awnconsulting

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

ENVIRONMENTAL REPORT FOR MAINTENANCE DREDGING AT DROGHEDA PORT, DROGHEDA, CO. MEATH

Technical Report Prepared For

Captain Martin Donnelly Master Mariner,
F.N.I. Harbour Master
Drogheda Port Company

Technical Report Prepared By

Ashley O' Toole, BA (Hons) MCIWM, Senior Consultant

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INTRODUCTION

At the request of Drogheda Port Company, AWN Consulting Ltd (AWN) has prepared the following Environmental Report to accompany the Dumping at Sea permit application for the maintenance dredging operation at Drogheda Port.

Drogheda Port Company currently holds a Dumping at Sea Permit S0015-02 for the period 2013 – 2021 and is applying for a Dumping at Sea permit for the period 2021 – 2029 for the sea disposal of dredged material. The ongoing dredging of the estuary and the seaward approaches is carried out to maintain the safe navigability of the channel. A portion of the dredged material will be disposed of at a dump site close to the surf zone in 4m of water. A portion of the dredged material will also be dumped 2.5km from the shore in 14m of water. There is also a third dump site which is now a redundant inactive site. Drogheda Port Company will also be engaging in a beneficial re-use option whereby a portion of the dredged material of up to 60,000 m^3 may be made available for beneficial reuse within the construction industry. The dredging works are necessitated by the need to dredge the river entrance, seaward approaches, navigation channel, berths and swing basins to restore safe navigational water depths. Beneficial reuse is employed to meet the requirements of the OSPAR Convention. Please see Figures 1.1 and 1.2 below for the location of the dredging extent and the dumpsites.

Figure 1.1 Site Location and Dredging Extent

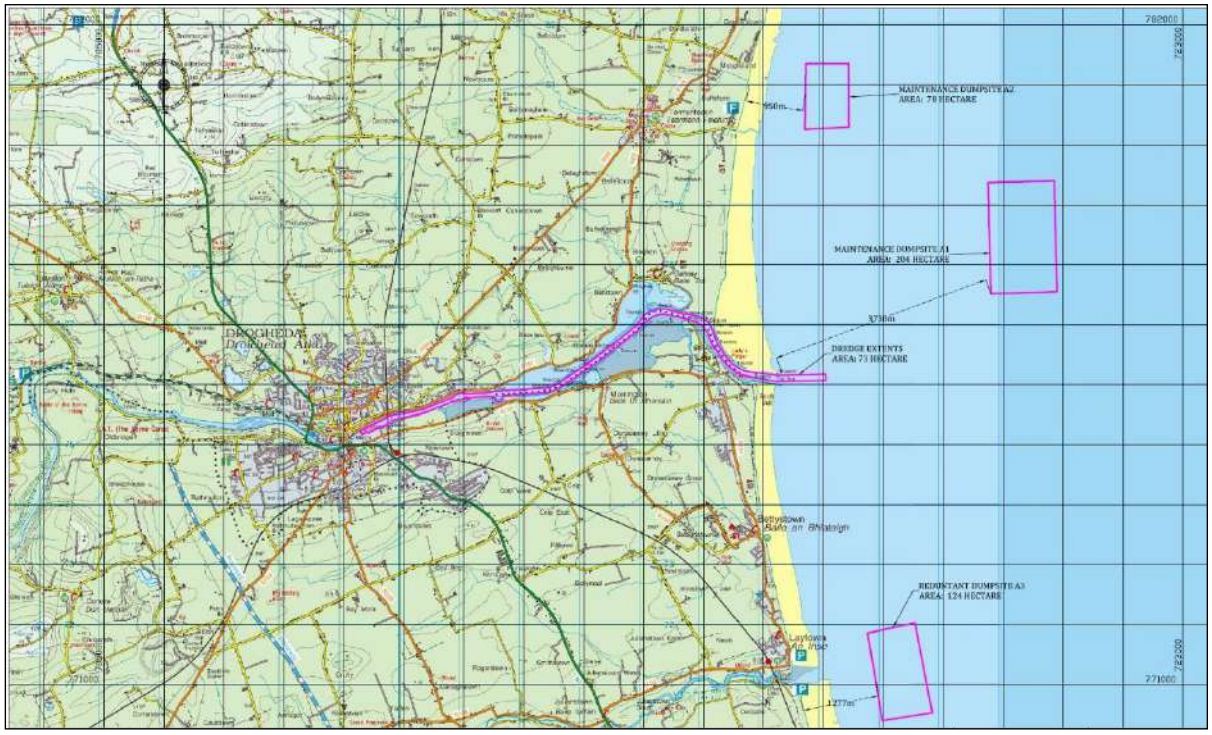

Figure 1.2 Location of Dumpsites

1.1 OBJECTIVES OF THIS ENVIRONMENTAL REPORT

The core objectives of this Environmental Report are to predict any significant environmental impacts that are likely to occur due to the maintenance dredging and dumping activity and, where applicable, propose measures to avoid, reduce or remedy them.

It reports on the findings of the EIA process and informs the competent authority i.e. the Environmental Protection Agency (EPA), statutory consultees, other interested parties and the public in general about the likely effects of the project on the environment.

In doing this, the Environmental Report has been prepared in compliance with the EIA Directive 2014/52/EU and the relevant domestic regulations and guidance. Chapter 2 Screening & Scoping provides details of the legislation that has been followed and the guidelines that have been taken into account. It also discusses the relationship between this Environmental Report and separate assessments prepared under other legislation.

1.2 FORMAT

This Environmental Report follows a grouped format structure. Using this structure, the Environmental Report examines each environmental topic in a separate chapter. The chapters generally follow this format:

Section	Notes
Introduction/methodology	
The proposed development	Including measures incorporated to avoid, prevent or reduce environmental effects (design stage mitigation)
The receiving environment	As it would be in the absence of the proposal
Predicted impacts	Focusing on impacts that are likely and significant
Mitigation measures	Post-assessment measures where required to reduce, remedy or offset predicted impacts
Residual impacts	Where relevant

Table 1.1 Environmental Report Format Structure

Interactions between issues that arise in separate chapters are assessed as they occur in each chapter. Cumulative effects are similarly assessed as appropriate in the relevant chapters of the Environmental Report.

Chapter 2 Screening & Scoping, gives more detail on the issues addressed under each heading. Separate reports prepared in accordance with other (non-EIA) requirements include:

- Appropriate Assessment (AA) Screening Report;
- Natura Impact Statement (NIS);
- Maintenance Dredging Hydraulic Modelling Study;
- Sediment Sampling and Analysis Report; and
- Survey Report on Drogue Release at Drogheda Offshore Dumpsite.

Some of these reports are also relevant in the consideration of the prescribed EIA topics so these are referred to in the Environmental Report, as and where appropriate. For example, the Land, Soils, Geology & Hydrogeology chapter refers to the Sediment Sampling and Analysis Report and the Biodiversity chapter refers to the Natura Impact Statement.

1.3 STUDY TEAM

Role	Personnel		Company
Director	Dr. Fergal Callaghan		AWN Consulting
Co-ordinator	Ashley O' Toole		AWN Consulting
Specialist Topics			
Chapter	**Role**	**Personnel**	**Company**
Waste Management	Main Author	Ashley O' Toole	AWN Consulting
Land, Soils, Geology & Hydrogeology	Main Author	Paul Conaghan	AWN Consulting
Water and Hydrology	Main Author	Paul Conaghan	AWN Consulting
Biodiversity	Main Author	Aebhin Cawley	Scott Cawley

Table 1.2 Environmental Report Study Team

Study Director – Dr. Fergal Callaghan has a BSc. in Environmental Chemistry from the University of Limerick and a Ph.D. in Chemical & Environmental Engineering from the University of Birmingham.

Fergal has led the AWN Environmental Planning Team for numerous EIS/EIA's in Ireland and mainland Europe over the last 19 years, in the role of Project Director. Fergal has 28 years of experience in the areas of Environmental Impact Assessment, environmental capacity assessment and master-planning of large and complex projects.

He has been the lead environmental consultant, leading the AWN EIS/EIAR teams for some of the largest and most complex Environmental Impact Assessment industrial

projects in Ireland, including the Intel Fab24C EIS and IPPC application (a 3 billion dollar capital investment programme), the Intel NEWFAB Project (a 3 billion dollar capital investment), the Sangart Biopharma EIS, the Chemco Chemical Storage Complex EIS in Mulhuddart, numerous pharmaceutical plant EIS over the last 19 years, including projects for Johnson and Johnson, Wyeth and Servier.

Study Co-ordinator and Waste Management – Ashley O' Toole has a BA (Hons) in Environmental Sciences from Trinity College Dublin and is a Practitioner Member of the Institute of Environmental Management and Assessment (PIEMA). Ashley is also a Chartered Waste Manager with the Chartered Institute of Waste Management (MCIWM). Ashley has over 10 years of experience working in the area of Environmental Assessment and Waste Management.

Ashley is an experienced Project Manager and Co-ordinator, proven by her track record in managing Industrial Emissions Licence applications, Environmental Impact Assessments and contaminated land site investigations.

Land, Soils, Geology & Hydrogeology and Water and Hydrology – Paul Conaghan is an Environmental Consultant at AWN Consulting with over 8 years' experience working in the environmental science and environmental engineering fields. Paul holds a degree in Environmental Science from the University of Limerick and a Masters in Environmental Engineering from Queens University Belfast. Paul has worked on a wide range of projects including hydrogeology, contaminated land, project management, site geotechnical evaluations, site assessments specialising in Environmental Impact Assessment. Paul is a member of the International Association of Hydrogeologists.

Biodiversity - Aebhin Cawley is Managing Director with Scott Cawley. She holds an honours degree in Zoology from Trinity College, Dublin and a postgraduate diploma in Physical Planning at Trinity. She is a Chartered Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a Full Member of the CIEEM. Aebhin Cawley is an experienced ecological consultant with extensive experience in public and private sector projects including renewable energy, ports and other major infrastructural developments. Aebhín has been undertaking Appropriate Assessment work in Ireland since 2002 and has been influential in determining the direction in which AA work is evolving in Ireland. She also has been Project Director for ecological services for several major transport and infrastructure applications including the M11 Enniscorthy Bypass and is currently managing the ecological aspects of the Galway City Ring Road.

1.4 IMPACT PREDICTIONS

Rating of potential environmental impacts in the specialist chapters generally follows the Glossary of Impacts contained in the EPA Guidelines[1] as shown in Table 1.3 below. This takes account of the quality, significance, duration and type of impact characteristic identified.

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment.
	Neutral	A change which does not affect the quality of the environment.
	Negative	A change which reduces the quality of the environment
Significance	Imperceptible	An impact capable of measurement but without noticeable consequences.
	Slight	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate	An impact that alters the character of the environment in a manner consistent with existing and emerging trends.
	Significant	An impact, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Profound	An impact which obliterates sensitive characteristics.
Duration	Short-term	Impact lasting one to seven years.
	Medium-term	Impact lasting seven to fifteen years.
	Long-term	Impact lasting fifteen to sixty years.
	Permanent	Impact lasting over sixty years.
	Temporary	Impact lasting for one year or less.
Type	Cumulative	The addition of many small impacts to create one larger, more significant impact.
	'Do Nothing'	The environment as it would be in the future should no development of any kind be carried out.
	Indeterminable	When the full consequences of a change in the environment cannot be described.
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost.
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant impact is of greater significance than the sum of its constituents.
	'Worst Case'	The impacts arising from a development in the case where the mitigation measures may substantially fail.

Table 1.3 Impact Predictions

1.5 DIFFICULTIES ENCOUNTERED

The EIA Regulations require that difficulties such as technical deficiencies, lack of information or knowledge encountered in compiling any specified information for the Environmental Report be described. In general, there were no significant difficulties encountered in the production of this Environmental Report. Any issues encountered during assessment of individual factors are noted within the specialist chapters.

[1] Draft Guidelines on the information to be contained in Environmental Impact Statements, EPA, 2017 (Section 3.7.3 Descriptions of Effects).

2.0 SCREENING & SCOPING

2.1 LEGISLATION AND GUIDANCE

Environmental Impact Assessments (EIAs) are carried out in response to the requirements of the European Directive on the assessment of the effects of certain public and private projects on the environment, particularly as codified in Directive 2011/92/EU. This Directive was amended by Directive 2014/52/EU. The key amendments affecting the information to be contained in an EIAR are set out in Table 2.1 below.

The enabling statutory instruments (S.I.s) which transpose the Directive into law in Ireland are the European Communities (Environmental Impact Assessment) Regulations, 1989, as updated by the Planning and Development Acts 2000 to 2006 (the EIA Regulations), with the key legislation being S.I. 600/01. These regulations prescribe the classes of projects subject to EIA. The amendments introduced by Directive 2014/52/EU were transposed into Irish law by the European Union (Planning And Development) (Environmental Impact Assessment) Regulations 2018 (SI 296/18). These came into effect on 1 September 2018. They set out the statutory format and content for an EIAR.

This Environmental Report has been prepared in accordance with the above and has regard to other relevant regulations including the Environmental Protection Agency (EPA) Guidelines on information to be contained in Environmental Impact Statements (EPA, 2002), the EPA Advice Notes on Current Practice in preparation of Environmental Impact Statements (EPA, 2003) and relevant European Commission guidance documents[2], as relevant.

The EPA has compiled draft revised Guidelines on the information to be contained in Environmental Impact Assessment Reports (2017). While these are subject to further review by the EPA including changes to ensure alignment with SI 296/18, they indicate the changes that are likely to be introduced, particularly regarding the information that will be required to be contained in an EIAR to make it compliant with the new legislation. This Environmental Report follows the 2002 Guidelines while also taking account of the changes contained in the draft revised Guidelines.

An Appropriate Assessment has been carried out to assess the potential of the proposed activity to affect the integrity of the Natura 2000 network. Its findings are provided in a Natura Impact Statement (NIS). The NIS is referred to in the Biodiversity chapter of this Environmental Report as relevant, while avoiding duplication of its contents.

The relationship between this Environmental Report and other assessments prepared under separate legislation is discussed in Section 2.3.3.

2.2 SCREENING

The legislation[3] specifies classes of development and thresholds for determining which projects should be subject to EIA. Projects that fall into any of the specified classes or exceed the thresholds automatically require EIA. The legislation also sets out criteria for deciding whether 'sub-threshold' projects should be subject to EIA.

Maintenance dredging and dumping does not fall within any of the classes of development specified in Part 10 of the Planning and Development Regulations 2001 (as amended). The proposal is considered under Schedule 7 'Criteria for determining whether a development would or would not be likely to have significant effects on the Environment' , as transposed in Irish legislation, which are grouped under three headings, viz.:

[2] Including EIA Guidance - Screening, EIA Guidance - Scoping and EIA Guidance - EIA Report, all EC, 2017.

[3] Ref. s2.1

(i) Characteristics of Proposed Development;

(ii) Location of Proposed Development; and

(iii) Characteristics of Potential Impacts

- it is considered that, having regard to the nature and scale of the proposal, the activity is not likely to have significant effects on the environment and therefore is not subject to EIA. Nonetheless, this Environmental Report has been prepared with the primary aim to provide sufficient information to the EPA, statutory consultees, other interested parties and the public in general about the likely effects of the project on the environment to allow them to determine that the maintenance dredging and dumping activity is not likely to have a significant effect on the environment.

2.3 SCOPING

2.3.1 Basis of Scoping for this Environmental Report

Scoping is the process of identifying potential concerns that need to be examined in an EIAR/Environmental Report. The determination of potential concerns to be addressed in this case was largely based on:

- The requirements of the EIA Regulations;
- The requirements of the EIA Directive 2011/92/EU (as amended);
- The EPA's Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2012) and Advice Notes on Current Practice (in the preparation of EISs) (EPA, 2003);
- The EPA's Draft Revised Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2017);
- The EIA team's experience of preparing and submitting previous EIARs; and
- Information available from the files of Drogheda Port Company on the detailed considerations for the previous Dumping at Sea permit which this application seeks to extend & revise.

The scoping process included circulation to and discussion of an Environmental Report Scoping Document with Drogheda Port Company, the EPA and a list of Consultees known as the Environmental Pillar i.e. national environmental non-governmental organisations (NGOs) who work together to represent the views of the Irish environmental sector. The Environmental Report Scoping Document and the list of Consultees is included as Appendix 2.1 and 2.2 to this Environmental Report. The chapters which follow all have regard to the requirements of the agreed scope i.e. Land, Soils, Geology and Hydrogeology, Hydrology, Waste Management and Biodiversity.

2.3.2 Consultation with Agencies

The following bodies were consulted in the preparation of this report:

- The Environmental Protection Agency (EPA);
- Inland Fisheries Ireland (IFI);
- Sea Fisheries Protection Authority (SFPA);
- Department of Housing, Planning and Local Government (DoHPLG) (Foreshore Section);
- The National Parks and Wildlife Service; and
- The Environmental Pillar.

The scoping process included circulation of an Environmental Report Scoping Document to all of the above for comment. A copy of this document, is included as Appendix 2.1.

Responses were received from the following members of the Environmental Pillar:

- The Irish Whale and Dolphin Group;
- Department of Agriculture, Food and the Marine;
- Birdwatch;
- Irish Seed Savers Association; and
- Louth Nature Trust.

Consultation meetings were held with the EPA, IFI and SFPA. All comments, suggestions and written responses provided were taken into account in the preparation of this Environmental Report.

2.3.3 Relationship between the Environmental Report and assessments under other EU Directives and Legislation

This Environmental Report takes account of available results from other relevant assessments while avoiding duplication of those assessments, particularly the following:

2.3.3.1 The Habitats and Birds Directives (92/43/EEC and 79/409/EEC)[4]

The proposal has been screened for requirement for a Natura Impact Statement and this found an NIS to be required. Chapter 8, Biodiversity, takes account of the results of the NIS as relevant.

2.3.3.2 The Waste Framework Directive (2009/98/EC)[3]

Chapter 7, Waste Management, considers aspects which also fall under this Directive, as appropriate.

2.3.3.3 Water Framework Directives (2000/60/EC) [3]

Chapter 6, Water & Hydrology, refers to requirements arising from the Water Framework Directive.

