012)

The first public meetings focused on presenting the project team, outlining the project objective and updating the public on project progress to date. It also outlined details on the application processes for the statutory consents prior to project implementation. The main purpose of these meetings was to seek input from the public with respect to the proposed development and to provide an open and transparent process for members of the public to participate and discuss the key issues they deemed relevant to their community.

These meetings were held in the Commodore Hotel in Cobh, Co. Cork on the 11th of October 2012 between 6.30pm and 9.00pm and in the Community Centre in Ringaskiddy, Co. Cork on the 19th of November 2012 between 6.30pm and 8.30pm. Stakeholders were notified of the Cobh open evening through a consultation letter as outlined in Section 3.2.1 above. Both meetings were published by way of Cork County Council's advertising campaign, which included radio, newspaper and website notifications to inform the public of these events. In addition Cork County Council made direct contact with local community group representatives and posted notices around both Cobh and Ringaskiddy.

A number of presentations were made by the project team at both open evenings setting out the following:-

- Summary of work completed to date;
- Overview of the project proposal;
- Overview of the key environmental issues being addressed;
- Overview of the project timeframe; and
- Details on how to get more information or follow up with observations.

Following the presentations, Cork County Council facilitated a 'Questions and Answers' session which allowed members of the public to pose questions to the key speakers from the project team. The Open Evening in Cobh was attended by forty-one interested parties and the Open Evening in Ringaskiddy was attended by fifteen interested parties.

Feedback forms were also circulated to all attendees. The Feedback Form template is provided in Appendix E: Consultation). An overview of the key issues raised at the public open days is summarised in Table 3.1, including the key issues raised in the feedback forms.

3.2.2.2 Second Public Meeting (January 2013)

The second public meeting was held in Cobh on the 31st of January 2013 and a bus was provided to facilitate people who wished to attend from the Ringaskiddy area. The meeting focused on presenting an update on the works completed, the finding of the DQRA and an overview of the proposed remediation solution and end use for the site. It also outlined details on key environmental issues addressed during the EIA process and the key mitigation and monitoring measures proposed to reduce any potential effects identified. The main purpose of the meeting was to seek input from the public with respect to the proposed development and to provide an open and transparent process for members of the public to participate and discuss the key issues they deemed relevant to their community.

A number of presentations were made by the project team at the open evening setting out the following:-

- Summary of work completed to date;
- Summary of the DQRA and key findings;
- Overview of the project, the remediation solution and end use proposal;
- Overview of the key environmental issues being addressed; and
- Overview of the project timeframe.

Following the presentations Cork County Council facilitated a 'Questions and Answers' session which allowed members of the public to pose questions to the key speakers from the project team.

The Open Evening in Cobh was attended by thirty one interested parties. An overview of the key issues raised is summarised in Table 3.1.

3.2.3 Project Website

Access to up-to-date, accurate and reliable information about the East Tip Remediation Project is considered essential to ensuring good consultation can occur. To aid the consultation process a stand-alone webpage was set up, in September 2011, on the Cork County Council website dedicated to the remediation project:-http://www.corkcoco.ie/haulbowline.

This website enables the public to access (at any time) up-to-date information on the consultation process, the proposed development and the overall project programme.

3.2.4 Issues Raised by Public Consultation

The issues raised through public consultation were recorded and are summarised in Table 3.1 below. Issues raised were broadly grouped into health and safety, traffic and transport, financial and programme, flooding and climate change, environmental pollution and technical considerations. Table 3.1 also indicates where these issues (where relevant) are addressed in the EIS.

Table 3.1: Summary of the Key Issues Raised During Public Consultation Process

Topic	Issue Description	Refer to EIS Chapter
Community, Health and Safety	Types of material on site i.e. asbestos, chromium VI and other hazardous waste.	Appendix A DQRA Chapter 1
	Remediation of the adjoining steelworks site which is not subject to a similar remediation plan.	Chapter 16 - Indirect, Cumulative Impacts & Impact Interactions Site will be subject to a Tier 1 Assessment during 2013 (Cork County Council)
	Potential for dust and contaminants to be mobilised during the remediation/construction phase.	Chapter 9 - Air Quality & Climate.
	Previous impacts to people including the safety of workers on the steelworks site during its operation and residents in pathway of plumes from the steelworks site.	Site will be subject to a Tier 1 Assessment during 2013 (Cork County Council)
	Safety of workers during the remediation works and requirement for appropriate protective clothing and equipment.	Chapter 6 – Project Construction and Chapter 7 - Community and Socio-Economic
	End use for the site.	Chapter 5 - Project Description
	Impacts to water sports in the periphery during construction.	Chapter 5 - Project Description and Chapter 7 - Community and Socio-Economic
	Potential employment opportunities.	Chapter 7 - Community and Socio-Economic
Traffic and Transport	Concerns relating to construction vehicle movements on local roads. Concerns over the safety of people crossing the road in Ringaskiddy. It was suggested that a pedestrian crossing should be provided. Provision of boat access to the Island	Chapter 8 - Traffic and Transport Chapter 5 - Project Description and Chapter 1 Introduction
Programme and Site Responsibility	Timeframe for completion of the project and the application processes. Responsibility for maintenance of the end use of East Tip.	Chapter 6 – Project Construction Chapter 5 - Project Description
Flooding and Climate Change	Concerns over the breach of the sea wall, climate change and sea level rise.	Chapter 5 - Project Description Chapter 13 - Soils, Geology and Hydrogeology

Topic	Issue Description	Refer to EIS Chapter
Environmental Pollution	Potential for leachate to enter the sea and adjoining Navy site. Aquifer vulnerability of the site. Future monitoring and/or abstraction requirements. Contamination from contaminated marine sediment and indirect impact to marine life and humans and commercial fish farms. Impacts to Natura 2000 sites and marine life. Monitoring during construction works	Chapter 13 - Soils, Geology & Hydrogeology Chapter 14 - Ecology Volume 4- Natura Impact Statement Chapter 6 - Construction and Chapters 9, 10, 11, 13, 14 and 15
Technical Considerations	Use of sheet piling for construction of remediation barrier and re–use of slag material in the capping and/or barrier. PES design, re-profiling requirements. Impermeable v permeable solution. Condition of Bridge to accommodate construction phase.	Chapter 5 - Project Description Chapter 6 – Project Construction DQRA Appendix A and Chapter 4 - Assessment of Alternatives Chapter 8 - Traffic and Transport
Financial	Cost incurred to date on surveys, clean up operations and exporting of waste to date. Funding available to complete the project and to remediate the steel works site.	Not relevant to the EIS.

3.3 EIS SCOPING CONSULTATION

As part of the EIS Scoping process, which involves assessing the project's possible impacts and deciding which impacts are likely and significant, RPS consulted with a number of interested parties through written correspondence or discussions. These interested parties included prescribed bodies for the purposes of the Planning and Development Act 2000-2010, the Waste Management Act 1996 and the Foreshore Act 1933, and other key organisations that would have an interest in the proposed project.

In September 2012, RPS issued EIS scoping consultation letters to the statutory and non statutory consultees outlining the project. A follow up letter was issued in January 2013 updating the key stakeholders on the remediation solution. Detailed letter template and parties consulted are outlined in Appendix A. The purpose of these letters was to advise consultees of the proposed development and to seek submissions in relation to the scope of the EIS. These letters were also used as a means of notifying consultees of the initial public consultation evenings in Cobh on 11th of October 2012 and 31st of January 2013 (see Section 3.2.2 and Section 3.2.3).

Table 3.2 below provides a summary of the key issues raised by the stakeholders and identifies where these issues have been addressed throughout this EIS. The letter template issued and the list of the stakeholders contacted is included in Appendix E: Consultation.

Table 3.2: Key Issues Raised Through EIS Scoping Process

Organisation	Responses and Key Issues Raised by Consultees	Form of Consultation	Refer to EIS Chapter
Department of Transport, Minister and the State	Acknowledgement only.	Letter	N/A
Department of Communications, Energy and Natural Resources	Acknowledgement only.	Letter	N/A
Fáilte Ireland	Impacts to tourism should refer to the Fáilte Ireland Guidelines for the treatment of tourism in the EIS.	Email	Chapter 7 - Community and Socio Economic
Department of Agriculture, Food and the Marine	Acknowledgement only.	Letter	N/A
An Taisce	Request for information on proposed site boundary (extent of works) within which the proposed barrier is to be located.	Letter	Chapter 1 - Introduction
Department of Arts, Heritage and the Gaeltacht	Acknowledgement	Email	N/A
Friends of the Irish Environment	Expressed interest in the Project and queried the status of the Appropriate Assessment. Contamination issues at the Steelworks site	Email	Volume 4- Natura Impact Statement The steelworks site will be subject to a Tier 1 Assessment during 2013 (Cork County Council)
South Western RBD	Recommended that the objectives of SWRB Management Plan (2009 - 2015) should be considered and integrated into any proposals.	Letter	Chapter 13 - Soils, Geology and Hydrogeology
Port of Cork (POC)	Recommended that due regard is given to the local hydrodynamic and sedimentation impacts and that there is no deterioration in quality of sediments. Recommended that the source, quantity and proposed method of transportation of capping and fill to site be addressed.	Email and Letter to ABP	Chapter 6 - Construction Chapter 14 - Ecology Chapter 8 – Traffic and Transport
Inland Fisheries Ireland	Impact on aquatic life to date, during construction and post construction of any escapement from the site should be addressed. Recommended sampling of fish and other aquatic life, tidal mudflats and testing for bio accumulation. Recommended control measures to be put in place during construction to prevent any escapement to waters from the site as a result of the works.	Email and Letter to ABP	Chapter 14 - Ecology
North Lee Environment Health HSE	Recommended that the EIS should identify how consultation has influenced the decision making process. Recommended monitoring and mitigation measures of Noise and Vibration, air quality and dust should be undertaken. Recommend assessing the potential impacts of the direct or indirect release of contaminants into the adjacent water body sampling should include hydrological and microbiological assessment.	Letter	Chapter 3 - Consultation Chapter 10 - Noise and Vibration and Chapter 9 - Air and Climate Chapter 14 – Ecology, Chapter 13 - Soils, Geology and Hydrogeology

Organisation	Responses and Key Issues Raised by Consultees	Form of Consultation	Refer to EIS Chapter
	It was recommended that the type and volume of waste on site should be assessed. Any possibly harmful contaminants should be removed from the site. Recommended that additional traffic movement on humans in and around the local area should be assessed and mitigated.		Chapter 1 - Introduction Chapter 5 - Project Description and Chapter 6 - Construction Chapter 8 - Traffic and Transport
Irish Whale and Dolphin Group	Recommended that consideration should be given to potential impacts with respect to whales, dolphin and porpoise.	Letter	Chapter 14 - Ecology
National Roads Authority	Recommended that each environmental discipline to Refer to specific NRA guidelines. Recommend consultation with local authority / National Roads Design Office. Particular concern in relation to potential impacts on national roads.	Letter and copy of letter to ABP	Chapter 8 - Traffic and Transport EIS in general
Bord Iascaigh Mhara	Advised of the location of licensed Aquaculture sites in Cork Harbour. Recommended that the impact of the remediation works to water quality aquaculture is addressed.	Letter	Chapter 14 - Ecology
Department of Public Health, HSE South	Recommend that public concerns are addressed at the outset. Recommended that the EIS should address the potential impacts (economic opportunities, health effects, nuisance and risks/hazards) on human beings and provide user friendly information on the issue in the EIS.	Email	Chapter 7 - Community & Socio Economics Chapter 9 – Air Quality and Climate, Chapter 10 - Noise and Vibration Chapter 14 – Ecology, Chapter 13 - Soils, Geology and Hydrogeology
Navy	Expressed concerns re: hazards once soil is disturbed and what are the procedures / control measures proposed to be put in place.	Email	Chapter 6 - Construction 9 - Air Quality & Climate
Cork Environmental Forum	Ensure compliance with the EU Habitat Directive and address impacts to Cork Harbour SPA. Recommended that the remediation solution should include for remediation of the Steelworks Factory site itself also under the precautionary principle.	Email	Volume 4 -Natura Impact Statement Chapter 16 - Indirect, Cumulative Impacts and Impact Interactions Site will be subject to a Tier 1 Assessment during 2013 (Cork County Council)
University College Cork	Recognised the environmental benefits of the remediation project to the area.	Letter	N/A

Organisation	Responses and Key Issues Raised by Consultees	Form of Consultation	Refer to EIS Chapter
Geological Survey of Ireland	Recommended that reference should be made to the GSI website www.gsi.ie/mapping for information in relation to soils, geology, hydrogeology and hydrology.	Email	Chapter 13 - Soils, Geology & Hydrogeology
National Parks and Wildlife Service (NPWS)	Introduction of contamination into food chain (particularly fish eating birds) and movement of contamination to designated areas (Monkstown Creek, Lough Beg). Introduction of invasive species (e.g. Japanese knotweed) during the importation of capping materials. Opportunity to enhance wildlife by increasing roosting potential (e.g. for oyster catchers) and that landscaping plan should maximise areas for bird usage. Dust control and noise issues during the construction works Potential pressure of berm around perimeter (if required) and potential uplift beyond berm and possible entrainment of contamination	Meeting	Chapter 14 - Ecology Chapter 11 - Landscape & Visual Impact Chapter 9 - Air Quality & Climate Chapter 14 – Ecology
Foreshore Unit of the Department of the Environment, Community & Local Government.	Potential for release of contaminants during the works Fill material used for the construction of the barrier should be clean and any rock armour is similar to other rock armour used in the harbour area.	Meeting	Chapter 14 - Ecology Chapter 5 - Project Description and Chapter 6 - Construction
Irish Planning Institute	Acknowledgement	Email	N/A
Meitheal Mara	Improved access to users of small boats in Cork Harbour including the potential for provision of a slipway and links to Spike Island.	Letter and email	Chapter 5 Project Description and Chapter 1 Introduction

3.3.1 EIS Scoping Requests

RPS on behalf of Cork County Council submitted EIS scoping requests to An Bord Pleanála and the Environmental Protection Agency (see Appendix E: Consultation for correspondence). Responses from EPA, Port of Cork, Inland Fisheries Ireland and the National Roads Authority were submitted as part of the An Bord Pleanála scoping response and are summarised below in Table 3.3.

The response from An Bord Pleanála on the EIS scoping request and the minutes of the meeting held with the EPA on the EIS scoping are provided in Appendix E: Consultation and summarised in Table 3.3 below.