4 as amended

2.4 APPROACH TO EIAR REQUIREMENTS INTRODUCED BY DIRECTIVE 2014/52/EU[5]

Relevant requirement	Notes / Approach in this Environmental Report	Chapter /Document Reference(s)
Description of reasonable, relevant alternatives	The alternatives examined are appropriate and relevant to the proposed activity	Chapter 3 Alternatives
Mandatory implementation of mitigation and monitoring measures / requirement for incorporation of mitigation and monitoring measures in consents and ensuring that developers deliver these measures.	Mitigation measures proposed after the assessment of impacts in each chapter are generally limited to measures to reduce, remedy or offset specific predicted impacts.	Chapters 5 to 8
Addition of 'Land' as a prescribed environmental factor	This aspect is described and addressed.	Chapter 5 Land, Soils, Geology & Hydrogeology
The factor 'Flora & Fauna' is replaced by 'Biodiversity'	This change in title aligns with current terminology and does not affect the scope of this factor.	Chapter 8 Biodiversity
Streamlining	Relevant assessments carried out under other Directives are referred to as applicable	
EIA quality / requirement for competent expertise	The team involved in preparation of this Environmental Report are all appropriately qualified, experienced and expert in their respective fields. The competent expertise of all Environmental Report contributors is set out at the beginning of the report.	Chapter 1, Section1.3 Study Team
Risks to human health, cultural heritage or the environment	Risks to human health, cultural heritage or the environment are addressed under the prescribed environmental factors.	Chapter 2.3 Scoping

Table 2.1 Approach to EIAR Requirements Introduced by Directive 2014/52/EU11

5 as set out in Appendix II of the draft Guidelines on the information to be contained in EIARs (EPA, 2017)

3.0 ALTERNATIVES

3.1 INTRODUCTION

Before looking at the impacts of any development on the environment, the 2018 regulations[6] require an EIAR to include:

A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.

3.1.1 Guidelines

The draft EPA Guidelines[7] give considerable coverage to alternatives because the consultation about the effectiveness of EIA practice found that "the acceptability and credibility of EIA findings can be significantly affected by the extent to which this issue is addressed."

The Guidelines deal with the issue of alternatives under three key headings.

The consideration of alternative routes, sites, alignments, layouts, processes, designs or strategies, is the single most effective means of avoiding environmental impacts. The acceptability and credibility of EIA findings can be significantly affected by the extent to which this issue is addressed.

However, it is important, from the outset, to acknowledge the existence of difficulties and limitations when considering alternatives. These include:

- *Hierarchy*
- *Non Environmental Factors*
- *Site Specific Issues*

Hierarchy
Many projects, especially in the area of public infrastructure, arise on account of plans, strategies and policies which have previously been decided upon. It is important to acknowledge that in some instances neither the applicant nor the competent authority can be realistically expected to examine options which have already been previously determined by a higher authority (such as a national plan or regional programme for infrastructure or a spatial plan).

Non-environmental Issues
EIA is confined to the environmental effects which influence the consideration of alternatives. It is important to acknowledge that other non-environmental factors may have equal or overriding importance to the developer, e.g. project economics, land availability, engineering feasibility, planning considerations.

Site Specific Issues
The consideration of alternatives also needs to be set within the parameters of the availability of land (it may be the only suitable land available to the developer) or the need for the project to accommodate demands or opportunities which are site specific. Such considerations should be on the basis of alternatives within a site e.g. design, layout.

[6] Schedule 6, 1 (d) of S.I. No. 296/2018, as transposed from Article 5, 1 (d) of Council Directive 2011/92/EC (as amended by Directive 2014/52/EU)
[7] Revised Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports ,EPA, 2017.

For the purposes of the Regulations, alternatives may be described at three levels:

1. *Alternative Locations*
2. *Alternative Designs*
3. *Alternative Processes*

As this proposal is for the maintenance dredging of a specific area and dumping of material at specific dumpsites, there is minimal scope for consideration of separate locations or alternative designs that are both reasonable and relevant. The examination of alternatives thus focusses on consideration of alternative processes i.e. alternative reuse of the dredged material instead of dumping at sea.

3.2 ALTERNATIVES TO DUMPING AT SEA

In order to investigate alternative means of disposal or reuse of the material dredged from the River Boyne estuary and seaward approaches, a STRIVE report commissioned by the EPA and compiled by the Cork Institute of Technology entitled 'Guidance on the Beneficial Use of Dredge Material in Ireland' was consulted by Drogheda Port Company. This document examines a wide range of beneficial uses of Dredged Material (DM). These may generally be categorised as:

1. Engineering uses: Involves beneficially using DM typically as an alternative to land based resources (for example quarry aggregate) and is common in many engineering projects, e.g. land reclamation, beach nourishment and coastal protection works.
2. Environmental Enhancement: Involves using DM as a resource with the potential for environmental enhancement when managed in a sustainable manner, e.g. habitat creation or sediment cell maintenance.
3. Agricultural and Product uses: Suitable DM may be used to form useful products or in the agricultural sector once the appropriate physical, chemical and biological properties comply with the appropriate industry standards, e.g. manufactured topsoil, landfill cover or production of ceramics/bricks/concrete.

Over the last two decades the Drogheda Port Company has, through its previous Dump at Sea Permits issued by the Department of the Marine/Marine Licence Vetting Committee (2 x capital dredging campaigns and 3 x maintenance dredging campaigns) and latterly the EPA (maintenance dredging), examined and exhaustively studied the feasibility of the alternatives and beneficial reuse of the DM from the River Boyne estuary and seaward approaches. The DM is of two distinct types i.e. silt/mud and sand/gravel.

The constraints to the use of the material with respect to maintenance dredging are wide and varied, i.e. suitability, environmental constraints, impact on the coastal process, plant suitability, sustainability of beneficial re-use activity, material demand and/or market conditions and material quantity. In the case of Drogheda, sustainable, alternative and beneficial reuse of the DM must be considered having regard to the findings of the RPS Hydraulic Modelling reports 2012 – updated 2019[8]. The conclusion of the Report in consideration of the coastal cell dynamic sediment transport regime validates the allowed use of the material for considered alternatives and beneficial re-use.

[8] Drogheda Port Company Maintenance Dredging Licence Application Hydraulic Modelling Study (RPS, 2019)

The below options were originally investigated by Kirk McClure Morton and presented in an Environmental Statement for a capital dredging scheme in 1999 - 2000[9]. The conclusions drawn then remain valid given the intensification of environmental legislation and controls, now coupled with additional concerns of coastal flooding, water quality etc.

3.2.1 Engineering Uses

3.2.1.1 Beach Nourishment

Drogheda Port Company already actively implements beneficial reuse of DM for beach nourishment within the nearshore coastal cell. The north in-shore dumpsite 'A2' is only suitable for sand material from the channel entrance and seaward approaches. This sand is part of the coastal sediment transport regime and as part of a beneficial re-use process is deposited at the near shore site to aid the coastal process and beach nourishment. The sand material is ideal, natural to the area having already been mobile within the coastal cell, moving south to north. This site has been determined by hydraulic and hydrodynamic mathematic computer modelling to be advantageous to aid the coastal process and beach re-nourishment.

An alternative disposal site (for capital dredging 1999-2000) for beach nourishment was considered behind the south training wall on the area of the accreting beach at Mornington. In this option it was proposed to excavate the sand which has built up behind the south wall and transport it southwards to form beach re-nourishment in the Bettystown/Laytown area which is suffering erosion. The dredged material would then be pumped directly to replace the excavated sand and the area covered with sand to replace the beach to the current levels. The scheme would have the benefit of improved beaches at Bettystown/Laytown but would increase the cost of the scheme by approximately €500,000 – 1,000,000. This proposal would require a sufficient volume of beach sand removal to permit dredged material infilling. However, the lowered beach levels after excavation would make the dunes in this proposed Natural Heritage Area (NHA) more vulnerable to erosion before infilling would be completed. The stretch of dunes closest to the training wall exhibit embryo dunes and evidence of seawards accretion. The habitat is also recognised by the proposed NHA status for environmental protection. In addition, beach surveys indicated that only 65% of the dredged material could be accommodated by excavating down to low tide level in a 1.8 km length of beach south from the training wall. As this would leave the dunes very exposed to erosion, the option was considered both environmentally and technically unacceptable.

An alternative option incorporating beach nourishment and material disposal was considered i.e. the dredged material could be spread on the beaches to the north and south of the Boyne entrance. The material would be dredged, placed in barges and then delivered to the beaches by pumping through several pipelines from nearshore pumpheads to the beaches.

While the dredged materials consist mainly of sand and gravel which would be technically suitable for coast protection, the south beach and sections of the north beach near Termonfeckin are used extensively for recreation. Clogherhead beach holds the European Blue Flag status indicating consistently good water quality, beach management principles and safety guidelines in compliance with EU criteria. The proportion of gravel in the dredged material is such that the beaches would become stony and not acceptable for recreational use. This change in the nature of the beaches would also affect the fauna and particularly bird populations which use the beach and hinterland for feeding and roosting. This option was rejected on the grounds of suitability as well as the additional cost of double handling the dredged material.

[9] Environmental Statement – Options for Disposal of Dredging Material (Kirk McClure Morton, 2000)

3.2.1.2 Landfill Cover

Suitable DM can be used as an alternative barrier material to traditional natural clays which act as a capping layer for municipal waste landfills; it may be applied as a daily, intermediate or as a final permanent capping layer. Both coarse and fine grained DM may be deemed suitable depending on the cover material required. A DM with a low moisture content would generally be most suitable as dewatering and desalination (if salt content is > 500mg) of the DM is recommended for the 'ideal' DM capping layer before use. Ideally the DM should be free draining and, preferably, of low clay content with low permeability characteristics to provide the most efficient cover material. The following is recommended when assessing DM as viable landfill cover material:

- The recommended cap should consist of a 0.61m layer of fine clayey DM (low permeability layer) covered by a 0.31m layer of coarser DM (vegetative layer);
- The pH should be between 5.5 and 8;
- A minimum organic content of 1.5% by weight;
- A maximum soluble salt content of 500mg/l

Sediment samples were taken from the dredging area and analysed for parameters stipulated in the Sampling and Analysis Plan provided by the Marine Institute, see Chapter 5. The material was found to consist of silt with varying proportions of sand and gravel. Gravel ranged from 0 to 39.6%, sand ranged from 12% to 99.2% and silt-clay ranged from 0.8% to 86%.

The DM was found to have a high moisture content which ranged from 22.4 to 70.8% which would make it unsuitable for landfill cover, which requires a low moisture content. The DM was also found to have a widely ranging clay content i.e. 0.8% to 86% which would make it unsuitable for landfill cover, which requires a low clay content.

3.2.1.3 Offshore Berm Creation

There are generally two types of offshore berm with differing applications; a feeder (or active or dispersive) berm, in which sand is transported shoreward to the beach and a stable (or non-dispersive) berm where the material remains in the vicinity of the berm and causes damping of the waves and thus sheltering of the landward beach. A wide range of locally sourced clean DM may be used with berm creation often undertaken in conjunction with beach nourishment as the two processes can mutually interact in a beneficial way. Fine to medium sand is often considered the most suitable type of DM for constructing feeder berms while coarser, more substantial DM such as rock and gravel are more appropriate for use in stable berms. Offshore berms constructed from fine muddy material have also been successfully used.

Drogheda Port Company, in conjunction with Meath County Council, have carried out three studies looking at the sediment stripping on the southern beach particularly in the area of Laytown Co. Meath. The stripping is due to the natural forces of wind and tide within the cellular bay configuration accelerated by the hard coastal protection engineered and non-engineered structures adopted over many years. The use of bunds was not acceptable to arrest the beach stripping due to the environmental and amenity impacts on the beach and the historical Laytown Races, the only remaining horse racing on an intertidal beach in the world.

3.2.1.4 Coastal Protection Works

DM can be used to fill geotextile tubes which are used to retain and dewater DM to form the core of different types of coastal structure. Geotubes are used to control beach erosion, provide shore protection and act as river training structures. Different types of DM may be dewatered using geotubes, although the fill material used is

generally sand based where the DM should consist of a minimum of 40% solids (i.e. sand) when used for marine structures.

Recommended selection criteria for the use of geotubes in association with a dredging project include:

- Shallow water with low tidal range and low wave energy;
- The geotubes must be maintained and covered;
- There must be no threat to life or property if failure occurs;
- The project must have flexible height and alignment requirements.

The type of dredger selected is restricted because of the need to pump a minimum of 40% solids, to fill the tubes. A small cutter suction dredger of type DOP (Damen Onderwater Pomp) with a 6 to 8 inch pipeline would be a typical plant of choice.

The beach nourishment referred to above (Section 3.2.1.1) is complementary to coastal protection. The DM dredged from the entrance and seaward approaches is deposited at a depth of 4m within the intertidal surf zone and dispersed to the beach to nourish and mitigate against sediment stripping as found to the south.

3.2.2 Environmental Enhancement

3.2.2.1 Wetland Habitat Creation/Enhancement

The option of extending the dunes on the foreshore to the north of the training walls has been thoroughly investigated. The “cut back” to the north of the north training wall is an area which is accreting naturally and lies within the proposed NHA and Specially Protected Area (SPA). The sands and gravels from the dredging could be pumped directly to the site and used to form a new dune system in front of the existing dunes. The bulk of the dunes would be formed from the sand/gravel while the sand from the entrance channel would be used to provide a sand cover. The dunes would be contoured and planted to match the existing grey dune system.

This option was considered by Office of Public Works (OPW) to be unacceptable. The OPW cites the ecological impact on the bird populations in this SPA and particularly the impact on ‘priority habitat’ embryo dunes in this proposed NHA to be environmentally unacceptable. In addition, the dune habitat has been classified as a proposed Special Area of Conservation (pSAC).

3.2.2.2 Sediment Cell Maintenance

Sediment cell maintenance, also known as sustainable sediment relocation involves the placement of DM in tidal estuary systems potentially reducing the erosion of tidal mudflats, banks and saltmarshes and also potentially improving both shallow sub-tidal and intertidal habitats. It typically applies to maintenance dredging projects where sediment contaminant levels are typically very low or entirely absent. The beneficial use of fine grained DM in sediment cell maintenance is suitable for maintenance dredging projects providing a continual and sustainable resource for the DM generated; the DM must be comparable in terms of physical, chemical and biological properties. The type of dredged sediment which is appropriate depends on the site specific requirements.

The sediment is commonly dredged using a hopper dredger and transported through a floating pipeline to a pontoon, from which it can be accurately deposited in the required area with a diffuser. When assessing a specific dredging site for the potential beneficial use of the DM in sediment cell management, it is important to include:

- Detailed field sampling and analysis of the existing sediment
- Multivariate studies of the micro-benthic and macro-benthic communities

- Computer modelling of the bed characteristics and sediment transport regime
- Post-disposal monitoring of the ecosystem to ensure no negative impacts.

The intertidal mudflats or polders created in the 1850's are already accreted and have lost a great deal of their originally engineered use. All the polders are now bird feeding habitats and designated under various EU Environmental designations. Deposition of DM would not be allowed and would possibly have an adverse impact on the flood mitigation regime for the greater town of Drogheda and the villages of Baltray and Mornington.

3.2.2.3 Fill for Abandoned Mines/Quarries

The option of disposal of the DM to quarry sites outside Drogheda was considered. There are old quarry workings on the Dundalk side of the town which could contain the DM. In this option the DM would be placed in barges and brought to the town quay where it would be unloaded into trucks for transportation to the quarry.

Some 352,000 tonnes of material would have to be transported annually which would lead to heavy traffic. This volume of heavy traffic, in combination with the disruptions to traffic flow associated with other ongoing major capital works schemes within Drogheda would have significant implications for the residents of Drogheda Town and through traffic on the N1 in terms of noise, traffic delays and airborne pollution.

3.2.3 Agricultural/Product Uses

3.2.3.1 Concrete Manufacture (already engaged by Drogheda Port)

Up to 60,000m^3 of the material which is dredged from the Boyne estuary and seaward approaches may be brought ashore for use as a raw material in the construction industry. Sand is offloaded from the dredger using a clamshell grab bucket and placed in stockpiles on the quay. The material is left on the quay for 24 hours before being loaded using a front end loader onto forty tonne articulated haulage trucks. Each load of sand is sheeted before it leaves the docks. Every load is weighed on the weighbridge before the sand is tipped in designated stockpiles at the contractor's receiving facility. Once delivered to the concrete works, the sand requires no further processing to be suitable as a raw material for concrete manufacturing.

The contracting party commissioned physical and chemical analysis of the DM by RSK Ireland. The findings are outlined below.

The sand is very uniform in physical and chemical characteristics: it comprises a continuously graded natural sand fine aggregate typically comprising chiefly quartz (79%) and calcite (11%) with minor proportions of feldspar and ironstone, and traces of modern shell fragments, sandstone, siltstone, chert and granite rock. With regard to particle size, 95% of the sand lies within the fraction 0.150mm to 0.063mm and thus is assigned the designation 0/1 (sand).

The sand is most suitable as a raw material for the preparation of concrete for use in buildings, roads and other civil engineering works.

Dredged material is inspected before and after unloading onto the quay side, any material deemed not to be suitable for concrete production can be used for pipe bedding, hauching and surrounding of pipes as it conforms with the specification IS EN 13242 i.e. fine and all-in aggregate. To date, no material has been deemed unsuitable for either use. Furthermore, less than 1% of the sand that was not used for concrete was instead used as pipe bedding material.

3.2.3.2 Road Sub-base Construction (already engaged by Drogheda Port)

Coarse and fine DM can be used in different aspects of road construction, including both as a structural material and as a general fill for the construction of road embankments and roadworks. Road and infrastructure projects in Ireland may

potentially provide a destination for recycled DM; either coarse grained or potentially fine grained where the mechanical characteristics would need to adequately spread wheel loads. In general, coarse DM is more easily integrated into road construction than fine grained sediment. For fine-grained DM, it is important to determine the saline and organic content of the DM as these components impact on the viability of using DM in road construction due to their negative impact on mechanical strength when the DM is stabilised with cement.

DM (sand) material brought ashore is available through the Drogheda Port contractor if sought by the industry.

3.2.3.3 Landfill Liner

DM can be used as a secondary protection mineral liner in conjunction with another stabilising material.

Precise quality control of the DM and the stabilising material mix is essential as the strength, landfill stability, permeability and durability of the lining system are important factors. The EPA has developed requirements for the properties of compacted clay liner which may be applicable when assessing the suitability of DM as a landfill liner. These requirements include:

- % fines (particles < 0.075mm) - ≥ 20%;
- % gravels (particles > 4.76mm) - ≤ 30%; and
- 0% moisture content.