Table 3.3: Summary of Issues Raised by An Board Pleanála and the EPA in the EIS Scoping Process

Organisation	Responses and Key Issues raised	Refer to EIS Chapter
An Bord Pleanála	**General** The EIS should describe precisely the nature of the works	Chapter 5 - Project Description
	The EIS should cover a wide variety of remediation techniques, including encapsulation of material, removal and replacement of materials, in situ and ex situ on site treatment of materials, removal and treatment of materials, and a variety of techniques including sorting, compaction, chemical, biochemical and thermal treatments including the construction of a wide variety of forms of impoundment or controlled biological structures.	Chapter 4 - Assessment of Alternatives and Chapter 6 – Project Construction
	The EIS should state specifically which techniques and methods are being excluded from consideration, and outline the primary assumptions about the nature and extent of the works.	Chapter 4- Assessment of Alternatives and Chapter 5 - Project Description
	The EIS should have a comprehensive & systematic overview of the alternatives to the proposed works. A set of alternatives for post-remediation uses for the site (with an analysis of health and safety implications of these alternatives) should be integral to the EIS.	Chapter 4 – Assessment of Alternatives
	The EIS should address all statutory requirements, with particular detail on:- - The potential impact on water quality and fish / shellfish in Cork Harbour. - The potential impact of dust on human health. - The visual impact of works from key viewpoints. - Traffic impacts arising from import of materials.	Chapters 14 -Ecology & Chapter 13 -Soils. Geology and Hydrogeology & DQRA Chapter 9 - Air Quality and Climate Chapter 11 – Landscape and visual Chapter 7 - Community and socio-economic Chapter 8 - Traffic and Transport
	The EIS must specify all baseline information and its sources, in addition to setting out any issues of scientific uncertainty or gaps in data.	Chapters 7 – 15
	The EIS must clarify the precise boundaries of the site including:- - That part of the site which is now shoreline which may be incorporated into the site. - All areas which will be covered by any planning applications, foreshore licence applications and the EPA waste licence.	Chapter 1 **-** Introduction and Chapter 2 Legislative and Policy Context
	The EIS should include an outline construction management plan to address all required mitigation measures.	Chapter 6 - Construction and Appendix I Outline Construction Environmental Management Plan
	The EIS shall include plans, elevations, sections and layouts for the existing and for the final proposed landform of the restored site, which shall have regard to any possible long term settlement of the site post-restoration, in particular where this may alter surface water drainage patterns.	Chapters 5 - Project Description, Chapter 11 - Landscape and Visual
	Humans **Dust Impacts –** The EIS should focus on mitigation measures and techniques to minimise the generation of dust and to protect receptors from such dust arising.	Chapter 9 - Air Quality and Climate
	Noise – The EIS should identify possible receptors for noise impacts from construction works. This should include consultations with the Naval Service.	Chapter 10 - Noise & Vibration

Organisation	Responses and Key Issues raised	Refer to EIS Chapter
	Recreational Benefits – The EIA should address how engineering requirements for the final landform can be reconciled with providing the highest level of design amenity for the probable recreational after uses and what health and safety requirements will be applied.	Chapter 5 - Project Description and Chapter 11 - Landscape Chapter 7 - Community and Socio-Economic
	The EIS shall address impacts on the tourism and recreational use of adjoining areas and the potential impact on shellfish and sea fish intended for human consumption or sport fishing.	Chapter 7 – Community & Socio-economic and Chapter 14 - Ecology
	The EIS shall use clear quantitative models for risk assessment modelling in line with statutory and regulatory requirements.	Appendix A DQRA
	Flora and Fauna The EIS shall have full regard to existing information on the ecological status of surrounding waters and the impact of heavy metals and other toxins on sea life. An assessment shall be made of the potential for the bio-concentrations of toxins from the site and how this will impact species higher up the food chain and those identified for conservation in nearby SACs and SPAs.	Chapter 14 - Ecology
	The EIS shall address any impacts of the construction works on wintering bird populations; in particular those listed under the conservation objectives for the Cork Harbour SPA.	Chapter 14 - Ecology
	Mitigation measures shall include a consideration of the final landform and use of the site and its potential as a wildlife habitat. A full programme for measuring impacts during and after reclamation on wildlife shall be included.	Chapters 11 – Landscape & Visual and Chapter 14 – Ecology
	Full regard should be had to any potential impact on EU designated sites within Cork Harbour and on migrating birdlife, in addition to impacts on designated shellfish waters.	Chapter 14 Ecology and Volume 4
	Soil The EIA shall set out requirements for capping materials with regard to reasonable predictions for landscaping and/or natural regeneration of the surface. This shall include:- - Details of the hydraulic and drainage characteristics of the final landform and any restrictions which may be required on its recreational uses. - The assessment of the long-term stability of any soil cover with regard to both surface water drainage and sea water ingress, in addition to storm and flood damage.	Chapter 5 - Project Description
	Water The EIS should include baseline information, modelling information on the impact of the works and proposals for longer term monitoring.	Chapter 14 - Ecology and Chapter 13 - Soils, Geology and Hydrogeology
	The EIS shall have regard to drainage, in particular:- - Alterations to drainage of the site during construction and following the finishing of an impermeable cover. - Shall include provisions to reduce run-off for the site to prevent excessive silt or other materials entering the sea. - Shall address storm water run-off to the sea during works with particular regard to the potential impact of major rainfall during works when areas of hazardous materials may be exposed. - In the event that an impermeable top layer is proposed, the EIS shall address the issue of permanent drainage for the site, which shall take account of issues such as erosion or settlement over time.	Chapters 5 - Project and Description, 6 - Construction
	The EIS shall include modelling data for tidal wave-flow within the tip area, and the interactions of water within the body of the tip and the sea.	Chapter 5 - Project Description and DQRA

Organisation	Responses and Key Issues raised	Refer to EIS Chapter
	Landscape Different landscape options for the final landform and the visual impact of differing landscaping / finishing options should be assessed fully.	Chapters 4 – Assessment of Alternatives and Chapter 11 – Landscape and Visual
	Cultural Heritage The visual impact and final landform should enhance the overall setting of the harbour and views from Cobh Cathedral.	Chapter 11 – Landscape and Visual
	Haulbowline has a rich history associated with its naval past and remnants of the Irish Steel plant have cultural importance for the industrial history of Cork. Proposals should be assessed to ensure the obliteration of all trace of this history does not occur.	Chapter 11 - Landscape and Visual and Chapter 15 - Archaeology
	Material Assets **Roads Impact –** An initial traffic impact assessment shall be made to identify maximum capacities for potential haul routes. An assessment should be made of any requirements to upgrade or alter roads (including the access bridge) onto the site, and other possible requirements for minimising dust and noise from additional traffic.	Chapter 8 - Traffic and Transport Chapter 7 - Community and Socio-Economic, Chapter 9 - Air Quality & Climate and Chapter 10 - Noise & Vibration
	The EIS should have regard to statutory and regulatory requirements, and should also indicate if a Road Safety Audit is required.	Chapter 8 - Traffic and Transport
	An assessment is required on the impact of the proposals on the hydraulic and sedimentation pattern of the harbour with particular regard to existing dredging and navigation requirements by the Port of Cork Company.	Chapter 14 – Ecology and Chapter 7- Community and Socio-Economic Chapter 16 Indirect and Cumulative Impacts and Impacts Interaction
IFI	The EIS should address the following:- - Impact on escapement from the tip on aquatic life. This should involve preworks, during construction and post construction sampling of fish and other aquatic life and testing for bio-accumulation. Control populations from outside the Cork Harbour environs would be needed for comparison purposes.	Chapter 14 - Ecology
	Sampling and analysis of tidal muds and waters in the vicinity of the sites preworks, during and after construction.	Chapter 14 - Ecology
	Control measures to be put in place during construction to prevent any escapement to waters from the site as a result of the works combined with a water monitoring programme during the construction phase.	Chapter 6 - Construction, Chapter 13 - Soils, Geology and Hydrogeology and Chapter 14 – Ecology
	An assessment of the impact of the construction phase on local usage of the fishery.	Chapter 7 - Community and Socio-Economic and Chapter 14 – Ecology
NRA	Recommended that each environmental discipline to Refer to specific NRA guidelines. Recommend consultation with local authority/National Roads Design Office. Particular concern in relation to potential impacts on national roads.	Chapter 8 Traffic and Transport of EIS and relevant environmental chapters (i.e., Noise, Landscape, Air, etc.)
EPA	Explain differences in application Boundaries for planning, waste licence and foreshore licence.	Chapter 1 – Introduction

Organisation	Responses and Key Issues raised	Refer to EIS Chapter
	Impacts during the construction phase should be outlined.	Chapters 7-17
	The EIS should identify the environmental monitoring that will be carried out during the construction works and after completion of the works. It should be an objective of the post-works monitoring to demonstrate that the objectives of the remedial works have been achieved and, on an ongoing basis into the future, continue to be effective in preventing environmental pollution.	Chapter 6 and Chapters 9, 10, 13, 14, 15 and 16.
	The selection of environmental quality standards to be used in the quantitative risk assessment should be described and the reasons for using certain criteria should be justified.	Appendix A DQRA
	The area where the deposited waste meets the sea wall of the island (at the western edge of the East Tip) and the potential for pollutants to move across the barrier towards the naval dockyard should be assessed in the EIS.	Chapter 13 - Soils, Geology &, Hydrogeology
	Hydrology & Water Quality – The EIS will explain that the groundwater is hydraulically linked with the harbour water and will refer to water quality monitoring completed in 2012. The EPA requested that the reasons for the selection of the environmental quality standards used in the assessment be outlined in the EIS. The EIS should address the fate of groundwater within the waste body once the existing tidal inflow/outflow pattern has been retarded in terms of the potential for pollutants to become more concentrated within this groundwater and the potential pathways of pollutants to receptors.	Chapter 13 - Soils, Geology &, Hydrogeology
	Air Quality & Climate – EIS to justify the appropriateness of the models used in the assessment. Assessment to refer to Agency's AG4 guidelines on air dispersion modelling. EIS to distinguish between sources of emissions i.e. those associated with construction and traffic at East Tip i.e. within the proposed waste licence boundary and those associated with traffic using the haul route or other activities outside of the proposed waste licence boundary. No odour is expected from the proposed works, however the EPA recommend that the potential for odourous emissions to arise should be assessed as part of the EIS and a contingency plan should be put in place in case it arises.	Chapter 9 - Air Quality & Climate
	Noise & Vibration – EIS to specify working hours for construction activities particularly with reference to potential source activities.	Chapter 10 - Noise & Vibration
	Soils, Geology & Hydrogeology – DQRA to consider risk of contaminants being released along the existing sea wall at the western boundary of the site. The permeability of the sea wall at the western boundary of the East Tip and the potential for contaminants to move across this barrier towards the naval dock was discussed.	Appendix A DQRA. Chapter 13 - Soils, Geology &, Hydrogeology
	Material Assets – Regarding the reuse of slag in the construction of the remediation solution the EPA requested that details be provided in the application and/or EIS that show this material is fit for purpose from an engineering and environmental perspective.	Chapter 12 - Material Assets Chapter 5 - Project Description Chapter 6 – Construction
	Alternatives - EIS to consider the alternative options considered for the remediation of the site e.g. moving all waste off-site and explain the rationale for the chosen approach.	Chapter 4 – Assessment of Alternatives
Port of Cork	In evaluating and advancing the design the EIS should have due regard to local hydraulic and sedimentation impacts of the proposal to prevent changes to current sedimentation patterns e.g. in the turning basin upstream of the Cobh Cruise Terminal.	Chapter 7 - Community and Socio-Economic and Chapter 14 - Ecology
	The POC should be notified of any dredging works proposed.	Chapter 6 – Construction
	The Port requested information on the quantity and source of capping material as the information becomes available.	Chapter 5 - Project Description and Chapter 3 - Consultation

3.3.2 Scoping Meetings

A number of meetings also took place with the NPWS, the EPA and the Foreshore Unit of the Department of the Environment Community and Local Government to discuss the proposed project. The issues discussed at these meeting included the following:-

- Licensing Requirements;
- Design Risk Assessment;
- Design and Remediation Issues;
- Environmental Issues;
- Previous Experience at Similar Sites;
- Potential Impacts to Natura 2000 site; and
- Mitigation and Monitoring Measures.

3.4 CONSULTATION WITH CONTRACTORS: TECHNICAL DIALOGUE

As outlined in Section 3.1, RPS also undertook a formal 'technical dialogue' process with contractors who were experienced with working in the marine environment and contaminated sites (refer to Appendix F: Technical Dialogue Report).

Site visits were conducted on the East Tip on the 17th and 18th of October and the 14th of November 2013 between RPS, Cork County Council. In total 22 companies from 5 different countries attended the site visit.

The main findings of this process are contained within Appendix F: Technical Dialogue Report. The findings were discussed between the design team for the proposed development and the various specialists in the EIS Study Team (see Chapter 1 'Introduction').

This form of consultation allowed the design and EIS team to understand the proposed construction methods and to evaluate their likely significant impacts. It also assisted in developing methods that would avoid or minimise environmental impacts. Through this process a thorough evaluation of potential impacts was undertaken and certain construction methodologies were eliminated from further consideration due to the likely significant impacts of their use.

3.5 CONSULTATION FEEDBACK TO DESIGN AND EIA PROCESSES

As outlined in the foregoing sections, consultation in its various forms has been undertaken throughout the EIA and design development periods. Feedback, information and queries arising in the course of these consultations were regularly disseminated to the EIA and design team, and the Applicant at weekly meetings. This has ensured that the concerns of the public, stakeholders and prescribed bodies have continually fed back into the project development process.

Where appropriate and possible the project proposals have been refined and finalized with public and stakeholder concerns provided for. In this regard, the detailed design proposals, the impact assessment procedures and the proposed mitigation measures have been influenced by the consultation process (including for example, undertaking hydrodynamic modeling and provision of enhancement measures for end use as raised by ABP, appointment of an Environmental Clerk of Works as recommended by the NPWS etc). Early engagement with the public and key stakeholders has allowed sufficient time for concerns to be addressed in the EIA process and now addressed in the final EIS document.

3.6 ON-GOING PUBLIC CONSULTATION

After the applications for the proposed development have been submitted, Cork County Council will continue to address any issues or concerns raised by the public through to the proposed construction phase for the project, if approvals are successful. They will also serve to keep the public and other stakeholders updated in relation to the various stages of the statutory approvals process (e.g., statutory consultation, oral hearing, etc) through the continued use of the project website.

This EIS, including a Non-Technical Summary (Volume 1), Appendices (Volume 2) and NIS (Volume 4), will be available on public display in the Offices of Cork County Council at County Hall and Cobh Town Council during the statutory consultation period. The EIS will also be available to view and download from the project website (see Section 3.2.3).

Prior to the commencement of works, Cork County Council will notify the public by project website updates of the intended project programme. The project website will also be updated as necessary to inform the public of progress prior to and during construction.

During the construction phase the contractor will appoint a key liaison officer/contact point for public enquiries, updates, monitoring of complaints, etc.

2 LEGISLATIVE AND POLICY CONTEXT

2.1 INTRODUCTION

This chapter sets out the planning and legislative context for the proposed development at the East Tip. It reviews both the strategic policy context for the proposed remediation of the East Tip site as well as the statutory planning context under which it should be considered. Other statutory policies and consent processes as required under the Waste Management and Foreshore Acts are also discussed.

This chapter also describes the planning history (see Section 2.5) of the subject site as well as outlining any planning history of relevance on neighbouring sites. Further details on the planning history are provided in Appendix D: Planning and Licensing Context.

2.2 LEGISLATIVE CONTEXT

The strategic context for this proposed development is set out below with reference to EU and national legislation, as well as strategic national policy provisions in respect of waste.

2.2.1 Current Legislative Context

2.2.1.1 Waste Management Acts 1996- 2013

In accordance with the Waste Management Acts 1996 to 2013 and the associated regulations, all landfill developments are subject to the waste licensing process.

As the East Tip was primarily developed as a landfill for the disposal of material from the Irish Steel Works facility, the site is subject to the Waste Licensing process and approval for the facility must be obtained from the Environmental Protection Agency (EPA). The East Tip will not operate as an active landfill.

The waste licence application is also required to satisfy the requirements of the ECJ who ruled in 2005 that Ireland had 'general and persistent breaches of the Waste Directive' and lacked of an effective permit system for waste undertakings, and in particular the content of the Formal Notice issued in 2010 relating to the East Tip. In 2012, the Irish state agreed with the European Commission to prepare an application for a licence to the EPA to address the deposition of waste, including hazardous waste elements and oversee necessary remedial action required. Waste material at the East Tip consists of slag waste, refractory waste, millscale, scrap metal, sludge, furnace dust, refuse waste, construction and demolition waste and topsoil. Slag constitutes the largest portion at approximately 64%. A significant proportion of the slag component of the waste body has been classified as non-hazardous (EWC code 10 02 01 and 10 02 02) (see Appendix C: Waste Classification Report for further detail). However, it is accepted that hazardous wastes are present on site and as these cannot be segregated, a hazardous waste licence is required to leave this material in-situ and remediate the site.

A waste licence application will be made to the EPA for Class D1 (as principal activity) of the Third Schedule of the Waste Management Acts 1996 as amended namely:-

Class D1. Deposit into or onto land (e.g. landfill, etc.)

The principal activity within Class D1 is Activity 2, namely the disposal of hazardous waste. Other classes of activities (listed under the Third and Fourth Schedule of the Waste Management Act 1996

as amended) are also proposed during the c*onstruction* phase *and End use, Maintenance and Aftercare* phase.

This EIS will accompany the Waste Licence Application to the EPA which will be made in accordance with Section 40 of the Waste Management Act, 1996 [1] to 2012.

2.2.1.2 Planning Approval

In addition to obtaining a waste licence from the EPA for the remediation of the East Tip site, planning approval is also required from An Bord Pleanála, prior to the issue of a Waste Licence, for the works now proposed. The proposed remediation comprises the capping of the existing waste mass on site and the construction of an engineered perimeter barrier which will essentially comprise the permanent landfill of this waste.

Section 181(3) of the Planning and Development Acts 2000-2013, as amended by the European Union (Environmental Impact Assessment and Habitats) (Section 181 of the Planning and Development Act 2000) Regulations 2013, relates to development by or on behalf of a government Minister, including development on the foreshore. It provides that approval may be sought from An Bord Pleanála:-

> *"where that Minister is satisfied –*
> *(i) that the carrying out of the proposed development is urgent in order to preserve, protect or improve the quality of the environment or protect human health, and*
> *(ii) having had regard to Part X and Part XAB, that an environmental impact assessment or an appropriate assessment, or, as necessary, both such assessments, of the proposed development is required."*

Schedule 5 of the Planning and Development Regulations, 2001-2013 outlines development for which an EIS must be prepared. These requirements are derived from EC Directive 85/337/EEC (as amended) which was recently repealed and replaced by EIA Directive 2011/92/EU on the assessment of the effect of certain public and private projects on the environment. Projects listed in Annex I of the Directive have mandatory EIA requirements; Annex II projects are considered on a case by case basis.