Sediment samples were taken from both dumpsites and the dredging area and analysed for parameters stipulated in the Sampling and Analysis Plan provided by the Marine Institute, see Chapter 5. The material was found to consist of silt with varying proportions of sand and gravel. Gravel % ranged from 0 to 39.6%, sand (fines) ranged from 12% to 99.2% and silt-clay (fines) ranged from 0.8% to 86%. The gravel % i.e. 0 - 39.6% surpasses the requirement outlined by the EPA (≤ 30%) and the fines % i.e. 0.8% - 99.2% also surpasses the requirement outlined by the EPA (≥ 20%). The moisture content of the DM was found to range between 22.4% and 70.8% which surpasses the requirement outlined by the EPA i.e. 0%. For these reasons, the DM may not be optimal for use as a secondary protection mineral liner for landfills.

However, DM (sand) material brought ashore is available through the Drogheda Port contractor if sought by the industry. It has been used previously as a capping.

3.2.3.4 Manufactured Topsoil

DM may be directly used as topsoil material depending on its properties and the presence of organic material in the DM. However the use of engineered manufactured topsoil (MS) allows the use of DM combined with recycled organic waste material to produce a manufactured topsoil that can improve soil growth characteristics.

It is suited to a location where a continuous supply of DM is available to supply an MS facility; an on-going and periodic maintenance dredging project is appropriate. In addition a source of organic material is required with a local demand in evidence for the topsoil produced.

A mix of coarse and fine grained material should be used but this needs to be determined on a site specific basis.

Transport logistics are complex (dewatering and desalination required) but are crucial to treatment processes and economic feasibility.

DM (sand) material brought ashore is available through the Drogheda Port contractor if sought by the industry. It have been used previously as a cover for equestrian centres etc.

3.2.3.5 Production of Bricks/Ceramics

Fine grained DM can be used as a substitute for sand or clay to produce bricks.

Physical and chemical analysis of the DM is necessary to assess suitability of DM. DM is considered a suitable raw material for brick manufacture if the sand content does not exceed 30%. The physical analysis carried out on sediment samples taken from the dumpsites and the dredging area has shown that the sand content ranges from 12% to 99.2%, which exceeds the requirement for brick manufacture i.e. 30%. For this reason, the DM from the dredging area may not be suitable for use in brick manufacture.

Proximity of brick manufacturing facility to the DM recovery area is also a major factor as the cost of DM transport may be significant.

4.0 PROJECT DESCRIPTION

4.1 INTRODUCTION

The commercial estuary of the River Boyne and seaward approaches is located at Drogheda Port and extends along the coastline of counties Louth and Meath. The river under the jurisdiction of the Drogheda Port Company is approximately 7km in length from St. Mary's Bridge in the town of Drogheda to the river mouth at Mornington. The ongoing dredging of the estuary and the seaward approaches will be carried out to maintain the navigability of the channel.

Drogheda Port Company currently holds a Dumping at Sea Permit S0015-02 for the period 2013 – 2021 and is applying for a Dumping at Sea permit for the period 2021 – 2029 for the sea disposal of the dredged material. A portion of the dredged material will be disposed of at a dump site close to the surf zone in 4m of water. A portion of the dredged material will also be dumped 2.5km from the shore in 14m of water. There is also a third dump site which is now a redundant inactive site. Drogheda Port Company will also be engaging in a beneficial re-use option whereby a portion of the dredged material of up to 60,000 m^3 may be beneficially reused within the construction industry. The dredging works are necessitated by the need to dredge the river entrance, seaward approaches, navigation channel, berths and swing basins to restore safe navigational water depths. Beneficial reuse is employed to meet the requirements of the OSPAR Convention.

4.1.1 Dredging Operation

The Dumping at Sea permit is sought for a period of 8 years to cover maintenance dredging requirements from 2021 to 2029. Dredging at the river mouth and port approaches is generally driven by weather events that cannot be predicted or scheduled. If the entrance or seaward approaches silts up due to a weather event resulting in impaired navigational safe depths, then dredging is immediately required. If depths are not impaired, no dredging takes place.

Drogheda Port Company maintains a dredging contract with commercial dredging contractors for immediate plant response availability. These contractors are updated on each hydrographical survey so that they are aware at any point in time of the current depth condition of the Drogheda Port entrance and seaward approaches and the likelihood of a call up following a weather event.

The primary locations for maintenance dredging are the entrance and seaward approaches, all berths, artificial berth dredged pockets, berths, ship swing basins and the main navigation channel. While some areas are dredged more than others, all areas will be dredged at some point over the duration of the permit.

Drogheda Port Company employs its own internal hydrographical unit to maintain an ongoing monitoring programme of the entrance and seaward approaches, berths, swing basins and channel. Some pre-planning of maintenance dredging at the river mouth and seaward approaches is possible given the historical database of information over the previous decade and knowledge of the sediment transport taking into account weather and on-going monitoring. However, given the weather sensitive nature and effects of storm events, unplanned maintenance dredging also takes places to maintain safe navigation. For that reason, Drogheda Port maintains an open 24/7/365 days per year maintenance dredging policy for the river mouth and seaward approaches without any encumbrances. This is essential to maintain the viability of port operations.

Over the decades the port has accumulated a good deal of data and experience on the performance of the river, entrance and seaward approaches and the effects of weather. This coupled with mathematical modelling now allows realistic figures to be placed on the maintenance dredging quantity predictions going forward over the next permit application period 2021 - 2029.

Estimated annual quantities of maintenance dredging of the berths, artificial berth pockets, ship swing basins, channel, river mouth and seaward approaches are shown below in Table 4.1. These estimates are averages, based on the last 18 years of data on actual quantities dredged. Annual requirements may increase or decrease on this estimated average depending on the severity of wind weather events.

Location	Estimated Annual Quantities
Channel from town to sea, including all berths and ship swing areas	30,000m^3
Entrance & Seaward approaches	90,000m^3
Contingency	100,000m^3

Table 4.1 Estimated annual quantities

An annual contingency of an additional 100,000m^3 is to allow for the unexpected and unplanned events, weather or otherwise, that may impair the safe navigational depth.

4.1.1.1 Appropriate Plant

A range of dredging plant is suitable for maintenance dredging in the River Boyne. A contractor's selection of preferred plant utilization will be dependent on plant availability, location of dredging (i.e. bar, channel, berths or ship swinging areas), type of dredging required and unit rate per m^3. For this maintenance dredging permit application, typical plant to include for utilisation on the river Boyne estuary, berths, artificial dredged pockets, ship swing basins, entrance and seaward approaches are:

1. Trailer Suction Dredger (TSD): the dredging vessel while underway drags a pipe on the river bed and material is sucked up into the hold of the vessel. The material settles in the hold and excess water from the suction operation is returned to the sea as the hold reaches capacity. Once the hold is full, the vessel proceeds to the approved spoil dump site and discharges the material through bottom doors in the hull that open to release the hold contents. The vessel continuously passes over the area to be dredged gradually increasing the depths to the required levels.

   This is the primary method of dredging contracted at Drogheda Port. The typical vessel used is circa 80m in length and can manoeuvre with ease at the entrance and seaward approaches, linear berths town quay berths, Flogas LPG terminal, Premier Periclase berth, Tom Roes Point berths and the general estuary. By virtue that the plant must be underway to dredge its efficiency and productivity is reduced when engaged to dredge the swing basins.

2. Backhoe dredger: this is a stationary dredger similar to a flat top barge with an excavator attached. The vessel is maintained in position by spud legs that anchor it to the ground and the excavator digs the area to be dredged. The material is loaded into a self-propelled barge that moors alongside the backhoe. As each area is dredged to the required depth, the spud legs are raised, the backhoe re-positions itself and the anchoring/digging process is repeated. Some backhoes are self-propelled with a fitted excavator, hold and dumping capability. This plant is ideally suitable to Drogheda for dredging of the ship swing basins and berth. The backhoe dredger generally tends to have a very high commercial mobilisation cost and rate per m^3.

3. Split barge: this is a purpose built barge for receiving dredged material from a dredging vessel such as the backhoe. Once the hold of the vessel is filled, it sails to the approved dumpsite and through bottom doors in the hull that opens and releases the material.

4. Grab dredger: a vessel with a grabbing crane on board and dredges using a cam shell bucket. The material is generally deposited into the vessel's hold for later sea disposal via bottom doors. This is a coarse dredger method, dredging

holes to create the required depth. On occasions, bed levelling may be required following the dredging where the material does not naturally slump.

5. Bed levelling: this is where a small tug or similar vessel tows a cage or plough and removes material to the required level. It is particularly useful after the work of the trailer suction dredger or backhoe to level out high spots remaining to obtain the required dredge level.

6. Plough: similar to bed levelling, this is where a cage or plough is towed behind a small tug or similar vessel. The water is agitated with the material being placed in suspension and then carried away by strong currents to be recovered by the trailer suction dredger some distance downstream of the plough operations where the sediments settle out. Such plant would be used where larger vessels due to the size and manoeuvring characteristics cannot operate.

4.1.2 Dumping Operation

Please see below for the location of the two dumpsites and the redundant dumpsite.

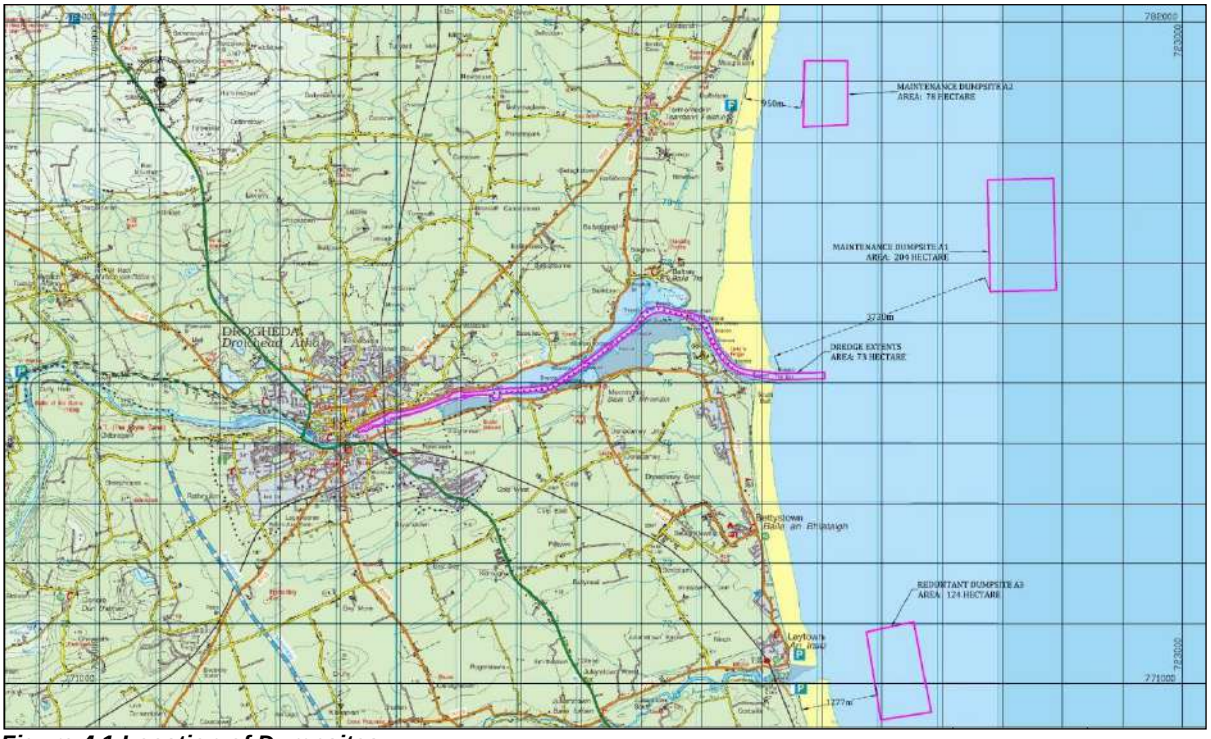

Figure 4.1 Location of Dumpsites

The seaward Dumpsite 'A1' has been used as the primary all material dumpsite for over the past three decades by Drogheda Port Company for maintenance and capital dredging material disposal. Drogheda Port Company is the only permit holder in respect of the 'A1' dump site. The site is located within the designated anchorage of Drogheda Port approximately 2.5km from the shore in a depth of 13-15 metres of water at Chart Datum.

The near shore Dumpsite 'A2' is used only for sand dredged at the channel entrance and seaward approaches. The site is close to the surf zone and the depth at this site is shallow with only 4 metres of water at Chart Datum.

Dredging and dumping is carried out by the same plant, which is usually a trailer suction dredger. This dredging vessel, while underway, drags a pipe on the river bed and material is sucked up into the hold of the vessel. The material settles in the hold and excess water from the suction operation is returned to the sea as the hold reaches capacity. Once the hold is full, the vessel proceeds to the approved spoil dump site and discharges the material through bottom doors in the hull that open to release the hold contents. The A3 site is redundant and is not for consideration in this application

5.0 LAND, SOILS, GEOLOGY & HYDROGEOLOGY

5.1 INTRODUCTION

This chapter assesses and evaluates the potential impacts of the proposed development described in Chapter 2 (Description of the Proposed Development) on the geological and hydrogeological environment. The impact on hydrology is addressed in Chapter 6.

5.2 METHODOLOGY

5.2.1 Guidelines

The rating of potential environmental impacts on the land, soils, geological and hydrogeological environment is based on the matrix from the EPA Guidelines which takes account of the quality, significance, duration and type of impact characteristic identified. Consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that attribute.

The methodology used in this assessment follows current Irish guidance as outlined in:

- Environmental Protection Agency (EPA) Draft 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (2017);
- European Commission *'Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report*' 2017
- EPA Draft 'Advice Notes for preparing Environmental Impact Statements' (2015); and,
- National Road Authority (NRA) 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes', by the National Roads Authority (2009).

The principal attributes (and impacts) to be assessed include the following:

- Geological heritage sites in the vicinity of the perimeter of the subject site;
- Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground;
- The quality, drainage characteristics and range of agricultural uses of soil around the site;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material on site as well as requirement to remove it off-site as waste for recovery or disposal;
- High-yielding water supply springs/wells in the vicinity of the site to within a 2 km radius and the potential for increased risk presented by the proposed development;
- Classification (regionally important, locally important etc.) and extent of aquifers underlying the site perimeter area and increased risks presented to them by the proposed development associated with aspects such as for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;

- Natural hydrogeological/ karst features in the area and potential for increased risk presented by the activities at the site;
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally; and
- Vulnerability of the proposed development to major disasters from a geological and hydrogeological standpoint such as landslides and seismic activity.

5.2.2 Sources of Information

Desk-based geological and hydrogeological information on the substrata underlying the extent of the site and surrounding areas was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1:100,000 mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register;
- Dublin City Council - illegal landfill information; and
- Research papers referred to in the text.

Site specific data was derived from the following sources:

- Guidelines for the Assessment of Dredge Material for Disposal in Irish Waters, April 2016, Cronin et al;
- Drogheda Port Annual Environmental Report 2018; and
- Aquafact Sampling and Analysis Results – Drogheda Port Company, February 2019.

5.3 RECEIVING ENVIRONMENT

The receiving environment is discussed in terms of geology, soils, hydrogeology and site history including potential for contamination.

The proposed activity i.e. maintenance dredging generates c. 120,000 m^3 of dredged sediment annually. Some of this material is deposited at sea at two dump sites (A1 and A2) while up to 60,000 m^3 may be beneficially reused by the construction industry. Drogheda Port Company is authorised for beneficial re-use of the material under its Foreshore Licence dated 10th April 2013 and confirmed in subsequent correspondence with the EPA (letter dated 4th April 2016 to Captain Martin J Donnelly). As such this chapter focusses on the offsite disposal only.

5.3.1 Environmental Setting

The two proposed maintenance dumpsites (existing) are located in the vicinity of Drogheda Port located in the Irish Sea. A portion of the dredged material will be disposed of at a dump site close to the surf zone in 4m of water (Maintenance Dumpsite A2). A portion of the dredged material will be deposited 2.5 km from the shore in 14m of water (Maintenance site A1). There is also a third dumpsite A3 which is now a redundant inactive site (Maintenance Dumpsite A3 which does not form part of this application). Both dumpsites encompass the offshore environment of County Louth. Figure 5.1 shows the proposed location of the maintenance dumpsites.