Where development requiring EIA is proposed by or on behalf of a Minister with respect the afore-mentioned category of development, the provisions of section 175 of the Planning and Development Acts 2000-2013 apply. Item 9 of Part 1 of Schedule 5 of the 2001-2013 Planning and Development Regulations identifies the following development to be subject to mandatory EIA:-

> *"Waste disposal installations for the incineration, chemical treatment as defined in Annex IIA to Directive 75/442/EEC under heading D9, or landfill of hazardous waste (i.e. waste to which Directive 91/689/EEC applies)."*

The development now proposed incorporates the capping of existing hazardous material (as defined in Directive 91/689/EEC) for remediation. This effectively comprises the permanent landfill of the hazardous material and in this regard it falls within the requirements of Item 9 of Schedule 5 Part 1.

Where a Natura Impact Statement (NIS) is required for a local authority development, the provisions of section 177AE of the foregoing Acts also apply.

[1] Incorporating amendments made by the European Union (Environmental Impact Assessment (Waste)) Regulations SI 283/2012.

Where works are to be carried out the foreshore, the provisions of section 226 also apply.

As a Minister of government, i.e. the Minister for Agriculture, Food and the Marine proposes to carry out this development, which is considered a matter of urgency for the protection of the environment and human health. Cork County Council will act as agents on the Minister's behalf with respect to the project. The project requires approval from An Bord Pleanála may be sought under section 181(3) of the Planning and Development Acts 2000-2013. As an EIS and NIS are required to be prepared and the proposed development includes development on the foreshore, sections 175, 177AE and 226 also apply. Article 15 Subsections (15) and (16) of the European Union (Environmental Impact Assessment and Habitats) Regulations 2011, clarifies that where a proposed development under section 177AEis required to be submitted to the Board under section 175 or section 226, it shall be sufficient for the applicant to make a single application to the Board provided that the applicant complies with section 177AE and the provisions of the other relevant part(s) of the Act. The Board shall issue a single decision in relation to the application. The European Union (Environmental Impact Assessment and Habitats) (Section 181 of the Planning and Development Act 2000) Regulations 2013 provides that any relevant provisions of these sections apply to applications made to the Board under section 181(3) of the Planning and Development Acts 2000-2013.

2.2.1.3 Foreshore Acts

The Foreshore Acts 1933 to 2009 (as amended) provides for the protection and preservation of the foreshore and the seashore.

The foreshore as defined by the Act includes the land and seabed between the line of high water of ordinary or medium tides and the twelve-mile limit. Sections 2 and 3 of the Act, as amended by the Foreshore (Amendment) Act 1992, and the Foreshore and Dumping At Sea Amendment Act 2009 provides that any works or placing structures or material on, or for the occupation of, or removal of material from the foreshore requires the granting of a consent in the form of a lease or a licence as appropriate from the Minister for Environment, Community and Local Government.

Foreshore Leases are generally granted where exclusive occupation of the foreshore is required whereas a Foreshore Licence is generally granted in situations where occupation of the foreshore is non-exclusive.

Any necessary foreshore consents will be obtained from the Department of the Environment, Community and Local Government. The area of foreshore where works are proposed to be carried out, is owned by the Minister for Agriculture, Food and the Marine.

RPS and Cork County Council are undertaking consultation with the Foreshore Unit of the Department of Environment Community & Local Government (see Chapter 3 'Consultation') on this matter.

2.2.1.4 Appropriate Assessment (AA) and Natura Impact Statement (NIS)

The requirement for Appropriate Assessment (AA) (also known as 'Habitats Directive Assessment') of plans or projects originates from Article 6 (3) and (4) of *European Union (EU) Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora*, commonly known as the 'Habitats Directive', which is implemented in Ireland through the European Communities (Natural Habitats) Regulations of 1997. The Habitats Directive was last amended in Ireland via the transposed EC (Natural Habitats) Amendment Regulations 2005 SI 387/2005 and S.I. No. 477 of 2011 European Communities (Birds and Natural Habitats) Regulations. The latter further elaborate on the specifics of Appropriate Assessment and gives effect to Directive 2009/147/EC (Birds Directive) which amends

(codifies) Council Directive 79/409/EEC of 2 April 1979 (as amended) and specifically offers protection for bird species.

The wording of Article 6 (3) of the Directive is as follows:-

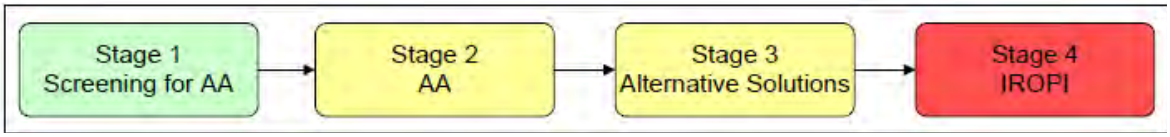
> '*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public*.'

The wording of Article 6 (4) of the Directive is as follows:-

> '*If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.*'

The Appropriate Assessment process for the proposed project has been completed in line with the Guidance for Planning Authorities entitled "*Appropriate Assessment of Plans and Projects in Ireland*" as published by the Department of the Environment, Heritage and Local Government in February 2010 and in consultation with the NPWS and the EPA.

The Four Stages of Appropriate Assessment



Stage 1 Screening for AA: An Appropriate Assessment Screening Statement has been prepared by RPS on behalf of Cork County Council for the proposed project and concluded that a Stage 2 Appropriate Assessment was required to be completed.

Stage 2 AA: Consequently, a Natura Impact Assessment was completed which comprised four distinct elements:-

Step 1: Description of plan or project and plan area characteristics.
Step 2: Identification of Natura 2000 sites and compilation of information on their qualifying interests and conservation objectives.
Step 3: Assessment of likely effects.
Step 4: Screening conclusion and statement.

A copy of the Natura Impact Statement accompanies the application for planning approval and is included as Volume 4 of the EIS.

As a result, the provisions of section 177AE of the Planning and Development Acts 2000-2010 apply, as discussed above. The NIS will also accompany the application to the EPA for a waste licence.

2.3 NATIONAL WASTE POLICY

2.3.1 National Hazardous Waste Management Plan 2001

The first National Hazardous Waste Management Plan (NHWMP) was produced in 2001. While previous waste policies had generally considered management or regulation of contemporaneous waste streams, the 2001 Plan did also identify a need to consider sites which had historically been used for unregulated hazardous waste activities. In this regard the Plan noted the requirements of section 26(2)(c) of the Waste Management Act 1996 which states as follows:-

> *"S26.(2) The hazardous waste management plan shall have regard to, and incorporate such information contained in, any waste management plan as the Agency considers appropriate and shall-*
>
> *(a) provide for, as appropriate, the identification of sites at which waste disposal activities, being activities that to a significant extent involved hazardous waste, have been carried on, the assessment of any risk of environmental pollution arising as a result of such activities, the taking or recommendation of measures in order to prevent or limit any such environmental pollution, the identification of necessary remedial measures in respect of such sites and the recommendation of measures to be taken to achieve such remediation, having regard to the cost-effectiveness of available remediation techniques."*

The NHWMP 2001 noted the Department of the Environment Circular Letter ENV 11/88 issued in 1988 which requested that local authorities identify the *"location and extent of land which may be contaminated either by waste disposal operations or past industrial activities".* One of the requirements of the letter was the identification of public and private sites which had been used or were at the time being used for waste disposal, and particularly for the disposal of industrial waste.

Cork County Council is aware that the subject site is among those sites within its functional area, which has been used for the disposal of industrial waste, and through its current role as facilitator for the site owner is actively involved in the proposed remediation of this site.

2.3.2 National Hazardous Waste Management Plan 2008 – 2012

The 2008 National Waste Management Plan contained further policies in respect of various types of legacy issues.

The Plan made recommendations in respect of three main areas of hazardous waste legacy issues. These were:-

- Soil and ground contamination associated with a wide range of historical activities;
- Old unregulated hazardous waste disposal sites; and
- Harbour sediments.

With reference to old disposal sites, ports and harbours specifically, the Plan makes the following recommendations:-

> *"27. Develop by 2010 a programme for the systematic identification, assessment and action planning for potentially contaminated harbour, port and marina sediments.*

Responsible: Department of Transport and Marine"

"28. Identify, assess and, where necessary, remediate sites where hazardous waste was to a significant extent disposed of in the past. This action should conform with the Code of Practice prepared by the EPA's Office of Environmental Enforcement. Make new regulations to properly and effectively regulate this sector and bring these sites into compliance with the Waste Framework Directive.

Responsible: Local authorities and Department of the Environment, Heritage and Local Government."

Recommendation No. 28 is included in Table 21 as a target for the lifetime of the plan (i.e. by the end of 2012). It is noted that the target seeks to identify, assess and remediate as necessary all sites where hazardous waste to a significant extent was disposed of. The identified Indicator for this Target is the 'number of sites identified, assessed and remedial actions undertaken'. The management of legacy sites is also linked in the Plan to environmental objectives to minimize environmental impact on water and soil.

In 2011, the EPA published an Implementation Report on the National Hazardous Waste Management Plan 2008 – 2012. This report considered progress to date on the recommendations of the 2008 Management Plan. With reference to Recommendation No. 28 the Implementation Report notes that a Code of Practice for the Environmental Risk Assessment for Unregulated Waste Disposal Sites was published by the EPA in 2007. It also notes that a web based system for local authorities to provide registers for such sites (under sections 22 and 26 of the Waste Management Act) was rolled out by the EPA and updated in 2009.

In terms of progress achieved on the target of identifying and remediating hazardous waste sites, the Implementation Report records that the *"identification and assessment process has been started, but completing remediation will be lengthy and expensive"*.

The Implementation Report noted that 20 sites were identified in the country as containing significant amounts of hazardous waste. Of these, 16 are local authority owned, 3 are privately owned and one relates to pre-1977 activities. The Implementation Report states that *"it will require considerable financial resources, over a long period of time, to apply full risk assessment and complete any necessary remedial actions to these sites".*

The EPA advises that the site at the East Tip, Haulbowline was not identified within a Section 26 register. However, the proposed remediation project is in accordance with the overall objectives of this Plan. It should be noted that The National Hazardous Waste Management Plan is currently being revised by the EPA.

2.3.3 A Resource Opportunity, 2012

The new National Waste Policy document entitled 'A Resource Opportunity, 2012' places an added focus on waste enforcement. The document highlights that there will always be a need for a robust enforcement regime to ensure the small minority who seek to avoid their responsibilities are dealt with in a manner which ensures the compliant majority are not burdened by their failures.

The document recognizes that work remains to be done to address a number of outstanding legacy issues which are being dealt with as part of a programme of measures agreed with the EU commission to complete Ireland's response to a 2005 European Court of Justice judgement which found systematic failures in the waste management regulatory regime. It states that '*the programme will require further considerable investment by the state to deal with issues such as illegal landfill sites cited in the case, unauthorised end-of-life vehicle sites and the regularisation of the former Irish steel site at Haulbowline, Co. Cork.'*

2.4 REGIONAL WASTE MANAGEMENT PLANNING

2.4.1 Cork County Waste Management Plan 2004

The Cork County Waste Management Plan 2004 was reviewed by the County Council in 2009 and was deemed to still be valid.

In March 2011 the EU Waste Framework Directive (2008/98/EC), hereafter the Directive, was transposed into Irish law with the passing of the European Communities (Waste Directive) Regulations, SI 126 of 2011. These transposing regulations give effect to the requirements of the Directive and the Waste Management Act 1996 (hereafter the Act) has been amended as necessary.

The legislative framework for waste management planning is set out in Part 2 of the amended Act with Sections (22) to (25) addressing the preparation of non-hazardous waste management plans. The requirement to evaluate waste plans has been introduced by the Directive and transposed into the Act.

Article 28 of the Directive requires Member States to include an "evaluation of how the plan will support the implementation of the objectives and provisions of this Directive" as part of the waste management plan process.

Article 30 of the Directive requires Member States to evaluate the waste management plan once every six years.

Section (22) (2) (d) of the Act requires waste management plans in existence at the commencement of the transposing regulations to be evaluated by 31st December 2012. In compliance with this statutory requirement, all regional and county waste management plans were required to be *evaluated* within this timeframe.

The new national waste policy document 'A Resource Opportunity, 2012' states that Regional Waste Management Plans will remain applicable until new plans have been put in place by the start of 2014. Furthermore the number of Waste Management Regions will be reduced from the current ten regions to three regions in accordance with local government reform measures. Official confirmation on composition of new Waste Management Regions is pending.

Objective 7.7 of the Cork County Waste Management Plan pertains to hazardous waste management. The actions included under this objective have regard to the provisions of the National Hazardous Waste Management Plan.

Action 74 states as follows:-

> *"Cork County Council will continue to investigate for possible land contamination.*
>
> *Sites which may give rise to hazardous waste due to past activities will be assessed and where necessary the appropriate restorative measures will be undertaken. Sites suspected or known to have been used for the disposal of hazardous waste will be included in a 'section 26 register'.*
>
> *It is important that information regarding the location and extent of land, which may be contaminated is available to local authorities and those who may be interested in developing or reclaiming such lands.*
>
> *Standard methodology for the compilation of the register which must be adhered to will ensure that there is consistency across all local authorities."*

2.4.2 Port of Cork Port Waste Management Plan - Updated August 2012

The purpose of this Port of Cork Waste Management Plan is to protect the marine environment from potential discharges into the sea of ship generated wastes and cargo residues only. It therefore has no policy context implications for the remedial works now proposed.

2.5 REGIONAL PLANNING AND LOCAL PLANNING POLICY CONTEXT

2.5.1 Introduction

The following table (Table 2.1) sets out the planning policy context for the subject site and the area in which it is situated. At a regional level, the Regional Planning Guidelines for the South West Region 2010-2012 is applicable. At a sub-regional scale, the site is located within that area guided by the Cork Area Strategic Plan 2001-2020 (as updated in 2008). The Cork County Development Plan 2009-2015 (and the current review) provides the county level planning policies for development in the area. On a local scale, the site is located within the Midleton Electoral Area and hence the Midleton Electoral Area Local Area Plan 2011 is of relevance. The corresponding plan for the Carrigaline Electoral Area must also be considered given that the land based access to the site is located within this area. The Cobh Town Development Plan 2013 should also be taken into consideration given the proximity of that settlement to the site and its visual links with Haulbowline Island. The site is located within Cork Harbour and the Cork Harbour Integrated Management Strategy 2008 and the Draft Cork Harbour Study 2011 are of relevance. Cork County Council has also recently adopted the Masterplan for Spike Island (2012) and is carrying out a Sustainable Travel Transport Strategy for the N28.

Table 2.1: Planning Policy Review

Plan	Content	Relevance to Subject Site/Study Area and Commentary
Regional Planning Guidelines for the South West Region 2010-2022 (South West Regional Authority)	Purpose: A strategic framework for the development of counties Cork and Kerry, to implement the policies of the National Spatial Strategy (NSS) at regional and local level and to guide policies and provisions of local plans. Cork Harbour: Important for reasons including economic and environmental considerations. As the largest port in Ireland outside of Dublin, it makes a strong contribution to the overall economic wellbeing of the South West Region, particularly in the manufacturing, commercial, industrial and tourism sectors. Also supports species and habitats of international conservation importance within Natura 2000 site designations. It is important that there are no significant adverse impacts on these Natura 2000 sites arising from future development in the Harbour Area. Waste Management: Considers predominantly the management of waste currently coming on stream, rather than historic waste disposal sites. Advises that hazardous waste management in the region needs to be addressed from the perspective of the most environmentally sustainable approach and in line with best international practice.	Implications for plans lower down in the planning policy hierarchy and for development management processes. Haulbowline Island occupies a prominent and strategic position within Cork Harbour. The proposed development has been progressed with due cognisance to this context; relevant economic and environmental considerations have been taken on board in the preparation of this EIS, particularly in Chapter 7 'Community and Socio-Economics' and Chapter 14 'Ecology'. An NIS has also been prepared (See Volume 4). The instant proposal involves the remediation of a site containing a proportion of hazardous waste. Best practice and environmental sustainability are two of the guiding principles informing the design solution.
Cork Area Strategic Plan 2001-2020 (Updated 2008) (Cork City and County Councils)	Purpose: To provide a vision and strategy for the development of the Cork City Region up to 2020. Potential and Development Capacity of the City Region: In preparing the Strategy, sites of former large industrial operations and those where operating industries were considered likely to close were considered for future development. In this regard the CASP states as follows:- *"In the event that the present industry installations at Haulbowline Island, Rushbrooke and Marino Point were to close – which is a possibility over the Plan's time horizon, then major medium to high density mixed-use redevelopment, (perhaps including high quality workplaces, apartments and cultural projects) could be pursued".*	Site is located within the study area. This section refers directly to Haulbowline and the former steelworks site and suggests its potential for future mixed use development. Chapter 4 'Assessment of Alternatives' refer to this recommendation.