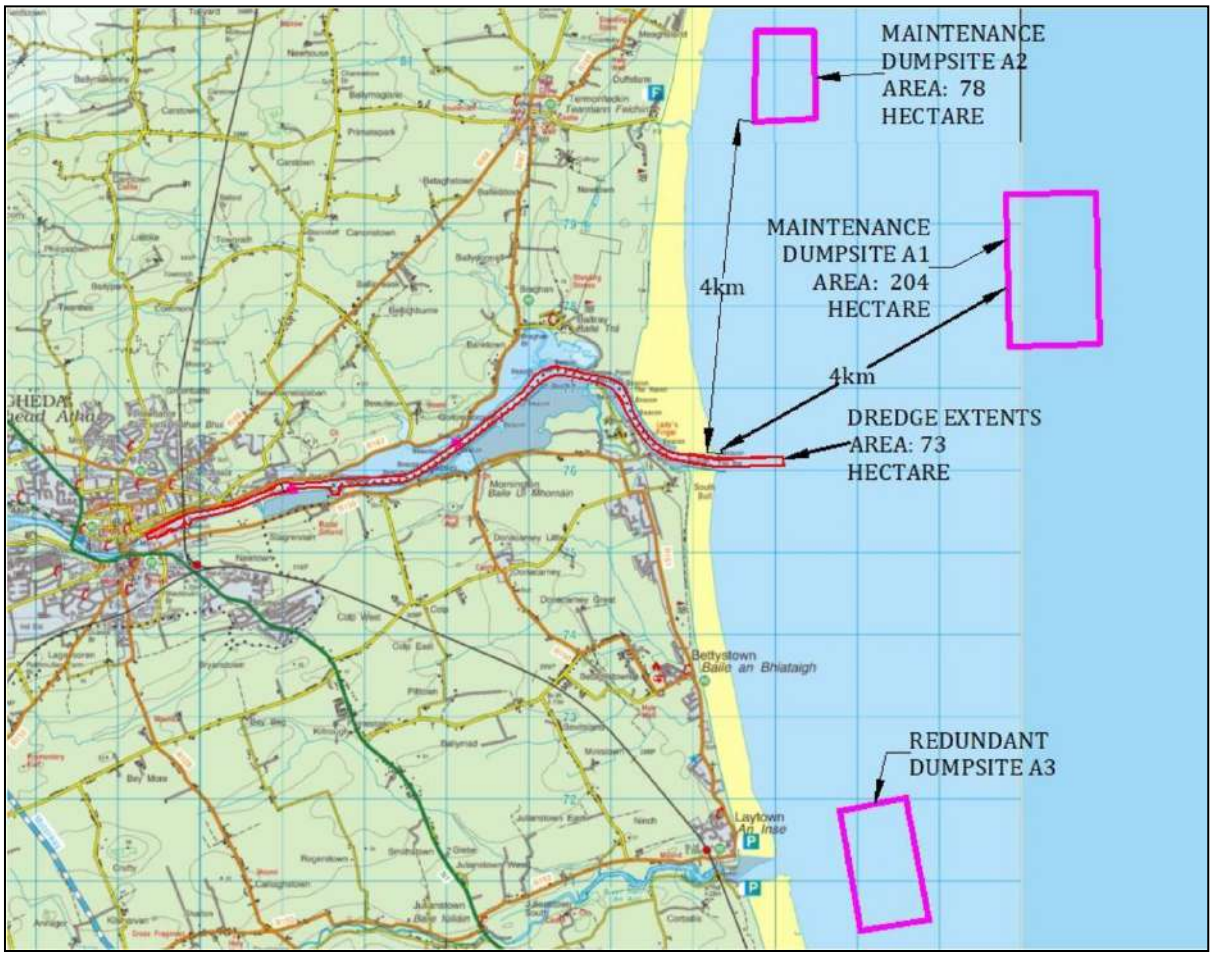

Figure 5.1 Proposed Offshore Maintenance Dumpsite

5.3.2 Regional Geology

Inspection of the available GSI mapping (GSI, 2019) shows the regional area is dominated by rocks of Carboniferous Age. Drogheda port and local area (specifically to the south of the Boyne Estuary) are underlain by dark limestone and calcareous shales and part of the Mornington Formation. The formation consists of thickly to thinly bedded dark grey packstones, wackestones, micrites and occasional grainstones and shales. Turbidites are common in the upper parts. Figure 5.2 shows the local geology.

The Tullyallen formation is prominent to the northwest of Drogheda. This formation consists of pale micristed grainstone/wackestone with the rock unit group categorised by the GSI as Dinatian pure bedded limestones.

In terms of the structural relationship of the area, the GSI database shows a number of faults in the region.

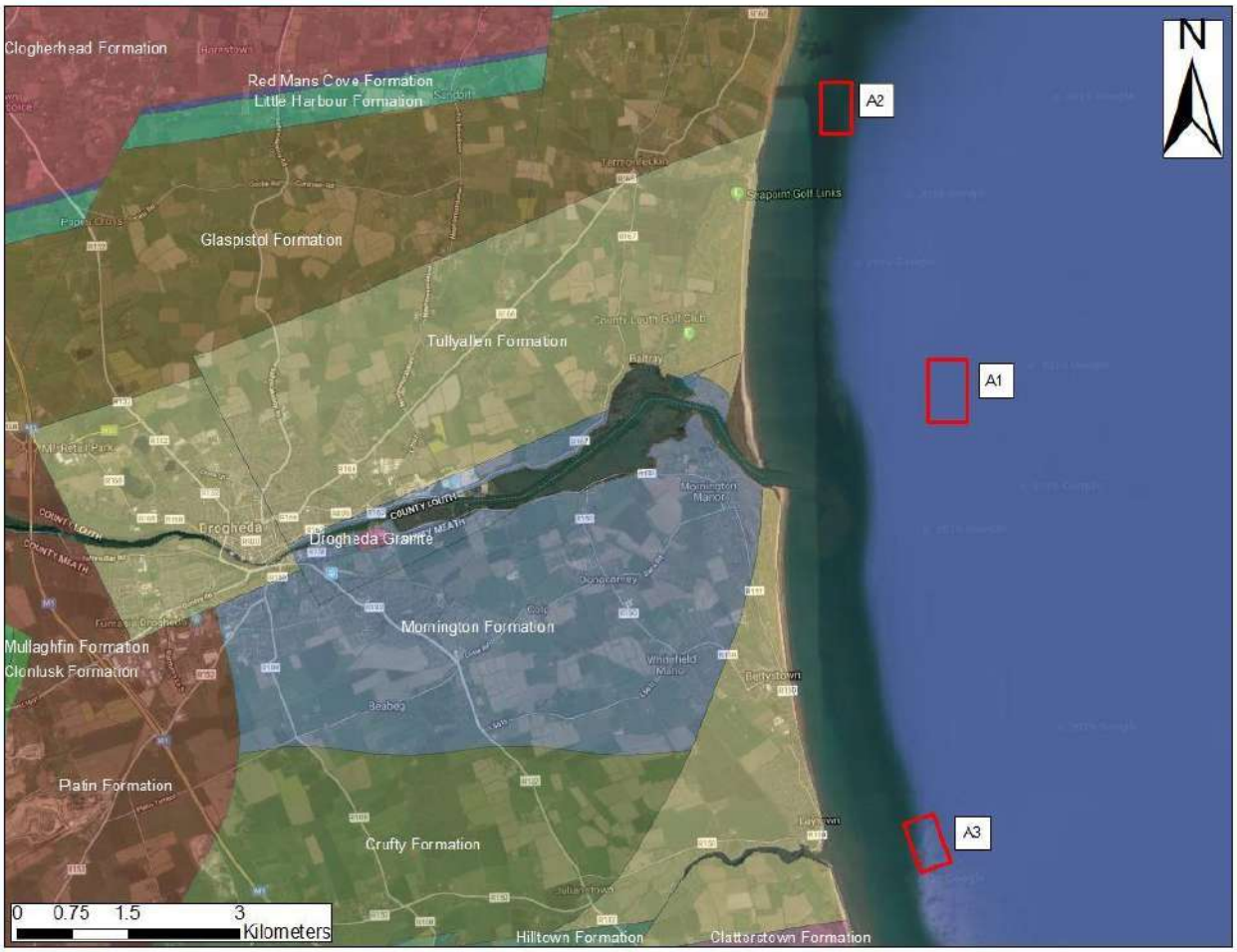

Figure 5.2 Bedrock geology map with approximate locations of maintenance dumpsites (Source: www.gsi.ie)

5.3.3 Regional Quaternary Sediments

The general lithological/geological sequence of the overburden within the North Meath/South Louth area comprises the following units:

Superficial Deposits
Made Ground (particularly in the Drogheda town area)
Estuarine/alluvial clays and silts
Estuarine/alluvial gravels and sands
Glaciomarine clays, silts and sands
Glacial Till (drift)
Glacial gravels and sands

Table 5.1 Superficial Deposits in north Meath/south Louth Region

The GSI geological web viewer (GSI, 2019) shows the area of North Meath and South Louth is underlain by a number of differing quaternary/subsoil categories. Ranging from Windblown Sands (WS & WSd) in the shoreline areas, sea till derived from sandstone and shales (IrSTLPSsS) which is most prevalent to the north and south of Drogheda, Estuarine silts and clays (Mesc) around the Boyne Estuary and Made Ground/Urban around Drogheda Town and Port.

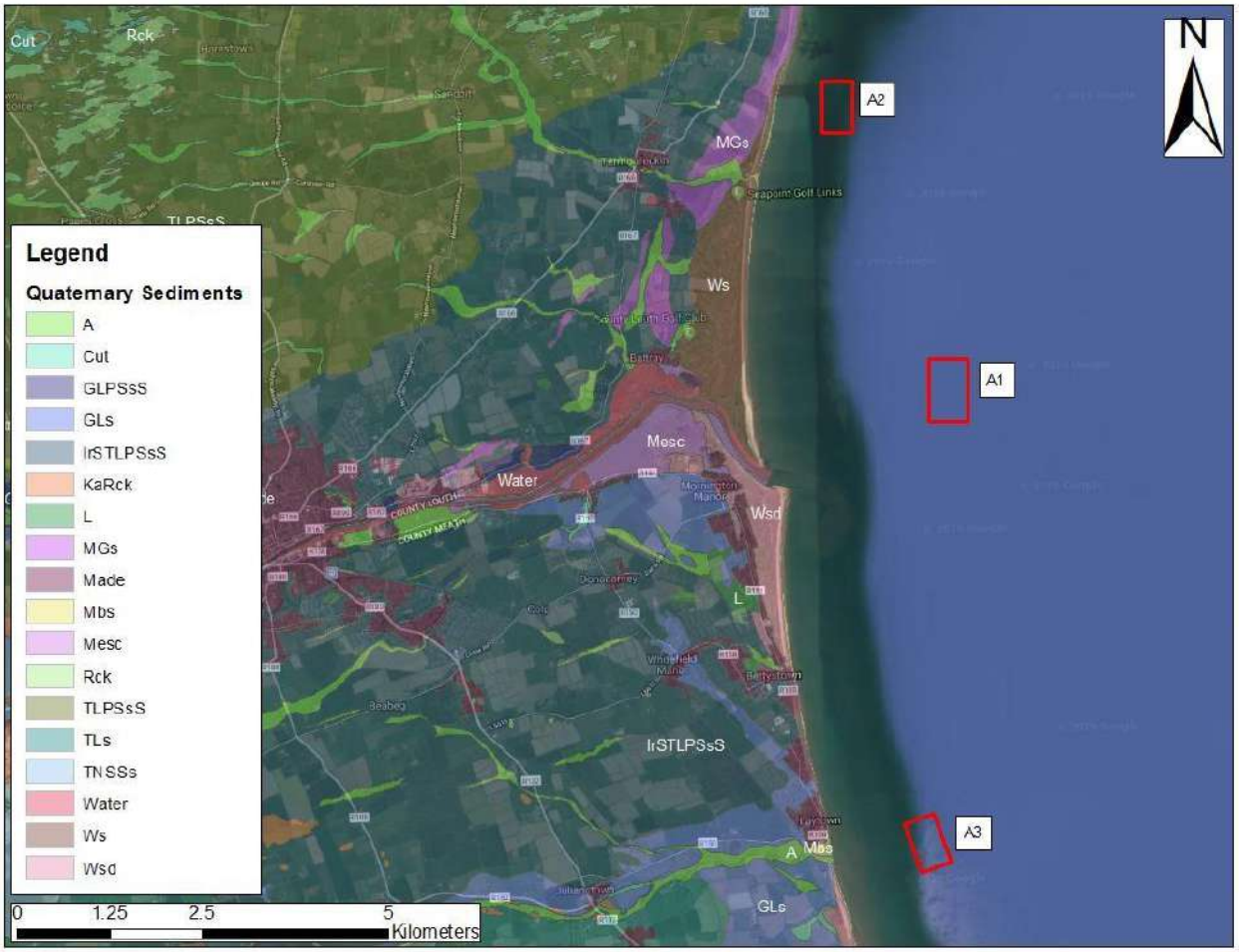

Figure 5.3 Quaternary Sediment map for the study area (Source: www.gsi.ie)

5.3.4 Hydrogeology

As the disposal sites are located in proximity to the estuary there is no potential to impact the natural hydrogeological regime and therefore this aspect is only described briefly.

Figure 5.4 Aquifer Classification map (*Source: www.gsi.ie*)

The study area is underlain by the Drogheda Groundwater Body (EU code: IE_EA_G_025) in the area around Drogheda town, the Bettystown GWB to the south (EU code: IE_EA_G_016) with the Wilkinstown GWB (EU Code: IE_EA_G_010) and Louth GWB (EU Code: IEGBNI_NB_G019) further to the north. The current groundwater body risk score for these is shown in Table 5.2.

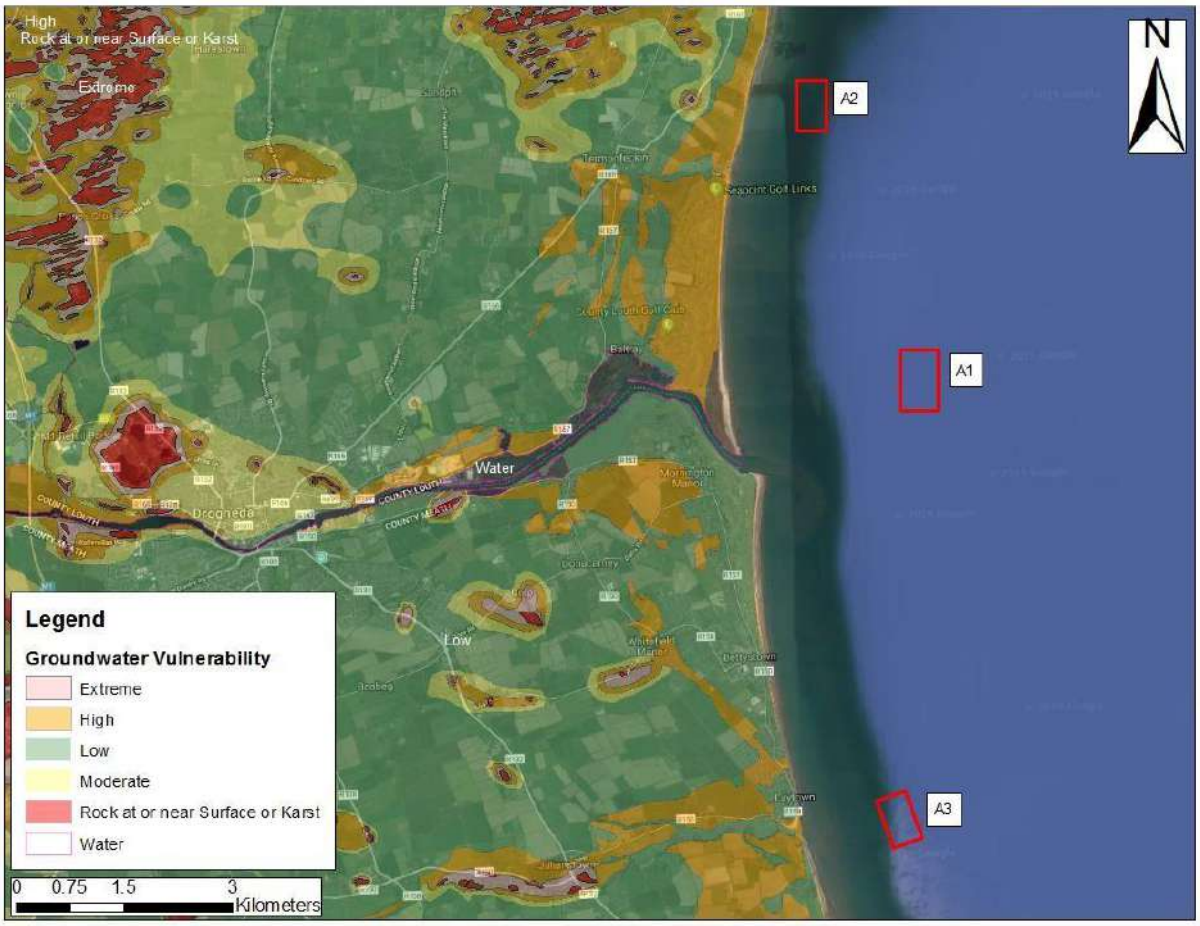

Figure 5.5 Aquifer Vulnerability map (*Source: www.gsi.ie*)

There are a number of groundwater bodies underlying the North Meath/ South Louth area (see section 5.3.5). Table 5.2 shows these bodies and their corresponding current WFD risk status and the also WFD 1st cycle rating (2010-2015). Figure 5.6 & 5.7 show the location and ratings of the groundwater bodies.