Plan	Content	Relevance to Subject Site/Study Area and Commentary
Cork County Development Plan 2009-2015 (Cork County Council)	Purpose: The key planning policy document for the Cork County area.	Subject site is located within the functional area of Cork County Council.
	Ringaskiddy: Ringaskiddy peninsula identified as one of four 'strategic employment centres' in the county - "*strategic locations for large scale industry usually associated with FDI (foreign direct investment) companies who require large stand alone premises and employ large numbers of employees. Typical land uses in these centres are: large-scale manufacturing plants (in excess of 60ha) for pharmaceuticals, biochemical, electronic, telecommunications, and international traded services*". Strategic objective for Ringaskiddy - Objective SET 4-2:- *"It is an objective of this Plan to encourage the development of Ringaskiddy as a major location for port development and large-scale industry, taking account of the need to enhance public transport including the provision of a high quality green route and protect the environment of the existing residential community, to continue the sustainable development of Ringaskiddy".*	The area in which the site is located is identified for continued growth and further development of large-scale industries. This is likely to result in an increase the working community within the vicinity of the site and at least maintain population levels should plans be implemented. The role of the port and its future development is also highlighted. The proposed development and the assessments undertaken in this EIS have taken due cognisance of the industrial success of the area and of the port operations.
	Reference to proposal for the relocation of the Port of Cork's container terminal to Ringaskiddy, which was refused permission by An Bord Pleanála. The Planning Authorities in conjunction with the Port of Cork will carefully assess the issues raised by An Bord Pleanála in relation to future Ringaskiddy development and if necessary consider possible alternatives.	Traffic impact is discussed in Chapter 8 'Traffic and Transport' of this EIS. The main traffic volumes associated with the proposed development will be at construction stage and therefore will be short-term in nature.
	Coastal Areas: An integrated approach to coastal zone management is supported. Objective RCI 16-2: *"it is a particular objective, to promote concepts of coastal zone management that strive for meaningful participation of all stakeholders to address issues in coastal zones, that are as fully integrated as possible and that deliver appropriate responses to local requirements".*	The EIA process conducted as part of this project has involved extensive consultation with stakeholders in the local coastal zone. Coastal issues are addressed as appropriate within the EIS, e.g. Chapter 7 'Community and Socio-Economics', Chapter 13 'Soils, Geology and Hydrogeology', Chapter 14 'Ecology' and Chapter 15 'Archaeology and Cultural Heritage'.
	Older Industrial Sites: *"Older industrial sites at Haulbowline and Marino Point which occupy key waterfront locations within the harbour are awaiting new uses".*	Direct reference to former steelworks site. This application proposes a new use for the East Tip, the former waste disposal site for the steelworks.
	Cork Harbour: Section 4.17.3 states that, *"it is recognised that the full potential of the harbour could best be realised through a more integrated approach to its planning and development. In this regard, the Council will seek to prepare an overall study for the development of the harbour. This study will build on work currently underway…and will inform future reviews of the Midleton, Blarney and*	The site is located on an island within Cork Harbour; the harbour location has been acknowledged throughout the design and EIA processes. The Draft of the Harbour Study (April 2011) referenced has been reviewed as have the relevant Local Area Plans – see below .

Plan	Content	Relevance to Subject Site/Study Area and Commentary
	Carrigaline Electoral Area Local Area Plans which straddle Cork Harbour".	
	Waste Management: Policy refers to the provisions of the Waste Management Plan for the County. No specific references or policies in respect of remediation of unregulated hazardous waste sites.	The Cork County Waste Management Plan is discussed above in Section 2.3.1.
	Landscape Designations: Located in Landscape Character Area 19. City Harbour and Estuary (City Estuary Harbour and Island Complex). Section 7.2.20 provides that all development is to be assessed on a site specific basis '*to avoid, minimise or mitigate any potential environmental or visual impact'*. Objectives ENV2-2 and 2-4 provide that landscape issues are an important factor in all land-use proposals (a pro-active view of development is to be taken while respect for the environment and heritage should be maintained) and that the content of the Draft Landscape Strategy for the County in terms of landscape values, character, distinctiveness and sensitivity are considered when managing development in the County to minimise visual and environmental impacts. The Draft Strategy includes for the value and importance of seascapes; this should be considered in the context of developments such as coastal defence works and marinas.	The landscape setting of the proposed development must be taken into account. The site is located in a prominent location and works such as the placing of rock armour to protect the waste mass and proposed perimeter engineered structure from coastal erosion are included within this application. The proposed remediation project, with specific reference to the amenity end use, will however, be a positive development in the context of the site's harbour setting. Landscape aspects such as values and sensitivities are discussed in Chapter 11 'Landscape and Visual Impact Assessment'.
	Neither the island of Haulbowline nor the mainland immediately to its north or south (Cobh and Ringaskiddy) are designated as scenic landscape; the nearest designated scenic landscape is near Monkstown, to the west. There are two scenic routes on the mainland in close proximity to the island; 1) S54 from Passage West to the end of the public road adjacent the Haulbowline access road, including the R610, the N28 and a local road and 2) S53, the R624 between Belvelly and Cobh on Great Island. Objective ENV 2-6 seeks to protect the county's visual and scenic amenities, ENV 2-9 seeks to preserve the character of all important views and prospects and ENV 2-11 seeks to preserve the character of views and prospects available from scenic routes.	Landscape designations, including scenic routes, must be considered when assessing development proposals such as the East Tip Remediation Project. Local policies in this instance inform the assessment carried out in Chapter 11 'Landscape and Visual Impact' of this EIS.
	Built Heritage Designations: An Architectural Conservation Area is located on Haulbowline (Haulbowline Conservation Area), which covers the western part of the island and largely coincides with the property of the Irish Naval Services (not including the naval dockyard). Policy ENV 4-6 seeks to '*conserve and enhance the special character of ACAs included in the Plan'*. There are two protected structures on Haulbowline Island (RPS00578 Martello Tower and RPS00670 Range of Limestone Warehouses and Offices). Such structures are protected within the plan under Objective ENV 4-2. Objective ENV 4-4 provides for the recognition of heritage not included in the Record of Protected Structures; the importance of Maritime Heritage is specifically referenced.	While these protected areas and structures are not located within the subject site, they are within close proximity to the proposed works and end use. Chapter 15 'Archaeology and Cultural Heritage' assesses the potential for any impact on the designations listed within the Cork County Development Plan. Underwater archaeology was considered as part of that assessment.

Plan	Content	Relevance to Subject Site/Study Area and Commentary
	No recorded monuments on Haulbowline. Objective ENV3-1(a) seeks to safeguard sites, features and objects of archaeological interest generally. Objective ENV 3-5 aims to protect and preserve the archaeological value of underwater archaeological sites; intertidal and sub-tidal environments are to be taken into account. Natural Heritage: There are a number of proposed National Heritage Areas (NHA) and proposed Special Protection Areas (SPA) sites in Cork Harbour. It is an objective of the plan to protect all natural heritage sites designated or proposed for designation in accordance with national and European legislation (Objectives ENV 1-5 to ENV 1-7 refer). Furthermore, Objective ENV 1-9 seeks to minimise the impacts of development outside of the protected sites on important habitats and features of natural interest. Risk assessments are required to be prepared where development is proposed to be carried out in environmentally sensitive areas. Geology: Cork Harbour has some areas of geological interest; the Harbour itself is noted for its coastal geomorphology including structural features, raised beaches and Devonian (ORS)[2]. Objective ENV 1-11 seeks to preserve important features of geological interest within the County. Open Space and Recreation: The Council's *Recreation and Amenity Policy 2006*, sets out a commitment to the provision of facilities to serve the recreational needs of the population it serves, so far as is possible. Both direct provision of facilities and the facilitation of other providers are included. Ways to improve the quality and capacity of existing facilities and ways to develop new facilities through private and public initiatives are among the elements of the policy are discussed. New facilities should generally be located where they can best meet the needs of the entire community that they are intended to serve. In the context of the strategic provision of public open spaces, a parks hierarchy is discussed which proposes neighbourhood parks (16-40ha) and local parks (c2ha per 1000 population). Objective HOU14-7 states: *"It is an objective to apply the principle of a hierarchy of parks, open spaces and outdoor recreation area within the County, so that different sectors of the*	While none of the designated sites are directly adjacent to the East Tip or the proposed application site, given the nature of the proposed works and the site's location within the vicinity of protected sites, the necessary assessments have been carried out as part of this EIS and through the Appropriate Assessment procedures. Chapter 14 'Ecology' and Volume 4: NIS are of direct relevance. Chapter 13 on 'Soils, Geology and Hydrogeology' discusses geological issues relevant to the site and to this proposal. A public park and a playing pitch to replace the existing Navy facility are proposed to be provided. Much of the policy content here refers to meeting the needs of proposed new residential development or new communities, however, and ensuring an adequate supply of amenity space commensurate to the level of population proposed. Notwithstanding same, the provision of amenity facilities is not at odds with the local authority's policy on open spaces. The playing pitch will be located adjacent the Naval dockyard which will allow the navy easy access to same. Ample parking is available within the navy lands. The park will be close to Ringaskiddy village, to the working population of the area and may also attract visitors. The proposed park

[2] ORS – Old Red Sandstone

Plan	Content	Relevance to Subject Site/Study Area and Commentary
	population can participate in a wide range of active and passive recreational pursuits within easy reach of their homes and places of work". Suitable pedestrian linkages between public open spaces should be provided and cycle lanes incorporated where appropriate to facilitate local access. Objective HOU14-9 seeks high quality open spaces that are suitably proportioned, well designed and accessible to the local community. The provision of active open spaces is encouraged by Objective HOU 14-11.	would be considered local in scale. The proposed development includes for the upgrading of pedestrian facilities between the proposed park and the existing amenity area at the end of the L2545. Proposed footpath improvements will also contribute to improved pedestrian linkage to other green spaces and walks within the area. Bicycle parking will be provided; the access road carries limited traffic and there is not sufficient space for cycle lanes on the bridge. A high standard of amenity is proposed.
	Variation No.4 of Cork County Development Plan 2009: Greenways Policy: Variation No. 4 was adopted on 28th January 2013. Its purpose is "*to support the development of greenways, dedicated walking and cycling routes, along the abandoned rail lines in the south and west of the County*" and to protect these routes from inappropriate development that could compromise future greenway developments. The proposed greenway routes include the development of a high quality walking and cycling route from Passage West to Carrigaline. A spur from Raffeen to Ringaskiddy forms part of those proposals assessed for that route in a feasibility study[3]	The proposed amenity use at East Tip would sit well within the overall plans to develop the walking and cycling offer of the Harbour area (among other parts of the county) and would provide an attractive destination point for the recreational users of the Ringaskiddy Spur. The plans for the spur currently ends at Ringaskiddy village, however future extension may be considered, and notwithstanding same, the road beyond the village becomes a cul-de-sac and the traffic levels in this area are reduced in comparison with those experienced further west on the Ringaskiddy peninsula.
	Cork County Development Plan Review Process: An Issues Paper "Planning for Cork's Future" was published during January 2013. Among the suggested key aims are "*a network of enhanced natural resources of clean water, biodiversity, nature conservation areas*, *landscape, coastline, greenbelts, parks and open spaces, and agricultural land;" as part of a Green Infrastructure Strategy and "Responsible guardianship of the County so that it can be handed on to future generations in a healthy state*".	The provision of a public park and a playing pitch is in keeping with the proposed approach to drafting the next County Development Plan.
	Key public infrastructure issues of note mentioned within the paper include the N28 road upgrade proposals and the proposed Cork Lower Harbour Sewerage Scheme.	The N28 upgrade is currently suspended and is not likely to have been implemented in advance of the proposed remediation project. In the event that the project is reactivated in the meantime and commences, implications for the haul route would be taken into

[3] The Feasibility Study was prepared by Kieran Boyle Consulting(2012)

Plan	Content	Relevance to Subject Site/Study Area and Commentary
		consideration in a Traffic Management Plan and through consultation with the National Roads Authority. The proposed Cork Lower Harbour Sewerage Scheme should improve water quality in the area.
Midleton Electoral Area Local Area Plan 2011 (Cork County Council)	Purpose: To provide detailed local policy guidance for the future development of the Midleton Electoral Area Zoning: Neither the subject site nor the island is included within a development boundary connected to a settlement or is provided with a specific zoning objective. Haulbowline: Section 34.3 of the LAP discusses problems and opportunities associated with future development at Haulbowline:- *"34.3.3 The potential redevelopment of the former steel plant at Haulbowline raises a number of important issues. Whilst it is recognised that Haulbowline may well have future development potential along the lines suggested in CASP, the continued existence of hazardous waste materials effectively precludes the consideration of these uses.* *34.3.4 The lack of adequate mains water supply and wastewater infrastructure, reliance on a single road access point, the absence of public transport and the lack of any existing community facilities or services to support a new community are further challenges particularly for any redevelopment involving a residential component or a jobs intensive employment use and significant public investment would be required to resolve these issues. The contamination on the eastern part of the island and the presence of subterranean structures in the vicinity of the old steel mill may also create uncertainty for investors."* Section 34.4 comprises a number of planning proposals for the island as follows:- *"34.4.1… the potential for redevelopment in Haulbowline is most likely to be based around the historic uses on the site, predominantly the naval base function. The naval service are keen to achieve greater direct access on foot across the mouth of the dock basin between their compound on the western end of the island and their buildings and ships on the eastern side of the dock which has thus far been ruled out by historic land ownership boundaries. Redevelopment proposals should not preclude this access arrangement being pursued.*	Haulbowline Island lies within the Midleton Electoral Area. Development proposals must be addressed on a site-specific basis and on their respective merits. It is considered that this comment relates to a scenario without remediation. The current proposal seeks to remediate the former waste disposal area, rendering it suitable for use for recreational purposes. The proposed end uses will not involve a residential component or a jobs intensive use. The proposed development does not preclude future access improvements between the two parts of the naval facilities or the considerations and proposals mentioned. Future uses for this specific site, other than those amenity uses proposed are discussed under Chapter 4 'Alternatives'.

Plan	Content	Relevance to Subject Site/Study Area and Commentary
	34.4.2 Potential would also appear to lie in the areas of heritage / cultural development, particularly given the location of the island in the heart of Cork Harbour and the potential to create linkages with similar maritime heritage and cultural projects based around Spike Island and Fort Camden amongst others. *34.4.3 In February 2007 a Scoping Study was published on behalf of the Irish Naval Service and the Heritage Council on the potential to create a naval or maritime museum on Haulbowline Island. The report noted the lack of a major cultural facility focused on Ireland's rich coastline and coastal waters or a museum dedicated to naval history.* *34.4.4 There may also be potential on the island for synergies or development related to the existing National Maritime College, or the Maritime & Energy Research Campus and Commercial Cluster (MERC) being developed at Ringaskiddy in a joint venture between a number of partners including UCC, CIT, the Marine Institute, Enterprise Ireland and the Irish Naval Service and which is seeking to establish a flagship cluster to produce innovative technical solutions to support the development of the Irish maritime and energy sectors."* Cobh Environs: This LAP also governs the development of the Cobh Environs. Provision is made for significant expansion; lands have been identified to accommodate an additional 1,900 dwellings and lands have been identified for future business uses. Zoning objectives also provide for a new primary school, a railway station with park and ride facilities at Ballynoe and community facilities. This area of Cobh lies to the north of the town centre and inner suburbs. The main area of the town and relevant planning context is discussed under the Cobh Town Development Plan below.	The proposed development is considered to be positive for both Cobh and its environs. No specific matters identified within this part of the LAP require to be addressed by this development proposal.
Carrigaline Electoral Area Local Area Plan 2011 (Cork County Council)	Purpose: To provide detailed local policy guidance for the future development of the Carrigaline Electoral Area Zoning and Development Boundaries: The Ringaskiddy area development boundary as defined in the LAP incorporates the two villages of Shanbally and Ringaskiddy. It extends from the area around Rafeen in the west to the end of the peninsula at the east. It includes the entire of the mainland as far as the bridge to Haulbowline. That part of the access road to Haulbowline located on the mainland is zoned as 'Existing Built Up Area'.	The Ringaskiddy area falls within the jurisdiction of the Carrigaline Electoral Area. Only road and footpath improvements are proposed to be carried out on the access road on the mainland. The proposed works are not in conflict with the zoning objectives in the area. The proposed development will improve the setting for the proposed expansion of the educational and research facilities on the mainland.