GWB Name	Code	Current WFD Risk Status	1st Cycle Status 2010-2015
Drogheda	IE_EA_G_025	Review	Poor
Bettystown	IE_EA_G_016	At Risk	Good
Wilkinstown	IE_EA_G_010	Poor	Good
Louth	IEGBNI_NB_G019	Review	Good

Table 5.2 Regional Groundwater Bodies & WFD Status

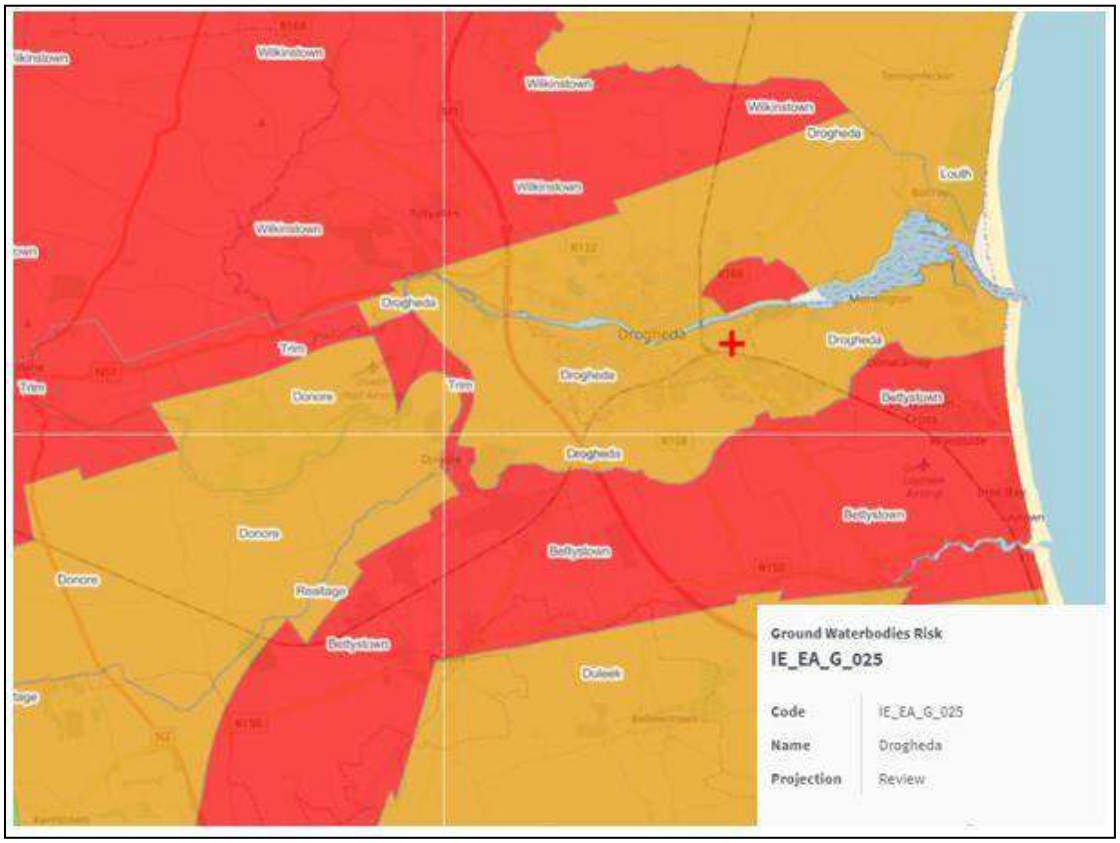

Figure 5.6 GWB WFD Risk for study area (EPA, 2019)

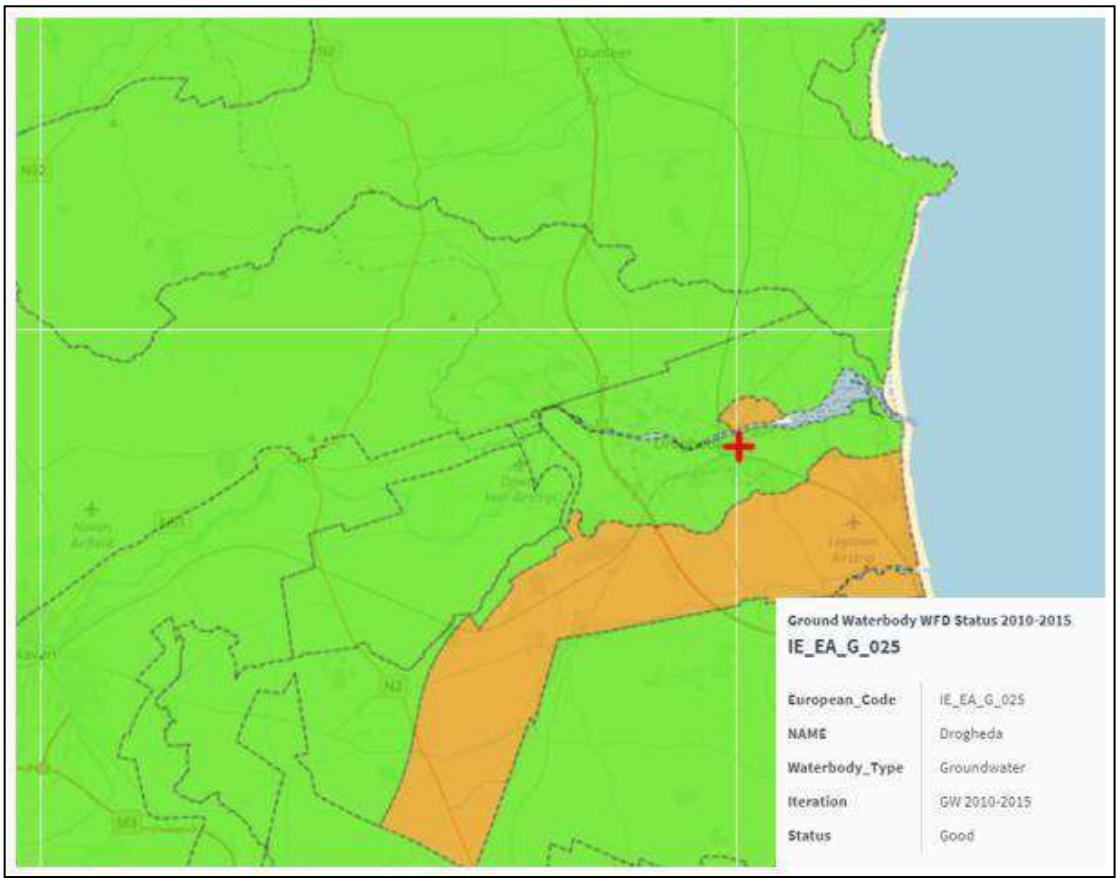

Figure 5.7 GWB WFD Status (period 2010-2015).

5.3.5 Areas of Geological Interest & Historic Land-Use

The GSI online data base was consulted regarding areas of geological interest in the area of Drogheda Port/Harbour and the Boyne Estuary. This showed two notable sites of geological heritage at the shoreline. The first is Clogher Head wave cut platform (narrow flat areas found the base of sea cliffs) c. 3 km north of Dumpsite A2. The Laytown to Gormanstown coastal plane is to the west of Dumpsite A3 and stretches for c 6.5 km from just south of Bettystown Co. Meath to Gormanstown.

Details of the site history and previous land use are included in Chapter 4. Dredging of the River Boyne can be traced to the 19th century. In 1970 the Drogheda Harbour Commissioner constructed the training walls both north and south at the river mouth. At that time it was forecasted that the reserve capacity of the south training wall to retain sand would have a time frame or life span of circa 30-40 years, before full sediment bypassing would take place across the river entrance.

According to the EPA mapping website, there are a number of licensed facilities in the study area. Drogheda Port Company operates under licence number P1011-010.

5.3.5.1 Areas of Conservation

There are a number of Special Protection Areas (SPA), candidate Special Areas of Conservation (SAC) and proposed Natural Heritage Areas in and around Drogheda Port and the vicinity of the proposed dumpsites. These include the River Boyne and River Blackwater SAC (Site Code 00299), the Boyne Estuary SPA (Site Code 00299), the Boyne Coast and Estuary SAC (001957), and the River Nanny and Estuary shore SAC. None of the potential impacts associated with the proposed activity will result in any perceptible residual effect on the receiving environment or on the qualifying interests/special conservation interests of national and EU protected sites See Chapter 8 Biodiversity for more information.

5.3.6 Sediments

Sediments in the marine environment are formed by particulate matter that settles out of the water body (estuarine, coastal etc.), and may consist of anything from coarse gravel and sand to clay and organic materials. Contaminants “stored” in such sediments can act as a source of long-term environmental pollution. Certain substances can bioaccumulate in benthic organisms resulting in biomagnification at higher levels in the food chain. Some widespread pollutants such as polychlorinated biphenyls (PCB’s) are no longer in use but due to their persistence they can still be detected in marine sediments (Cronin, McGovern et al, 2006).

5.3.6.1 Sediment Sampling - Environmental

Drogheda Port Company contracted AQUAFACT International Services Ltd. to carry out sediment sampling throughout Drogheda Harbour in order to evaluate the sediment for the purposes of Disposal at Sea (DaS). Sediment characterisation of the harbour area was carried out in line with Cronin *et al*. (2006) ‘Guidelines for the assessment of dredge material for disposal in Irish waters.

On the 28th February 2019, 17 stations in the harbour and 1 station at each of the Dumpsites A1 and A2 were sampled for physical and chemical analysis as per a request from the Marine Institute. A 0.025 m^2 Van Veen grab sampler was used to collect surface sediment samples from AQUAFACT’s RIB.

Figure 5.9 shows the station locations and Table 5.3 shows the comparison of these samples against Marine Institute Guidelines for the Assessment of Dredge Material for Disposal in Irish Waters. Samples suitable for analysis could not be retrieved from stations 1 and 2 due to the coarse nature of the seabed in these areas.

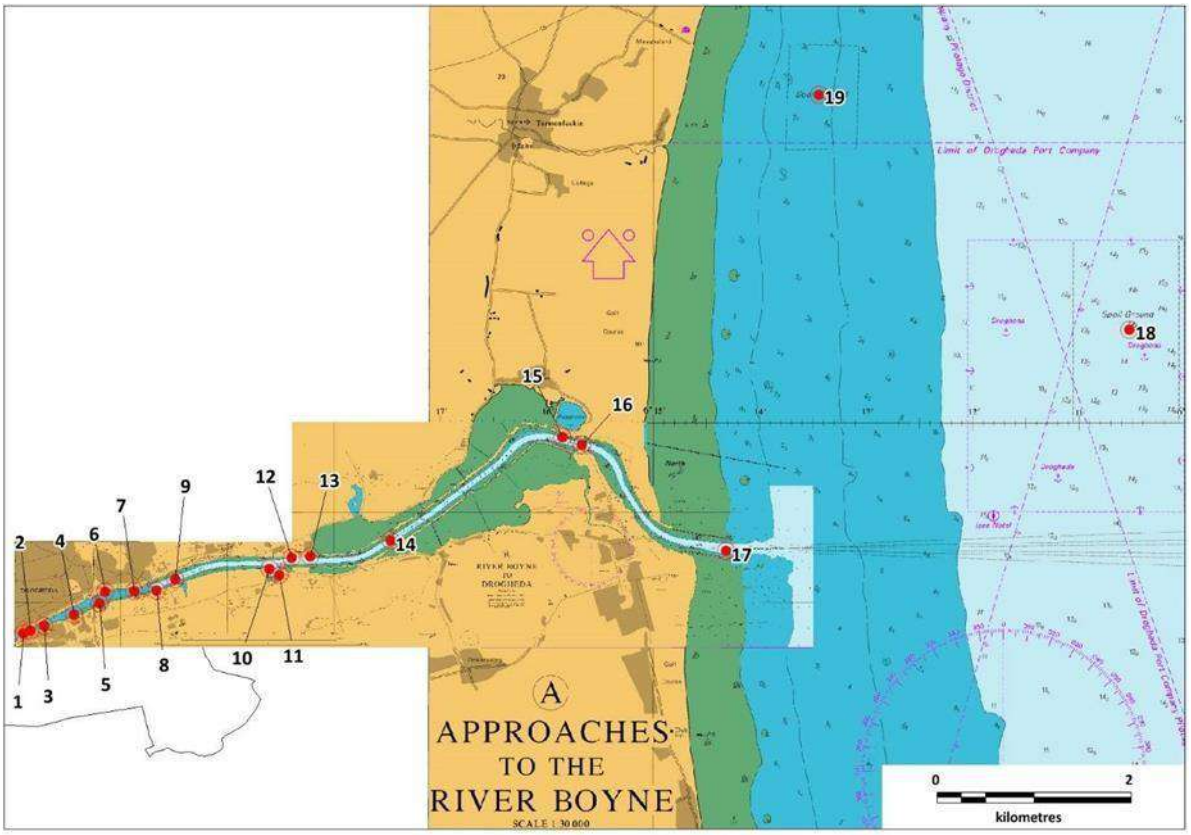

Figure 5.8 Sample locations in study area

Sediment samples were sent to the SOCOTEC Laboratories in Burton on Trent and physical and chemical analysis and the sample for radiological analysis was sent to the Office of Radiological Protection and Environmental Monitoring. Full analysis results can be viewed in Appendix 5.2 with full sediment chemistry analysis compared to Irish action levels shown in Table 5.3.

The sediments analysed for disposal at sea were below the upper action limit for all parameters at all stations. Mercury, Aluminum, Chromium, Lithium and Manganese were all below the lower level guidance value. Arsenic was above the lower action level at stations DP 3-6 and 8-15. Cadmium was above the lower action limit for stations DP 6 and 11. Copper was above the lower action limit for stations DP 3 and 8. Lead was above the lower action limit for station DP 11. Nickel was above the lower action limit for stations DP 3-9 and 11-15. Zinc was above the lower action limit for station DP 11. All stations were below the lower action limit for all organochlorines including ɣ-HCH (Lindane). Six of the PCBs plus the sum of the 7 PCBs were above the lower action limit at station DP 16. Total extractable hydrocarbons ranged from 0.003 to 0.56 g/kg and all stations were below the lower guidance level. Tributyltin (TBT) and dibultytin (DBT) were below the lower action limit for all stations. The sum of the 16 PAH's was below the lower action limit for all stations except DP 16.

The results showed that none of the analysed samples exceeded the upper limits of the Marine Institute Guidelines. Measurable physical, chemical or biological persistence is considered very unlikely.

As the results of the suite of analyses on the range of analytes examined shows no exceedances above upper limits, accumulation and biotransformation in biological materials or sediments is considered very unlikely.

The disposal of these dredged sediments will not give rise to the formation of new compounds.

Parameter	Units (dry wt) Note 2	Lower level	Upper level	Sampling points (locations of sampling stations included)															
				DP3	DP4	DP5	DP6	DP7	DP 8	DP 9	DP10	D11	DP12	DP 13	DP 14	DP 15	DP 16	DP 17	DP 18	DP 19
Arsenic	mg kg^{-1}	9	70*	12.9	12.2	9.1	12.2	7.8	10.8	9.9	9.6	11.7	9.6	9.4	10.8	9.5	8.1	4.6	5.3	4.2
Cadmium	mg kg^{-1}	0.7	4.2	0.7	0.4	0.7	0.9	0.4	0.7	0.5	0.4	1.4	0.5	0.4	0.4	0.4	0.3	<0.1	<0.1	<0.1
Chromium	mg kg^{-1}	120	370	92.2	52.9	51.3	65.4	48.9	64.6	56.9	36.3	57.7	59.9	46.5	57.1	46.5	36.1	16.7	24.2	17
Copper	mg kg^{-1}	40	110	58.3	35.7	24.3	29.2	24.3	46.7	23.1	13.9	32.1	22.9	21.6	16.2	13.1	10.7	6.4	6.6	4
Lead	mg kg^{-1}	60	218	44.8	27.1	36.7	36.3	23.7	31.9	28.1	21	105	35.9	25.3	28.3	23.7	15.8	7.5	11.8	7.5
Mercury	mg kg^{-1}	0.2	0.7	0.05	0.05	0.06	0.06	0.04	0.07	0.05	0.05	0.09	0.05	0.04	0.05	0.04	0.02	<0.01	<0.01	<0.11
Nickel	mg kg^{-1}	21	60	32.9	27.5	27.8	32.7	28.0	39.1	28.4	19.1	30.4	31.1	25.3	27.8	22.6	17.3	8.0	10.1	7.1
Zinc	mg kg^{-1}	160	410	77.7	124	135	148	129	139	128	93.1	247	138	114	113	92.9	64.3	34.7	53.4	33.7
Σ TBT & DBT Note 3	mg kg^{-1}	0.1	0.5		<5	<5	<5	<5	<5	<5	<5	<5	16.4	<5	<5	<5	<5	<5	<5	<5
γ-HCH (Lindane) Note 4	µg kg^{-1}	0.3	1		<0.1	0.133	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HCB Note 5	µg kg^{-1}	0.3	1		0.147	0.190	0.125	0.058	0.115	0.119	0.176	0.094	0.184	0.159	0.105	<0.1	<0.1	<0.1	<0.1	<0.1
PCB 028	µg kg^{-1}	1	180		0.419	0.401	0.491	0.139	0.366	0.329	0.367	0.298	0.509	0.395	0.269	0.246	0.373	<0.08	0.162	0.092
PCB 052	µg kg^{-1}	1	180		0.386	0.364	0.449	0.132	0.285	0.276	0.303	0.241	0.438	0.299	0.184	0.166	1.35	<0.08	0.161	<0.08
PCB 101	µg kg^{-1}	1	180		0.228	0.241	0.264	0.089	0.204	0.210	0.183	0.146	0.224	0.186	0.108	0.109	2.56	<0.08	<0.08	<0.08
PCB 138	µg kg^{-1}	1	180		0.270	0.323	0.313	0.111	0.305	0.304	0.253	0.185	0.271	0.252	0.147	0.176	3.44	<0.08	<0.08	<0.08
PCB 153	µg kg^{-1}	1	180		0.292	0.301	0.319	0.103	0.337	0.275	0.282	0.205	0.266	0.245	0.144	0.162	3.60	<0.08	<0.08	<0.08
PCB 180	µg kg^{-1}	1	180		0.110	0.112	0.129	<0.08	0.111	0.149	0.106	0.094	0.105	0.115	<0.08	<0.08	1.85	<0.08	<0.08	<0.08
PCB 118	µg kg^{-1}	1	180		0.254	0.256	0.277	0.091	0.317	0.235	0.263	0.176	0.246	0.231	0.151	0.151	2.08	<0.08	<0.08	<0.08
PCB (Σ ICES 7) Note 6	µg kg^{-1}	7	1260		1.959	1.998	2.242	0.745	1.925	1.778	1.757	1.345	2.059	1.723	1.083	1.09	15.253	0.56	0.723	0.572
PAH (Σ 16) Note 7	µg kg^{-1}	4000			865.74	1340.25	871.71	405.11	920.26	832.85	972.61	954.03	1472.03	796.69	1180.48	8492.5	1259.1	18.41	70.46	1.06
Total Extractable Hydrocarbons	g kg^{-1}	1.0			0.56	0.55	0.30	0.13	0.23	0.21	0.28	0.27	0.21	0.16	0.11	0.13	0.79	0.0069	0.012	0.0035

Table 5.3 Sediment Chemistry Analysis Results

	Exceed Lower Irish Action Limit
	Exceeds Upper Irish Action Limit

Note 1: Applicants should highlight in Table B.1 any results which exceed either the upper or lower Irish action levels. Action levels are published in *Cronin et al. 2006. Guidelines for the Assessment of Dredge Material for Disposal in Irish Waters. Marine Environment & Health Series, No. 24. Marine Institute.*

Note 2: Total sediment <2 mm
Note 3: Sum of tributyl tin and dibutyl tin
Note 4: 1α,2α,3β,4α,5α,6β-hexachlorocyclohexane
Note 5: Hexachlorobenzene
Note 6: ICES 7 polychlorinated biphenyls: PCB 28, 52, 101, 118, 138, 153, 180.
Note 7: Polyaromatic hydrocarbons (measured as individual compounds): Naphthalene, Acenaphthylene, Acenaphthene, Fluorene,Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenzo(ah)anthracene, Benzo(ghi)perylene, Indeno(123-cd)pyrene.
***** Where < values were encountered, the < value was ignored.

5.3.6.2 Sediment Sampling - Environmental

A number of samples were also recovered from physical analysis from the stations shown in Figure 5.8. These include moisture content and particle size analysis. Samples were also sent for radiological analysis.

Moisture values ranged from 22.4 to 70.8%. Density values range from 2.55 to 2.71%. Organic carbon values ranged from 0.09 to 4.51%. Carbonate values ranged from 2.2 to 17.3%. The sediment is not likely to contain any viruses, bacteria, yeasts, parasites of concern. The Office of Radiological Protection have stated that the dumping of these materials at sea will not result in a radiological hazard (Aquafact, 2019).