Plan	Content	Relevance to Subject Site/Study Area and Commentary
	It is noted that the lands to the west of Haulbowline access road between the N28 and Haulbowline Bridge are zoned for a third level educational campus for marine related education, research and training. Related residential development is considered more appropriately accommodated within nearby town centres. Strategic Issues for Ringaskiddy: Strategic aim is to *"reaffirm its strategic industrial and port related roles and seek to promote its potential for large-scale stand-alone industry".* Strategic issues include securing enhanced public transport infrastructure possibly by the provision of a high quality green route; improved traffic management, and environmental protection for the existing residential community in the area. Road infrastructure proposals include the improvement of the N28 (see above). It is critical that the N28 project be finalised as quickly as possible in order to bring certainty and assurance of commitment to existing and future investment in the Ringaskiddy area. [4] There is limited potential for further residential development. The population of Ringaskiddy is likely to remain relatively static within the LAP lifetime. There is potential for limited residential development within the town centres of Ringaskiddy and Shanbally villages. Outside of these areas there is no land in the area zoned for residential development. An increase in housing stock of only 90 houses within the Plan period is proposed, which would bring the total number of housing stock in the villages to approximately 537 houses by 2020.	The proposed development will not compromise the overall aim for the settlement but rather enhance the setting in terms of an attractive location for the workforces of major industrial undertakings. The location and extent of the local residential community is discussed in Chapter 7 'Community and Socio-Economics'. Measures to protect the existing residential community are discussed therein and reference is made to other chapters of relevance. These would apply also to any future residential communities which are expected to be minimal. The remediation of this former industrial waste disposal site and the provision of a public park is considered a positive development for the residential community. Traffic and Transport matters of relevance to the proposed development are set out in Chapter 8 'Traffic and Transport'.
Cobh Town Development Plan 2013 (Cobh Town Council)	Purpose: Sets out policies and objectives for the town of Cobh. Views from Cobh: The Plan acknowledges the prominent position of Cobh overlooking Cork Harbour and the islands of Spike and Haulbowline. Settlement Size and Nature: Cobh has a population of over 12,000 people; the target population for 2020 is >14,500. Cobh functions essentially as a commuter town to Cork City which is facilitated by a rail line and cross-river ferry at Carrigaloe.	Haulbowline Island has long-established links with Cobh and is less than 1km from the town across the water. The East Tip site is prominent in views from parts of the town. The proposed remediation will be a positive development for the town in this respect. Significant residential population located close to subject site (refer to Chapter 7 'Community and Socio-

[4] The project is currently suspended according to Road Scheme Activity Updates on the website of the National Roads Authority reviewed 27th March 2013.

Plan	Content	Relevance to Subject Site/Study Area and Commentary
		Economics').
	Economy: The direct economic benefits to the town from industrial developments in the harbour area such as the former steelworks on Haulbowline are acknowledged in the Plan. The future economic prosperity of Cobh is also considered likely to be linked to the harbour and its potential, i.e. marine and port-related uses, tourism, recreation ,marine leisure uses as well as marine education and research uses. References are made to Fáilte Ireland's plans for the South West, which include the development of Cork Harbour and Spike Island, investment in day trip attractions in locations like Cobh and the development of the marine leisure sector including boat touring.	Reference to historic links with Haulbowline. Acknowledgement of importance of harbour related uses, including tourism and recreational uses. The remediation project, if implemented will contribute to the wider economic and environmental improvements of the harbour as a resource for the town of Cobh as well as improving the visual outlook from the town.
	Water Quality: Poor water quality in the waters around Cobh due to the lack of a wastewater treatment plant in the town and the benefits of the forthcoming Lower Harbour Sewerage Scheme are discussed. The Plan notes the existence of environmentally designated sites in the harbour and the natural heritage aspects of the town itself.	The existing foul water arrangements for Cobh are negative in terms of water quality in the area. The proposed development will have positive impacts on water quality in the area – See Chapter 13 'Soils, Geology and Hydrogeology' and Chapter 14 'Ecology'.
	Tourism: Planning permissions issued for a ferry service linking Cobh to other harbour settlements, a marina, and a pontoon facilitating a sea plane are noted. The Plan states that as tourism numbers increase, the viability of water based transport in the harbour will improve and this will become a tourist attraction in its own right. The plan contains an objective to enhance facilities and infrastructure for the cruise liner sector. Additional berthing provision is supported. Specifically in relation to Haulbowline, the Plan notes that Cobh has the capacity to act as a gateway for tourism development at Haulbowline and Spike Islands and could benefit from the promotion of coastal fortifications on both islands along with others in the harbour. Objective EDT-16 on Cork Harbour Heritage states: - *"It is an objective of Cobh Town Council to work closely with Cork County Council in the development of tourism and heritage facilities within the wider harbour area, including Spike Island and Haulbowline, and to promote Cobh as the gateway to such facilities."*	The proposed development is positive in terms of supporting the plans for the town and wider area in terms of tourism. The site is located close to the cruise terminal and is visible to cruise visitors. The construction phase will not impact on the turning circle for cruise liners. The proposed development does not preclude the future potential for Cobh as a gateway to access tourism development at Haulbowline and Spike.
	Heritage and Views: Cobh is a Heritage Town; there are a number of heritage trails in the town. Views from the Cathedral are among those considered significant in the Plan.	The island of Haulbowline is visible from some of these trails, particularly those along or overlooking the waterfront, and from the approach roads to the town. The East Tip can be viewed for example from the town promenade and from the front of St. Colman's Cathedral. The remediation of the site will result in a positive impact on those views (See Chapter 11

Plan	Content	Relevance to Subject Site/Study Area and Commentary
		'Landscape and Visual').
	Cycle Network: The potential for cycling trails and a link to the cross-river ferry is referenced.	These proposals sit well within the wider proposals for amenity in the area, including the Passage West-Carrigaline Greenway and the proposed park at the East Tip, which will include bicycle parking.
Cork Integrated Harbour Management Strategy 2008 (COREPOINT Project)	Purpose: '*to bring all those involved in the development, management and use of Cork Harbour together in a framework which encourages the integration of their interests and responsibilities to achieve common objectives in a sustainable manner'.*	The subject site is located within the Cork Harbour area.
	Objectives: 1. Develop a policy framework to facilitate integration for planning and management of Cork Harbour. 2. Protect and promote the unique natural environment of the Harbour. 3. Promote the social and cultural assets of the Harbour to maintain / protect the unique identity of the area. 4. Promote the economic development of the Harbour in line with the principles of sustainable development. 5. Promote and develop the Harbour as a facility for water based sport and leisure activity.	The proposed remediation of the East Tip and the development of an amenity end use will contribute to the achievement of these objectives, particularly objectives 2, 3 and 5.
	The Strategy included 'examples of proposed actions' that might be developed during implementation including: • Identify constraints to access to heritage sites (e.g. Fort Camden, Spike Island and Haulbowline) with a view to improving public access. • Explore the potential for future growth of water based sport, leisure and general recreational activities in Cork Harbour (e.g. strategies for marinas, dingy parks, moorings, walking trails and cycling paths).	The creation of public access to an amenity area at this coastal location is an important positive impact. It is possible that the amenity area could in the future link with walking or cycling trails around the wider Ringaskiddy area.

Plan	Content	Relevance to Subject Site/Study Area and Commentary
Draft Cork Harbour Study – April 2011 (Cork County Council)	Purpose: To inform Local Area Plans in the context of the need for an integrated approach to the Harbour. The need for this study was identified in the Cork County Development Plan 2009. Development Options for the East Tip: The Study identifies current options for the site as being as follows:- (i) Capping the tip with inert material and top soil, and then grassing and planting the area. (ii) As (i), but with a quay wall to prevent erosion or leaching (if it is felt this could pose an environmental / health risk). (iii) Removal of some or all of the material, if considered necessary on environmental / health grounds, and assuming there is a suitable site elsewhere to which the material could be exported. The Study suggests that whichever of these options is followed, *"it seems unlikely that it will be available for use in the short-medium term. It could however have a passive amenity function, particularly in relation to Cobh, if a satisfactory containment strategy could be shown to be acceptable, and the area could be covered with a suitable depth of clean soil, grassed and planted.* *In the long term, treatment on the lines of option (i) or (ii) might produce a usable site, depending on whether the environmental standard of at least part of the area could be improved sufficiently to allow building foundations to be placed on it, for instance for a small-medium stand-alone industrial site. However, it is somewhat doubtful that the value of such a site would justify the further works that it might make necessary."*	Site location within Cork Harbour and direct reference to Haulbowline and the East Tip. The proposed project sets out a comprehensive remediation proposal for the East Tip. Capping will be carried out and a perimeter engineered structure provided with rock armour facing to prevent erosion. An active amenity function is proposed post-remediation.
Masterplan for Spike Island 2012 (Cork County Council)[5]	Purpose: A Masterplan for the redevelopment of Spike Island as a major tourism, heritage and amenity facility.	Haulbowline is referenced as one of the locations for potential facilities to support the development of Spike.

[5] Prepared by Scott Tallon Walker Consortium

Plan	Content	Relevance to Subject Site/Study Area and Commentary
	Proposals: The vision for Spike includes an aspiration to promote the development of Cork Harbour as a green infrastructure asset, '*a necklace of visitor attractions, recreation assets and facilities all interlinked by the defining element of the harbour*'. The proposals are to be developed in three phases; Phase 1 will include safety works, the provision of extended public walkways, a pontoon and slipways, Phase 2 would enhance the fort on the island and provide toilets, a stage and ticketing facilities and Phase 3 an aquarium and interpretive centre. In the long-term it is hoped that the island could attract 300,000 visitors per annum; the proposed event space would accommodate 6000 patrons. Phase 1 of the Masterplan is to commence in 2013, subject to funding. Links between Haulbowline and Spike: The Masterplan refers to views to Haulbowline from Spike, particularly from the pier. The historical context of Haulbowline and its location as a key fortification prior to the large-scale development on Spike is noted. Links to the island are also discussed in the context of convicts on Spike working on dockland preparation work at the basin on Haulbowline. Implications for the Development of Haulbowline: A series of options and possibilities regarding access to Spike Island are discussed, including potential access from Haulbowline. The conclusion of the Masterplan considers it likely that initial demand for parking can be accommodated within the existing network at Cobh but that the construction of a car park at Haulbowline will be necessary. An initial requirement for 100-150 parking spaces at Cobh with an equivalent at Haulbowline is expected to be necessary. Links to Cobh are to be strengthened and links to a regenerated Haulbowline maximised. Section 5 specifically refers to the consideration of parking facilities in any future land use study at the East Tip. The masterplan also references greenfield lands adjacent to Haulbowline Bridge on the mainland that could be used for potential park and ride services to Spike. Further objectives seek to ensure that the navigability of craft through the sound separating Spike Island from Haulbowline and Ringaskiddy is not reduced.	The provision of an amenity area will be in keeping with this aspiration for a series of amenity areas within the harbour. Refer to Chapter 11 'Landscape and Visual' and Chapter 15 'Archaeology and Cultural Heritage' which discuss these specific aspects of Spike and Haulbowline. The overall end use proposals and site layout will not preclude the implementation of the Masterplan as adopted. The car park on Haulbowline and the availability of future space for additional parking provision is in keeping with the proposed development of Spike Island as a visitor attraction and does not preclude future access from the East Tip site (see Chapter 5 'Project Description' for a description of the proposed car park).
N28 Sustainable Travel Transport Strategy (Cork County Council)	Purpose: To encourage commuters to consider modal shift from private vehicles through promotional initiatives and relatively low cost infrastructural improvements.	This strategy should reduce the level of commuter traffic on the N28 including routes through Ringaskiddy. If measures are successful, this could affect the baseline traffic volumes on the proposed haul route to the East Tip site in a positive manner and help counteract traffic impacts. Chapter 8 'Traffic and Transport' discusses potential traffic impacts.

2.5.2 Conclusion

As demonstrated in Table 2.1, the proposed development is in keeping with the current regional and local planning policy objectives for the site, for Haulbowline and for the broader area in which they are situated. The proposed development can support existing objectives contained within the policy documents including the promotion of Cork Harbour as an economic and environmental asset.

2.6 PLANNING HISTORY

The East Tip has been the subject of only one planning application and permission in the past: (Ref: 97/4031) and is summarised below. It should be noted however that application Ref. 77/1907 which predominantly relates to the main steelworks site, included for the dumping of waste on the East Tip site and is therefore also discussed below.

Over the years, other planning applications relating to the main steelworks site on Haulbowline Island (which is separated from the East Tip by the Naval Dockyard) and planning applications relating to other lands on the mainland were made by the operators of the former steelworks. Details of these, and other planning applications related to Haulbowline Island and Rocky Island are provided in Appendix D: Planning and Licensing Context.

The current planning status of other relevant projects in the area is provided in Chapter 16 'Indirect and Cumulative Impacts and Interaction of Impacts'.

2.6.1 Cork County Council Reg. Ref. 97/4031

Under this planning application, Irish Ispat Ltd. was granted permission for the construction of a rock armour faced sea wall on the north, south and east sides of the east tip on 19th January 1998. A foreshore licence granted in 1996 required that such a wall be constructed within 15 years of the issue of the licence or such extended time as may be agreed (ref. EPA Inspector's report on IPC licence application 2001) to protect the site against erosion.

One condition was attached to this planning permission; this relates to landscaping, including wind protection of any planting carried out.

The permitted design consisted of a rock armour wall and a geotextile filter fabric placed on top of fill material and covered by a layer of top soil. The top soil layer was proposed to be 1.5m minimum depth; the proposed rock layer on the sites was to be 90cm. The proposed rock armour wall was permitted to have a slope of 1:5 and was to be 7m tall from the base. Trees and shrubs were to be planted along the top in the topsoil. The works were to extend to a width of 21m on the three seaward sides of the site and were to extend for 292 m along the southern side of the site, 296m at the eastern side and 320m at the northern site. The planner's report states: *"This is a welcome application as it will help screen the apparent ugly dumping to the east of the industrial complex."*

No works were carried out pursuant to this grant of permission.

2.6.2 Main Steelworks Complex, Haulbowline – Cork County Council Reg. Ref. 77/1907

Irish Steel Holdings Ltd. was granted permission for extensions and modifications to the steel making plant on 1st January, 1979. Conditions of note which were attached to the permission are as follows:-

5. *Mill scale and other suspended matter shall be recovered by cyclones or lagoon system. The extracted matter shall be disposed of on the company's disposal dump.*

6. *The following solid waste materials which have been heated to a maximum of 1000 degrees C and which are non-toxic and cannot be leached by fresh or salt water shall be disposed of on the company's disposal dump in the area licensed by the Minister for Transport and Power-*

   a) Melting furnace slag
   b) Re-Heating furnace slag (clinker scale)c) cyclone scale
   d) Demolition rubble from furnaces and ladles

9. *Dust collected by the bag filters shall be:–*

   a) Removed off site in sealed containers for export by sea or road, or
   b) Pelletised on site and thereafter shipped by sea in bulk, or,
   c) *Dumped in a location in Cork County, details of which shall be agreed with the planning authority within 6 months of the grant of permission*.

Condition 13 specifies air quality monitoring locations at the naval base, Cobh, Monkstown and Ringaskiddy Village.

A report submitted with the application specified that solid waste would be disposed of by dumping to reclaim land at the eastern side of the island – Appendix G9 Areas A and B specifically, where a '*licence for dumping'* [6] was granted by the Department of Transport and Power in 1959. Areas A and B are shown as the northern and southern parts of the East Tip.

2.7 LICENSING/ PERMIT HISTORY

The following authorisations were issued to the steelworks facility and included authorisation for the subject site (East Tip). These are discussed in turn below.

Table 2.2: Licences and Permits Issued for the Subject Site

No.	Authorisation	Ref No.	Date	Issued by
1.	IPC Licence	Reg No. 498	2001	EPA
2.	Waste Permit	Ref No. 811/1998	1998	Cork County Council
3.	Waste Permit	Ref No. 43/1997	1997	Cork County Council
4.	Licence Agreement[7]	Deed No. 1033	1996	Department of the Marine

[6] The licence referenced refers to a lease issued to Irish Steel Holdings Ltd. in 1964 for the reclamation of foreshore off Haulbowline within 30 years and is discussed below in Section 2.8.

[7] Source: EPA Inspectors Report on Irish Ispat Ltd IPC Licence Application 2001.

2.7.1 IPC Licence (Reg No. 498)

In 2001, the EPA issued an IPC licence to Irish Ispat Ltd for the facility to carry out the initial melting or production of iron or steel. The licence issue date was one week after the closure of the facility was announced. In 2002, the liquidator applied to the High Court pursuant to S.290 of the Companies Act, 1963, for leave to disclaim the IPC licence. The judgement in 2004 allowed the liquidator to disclaim the licence.

2.7.2 Waste Permit (Ref No. 811/1998)

In 1998, Cork County Council issued a Waste Permit to Irish Ispat Ltd to treat waste (i.e operate a scrap metal processing plant) at Haulbowline until the 31st of December 1998 subject to 31 conditions. The permit authorised the acceptance of slag for deposition on the waste heap. Dust contaminated with lead or zinc was not permitted for deposition. Dust and sludge containing reusable iron or iron compounds was required to be recovered as far as possible.

2.7.3 Waste Permit (Ref No. 43/1997)

In 1997, Cork County Council issued a Waste Permit to Irish Ispat Ltd at Haulbowline for the treatment of waste (i.e operate a scrap metal processing plant) at Haulbowline from January to the 31st of December 1997 subject to 33 conditions. This permit authorised the deposition of slag, millscale, spent refractories and scrap stock at the Tip head. Dust contaminated with lead and Zinc was permitted to be accepted temporarily but required covering by a waterproof sheet. Dust and sludges containing reusable iron and iron compounds were required to be recovered and reused as far as possible.

2.7.4 Licence (Deed No. 1033)

A Licence Agreement dated 22 May 1996 between Irish Ispat and the Department of the Marine required the construction of a sea wall within 3 years “to complete and secure from erosion” the area north of the sports ground. The agreement required a sea wall to be constructed around the landfill area within 15 years or such extended time as may be agreed (ref. EPA Inspector’s report on IPC licence application 2001).

2.8 FORESHORE LICENSING HISTORY

The East Tip site has a complex history of foreshore licensing. Any necessary application for foreshore consent for proprietary rights will be determined by the Foreshore Unit of the Department of the Environment, Community and Local Government. The Foreshore Unit will take any consents considered relevant into consideration if and as necessary in determining such an application.

The licence referenced above in Section 2.5.1.2 as issued by the Minister for Transport and Power refers to a lease issued to Irish Steel Holdings Ltd. in 1964 for the reclamation of foreshore off Haulbowline within 30 years. In doing so, the licence allowed for the deposition of waste and the construction of a retaining wall.

1 INTRODUCTION

This Environmental Impact Statement (EIS) has been prepared by RPS for the remediation of the East Tip, Haulbowline Island, Co. Cork on behalf of Cork County Council. The Council is facilitating the regularisation of the site on behalf of the Minister for Agriculture, Food and the Marine.

The East Tip is an area of land (approximately 9 hectares) reclaimed from the sea by infilling with processing waste, approximately 650,000m^3 from a former steelworks site on Haulbowline Island. Haulbowline Island is located within Cork Harbour, between Cobh to the north and Ringaskiddy to the south. It is connected to the mainland at Ringaskiddy via a bridge which traverses Rocky Island. The Headquarters of the Irish Naval Service is situated on the western portion of the Island within the Naval Dockyard to the east. Separating these is the site of the former Irish Ispat Steelworks.

The East Tip site (the subject of this Environmental Impact Assessment (EIA)) is situated to the east of the Naval Dockyard. The location and extent of East Tip is shown on Figure 1.1.

The East Tip is owned by the Minister for Agriculture, Food and the Marine who, following a European Court of Justice Ruling (Case C494/01 (2005)), propose to remediate the site to ensure compliance with Article 4 of the Waste Framework Directive (WFD) 2008 and associated legislation. Cork County Council, on behalf of the Minister for Agriculture, Food and the Marine, is currently managing the regularisation of the East Tip in accordance with the WFD 2008.

This EIS has been prepared with input from a team of specialists as outlined in Table 1.1. A Detailed Quantitative Risk Assessment (DQRA) utilising best national and international practice was completed by White Young Green (2013) in order to determine the best solution to remediate the site. The DQRA identifies potential existing pathways (or linkages) between contamination present in the East Tip and human and environmental receptors such as users and visitors to the site and ecological receptors in the harbour. The DQRA demonstrated that there is no predicted impact from the majority of constituents within the waste on the receiving waters and only a hypothetical impact to marine waters for two metals in groundwater discharging from the site in the near shore marine water body. The DQRA did conclude, however, that in its present condition the East Tip poses a risk to both site visitors and ecological receptors in Cork Harbour waters and that a remediation solution would be required to break or control the pathway between the East Tip and human and environmental receptors identified.

The proposed solution recommended in the DQRA was therefore to provide a low permeability[1] cover system to minimise infiltration of surface water into the waste and underlying waters in combination with an engineered perimeter system with a maximum permeability of 10^{-5}m/s to reduce contaminant flux leaving the waste into the Cork Harbour waters and secondly to prevent erosion of the waste material into the sea.

This recommendation formed the basis for the proposed preliminary/outline design solution to construct an engineered capping system and perimeter engineered structure at the East Tip, which is the subject of the EIA. The outline design for this proposal has been completed by RPS and detailed in Chapter 5 'Project Description'. The DQRA is included as Appendix A in this EIS.

[1] *For the purposes of this EIS the term low permeability is defined as a maximum permeability of $1x10^{-9}$m/s*

This Environmental Impact Statement (EIS) therefore addresses the following elements, which are described further in Chapter 5 'Project Description':-

- Remediation of the East Tip by constructing a low permeability engineered capping system over the surface of the waste and a perimeter engineered structure with a maximum permeability of 10^{-5}m/s around the East Tip (and all associated preparatory and temporary works).

- Proposed end use for the East Tip as a recreational area including the provision of a public park (including viewing areas, walking and running tracks and car park) and a playing pitch for the Irish Naval Services to replace the existing facility (and all preparatory and associated temporary works).

- Improvements to the access road on Haulbowline Island between the existing public car park, the bridge and the entrance to the East Tip (and all associated preparatory and temporary works).

- Improvements to pathways from the public road to the East Tip (and all associated preparatory and temporary works).

The above elements are shown on Figure 1.2 and Figure 1.3 shows the existing layout for the site including the playing pitch, site offices, etc.

1.1 EIS GUIDELINES

This EIS has been prepared in accordance with all relevant legislation including significant updates to legislation that have been passed in order to fully enact into Irish statute the EIS Directive 2011/ 92/EU (which has repealed EIA Directive 85/227/EC). These include the EU (Environmental Impact Assessment (Waste)) Regulations SI 283/2012, Environment (Miscellaneous Provisions) Act No. 20 of 2011, and other relevant amendments to the Planning and Development Regulations 2001-2013.

The EIS has also been prepared in accordance with the Environmental Protection Agency (EPA) documents 'Guidelines on Information to be contained in Environmental Impact Statements' (2002) and 'Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (2003) and having regard to the European Communities (Environmental Impact Assessment) Regulations. Other environmental guidelines have also been considered and have been referenced throughout the EIS.

While the current guidelines do not specify the requirement to undertake a human health impact assessment, health impacts have however been considered in the DQRA and this EIS addresses the proposed remediation solution which the DQRA has identified as necessary to protect human health.

Chapter 7 'Community and Socio-economic', Chapter 9 'Air Quality and Climate', Chapter 13 'Soils, Geology and Hydrogeology' and Chapter 14 'Ecology' specifically address potential impacts to human health with regards to pathways from air, groundwater and surface water.

Table 1.1 below refers to specific guidelines that were used for the various specialist areas (i.e., marine, air, etc.).

Table 1.1: Specialists that Contributed to Completion of EIS

Chapter	Topic	Specialists	Guidelines and Legislation Adhered to for Specialist inputs
Chapters 1, 2, 3 and 6	Introduction, Consultation Process, Legislative Context, Construction Description	RPS	Section 1.1 above.
Chapter 4	Assessment of Alternatives	White Young Green on outline Remediation Options RPS on design, end use and construction alternatives	Section 1.1 above.
Chapter 5	Project Description	RPS White Young Green	Section 1.1 above.
Chapter 7	Community & Socio-economic	RPS	Section 1.1 above. Fáilte Ireland Guidelines for the Treatment of Tourism in an EIS (2001).
Chapter 8	Traffic and Transport	RPS	Section 1.1 above. NRA document *Traffic and Transport Assessment Guidelines (2007)*.
Chapter 9	Air Quality and Climate	RPS	Section 1.1 above. WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide Global update 2005, Summary of risk assessment. Air Quality Standards Regulation 2011 (S.I. 180 of 2011). The Air Quality Standards Regulation 2011 (SI 180 of 2011). Guidelines for the Treatment of Air Quality During the Planning and Construction of National Roads Schemes, 2006. Danish EPA Environmental Guidelines No. 1, 2002 “Guidelines for Air Emission Regulation Limitation of air pollution from installations. TA Luft from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 2002, “Technical Instructions on Air Quality Control.

Chapter	Topic	Specialists	Guidelines and Legislation Adhered to for Specialist inputs
			Appendix D of UK Environment Agency IPPC H1 - IPPC Environmental Assessment for BAT. Health and Safety Authority (HSA) in the 2011 “Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (S.I. No. 619 of 2001). Design Manual for Road and Bridges (DMRB), Volume 11, Section 3, Part 1.
Chapter 10	Noise & Vibration	RPS	Section 1.1 above EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Schedules Activities (NG4 2011). British Standard BS5228:2009 Noise and Vibration Control on Construction and Open Sites. British Standard 8233:1999 Sound Insulation and Noise Reduction for Buildings - Code of Practice. British Standard BS4142:1997 - Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas. World Health Organisation (WHO) - Guidelines for Community Noise. UK Department of Transport (Welsh Office) - Calculation of Road Traffic Noise [CRTN].
Chapter 11	Landscape & Visual	RPS	Section 1.1 above. DoEHLG Landscape and Landscape Assessment” (June 2000). Guidelines for Landscape and Visual Impact Assessment’ (GLVIA) by The Landscape Institute and Institute of Environmental Management and Assessment (2002).
Chapter 12	Materials Assets	RPS	Section 1.1 above.
Chapter 13	Soils, Geology and Hydrogeology Hydrology & Flood Risk Assessment Hydrodynamics Water Quality	Environmental Risk Solutions RPS RPS White Young Green (DQRA)	Draft Institute of Geologists of Ireland (IGI) Guidance on the preparation of Environmental Impact Statements (to be published 2013). Guidelines on Procedures for Assessment and Treatment of Geology,

Chapter	Topic	Specialists	Guidelines and Legislation Adhered to for Specialist inputs
			Hydrology and Hydrogeology for National Road Schemes (2006).
Chapter 14	Ecology (including marine and terrestrial) Sediment analysis Bat Survey Ornithology Survey Sediment Modelling	RPS NUIG Aardwolf Wildlife Surveys Doherty Environmental RPS	DOEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government. EC (2007a) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, and opinion of the commission. European Commission. European Communities (Environmental Impact Assessment) Regulations, 1989 to 2001. Planning and Development Act 2000 (as amended). European Communities (Birds and Natural Habitats) Regulations 2011. Wildlife Act 1976 and Wildlife (Amendment) Act 2000. Flora (Protection) Order 1999. EC (2007b) Interpretation Manual of European Union Habitats. Version EUR 27. European Commission. Section 1.1 above.
Chapter 15	Archaeology and Cultural Heritage: Terrestrial and Underwater	Courtney Deery Heritage Consultancy Archaeological Diving Company Ltd (ADCO)	National Monuments Acts, 1930-2004; The Planning and Development (Strategic Infrastructure) Bill, 2006. The Heritage Act, 1995. Guidelines on the information to be contained in Environmental Impact Statements, 2002, EPA. Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2003, EPA. Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes, NRA.

Chapter	Topic	Specialists	Guidelines and Legislation Adhered to for Specialist inputs
			Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands. Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000. Code of Practice between Bord Gáis Éireann and the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Department of Environment Heritage and Local Government), 2002.
Chapter 16	Indirect, Cumulative Impacts & Impact Interactions	RPS	Section 1.1 above.
Chapter 17	Summary of Potential Impacts and Mitigation Measures	RPS	Section 1.1 above.
EIS	Peer Review	Sinclair Knight Merz Enviros (SKME)	Relevant Guidelines Identified above and Section 1.1 above.

LEGEND:

Haulbowline Island

East Tip

Title
SITE LOCATION MAP

Figure 1.1

File Ref : MCE0734 Figure 1.1
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

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LEGEND:

- Study Area Boundary
- Predicted Extent of Permanent Works
- Outer Extent of PES
- End Use - Recreational Area
- Access Road and Footpath Improvement Area

Title

EXTENT OF WORKS (STUDY AREA) BOUNDARY

Figure 1.2

File Ref : MCE0734 Figure 1.2
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

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Title

SITE LAYOUT MAP

Figure 1.3

File Ref : MCE0734 Figure 1.3
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

RPS

1.2 A BRIEF HISTORY AND BACKGROUND TO HAULBOWLINE ISLAND AND THE EAST TIP

1.2.1 A Brief History of Industry on Haulbowline Island

Haulbowline Island has been in State ownership since 1602 and was shared by the British Boards of Admiralty and Ordnance since 1805. The earliest maps indicate that the Island was confined to the higher ground on the west side of the Island (O'Callaghan Moran (OCM), 2002). The Island was originally used as a naval supply and dock yard by the Royal Navy in the 18th and 19th centuries and extensive land reclamation occurred during the development of the naval docks. Construction of the dockyard started on the Island in 1865 and was completed in 1894. The construction involved the extension of the eastern part of the Island using fill material obtained from quarries on the Island itself and the mainland (OCM), 2002). Haulbowline consisted of two Islands linked by a bridge until 1902 when the body of water separating the two land masses was infilled (White Young Green (WYG), 2008[2]). Figure 1.4 shows a historical map of the site.

The steelworks commenced operations in 1938 (Environs Aspinwall (EA), 2002) but closed shortly afterwards in 1941 and restarted again in 1942 when the Government provided capital for the purchase of two 35 tonne open hearth furnaces. These operations then ceased in early 1947 but re-opened later in 1947 when the facility was reopened under Irish Steel Holdings Limited, a company owned by the State (OCM, 2002).

The steel plant was set up in the eastern side of the Naval Base making use of a number of the existing buildings. A pickling, galvanizing and corrugation plant was opened in 1954. Initially, the open hearth furnaces were powered by coal gas (EA, 2002).

Various changes occurred at the plant throughout the 1970's and 1980's including:-

- Conversion of the coal hearth furnaces to fire oil;
- Replacement of the oil fired open hearth furnace with an electric furnace;
- Installation of an electrical substation and transformers to power the furnace;
- Connection of the plant to the natural gas supply system operated by Bord Gáis;
- Cessation of the galvanizing plant operations in 1981, and
- Installation of a 90 tonne arc furnace and reconfiguration of the plant to combine fast melting in the arc furnace with continuous casting and a continuous universal mill (WYG A, 2008).

In 1996, the Irish Government sold the facility to Ispat International, who formed Irish Ispat Limited (IIL) to operate the plant. In 1997 and 1998 Cork County Council issued a waste permit to IIL under the European Communities (Waste) Regulations 1979 (S.I No 390 of 1979 and Permit No. 2/97) to treat, tip or store waste. In 1999, IIL applied to the EPA for an Integrated Pollution Control (IPC) Licence to operate the facility in compliance with the requirements of the Environmental Protection Agency Act 1992. IIL went into liquidation on 15th of June 2001 and steel production ceased. An IPC licence was subsequently issued by the EPA to IIL on 22nd June, 2001 (*Cork County Council East Tip, Haulbowline Island Factual Report 12 June 2001*) but was declined by the liquidator. Cork County Council has been advised by the EPA that this licence has no current legal standing.