5.3.7 Geohazards

There are no expected geohazards at this location. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff landslides and falls lead to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. The GSI landslide database was consulted and the nearest landslide to the proposed development was 4 km to the north, the date and exact details were not available on GSI online database. There have been no recorded landslide events at the site. Due to the local topography and local strata there is a negligible risk of a landslide event occurring at Drogheda Port/Harbour.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently there are five permanent broadband seismic recording stations in Ireland and operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events. Records since 1980 show that the nearest seismic activity to Drogheda Port was in the Irish sea (1.0 – 2.0 Ml magnitude) and ~80 km to the south in the Wicklow Mountains. There is a very low risk of seismic activity to the proposed development site.

There are no active volcanoes in Ireland so there is no risk from volcanic activity.

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The commercial estuary of the River Boyne and seaward approaches is located at Drogheda Port, Drogheda, Co. Louth and extends along the coastline of counties Louth and Meath. The river under the jurisdiction of the Drogheda Port Company is approximately 7.5 km in length from St. Mary Bridge in the town of Drogheda to the river mouth at Mornington. The proposed dredging of the estuary, entrance and seaward approaches will be carried out to maintain the safe navigability of the channel.

Drogheda Port Company currently holds a Dumping at Sea Permit for the period 2013 – 2021 and is applying for a Dumping at Sea permit for the period 2021 – 2029 for the sea disposal of the dredged material. The proposed activity i.e. maintenance dredging generates c. 120,000 m^3 of dredged sediment annually. Some of this material is deposited at sea at two dump sites (A1 & A2) while up to 60,000 m^3 may be beneficially reused by the construction industry. It should be noted that the dredged material is not considered a waste. Due to its beneficial reuse in the construction industry, it is considered to be a raw material. No construction of any kind forms part of the dredging works.

5.4.1 Dredging Operations

The primary locations for maintenance dredging are referred to in Appendix A Dredging Area Locations of the licence application i.e. the commercial estuary

including all berths and ship swing basins, channel and the river mouth and seaward approaches. However, dredging can take place at any location within the commercial estuary. Maintenance dredging at Drogheda Port is primarily trailer suction dredging however the plant used depends on availability of plant and location of dredging. Typical plant which would be used for the dredging would be:

- Trailer suction dredger;
- Backhoe dredger;
- Split barge;
- Grab dredger;
- Bed levelling; and
- Plough.

Drogheda Port maintains an open 24/7/365 maintenance dredging policy for the channel, entrance and seaward approaches in order to maintain safe navigation.

5.4.2 Dumping Operations

The main dumpsite (Dumpsite A1) was primarily used in the past for port maintenance and capital dredging and has been used as the main dumpsite for over the past two decades (see Figure 5.1). Dumpsite A1 can accept deposits of sand, mud, silt and gravel and it is therefore requested that Dumpsite A1 continues to be used as the main dumpsite for the future maintenance dredging sea disposal from the berths, ship swinging basins and channel, etc, i.e. from town to sea, and for the sand material from the river mouth and seaward approaches.

The north dumpsite (Dumpsite A2) is contained within the defined port pilotage limits of the Drogheda Port Company and regulated as such from a navigational and control of shipping perspective. It can only accept deposits of sand from the bar and has been determined by hydraulic and hydrodynamic mathematic computer modelling to be the most advantageous sites to aid the coastal process and beach re-nourishment. It is therefore requested that Dumpsite A2 continues to be used as the dumpsite for sand material dredged from the bar.

While every effort is made to maximise the use of this site the safe disposal of material at this ‘A2’ site is at the discretion of the dredger Master and is dependant on the following factors, state of tide, available depth of water (with bottom doors open) sea state and the prevailing wind direction and conditions.

As discussed, Dumpsite A3 is a redundant, inactive site.

5.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

There are no potential impacts on land and hydrogeology as the disposal works occur offshore. As the dredging and disposal will not require any excavation into rock there is no potential impact on the existing geology. The only potential impact is soil disturbance within the estuary during operation of the activity which is the objective of the activity. Soil sampling as described above does not indicate the potential for residual contamination being mobilised by dredging. The only potential impact is that soils could become contaminated from an accidental oil leak from the dredging equipment.

5.6 REMEDIAL AND MITIGATION MEASURES

This section describes any mitigation measures designed to avoid, reduce or offset any potential adverse soil impacts identified.

5.6.1 Construction Phase

There will be no construction phase as part of the dredging works outlined above.

5.6.2 Operational Phase

There will be no planned emissions to ground or the underlying aquifer from operational activities.

During the proposed activities there is no potential for site activities to impact on the land, geological and hydrogeological environment of the area. Measures are in place to manage an oil leak during dredging works.

Environmental Procedures

Drogheda Port Company has an Emergency Plan (updated June 2019) including a pollution response plan. The plan incorporates procedures for pro-active management of environmental issues and liabilities. Through this system, the facility operates a formal structure for environmental management, ongoing assessment of environmental performance and continual improvement of all its activities.

5.7 PREDICTED IMPACT OF THE PROPOSED DEVELOPMENT

This section describes the predicted impact of the proposed development following the implementation of the remedial and mitigation measures.

5.7.1 Construction Phase

There will be no construction required as part of this application.

5.7.2 Operational Phase

The impact will be ***long-term-imperceptible-neutral.***

5.8 RESIDUAL IMPACTS

The residual impacts on land soils, geology and hydrogeology (following EPA Draft EIA Report Guidelines 2017) are considered to have a ***long-term, imperceptible*** significance, with a ***neutral*** impact on quality.

5.9 CUMULATIVE IMPACTS

There are no likely significant cumulative impacts on the land soil, geological or hydrogeological environment associated with the proposed activities. Drogheda Port Company is the sole operator with responsibility of dredging the Boyne Estuary and as such the impact is considered to have a ***long-term, imperceptible*** significance with a ***neutral*** impact on quality i.e. no effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.

6.0 HYDROLOGY

6.1 INTRODUCTION

The following section presents an assessment of the impacts of the proposed activities in terms of the natural hydrological environment. In assessing likely potential and predicted impacts, account has been taken of both the importance of the attributes and the predicted scale and duration of the likely impacts. Where an impact is identified, planned mitigation measures are identified and assessed.

6.2 METHODOLOGY

The rating of potential environmental impacts on the hydrological environment is based on the matrix from the EPA Guidelines which takes account of the quality, significance, duration and type of impact characteristic identified. Consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that attribute.

The methodology used in this assessment follows current Irish guidance as outlined in:

- Environmental Protection Agency (EPA) Draft 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (2017);
- European Commission *'Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report'* 2017
- EPA Draft 'Advice Notes for preparing Environmental Impact Statements' (2015); and,
- National Road Authority (NRA) 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes', by the National Roads Authority (2009).

The following sources of information were consulted:

- Current EPA on-line database -Envision water quality monitoring data for watercourses in the area;
- River Basin Management Plan for Ireland (2018-2021)
- Eastern River Basin District (ERBD) Management Plan – Boyne Estuary Water Management Unit and Programme of Measures – ERBD
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW));
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie);
- Dublin City Council (2005), Greater Dublin Strategic Drainage Study: Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council;
- DoEHLG & OPW (2009) Flood Risk Management Guidelines for Planning Authorities
- 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001); and
- "Guidelines on protection of fisheries during construction works in and adjacent to waters" Inland Fisheries Ireland (2016).

The attributes (and impacts) to be assessed include the following:

- Surface watercourses near the site and potential impact on surface water quality arising from the related works including any discharge of surfacewater run-off;
- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any); and

Site specific data was derived from the following sources:

- Guidelines for the Assessment of Dredge Material for Disposal in Irish Waters, April 2016, Cronin et al.
- Drogheda Port Annual Environmental Report 2018.
- Environmental Liabilities Risk Assessment Drogheda Port Dredging & Disposal Operations (S0015-02), Aqufact International Services Ltd. (March 2015); and
- Drogheda Port Company Maintenance Dredging Licence Application Hydraulic Modelling Study, RPS Group (May 2019).

6.3 RECEIVING ENVIRONMENT

6.3.1 Existing Environment

The two maintenance dumpsites are located in the vicinity of Drogheda Port located in the Irish Sea. A portion of the dredged material will be deposited at a “dump site” close to the surf zone in 4 m of water (Maintenance Dumpsite A2). A portion of the dredged material will also be disposed of 2.5 km from the shore in 14 m of water (Maintenance site A1). There is also a third dump site which is now a redundant inactive site (Maintenance site A3). Both active sites are encompassed within offshore environments of both County Louth and County Meath.

The proposed activity i.e. maintenance dredging generates c. 120,000 m^3 of dredged sediment annually. Some of this material will be deposited at sea in either of the two dump sites and up to c. 60,000 m^3 may be beneficially reused by the construction industry. Drogheda Port Company (Register Number IED P1011-01). is authorised for beneficial re-use of the material under its Foreshore Licence dated 10th April 2013 and confirmed in subsequent correspondence with the EPA (letter dated 4th April 2016 to Captain Martin J Donnelly).

Figure 6.1 below presents the location of the proposed disposal sites in the regional hydrological context.

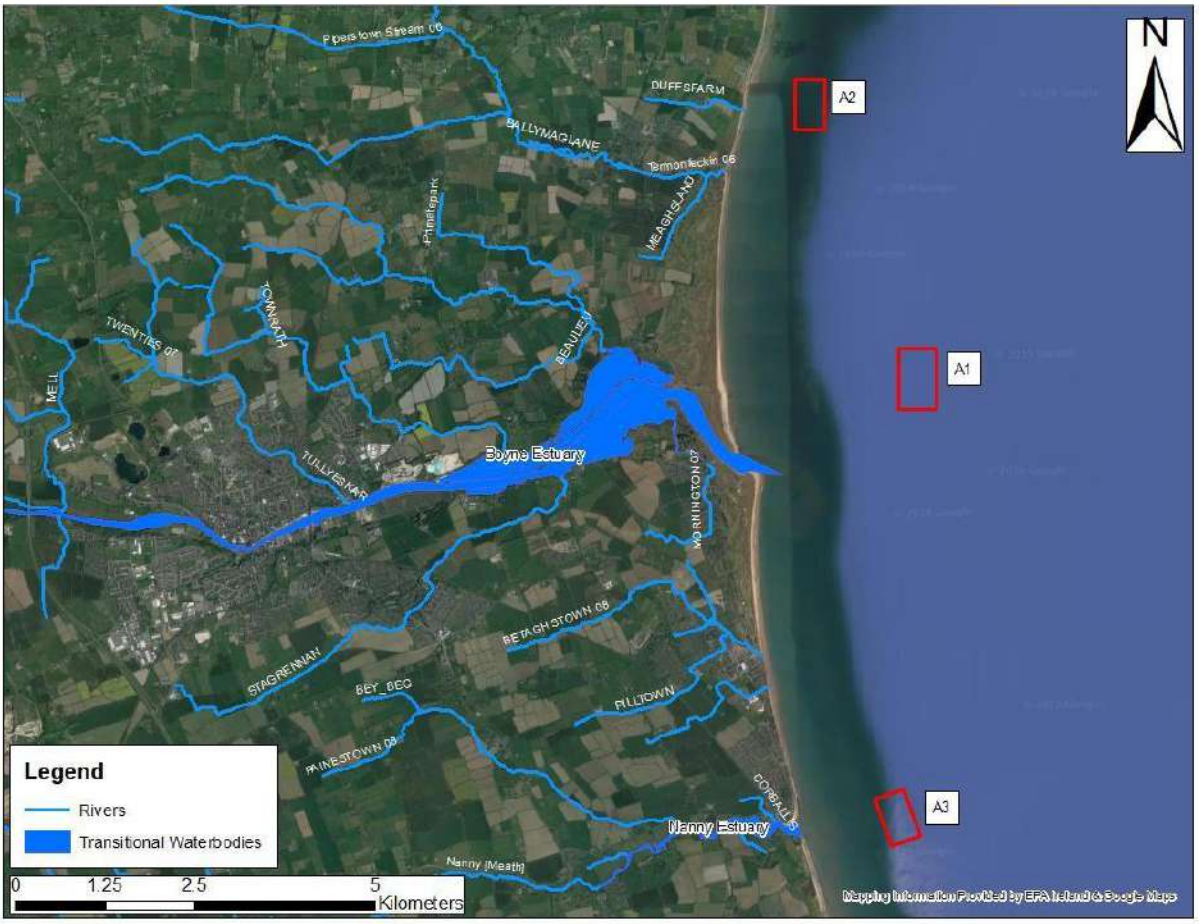

Figure 6.1 Regional Hydrological Environment

The maintenance dredging site is located in the main channel of the River Boyne estuary from the upstream extent of the dredging at the Town Quays to beyond the seaward extent of the breakwater walls at the estuary mouth. This maintenance dredging section is c.7.5 km in length. Two dump at sea sites are located off the north shore (A2) of the northern breakwater c.4 km northeast and c.4 km east-northeast (A1) of the breakwater.

The River Boyne rises in the north midlands and exits to the sea at Mornington, Co. Meath. The river flows through the towns of Kells, Trim, Navan, Slane and finally Drogheda where international commercial shipping traffic uses the river to service Drogheda Port and third-party facilities.

6.3.2 Surface Water Quality

The Proposed activity is located within the former ERBD (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). It is situated in Hydrometric Area No. 07 of the Irish River Network. It is located within the Boyne Catchment.

The WFD requires *'Good Water Status'* for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. 'Good status' means both *'Good Ecological Status'* and *'Good Chemical Status'.* In 2010 the ERBD River Management Plan (RMP) 2009-2015 was published. In the RMP, the impacts of a range of pressures were assessed including diffuse and point pollution, water abstraction and morphological pressures (e.g. water regulation structures). The purpose of this exercise was to identify water bodies at risk of failing to meet the objectives of the WFD by 2015 and include a programme of

measures to address and alleviate these pressures by 2015. This was the first River Basin Management planning cycle (2010-2015). The second cycle river basin management plan for Ireland is currently in place and will run between 2018-2021 with the previous management districts now merged into one Ireland River Basin District (Ireland RBD).

This second-cycle RBMP aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). In more general terms, three key lessons have emerged from the first cycle and the public consultation processes. These lessons have been firmly integrated into the development of the second-cycle Plan. Firstly, the structure of multiple RBDs did not prove effective, either in terms of developing the plans efficiently or in terms of implementing those plans. Secondly, the governance and delivery structures in place for the first cycle were not as effective as expected. Thirdly, the targets set were too ambitious and were not grounded on a sufficiently developed evidence base. The second cycle RBMP has been developed to address these points.

The strategies and objectives of the WFD in Ireland have influenced a range of national legislation and regulations. These include the following:

- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003);
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014);
- European Communities Environmental Objectives (Surface Waters); Regulations, 2009 (S.I. No. 272 of 2009)
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010);
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010); and
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011).

Figure 6.2 below presents the EPA quality monitoring points in the context of the Boyne Estuary and other regional drainage settings.

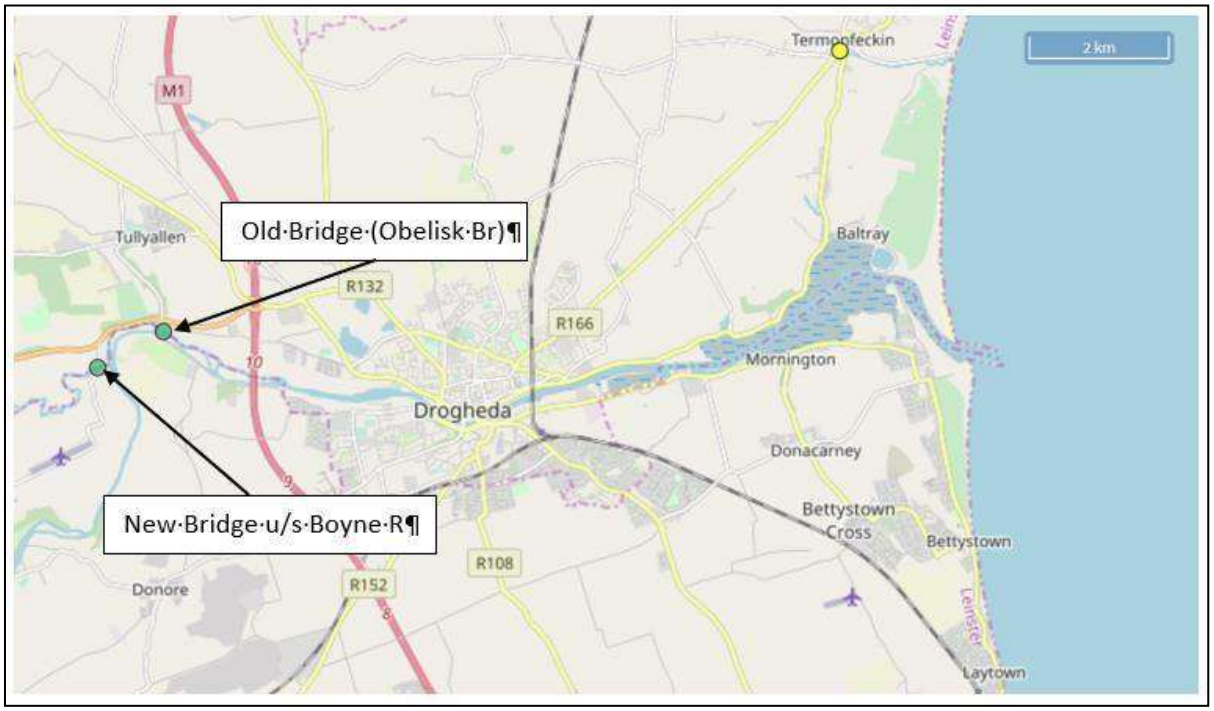

Figure 6.2 Surface Water Quality Monitoring Points on and in the vicinity of the Lower River Boye (EPA, 2019)

Surface water quality is monitored periodically by the EPA at various regional locations along principal and other smaller watercourses. With reference to the site setting, the nearest EPA monitoring station is situated upstream of Drogheda Port. The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality. There are two water quality monitoring station located upstream of the Boyne Estuary, The Old Bridge (RS07B042200) and the New Bridge (RS07M010300) both obtained a Q4- Good WFD status (in 2018 and 2006 respectively).