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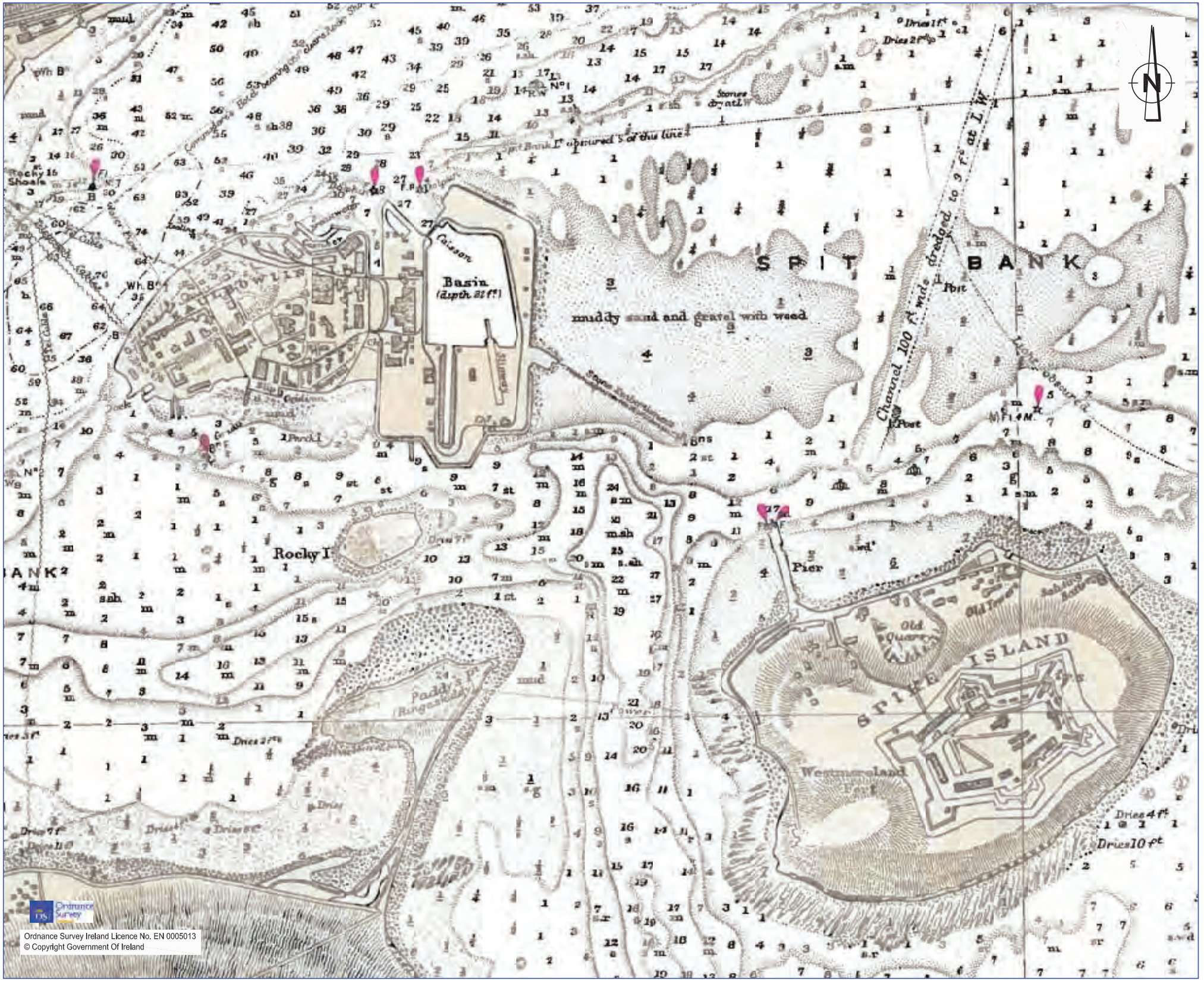
[2] White Young Green A (WYG A, 2008) *Former Irish Steel Plant, Haulbowline Island, Environmental Report Volume 1 & Volume 2* (1).



Title

HISTORICAL MAP
(Showing the Sea Wall)

Figure 1.4

File Ref : MCE0734 Figure 1.4
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP
REMEDIATION
PROJECT

RPS

1.2.2 Brief History of the East Tip and the Need for this EIS

Process waste was dumped on a sand spit to east of the Naval Dockyard from early 1960s creating the East Tip (See Figure 1.5 below). During the period 2005 to 2006 the steel production buildings were demolished and some of the construction and demolition waste was also deposited on the East Tip. Between 2007 and 2008 the main site was cleared together with steelwork wastes on the surface of the East Tip. It was at this time that un-authorised excavations were carried out on the East Tip by a contractor who excavated and removed oily sludge material buried within the slag material.

Under Article 4 of the Waste Directive (European Directive 75/442/EEC on Waste (as Amended by 91/156/EEC, 91/692/EEC and 96/350/EC, 2008/98/EC and enacted in Irish Law by European Communities (Waste Directive) Regulations, S.I. No 126 of 2011)), Ireland is required to ensure that waste is recovered or disposed of without endangering human health and without using processes and methods which could harm the environment.

In 2005 the European Court of Justice ruled (Case C494/01 *Commission V Ireland)* that Ireland had infringed the Waste Framework Directive (77/442, amended by 91/156) for generally and persistently failing to meet the requirements of various articles contained therein.

The Court held that Ireland did not meet its obligation, by which it has been bound since 1977, to ensure that all municipal landfills hold the relevant permit required by the Directive. In an additional Letter of Formal Notice from the European Commission to Ireland on the 30th of September 2010, it was noted that the measures taken by Ireland to satisfy the judgment were incomplete or otherwise deficient for specified reasons at that time. It referred to the 12 sites which had been the subject of the original complaints to the Commission, as well as other sites which were the subject of later complaints. The East Tip was the subject of a formal complaint made in 2008 and is one of the latter sites, which now comes under the ambit of the ECJ (Case C494/01, Commission V Ireland, 2005) ruling. The additional Letter of Formal Notice stated as follows in respect of the East Tip:-

> *"The fact that the waste deposited at the site is not covered by a waste permit means that it is not subject to legal conditions ensuring its environmental safety in accordance with Article 4 of the Directive. It also illustrates a deficient implementation of the prohibition on abandonment of waste found in Article 4".*

In 2012, following bilateral meetings with the European Commission, Ireland agreed to draft a Road Map of outstanding deliverables to comply with the Directives. A document was produced by the Waste Policy section of the Department of the Environment, Community and Local Government setting out the deliverables and a firm time line for each item. The programme of measures agreed with the EU Commission to complete Ireland's response to the judgement included licensing and remediation of East Tip (Programme of measures available at http://www.environ.ie/en/publications/environment), which is the subject of this EIS. In relation to the former Ispat site it was agreed that an application for a licence to the EPA be made. This application would address the deposition of waste, including hazardous waste elements, on Haulbowline Island, and oversee any necessary remedial action required.

1.2.3 Overview of Works Completed Since the ECJ Case C494/01, Commission V Ireland, 2005

Between 2008 and 2012 Cork County Council compiled a large volume of data and information relating to the East Tip through various studies and reports undertaken by consultants (including site investigations, environmental reports, risk assessments etc). A summary of this information is contained in a report entitled *East Tip, Haulbowline Factual Report (March, 2012) and Addendum (August, 2012)*. The purpose of gathering this data was to provide a valuable resource library to all stakeholders involved with the future reclamation of the East Tip.

In 2012, Cork County Council (on behalf of the Minister for Agriculture, Food and the Marine) set up a panel of consultants to support in the execution of a number of technical studies to progress towards regularisation and remediation of the tip in order to comply with the ECJ (Case 494/0, Commission V Ireland, 2005) judgement.

In January 2012, Cork County Council commissioned White Young Green Environment, Planning and Transport (WYG EPT Ltd) to undertake site investigations including installation of monitoring wells into the waste, underlying sediments and bedrock. The results of the investigation were used to complete a Detailed Quantitative Risk Assessment (DQRA) for the East Tip site using best practice procedures adopted in Ireland and Europe. As part of this DQRA WYG EPT provided recommendations for remediation including the use of a capping system and engineered perimeter structure.

As stated above the DQRA recommended that in its present condition the East Tip poses a risk to both site visitors and ecological receptors in Cork Harbour waters and that a remediation solution would be required to break or control the pathway between the East Tip and human and environmental receptors identified.

The proposed solution in the DQRA therefore recommended that the remediation solution should include a low permeability cover system to minimise infiltration of surface water into the waste and underlying waters in combination with an engineered perimeter system with a maximum permeability of 10^{-5}m/s to reduce contaminant flux leaving the waste into the Cork Harbour waters and secondly to prevent erosion of the waste material into the sea.

In August 2012 Cork County Council commissioned RPS to prepare the outline design for the proposed remediation solution which is the subject of this EIS. Supplementary to the need to remediate the site, the proposal also includes for the creation of an amenity area at the East Tip and ancillary works to improve the access and footpaths to the site which will provide a positive community gain.

In addition, Sinclair Knight Merz Enviros (SKME) was appointed by Cork County Council as peer reviewers for the duration of the project and to provide Cork County Council with specialist technical and environmental advice.

1.2.4 Overview of Waste at East Tip

The original island was 11.5ha but by 1998 had grown to 33.5ha with the East Tip having a total area of 7.6ha. By 2002 the East Tip had further increased in size by 1.4ha thus encompassing an area of approximately 9ha in total. It may therefore be concluded that the area of the island was 23.5 ha when steel processing started in 1938 and 34.9 ha when production ceased in 2001, an increase of almost 50% (WYG A, 2008). It is thought that the deposition of steel making waste on the East Tip of the Island has been taking place since the 1960's but intensified in the late 1970's (EA, 2002). In 1984, a section along the western perimeter of the East Tip was reclaimed by the Navy as a football pitch (KTC, 1995) (See Figure 1.5 for an overview of the Historic Progression of East Tip).

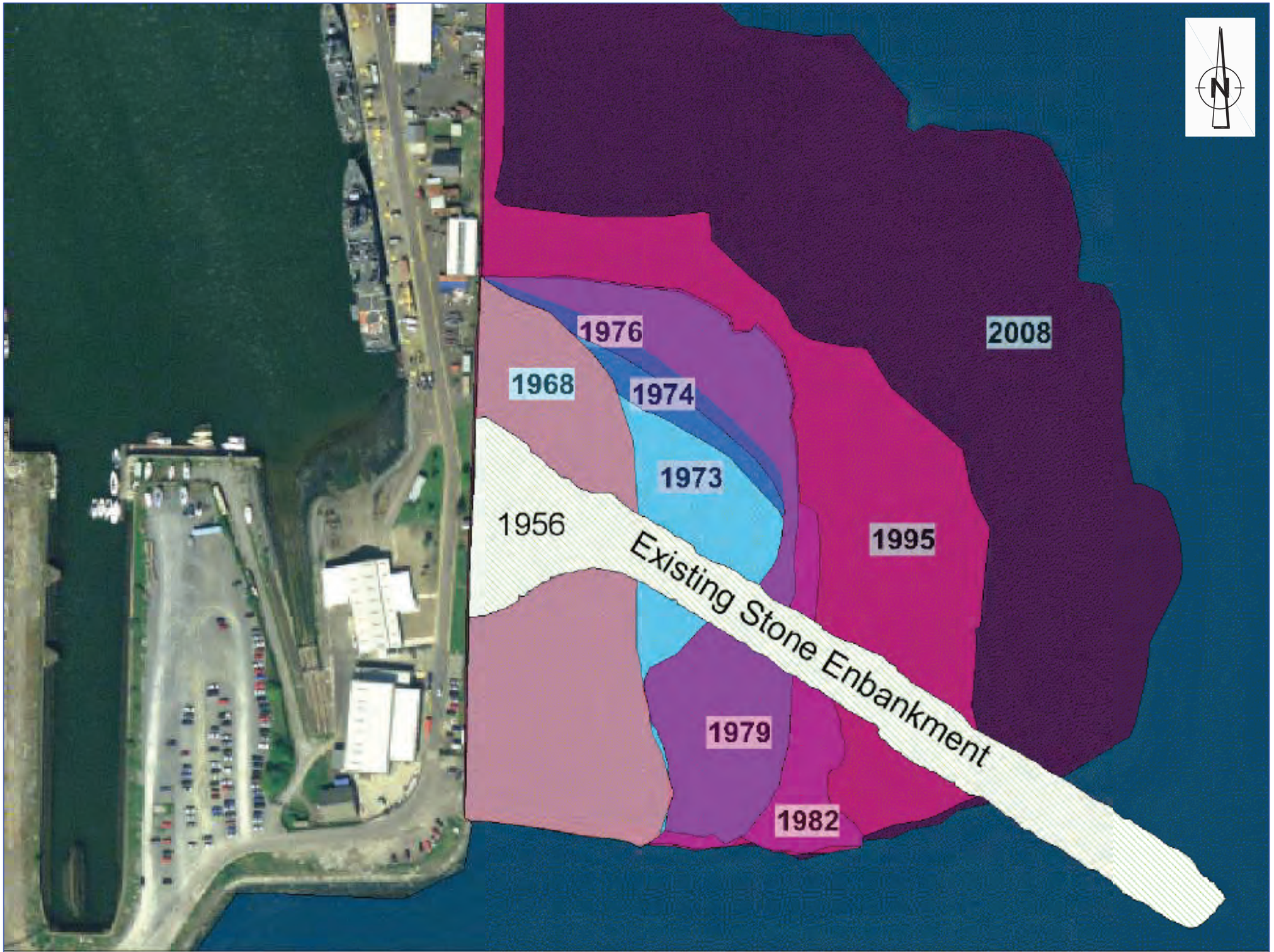
The East Tip comprises various wastes that largely originated from the steel making processes on Haulbowline Island. Additional waste types were also deposited during the operational phase of the steel plant (WYG A, 2008). Site investigations (WYG, 2005, Kevin T. Cullen & Co (KTC), 1995 & 1998 and RPS 2013 (Foreshore Area)), interviews with former key personnel of Irish Ispat (EA, 2002) and review of key documents (EA, 2002) have contributed to determining the types of waste that have been deposited. Appendix B provides details on Site Investigation works undertaken at East Tip.

In 2008, WYG estimated the approximate percentage composition of the East Tip waste material but due to the uncontrolled nature of the dumping of waste on the East Tip, the volume ratios determined are only estimates. Figure 1.6 and Table 1.2 overleaf provides an overview of the waste types identified on site in the WYG Report (2008). These data were obtained both from personnel who worked on site during operation of the steelworks and historical analytical data relating to the different waste materials. It was estimated that approximately 64% of the waste on site was slag waste from the steel manufacturing industry which is classified as non hazardous according to the European Waste Catalogue and Hazardous Waste List. In 2013, RPS were commissioned by Cork County Council to undertake a waste classification assessment of the slag component of the waste within the East Tip. The suite of analysis agreed for this waste classification exercise was informed by the Environmental Protection Agency (EPA) and used the EPA's Paper Tool to examine if dangerous substances are present in the deposited slag, and if so, if they were present at concentrations that render the slag hazardous.

While it is accepted that there are hazardous wastes within the tip; the purpose of this study was to determine the non-hazardous nature of ferrous slag outputs from the steel manufacturing industry, and to investigate the deposited slag to establish whether it remains non-hazardous, and to what extent. The study concluded that a significant proportion of the waste body is non-hazardous. A separate report on this study is provided in Appendix C and the potential for re-use of slag material for the construction stage is discussed in Chapter 6 'Project Construction'.

Site investigation works completed prior to this EIS did not undertake surveys in the foreshore therefore the extent of waste remained unknown. In 2013 Cork County Council commissioned RPS to investigate the extent of waste at East Tip in the foreshore zone. The anticipated extent of wastes is contained within the planning and waste licence boundaries as shown on Figure 1.7 and Section 1.6.1 below. These site investigations have identified waste in the foreshore of the East Tip which, in some locations, extends to the mean low water mark (MLWM)[2]. Please refer to Chapter 5 'Project Description' for further detail and Figure 1.2.

[2] Mean Low Water Mark- Low water mark as surveyed during the topographical survey 21/9/2012.



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Title

HISTORIC PROGRESSION OF EAST TIP 1956 - 2008

Figure 1.5

File Ref : MCE0734 Figure 1.5
Date : April 2013 Rev : F01

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Figure 1.6: Approximate Composition of Waste at East Tip

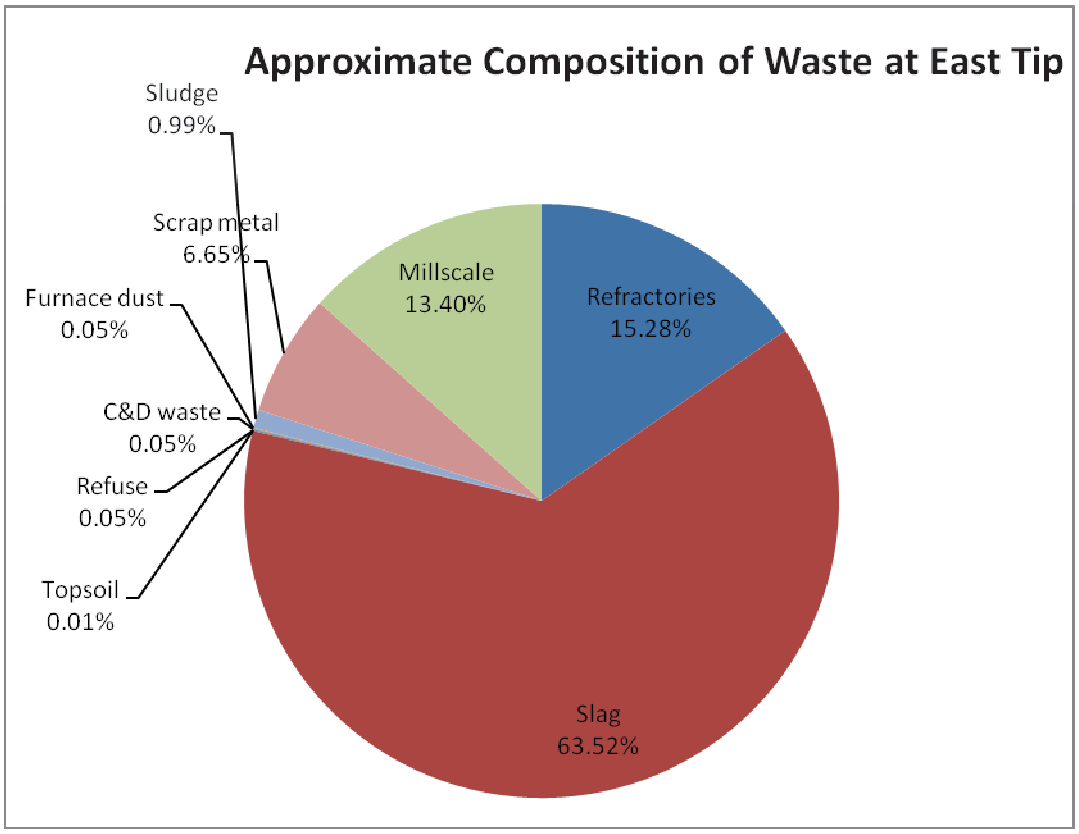

Table 1.2: Estimated Quantity of Waste Materials on Site

Waste Type	Estimated Quantity (percentage)
Refractories	15.28%
Slag	63.52%
Topsoil	0.01%
Refuse	0.05%
C&D Waste	0.05%
Furnace Dust	0.05%
Sludge	0.99%
Scrap Metal	6.65%
Millscale	13.40%

1.3 SCOPE OF EIS

This EIS has considered the construction, enduse, aftercare and maintenance of the following elements of the proposed development:-

1. The proposed engineered capping system and perimeter engineered structure. Once in place, no systems, controls or dedicated management practices are required to operate this remediation solution, however monitoring and maintenance will be required.

2. The amenity area at The East Tip including a public park and navy playing pitch.

3. All road (public road and access road) and pathway improvements.

4. The proposed drainage requirements for the site.

It is not anticipated that the above elements will be decommissioned; hence the EIS has not considered decommissioning of these elements.

In addition, the construction and removal of all temporary works including contractor compounds and temporary access roads required for the construction of the above three elements are considered in this EIS along with the following preparatory works:-

- Creation of a landform to allow for the placement of the capping system. This will consist of regrading the existing profile and will involve the excavation, processing and movement of waste on-site.

- Demolition of all existing site infrastructure (including gantry and sheds) and removal off site for recovery (where possible) (See Figure 1.3 for location of existing infrastructure and Figure 6.3 for the location of structures to be demolished).

- Removal off site of some existing stockpiles of material, e.g. mill scale.

- On-site processing of slag material from the East Tip for reuse in perimeter engineered structure.

Chapter 5 'Project Description' provides a detailed description of the proposed development, while Chapter 6 'Project Construction' provides a description of the proposed construction activities associated with the project.

It should be noted that this EIS is based on a preliminary/outline design solution as described in Chapter 5, 'Project Description' which will be subject to detailed design at a later stage.

1.4 EIS STRUCTURE

This EIS is contained within four volumes as follows.

Volume 1: EIS – Non Technical Summary

This document provides a non-technical summary description of the proposed development. It also outlines the application processes and the statutory consultation process. A summary description of the main potential impacts associated with the proposed development and the proposed measures to mitigate against these impacts is also provided.

Volume 2: EIS Main Report

The EIS includes 17 chapters, which are grouped as follows:-

Introduction & Project Description - Chapters 1-6: These chapters provide an introduction to the EIS; describe the consultation process and sets out the statutory application processes and legislative context. They also outline the need for the proposed remediation project, the alternatives considered and describe the proposed project including the associated construction activities.

Human & Natural Environment - Chapters 7-12: These chapters provide details on the existing human and natural environment prior to the proposed development, describe the potential impacts (including residual and indirect impacts) during the construction and aftercare phases of the proposed development, the mitigation measures proposed in order to eliminate or reduce these impacts and any residual impacts. These chapters address Community & Socio-Economic, Traffic and Transport, Air Quality and Climate, Noise and Vibration, Landscape and Visual and Material Assets.

Natural Environment - Chapters 13 & 14: These chapters address Soils, Geology, Hydrogeology, Hydrology and Ecology (marine and terrestrial). These chapters address the existing natural environment prior to the proposed development, describe the potential impacts (including residual and indirect impacts) during the construction and aftercare phases of the proposed development, the mitigation measures proposed in order to eliminate or reduce these impacts and any residual impacts on the natural environment.

Archaeology & Cultural Heritage - Chapter 15: This chapter addresses the features of archaeological, architectural and cultural heritage interest, including underwater archaeology at and close to the East Tip. Mitigation measures proposed in order to eliminate or reduce any impacts are also outlined.

Indirect Impacts, Cumulative Impact and Interaction of Impacts Assessment - Chapter 16

Summary of Potential Impacts & Mitigation Measures - Chapter 17

Volume 3 – Technical Appendices

Volume 3 includes the technical appendices, which contain supplementary information to the main EIS report including details on the DQRA, waste classification, consultation, sediment modelling, etc.

Volume 4: AA Screening and Natura Impact Statement

This volume comprises a Natura Impact Statement (NIS), which is a report to inform the Appropriate Assessment (required under Article 6 of the Habitat's Directive 1992, as amended) with respect to the potential impact of the proposed remediation project on Natura 2000 sites (in particular Cork Harbour Special Protection Area (SPA) and Great Island Channel candidate Special Area of Conservation (cSAC).

1.5 EIS STUDY TEAM

This EIS has been prepared by RPS on behalf of Cork County Council. Input was obtained from specialists who contributed to the EIS as outlined in Table 1.1 above.

1.6 STATUTORY APPROVALS

This EIS will support the following applications for consent for the proposed development:-

1. Planning approval under Section 181(3) of the Planning and Development Acts 2000-2013 to An Bord Pleanála; and

2. Approval under the Waste Management Acts 1996-2013. A Waste Licence Application will be submitted to the Environmental Protection Agency (EPA) in accordance with Section 40 of the Waste Management Acts 1996-2013 and the Waste Management (Licensing) Regulations 2004 as amended.

As the development proposal involves works in the foreshore, any necessary consent required from the Department of the Environment, Community and Local Government (DECLG) will be sought as appropriate. The area of foreshore in question is owned by the Minister for Agriculture, Food and the Marine.

Further detail on the relevant legislative context for the proposed development is provided in Chapter 2 'Legislative and Policy Context' of this EIS.

1.6.1 Application Boundaries

As outlined above, three separate applications will be prepared to seek approval for the proposed development. Each application will have different documentation requirements and the proposed application boundaries will also differ for each application as follows:

- Waste licence application boundary will include all permanent works associated with the remediation and creation of recreational end use of the East Tip and any other related on-site waste activities (See blue line on Figure 1.7).

- Planning application boundary will cover the extent of all permanent and temporary works associated with the remediation and creation of recreational end-use of the East Tip, improvements to the access road, public road and pathways (See redline on Figure 1.7).

- Any foreshore consent application will delineate areas as deemed appropriate, in consultation with the Foreshore Unit of the DECLG and will include all permanent and temporary works associated with the remediation in the foreshore (The High Water Mark is indicated by the green line on Figure 1.7).

As this EIS will accompany the necessary statutory applications, it addresses all aforementioned permanent and temporary infrastructure and works. Figure 1.7 outlines the application boundaries.

LEGEND:

- Planning Boundary
- Waste Licence Boundary
- High Water Mark

Title
APPLICATION
BOUNDARIES

Figure 1.7

File Ref : MCE0734 Figure 1.7
Date : April 2013 Rev : F01

East Tip Remediation Project

EAST TIP REMEDIATION PROJECT

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1.7 CONSTRAINTS/DATA GAPS ENCOUNTERED DURING PREPARATION OF THE EIS

No specific constraints have limited the assessment of likely significant impacts detailed in this EIS. Where data limitations have been encountered, these are described within Chapters 7-15.

It has been necessary in respect of a number of design and construction details to make a number of assumptions. In these cases, the worst case scenario has been assessed in order to ensure all potential and likely impacts of the proposed development have been considered and to deliver a robust assessment.

Two key design elements, for which assumptions have been made, are the maximum height of the finished profile of the site and the maximum extent of works for the construction of the perimeter engineered structure. These details can only be finalised at the detailed design stage and once a Contractor is appointed. These assumptions are described fully in Chapter 5 'Project Description'.

With regard to the construction process it is not possible at this time to be definitive about the sources of materials required to construct the engineered capping system. The preferable sources of material for the project are from site itself (materials which can safely be reused) and from other nearby construction sites from which material needs to be exported. Depending on the quantities available from such sources at the time of construction, other options may need to be considered. Such options may include the reuse of suitable dredge material from Cork Harbour, or material sourced from licensed sites that have sufficient capacity. Regardless of the source the soils will comprise material of appropriate engineered grade that will meet the requirements for remediation, end-use, maintenance and aftercare.

For the purposes of impact assessment a worst case scenario has been assumed under which most material will be imported to the site and will be transported by road. Chapter 5 'Project Description' outlines the volumes and quantities of materials required for the various elements of the project (e.g. PES, landscaping, etc.) and Chapter 8 'Traffic and Transport' addresses potential impacts and appropriate mitigation measures (including the preparation of a Traffic Management Plan (TMP)) associated with the haulage of materials required for the construction stage.

Whilst a worst case scenario (sourcing all material by road) was considered in this EIS it is recommended that the option of using a barge to transport material is also explored once the source of material becomes known. Chapter 8 'Traffic and Transport' of this EIS recommends that this option is explored through the relevant statutory approval process and consultation with key users of Cork Harbour (i.e., boat users and Port of Cork). If transport of material using a barge proves to be an option, then it is recommended that transport and unloading activities be undertaken in accordance with the Construction Environmental Management Plan (CEMP) (see Chapter 6) and Traffic Management Plan (TMP) (see Chapter 8) for this project, and best practice.

The TMP, and if necessary the traffic modelling, will be updated once the source, haulage route (sea or road) and the timeframe for when the materials will be available for transportation to the East Tip are known. Should the option of using dredge material from Cork Harbour be explored at the detailed design stage any works will take place in accordance with the Marine Institute Guidelines for the *"Assessment of Dredge Material for Disposal in Irish Waters* (Marine Institute, 2006).

Similarly, if certain wastes are encountered during the works that require off-site disposal, contingency measures have been recommended for handling and exporting such waste in accordance with appropriate disposal requirements (see Chapter 6 'Project Construction') to prevent/minimise environmental impact.

EAST TIP REMEDIATION PROJECT ENVIRONMENTAL IMPACT STATEMENT

DOCUMENT CONTROL SHEET

Client:	**Cork County Council**					
Project Title:	**East Tip Remediation Project**					
Document Title:	**Environmental Impact Statement**					
Document No:	**RPS/MCE0734Rp004/EIS001F01**					
This Document Comprises:	**DCS**	**TOC**	**Text**	**List of Tables**	**List of Figures**	**No. of Appendices**
	1	**1**	**-**	**1**	**1**	**17**

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
F01	Final	RPS	Aileen Fitzgerald Michelle Bennett Larry O'Toole Cathriona Cahill	Frank Maguire	Cork	25.10.13

PREFACE

The Environmental Impact Statement (EIS) for the East Tip Remediation Project consists of four volumes as follows:-

Volume 1: EIS Non Technical Summary

Volume 2: EIS Main Report

Volume 3: Technical Appendices

Volume 4: AA Screening and Natura Impact Statement (NIS)

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ACKNOWLEDGEMENTS

This Environmental Impact Statement for the East Tip Remediation Project has been prepared by RPS for and with the assistance of Cork County Council.

RPS wish to acknowledge the valuable input provided by their Environmental Sub-Consultants (as outlined in Table 1.1 of the EIS) and SKM Enviros (SKME) who undertook a peer review of the EIS on behalf of Cork County Council under a parallel agreement.

The study team would also like to thank the various interested parties including key statutory and non-statutory stakeholders and members of the public who participated in the consultation process.

Preamble

In August 2011 Cork County Council, on behalf of the Irish State, embarked on a programme to regularise the status of the East Tip on Haulbowline Island, Co. Cork. The objective is to address the legacy associated with the disposal of steelwork's waste on a sand spit in Cork Harbour over a 40 year period through its remediation and conversion to an amenity for the beneficial use of the local communities.

Whilst the regularisation process was initiated on foot of a European Court of Justice judgement (ECJ494/01), the Irish State is committed to ensuring that the remedial solution and amenity development are completed in accordance with current relevant national and international best practice and guidance.

The initial step in the process requires the submission of a planning application to An Bord Pleanála for the remediation works and a change of landuse to facilitate the development of the public amenity.

A Waste Licence also has to be obtained from the EPA, although the site will never operate as a functioning waste facility. The Waste Licence Application is primarily to seek approval for the works and various processes that have to be undertaken to remediate the site and is the mechanism required to fully regularise the site. The majority of the waste material (almost approximately two thirds) at the site is slag which is classified as non-hazardous, however the presence of some hazardous wastes within the bulk waste mass and mixed within the slag means that a hazardous Waste Licence must be applied for.

As the remediation will involve works in the foreshore around the perimeter of the site all necessary foreshore consents will also be obtained.

Whilst the site is unique in an Irish context, Haulbowline Island being the location of the only steelworks ever to operate in Ireland, in international terms it is not unusual. The site is also relatively small in an international context and whilst it does contain some hazardous wastes, it does not contain many of the difficult wastes that other steelworks tips do overseas, e.g. wastes from coke manufacturing and other by-products from ancillary processes.

There has been much written in the public domain about the site over the years however the various assessments carried out for the EIS have confirmed that the site currently poses a relatively low level of risk to human health and to the environment – these assessments have been numerous and extensive and have included a comprehensive desk study and detailed review of a very extensive body of monitoring data. This has been supplemented recently by sampling and testing of all waste types present in the East Tip, sampling and testing of geological strata underlying the site, detailed investigation and sampling of groundwater within and beneath the East Tip, sampling and testing of the waters in Cork Harbour surrounding the site, sampling and testing of sediments adjacent to the Tip shoreline and a detailed environmental risk assessment. An assessment of baseline conditions at the site and the surrounding area has also been undertaken with respect to human and other environmental factors. All of the above work has been undertaken with reference to relevant guidance documents and recognised Irish and International norms. This work has culminated in an Environmental Impact Statement (EIS) which has been prepared to support the remediation proposals.

The proposed remediation measures entail the construction of a perimeter engineered structure (PES) and a capping layer. They have been developed from these detailed studies and assessment of the risks. The suite of remediation measures and extensive mitigation

measures proposed in the EIS are conservative, they represent the application of 'Best Available Techniques' and they fully address the level of risk posed by the site so as to ensure that the site can be enjoyed safely as an amenity in the future and will not pose a risk to the surrounding environment generally.

The development proposals have also been informed by extensive statutory and non-statutory consultation. Regular meetings and updates have been held with the European Commission. In 2011 a Project Steering Group was established by the Minister for Agriculture, Food and the Marine, Mr. Simon Coveney together with representatives from Cork County Council, the EPA, DECLG, Department of Defence, Department of Jobs, Innovation and Enterprise, local politicians, OPW, Naval Service, Port of Cork, National Maritime College and Cork Harbour for a Safe Environment. In addition meetings have been held with statutory bodies and non-statutory organisations and public meetings were held in Cobh and Ringaskiddy to appraise the public of progress and to invite comments and feedback. Overall a wide range of issues were raised through the various consultation processes and these have all been addressed in the EIS.

The project has the principles of sustainability central to its development, in terms of environmental protection, in terms of social inclusion and enhancement for the wider community and in terms of appropriate economic considerations in aspects such as design proposals, reuse of materials during construction and in terms of the development of a design which will have a relatively low future management and aftercare cost and low energy requirements.

In summary the project will reverse the negative legacy associated with the site to date and will be a positive development for the immediate area, for it's communities and for the Lower Cork Harbour area.