In accordance with the WFD, each river catchment within the former ERBD was assessed by the EPA and a water management plan detailing the programme of measures was put in place for each. Currently, the EPA classifies the WFD status for of the Boyne Estuary as '*At Risk'* (of not meeting WFD objectives). Upstream of the estuary the River Boyne is listed as 'not at risk' (of not meeting WFD objectives). Most of the tributaries which feed directly into the Boyne Estuary are currently under review in regards their WFD status, meaning there is insufficient information to determine the risk , or there have been measures implemented but some additional monitoring is required to confirm expected improvements have been achieved.

The current WFD coastal waterbody approved risk for the Louth Coast Body (HA 06) (location of site A2) is '*Not at Risk''.* Both the Boyne Estuary Plume Zone and the Northwestern Irish Sea (HA 08) (Locations of sites A1 & A3) both are currently *'Under Review'.* Figure 6.3 shows the current WFD Status for all waterbodies in the vicinity of the proposed sites and Drogheda Port.

Figure 6.3 Current River, Transitional Waterbody and Costal Body Scores. Red = At Risk Orange = Under Review, Green = Not at Risk. (EPA, 2019)

The water quality of the Boyne Estuary was classified as moderate according to the Eastern River Basin District Management Plan (ERBD, 2010). Classified as a 'heavily modified waterbody,' the pressures upon the system were identified as wastewater/industrial discharges (70%), dangerous substances (20%) and agricultural inflows (10%). A wastewater treatment plant at Drogheda, several points of wastewater discharge and the adjacent urban area of Drogheda all contribute. Coastal waters were classified of high quality (Boyne estuary plume) (ERBD, 2010).

6.3.3 Marine Strategy Framework Directive

The Marine Strategy Framework Directive (MSFD) (2008/56/EC) was formally adopted by the European Union in June 2008 and is transposed into Irish law by the European Communities (Marine Strategy Framework) Regulations, 2011 (SI No. 249 of 2011). The overarching aim of the Directive is to protect Europe's marine waters by applying an ecosystem-based approach to the management of human activities while enabling the sustainable use of the marine environment for present and future generations. The Directive establishes a legal framework for the development of marine strategies designed to achieve Good Environmental Status (GES) in the marine environment by the year 2020. The marine strategy involves defining GES, setting environmental targets and indicators, implementing monitoring programmes for ongoing assessment, and developing and implementing programmes of measures to achieve or maintain GES. GES is defined as 'the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations'. The assessment of GES is undertaken by reference to 11 qualitative descriptors which define overarching objectives in respect of key socio-economic or ecological aspects of the marine environment. These specifically require the consideration of the following:

- Biodiversity;
- Non-indigenous species;
- Exploited fish and shellfish;
- Food webs;
- Human-induced eutrophication;
- Sea-floor integrity;
- Alteration of hydrographical conditions;
- Contaminants in water and seafood;
- Marine litter; and
- Introduction of energy including underwater noise.

To date, an Initial Assessment (constituting a comprehensive review of the physical, chemical and biological characteristics of the marine area, as well as the human pressures acting upon it) has been undertaken (DEHLG 2013)). The Marine Strategy Framework Directive Programme of Measures Summary Report was produced in July 2016. Appendix 6.2 of this report lists the programme of measure required to make a significant contribution towards the overall achievement of GES in coastal and marine waters. The proposed activities will be undertaken in reference to these measures.

6.3.4 EPA Water Quality in 2017: an indicators report

The EPA published their indicators report in 2018. Environmental indicators represent a significant aspect of the state of the environment and related human activities. Indicators focus on:

- Trends in environmental changes,
- The stresses causing them,
- How the environment and its components respond to these changes, and
- Societal response to prevent, reduce or ameliorate these stresses.

The 2018 report is an update to Water Quality in 2016: An Indicators Report 1 and focuses on the same 16 indicators and provide an update on any changes. Each indicator summarises a particular water quality parameter or issue. These indicators tell the story of the state of Ireland's aquatic environment.

The indicators present the current situation, an indication of recent change and, where possible, longer term trends. These trends provide information on the improvement or deterioration in aspects of water quality and help stakeholders decide what actions to take to protect and improve water quality. The indicators have been set out in a 'stand-alone' fashion so that a concise assessment is available for each.

The selected indicators are based on their scientific value, ease of detection and relevance to policy implementation, both nationally and internationally, in the context of the EPA's existing core set of environmental indicators and following a review of other relevant water quality indicator sets maintained by the European Environment Agency. Also considered are indicators being developed to track progress in the implementation of the United Nations Sustainable Development Goals; these goals aim to promote prosperity while protecting the planet and are aimed at all countries. One of the relevant goals is Goal 6: clean water and sanitation.

The 16 indicators are:

1: River quality

2: High-quality river sites

3: Nitrate in rivers

4: Phosphate in rivers

5: Canal quality

6: Lake biological quality

7: Total phosphorus in lakes

8: Fish kills

9: Trophic status of estuaries and coastal waters

10: Nitrogen in estuaries and coastal waters

11: Phosphorus in estuaries and coastal waters

12: Nutrient inputs to the marine environment

13: Nitrate in groundwater

14: Phosphate in groundwater

15: Bacteria in groundwater

16: Bathing water quality.

The location of the proposed activities relates specifically to points 9, 10 & 11 (point 12 deals with national trends and cannot be specified to the Boyne Estuary and associated costal area specifically) Eutrophication in estuaries and coastal waters can be caused by nitrogen and/or phosphorus. Phosphorus is generally considered the primary limiting nutrient in river-dominated estuaries while nitrogen is considered the primary limiting nutrient in coastal ecosystems. The limiting nutrient is the nutrient that is naturally in short supply under normal conditions. If the amount of the limiting nutrient increases, this may cause ecological problems. The estuarine and coastal 2015 – 2017 trophic status of the study area are shown in Table 6.1. The trophic status of transitional and coastal water bodies is assessed using the EPA's Trophic Status Assessment Scheme (TSAS). This assessment is required for the EU Urban Wastewater Treatment Directive (91/271/EEC) and the EU Nitrates Directive (91/676/EEC). The scheme compares the compliance of individual parameters against a set of criteria indicative of trophic status and classifies water bodies as follows:

- Eutrophic water bodies are those in which criteria in each of the categories are breached i.e. where elevated nutrient concentrations, accelerated growth of plants and undesirable water quality disturbance occur simultaneously;
- Potentially Eutrophic water bodies are those in which criteria in two of the categories are breached and the third falls within 15 % of the relevant threshold value:
- Intermediate status water bodies are those which breach one or two of the criteria;
- Unpolluted water bodies are those which do not breach any of the criteria in any category.

Estuarine and Coastal Trophic Status 2015 – 2017	
Name	**Status**
Boyne Estuary	Eutrophic
Boyne Estuary Plume Zone	Intermediate
Northwestern Irish Sea (HA 08)	Unpolluted

Table 6.1 *Estuarine and Coastal Trophic Status 2015 – 2017 (EPA 2018)*

The EPA undertook a trend analysis of winter median concentrations of Nitrogen in estuarine and coastal water bodies in 19 catchments from 2007 to 2017. A significant trend was found in 36 water bodies of the 95 assessed. Since 2007, there has been a significant decrease in dissolved inorganic nitrogen in seven water bodies with the Boyne Estuary being one of these.

Trend analysis of winter median phosphorus concentrations in estuarine and coastal waters in 19 catchments was undertaken between 2007 and 2017. Results show that concentrations in eight water bodies decreased significantly over that period with the Boyne Estuary being included in this list.

6.3.5 Bathing Water Quality

The EU Directive on bathing water (2006/7/EC) came into force in March 2006, transposed into Irish law by the Bathing Water Quality Regulations, 2008 (SI No. 79 of 2008. The 2006 Directive established a new classification system for bathing waters (based on microbiological standards) and required that a classification of at least 'sufficient' be achieved by 2015 for all bathing waters. Standards for E.Coli and Intestinal Enterococci are used to classify bathing waters into four categories (excellent, good, sufficient and poor). Classification is based on assessment of water quality data over a rolling four-year period rather than just the past seasons data.

The EPA report on the the bathing water quality in Ireland annually. In their last report for the year 2018 (EPA, 2019) it reported that 94% of Bathing Waters (137 of 145) met the minimum required standard of Sufficient. Table 6.2 below lists the classification af all bathing waters in Co. Meath and Co, Louth for the period 2015 to 2018 inclusive.

Classifications Bathing Waters for the period 2015 to 2018					
Local Authority	**Bathing Water**	**2015**	**2016**	**2017**	**2018**
Louth Co Co	Clogherhead	Excellent	Excellent	Excellent	Excellent
Louth Co Co	Port, Lurganboy	Excellent	Excellent	Excellent	Excellent
Louth Co Co	Sea Point	Excellent	Excellent	Excellent	Excellent
Louth Co Co	Shelling Hill/Templeton	Excellent	Excellent	Excellent	Excellent
Meath Co Co	Laytown/Bettystown	Good	Good	Good	Good

Table 6.2 Classification of Bathing Water (EPA 2019)

As the activities proposed will not change in scope or intensity it is not perceived that the proposed dredging and dumping at sea of sediments from Drogheda Port will impact on the classifications shown in table 6.2 above.

6.3.6 Suspended Sediment

Advanced computer modelling simulations have been undertaken of suspended sediment plumes for the maintenance dredging at areas in and around Drogheda Port and the Proposed Dredging Site these include, the bar, Tom Roe's terminal berth and swing basin as well as the river navigation channel. The work was undertaken using RPS existing Mike21 models of the Boyne River estuary and adjoining sea area.

The results of the simulations of the maintenance dredging at the bar showed that away from the immediate area around the dredger, the total suspended sediment concentrations are very low at less than 80 mg/l and the plume does not approach the

area where little terns nest on the northern side of the training walls (See Chapter 8 Biodiversity). It should also be noted that the area around the bar and the adjoining beaches is subject to regular storm wave events which lift sediment into suspension with concentrations of up to 380 mg/l which is much higher than the levels of suspended sediment that occurs during the maintenance dredging of the bar. The simulation of the maintenance dredging of the fine silt deposits from Tom Roe's terminal berth, the swing basin and the river channel has shown that, apart from the area around the dredger, the suspended sediment plume concentrations are generally low with values typically less than about 80 mg/l and they further disperse relatively quickly.

6.3.7 Flood Risk

The potential risk of flooding as a result of the dredging and dumping activities was also assessed. Based on a review of the OPW Catchment Flood Risk Assessment and Management (CFRAM) maps, Drogheda Port and certain areas of the Boyne Estuary are at risk of fluvial and coastal flooding. As there is no construction that forms part of this application and the dredging and dumping activities are undertaken within the estuary itself, the proposed activities will not increase the risk of flooding in the local area both for a current or future scenario.

6.3.8 Rating of Site Importance of the hydrological features

Based on the NRA methodology and the criteria for rating site importance of hydrological features (see Appendix 6.1, Table 1), the importance of the hydrological features at this site is categorised as "High'' based on the fact that the Boyne Coast and Estuary is an SAC and SPA. However, the Boyne Estuary in not a widely used amenity site, it has a low quality status and that is is not used in the supply of potable water to domestic dwellings.

6.4 CHARACTERISTICS OF THE DEVELOPMENT

The commercial estuary of the River Boyne and seaward approaches is located at Drogheda Port and extends along the coastline of counties Louth and Meath. The river under the jurisdiction of the Drogheda Port Company is approximately 7 km in length from St. Mary Bridge in the town of Drogheda to the river mouth at Mornington. The proposed dredging of the estuary and the seaward approaches will be carried out to maintain the safe navigability of the channel.

Drogheda Port Company currently holds a Dumping at Sea Permit S0015-02 for the period 2013 – 2021 and is applying for a Dumping at Sea permit for the period 2021 – 2029 for the sea disposal of the dredged material. A portion of the dredged material will be deposited at a dump site close to the surf zone in 4 m of water. A portion of the dredged material will also be dumped 2.5 km from the shore in 14 m of water. There is also a third dump site which is now a redundant inactive site. Drogheda Port Company will also be engaging in a beneficial re-use option whereby a portion of the dredged material i.e. up to 60,000 m^3 may be beneficially reused within the construction industry. The dredging works are necessitated by the need to dredge the river entrance, seaward approaches, navigation channel, berths and swing basins to restore safe navigational water depths. Beneficial reuse is employed to meet the requirements of the OSPAR Convention.

The characteristics of the activity (dredging and dumping) that are relevant in terms of are summarised below.

6.4.1 Dredging Operations

The primary locations for maintenance dredging are referred to in Appendix A Dredging Area Locations of the licence application i.e. the commercial estuary including all berths and ship swing basins, channel and the river mouth and seaward approaches. However, dredging can take place at any location within the commercial

estuary. Maintenance dredging at Drogheda Port is primarily trailer suction dredging however the plant used depends on availability of plant and location of dredging. Typical plant which would be used for the dredging would be:

- Trailer suction dredger;
- Backhoe dredger;
- Split barge;
- Grab dredger;
- Bed levelling; and
- Plough.

Drogheda Port maintains an open 24/7/365 maintenance dredging policy for the river mouth and seaward approaches in order to maintain safe navigational depths.

6.4.2 Dumping Operations

The main dumpsite primarily used in the past for port maintenance and capital dredging is Dumpsite A1 which has been used as the main dumpsite for over the past two decades (see Appendix B Location of Maintenance Dredging Dumpsites, of the licence application). This is the site requested for the future maintenance dredging sea disposal from the berths, ship swinging basins and channel, etc, i.e. from town to sea, and for the sand material from the river mouth and seaward approaches.

The north near shore 'A2' site is contained within the defined port pilotage limits of the Drogheda Port Company and regulated as such from a navigational and control of shipping perspective. Having been determined by hydraulic and hydrodynamic mathematic computer modelling to be the most advantageous site to aid the coastal process and beach re-nourishment.

Dumpsite A3 is a redundant, inactive site.

6.5 POTENTIAL IMPACTS OF THE ACTIVITY

The potential impacts in relation to surface water from the dredging and dumping activities are outlined here. The assessment of impact is based on the description of effects as set out in the Draft EPA 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (2017). As there is no construction phase as part of this application, operational activities only are considered below.

6.5.1 Fuel and Other Accidental Spills

There is a potential for leaks and spillages of bulk fuel from the dredger due to accidental release / storage tank fault / collision. This could result in a discharge to surface water which would have a short-term negative impact on the Boyne Estuary and nearby costal water bodies if not adequately mitigated.

Due to the tidal nature of the Boyne Estuary there would be no impact to upstream tributaries.

6.5.2 Increase in Suspended Solids

Due to the nature of the proposed activities there is a potential for an increase in suspended solids both in the Boyne Estuary and at the dump site locations. This may have an impact of aquatic wildlife and the quality of the estuarine reaches of the Boyne.

6.6 REMEDIAL AND MITIGATION MEASURES

This section describes mitigation measures incorporated in the project design to avoid, reduce or offset any potential adverse hydrological impacts identified.

6.6.1 Environmental Procedures

Drogheda Port Company has and Emergency Plan (updated October 2019) including a pollution response plan. The plan incorporates procedures for pro-active management of environmental issues and liabilities. Through this system, the port

company operates a formal structure for environmental management, ongoing assessment of environmental performance and continual improvement of all its activities.

6.6.2 Fuel & Chemical Storage/ Handling

All dredger bunkering supply operations are carried out while moored at Drogheda port. Bunker transfers are only allowed by permission of the Harbourmaster and standard operating procedures (SOP's) must be followed by the vessel and bunker supply contractor. In the unlikely event of a collision, the vessels bunker tanks are located in the engine room of the dredger within the integral hull. Given the relative speeds of the vessel, collision impact penetration to an internal bunker tank is not likely. If a release did occur, given that the dredger engaged at Drogheda port all use light diesel marine gas oil (MGO), this fuel from a pollution perspective would be left to degrade naturally and this is consistent with the DPC Pollution Response Plan.

Emergency oil spill kits and oil spill containment equipment will be held on board by the dredging operator in the event of an oil spill during dredging operations. Drogheda Port Company will maintain its Tier 1 pollution response unit and equipment for immediate deployment. Drogheda Port Company as part of its pollution plan has a contract call up facility for additional resources and expertise in the event of a spill.

6.6.3 Surface Water Runoff

In the event that dredged material is brought ashore for beneficial reuse by the construction industry, the sediment would be stored at No. 1 berth on the Town Quays for a duration of 24 hours. As the dredged material is dewatered on the dredging plant before it is deposited on the Town Quays, there would be no surface water run-off from the stored material. The only possibility of surface water run-off from the stored material would be due to overnight rainfall. In this event, the rainwater would drain from the stored material from the Town Quay into the River Boyne. Although there would be a direct hydrological link between the River Boyne and the run-off, there is a low likelihood of contamination as the sediment analysis results conclude that no evidence of contamination was detected in the sediment sampled at the dredging locations. Please see Chapter 6 Land, Soils and Geology for further details of this analysis.

6.6.4 Suspended Solids

Measures will be taken during loading to limit the generation and release of suspended solids to water. No loading will be carried out at periods of low tide. The annual contingency quantity can only be dredged if required to maintain navigable depths, as evidenced by pre-dredge and post-dredge bathymetric surveys. Dumping activities will be conducted to ensure uniform spread of material throughout the dumping sites. See section 6.3.8 for more information.

6.7 PREDICTED IMPACTS OF THE ACTIVITIES

The implementation of mitigation measures highlighted in Section 6.6 will ensure that the predicted impacts on the hydrological environment do not occur during the operation of the facility and that the impact will be ***long-term-imperceptible-neutral.*** Following the NRA criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered ***Negligible****.*

6.8 RESIDUAL IMPACTS

The residual impacts relate to those impacts that would occur after implementation of the mitigation measures as outlined in Section 6.6 above and upon cessation of the activity. In the case of the proposed development, there is no evidence of any significant residual impacts on surface water. The residual impact is considered to be ***long term, imperceptible*** and ***neutral.***

6.9 CUMULATIVE IMPACTS

The impact of the activities has been considered in relation to the surrounding developments currently permitted or planned within the vicinity of the site. There is no construction phase proposed and as such cumulative construction-related impacts are not considered.

The operation of the proposed activities will have an ***imperceptible*** significance with a ***neutral*** impact on quality due to the mitigation measures in place to protect water quality during dredging and dumping activities. As Drogheda Port Company is the sole operator with responsibility of dredging the Boyne Estuary the cumulative impact is considered to be ***imperceptible*** significance with a ***neutral*** impact on water.

6.9.1 Monitoring

Drogheda Port will carry out a five yearly sediment analysis programme, consistent with the timing of previous sediment programmes and to the guidance of the Marine Institute. A daily log will be automatically recorded during each dumping voyage.

7.0 WASTE MANAGEMENT

7.1 INTRODUCTION

This chapter of the Environmental Report comprises an assessment of the likely impact of waste generated from the proposed activity as well as identifying proposed mitigation measures to minimise any impacts.

The proposed activity i.e. maintenance dredging generates c. 120,000 m^3 of dredged sediment annually. Some of this material is deposited at sea at two dump sites while up to 60,000 m^3 may be beneficially reused by the construction industry. It should be noted that the dredged material is not considered a waste. Due to its beneficial reuse in the construction industry, it is considered to be a raw material.

The waste generated from the proposed activity are the wastes generated from the ships bearing and transporting the dredging plant. This document will ensure the sustainable management of these wastes in accordance with legislative requirements and best practice standards.

7.2 METHODOLOGY

The assessment of the impacts of the proposed activity arising from the generation of waste materials was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management including national and regional waste policy, waste strategies, management plans and legislative requirements.

This Chapter is based on the proposed activity and considers the following aspects:

- Legislative context;
- Operational Phase only (Dredging and Dumping Operation).

A desk study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the proposed activity; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Mitigation measures are proposed to minimise the effect of the proposed activity on the environment, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 7.6.

7.2.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended).

In addition, the Irish government issues policy documents which outline measures aimed to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document “A Resource Opportunity – Waste Management Policy in Ireland” was published in 2012 and stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention.

7.3 RECEIVING ENVIRONMENT

In terms of waste management, the receiving environment is largely defined by Louth County Council (LCC) as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021.

The waste management plan sets the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

In terms of physical waste infrastructure, there are a number of waste permitted and licensed facilities located in the Eastern-Midlands Waste Region for management of waste. These include hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The commercial estuary of the River Boyne and seaward approaches is located at Drogheda Port, and extends along the coastline of counties Louth and Meath. The river under the jurisdiction of the Drogheda Port Company is approximately 7.5 km in length from St. Mary Bridge in the town of Drogheda to the river mouth at Mornington. The proposed dredging of the estuary and the seaward approaches will be carried out to maintain the safe navigability of the channel.

Drogheda Port Company currently holds a Dumping at Sea Permit S0015-02 for the period 2013 – 2021 and is applying for a Dumping at Sea permit for the period 2021 – 2029 for the sea disposal of dredged material. The ongoing dredging of the estuary and the seaward approaches is carried out to maintain the safe navigability of the channel. A portion of the dredged material will be disposed of at a dump site close to the surf zone in 4m of water. A portion of the dredged material will also be dumped 2.5km from the shore in 14m of water. There is also a third dump site which is now a redundant inactive site. Drogheda Port Company will also be engaging in a beneficial re-use option whereby a portion of the dredged material of up to 60,000 m^3 may be made available for beneficial reuse within the construction industry. The dredging works are necessitated by the need to dredge the river entrance, seaward approaches, navigation channel, berths and swing basins to restore safe navigational water depths. Beneficial reuse is employed to meet the requirements of the OSPAR Convention.

The characteristics of the activity (dredging and dumping) that are relevant in terms of waste management are summarised below.

7.4.1 Dredging Operations

The primary locations for maintenance dredging are referred to in Appendix 7.2 Dredging Area Locations i.e. the commercial estuary including all berths and ship swing basins, channel and the river mouth and seaward approaches. However, dredging can take place at any location within the commercial estuary. Maintenance dredging at Drogheda Port is primarily trailer suction dredging however the plant used depends on availability of plant and location of dredging. Typical plant which would be used for the dredging would be:

- Trailer suction dredger;
- Backhoe dredger;

- Split barge;
- Grab dredger;
- Bed levelling; and
- Plough.

Drogheda Port maintains an open 24/7/365 maintenance dredging policy for the river mouth and seaward approaches in order to maintain the port operations.

7.4.2 Dumping Operations

The main dumpsite primarily used in the past for port maintenance and capital dredging is Dumpsite A1 which has been used as the main dumpsite for over the past two decades (see Appendix 7.3 Location of Maintenance Dredging Dumpsites). This is the site requested for the future maintenance dredging sea disposal from the berths, ship swinging basins and channel etc, i.e. from town to sea, and for the sand material from the river mouth and seaward approaches.

The north 'A2' site are contained within the defined port pilotage limits of the Drogheda Port Company and regulated as such from a navigational and control of shipping perspective. Having been determined by hydraulic and hydrodynamic mathematic computer modelling to be the most advantageous sites to aid the coastal process and beach re-nourishment.

Dumpsite A3 is a redundant, inactive site.

7.4.3 Drogheda Port Waste Management Plan

Drogheda Port Company adhere to a Port Waste Management Plan (see Appendix 7.1) which was approved by the Department of Tourism, Transport and Sport (DTTAS) in September 2017. The Plan specifies the following facilities are present on the various quays and jetties at the Port:

- Two sealed swill bins of 1.6kl capacity appropriately marked Flogas & Premier Periclase;
- One sealed swill trailer (approved by the Department of Agriculture, Food and Marine (DAFM), 9m^3 capacity;
- One open top stevedoring waste trailer, 15m^3 capacity;
- Waste Oil contractors' tanker, capacity to suit collection requirements;
- Sewage waste contractors' tanker, capacity to suit collection requirements; and
- Specialist contractor waste oil collection at designated berth by ship request.

The DPC Waste Management Plan incorporates a daily collection of ship-generated waste by DPC staff at the town quays, Tom Roes Point terminal and Fishmeal quay. At Flogas and Premier Periclase, the ship crew deposit the waste directed to dedicated sealed skips provided. These are in turn emptied by DPC staff. All ship catering waste collected is deposited to a sealed trailer and later disposed of under supervision of the DAFM Veterinary Officer to the Indaver Ireland incinerator facility in Duleek Co. Meath, an EPA licensed facility. This operation is approved and licensed by the DAFM.

Stevedoring waste and cargo residues are collected daily by DPC. Non-recyclable materials are stored in an open trailer and disposed of at the Govista Facility (trading as Orange Skips), also licenced by the EPA. Recyclable materials are stored on site in a designated area in contractor-supplied skips and collected periodically for disposal at a licensed recycling facility.

Waste landed and rejected by DPC is returned to the vessel as local reception facilities will not accept certain wastes. Example of such waste are paint drums etc.

A specialist licensed contractor carries out waste oil disposal or hazardous waste collection and disposal by arrangement. A specialist licensed contractor carries out sewage collection and disposal by arrangement.

Throughout the waste disposal chain a documented chain of custody has been employed. Ship-generated waste landed for disposal is recorded and copies are available for the ship's Master. Ship-generated waste/swill and stevedoring waste disposed of at licensed facilities is recorded by load to that facility. Stevedoring materials and cargo residues collected by the licensed contractor for beneficial re-use and re-cycling are documented with recycling certificates per collection.

Records are retained by DPC for inspection/audit purpose. Waste returns are submitted to the DTTAS by request.

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at Drogheda Port. The knock-on effect of litter issues is the presence of vermin at the Port and the surrounding areas.

7.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

7.5.1 Waste Generated

The proposed activity will generate a range of non-hazardous and hazardous waste materials from the ships bearing and transporting the dredging plant such as wastes related to maintenance and repair of the plant/equipment. General ship housekeeping will also generate waste materials as well as typical municipal wastes generated by crew members including food and canteen wastes. Please see below for a list of wastes likely to be generated during the dredging and dumping activity:

- Fuel oil and diesel;
- Lubricant oil;
- Hydraulic oil;
- Oily rags/wipes;
- Textiles;
- Sanitary waste;
- Food waste;
- Paper and plastic packaging;
- Glass;
- Cooking oil;
- Bulky waste;
- Light bulbs; and
- Cleaning chemicals.

7.5.2 Potential Impact

The potential impacts on the environment of improper, or a lack of, waste management during the proposed activity would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices.

Wastes arising will need to be taken to suitably registered/permitted/licensed waste facilities for processing and segregation, reuse, recycling, recovery and/or disposal as appropriate. There are numerous licensed waste facilities in the Eastern Midlands region which can accept hazardous and non-hazardous waste materials and acceptance of waste from the proposed activity would be in line with daily activities at these facilities. Where possible, waste will be segregated into reusable, recyclable and recoverable materials.

The potential impact of waste generated from the proposed activity is considered to be ***medium-term, not significant*** *and* ***neutral.***

7.5.3 Potential Cumulative Impacts

There is no potential for cumulative impacts as there are no other dumping operations carried out at the dump sites. There is limited potential for traffic impacts as the dredging and dumping forms part of normal quay traffic and is part of general Port operations.

There are no mussel aquaculture operations in the channel. There is no commercial fishing in the dredging area, just recreational fishing at the breakwater. The dumping activity has no impact on fishing in the area.

Other developments or activities in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a ***long-term***, ***imperceptible*** and ***neutral***.

7.5.4 'Do Nothing' Impact

The proposed activity is a continuation of the activity which is currently in operation at Drogheda Port. If the proposed activity was not to go ahead, the current operation would cease and there would be no dredging or dumping carried out at Drogheda Port. There would be a ***neutral*** effect on the environment.

7.6 REMEDIAL & MITIGATION MEASURES

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021. In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
    - Organic waste;
    - Dry Mixed Recyclables;
    - Mixed Non-Recyclable Waste;
    - Glass;
    - Cooking oil;
    - Light bulbs;
    - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and
    - Furniture (and from time to time other bulky waste).
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly

identified with the approved waste type to ensure there is no cross contamination of waste materials;

- All waste collected from Drogheda Port will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- All waste leaving the Port will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the proposed activity is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997 and the EMR Waste Management Plan (2015 - 2021). It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

7.7 PREDICTED IMPACT

The implementation of the mitigation measures outlined in Section 4.6 and continued adherence to the Drogheda Port Company Waste Management Plan will ensure that a high rate of reuse, recovery and recycling is achieved during the dredging and dumping operation. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the proposed activity on the environment will be ***long-term, imperceptible and neutral.***

7.8 MONITORING

Due to the nature of the proposed activity and the limited quantities of waste which will be generated during the activity, there will be no requirement for monitoring.

However, waste legislation should be consulted on a regular basis in case of any changes which may impact on waste management procedures.

7.9 DIFFICULTIES ENCOUNTERED

There were no difficulties encountered during the production of this chapter of the Environmental Report.

8.0 BIODIVERSITY

8.1 INTRODUCTION

Scott Cawley was commissioned to undertake an Ecological Impact Assessment for the proposed activity to inform the Environmental Report.

The proposed activity i.e. maintenance dredging generates c. 120,000 m^3 of dredged sediment annually. Some of this material is deposited at sea at up to two dump sites while up to 60,000 m^3 may be beneficially reused by the construction industry. It should be noted that the dredged material use as beneficial reuse is not considered a waste. Due to its beneficial reuse in the construction industry, it is considered to be a raw material.

The aims of this assessment were to:

- Establish baseline ecological data for the proposed dredging and dump at sea sites and other relevant areas;
- Determine the ecological value of the identified ecological features;
- Assess the impact of the proposed dredging and dump at sea operations on ecological features of value;
- Recommend mitigation measures to avoid, reduce and remedy the identified impacts; and
- Identify any residual impacts after mitigation.

8.2 METHODOLOGY

8.2.1 Legislative Context

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

The following international legislation is relevant to the proposed development:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter the 'Habitats Directive';
- Directive 2009/147/EEC; hereafter the 'Birds Directive'; and
- Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014, hereafter referred to as the EIA Directive.

The following national legislation is relevant to the proposed activity:

- Wildlife Acts, 1976 to 2018; hereafter collectively referred to as the Wildlife Acts. The Wildlife Acts are the principal pieces of legislation at national level for the protection of wildlife and for the control of activities that may harm wildlife.
- Planning and Development Acts 2000 to 2018. This piece of legislation is the basis for Irish Planning. Development plans as required by this legislation often include objectives for the conservation of natural heritage and for the conservation of European Sites.
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011 (as amended); hereafter the 'Birds and Habitats

Regulations'. This legislation transposes the Habitats and Birds Directives into Irish law. It also contains regulations (49 and 50) that deal with invasive species (those included within the Third Schedule).

- Flora (Protection) Order, 2015. This lists species of plant protected under Section 21 of the Wildlife Act, 1976.

The following relevant policies plans are applicable to the proposed activity:

- Drogheda Borough Council Development Plan 2011-2017;
- Louth County Development Plan 2015-2021; and,
- Meath County Development Plan 2013-2019.

Approach to Ecological Evaluation and Impact Assessment

Biodiversity receptors (including identified sites of biodiversity importance) have been valued with regard to the ecological valuation examples set out in the TII guidelines[10].

In accordance with these guidelines, biodiversity features within what is referred to as the Zone of Influence (ZoI) of the proposed activity which are "both of sufficient value to be material in decision making and likely to be affected significantly" are deemed to be 'Key Ecological Receptors' (KERs). These are the biodiversity receptors which may be subject to likely significant effects from the proposed activity, either directly or indirectly. KERs are those biodiversity receptors with an ecological value of local importanc e (higher value) or greater.

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

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

Characterising and Describing the Impacts

The parameters considered in characterising and describing the potential impacts of the proposed activity are per the EPA Guidelines.

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

Professional judgement is used in considering the contribution of all relevant criteria in determining the overall magnitude of an impact.

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

Significant Effects

In determining whether potential impacts will result in significant effects, the CIEEM (2018) guidelines were followed. The approach considers that significant effects will occur when there are impacts on either:

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

Integrity

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

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

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

Conservation Status

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

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

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status.

After the definitions provided in the EU Habitats Directive 92/43/EEC, the conservation status of a habitat is favourable when:

- Its natural range and areas it covers within that range are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable as defined below under species.

And, the conservation status of a species is favourable when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

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

Desk study

A desk study was undertaken to collect any available information on the local ecological environment. The following resources assisted in the production of this report, in addition to those listed in the "Reference" section of this report:

- Online data available on European sites and protected habitats/species as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie, including conservation objectives documents;
- Online data available on protected species as held by the National Biodiversity Data Centre (NBDC) from www.biodiversityireland.ie;
- Information on the fish population of the Boyne Estuary from Inland Fisheries Ireland (IFI) available from www.fisheriesireland.ie;
- A data request was submitted to the Irish Whale and Dolphin Group (IWDG) for records of marine mammal sightings within the study area;
- Information on the surface water network and surface water quality in the area available from www.epa.ie;
- Information on groundwater resources and groundwater quality in the area available from www.epa.ie and www.gsi.ie;
- Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie;
- Information on the location and nature of the operation supplied by the applicant's team; and
- Specialist technical information provided by the applicant's team.

Consultation

The following bodies were consulted in the preparation of this application:

- The Environmental Protection Agency (EPA);
- Inland Fisheries Ireland (IFI);
- Sea Fisheries Protection Authority (SFPA);

- Department of Housing, Planning and Local Government (DoHPLG) (Foreshore Section);
- The National Parks and Wildlife Service (NPWS); and
- The Environmental Pillar.

Responses were received from the following members of the Environmental Pillar:

- The Irish Whale and Dolphin Group;
- Department of Agriculture, Food and the Marine;
- Birdwatch Ireland;
- Irish Seed Savers Association; and,
- Louth Nature Trust.

Consultation meetings were held with the EPA, IFI and SFPA. All comments, suggestions and written responses provided, and relevant to ecology, were taken into account in the preparation of this Environmental Report chapter.

Field Survey Methodology

Intertidal Benthic Flora Surveys

An intertidal field survey was carried out by BEC Consultants on 8th - 9th April 2019 during low water spring tides. Intertidal core samples were taken along three transects using a 0.01 m^2 core to a depth of 25cm. The methodology for the survey generally followed that of the Marine Monitoring Handbook (Davies *et al*., 2001). Sample sites were chosen provide a spread of sites from the upper estuary out onto the beaches north and south of the Boyne Estuary mouth (Figure 8.1).

Figure 8.1: *Map showing location of intertidal sample sites within the Boyne Estuary and surrounds*

Three replicate cores were taken at each sample site. Each replicate was sieved through a 1mm sieve and the residue retained for macroinvertebrate analysis. The samples were fixed in 10% formalin and placed in containers labelled inside and out, before being returned to the laboratory for sorting, identification and enumeration. One small core was taken for sediment analysis, placed in a labelled container and stored in a cooler box before being returned to the laboratory where the samples were frozen prior to analysis for Particle Size Analysis (PSA) and Total Organic Carbon (TOC). On arrival in the laboratory, all samples, both macroinvertebrate and sediment, were logged on appropriate log sheets.

Data collected on standard field sheets at each sample side comprised the following:

- Location
- Surveyors
- Sampler type
- Weather
- Date
- Time
- Station
- Irish Grid Reference
- Exposure
- Sieve size (mm)
- Core depth (cm)
- Sediment description
- Photo reference numbers

Subtidal Benthic Fauna Survey

A subtidal field survey was carried out by BEC Consultants on 25 - 26th April 2019 using a 0.1m^2 Day grab deployed from the M.V. Sharpshooter. A total of 16 stations were sampled for macroinvertebrate and sediment analysis (PSA and TOC) (Figure 8.2). Four sample stations were situated within the Boyne River estuary, while the remaining 12 were located outside the breakwaters. Of these, two stations were located within each of the three dredge spoil dump sites, while a further two were located to the north and south to act as control sites. Sample stations were located using the Sharpshooter's on-board GPS system, onto which preselected sample station locations were loaded.

Figure 8.1: *Map showing location of subtidal sample sites within the Boyne Estuary and surrounds, including the spoil dump sites*

The Day grab was deployed from an A-frame on the survey boat. Sediment samples were taken as a core into the retrieved sediment, labelled and placed in a cooler box. These were subsequently frozen on return to shore. Macroinvertebrate samples were washed through a 1 mm mesh sieve. The residue was transferred to labelled sample containers and fixed with 10% Formalin before being transported back to the laboratory for processing. On arrival in the laboratory, all samples, both macroinvertebrate and sediment, were logged on appropriate log sheets.

In addition to the sample, the following data was recorded on prepared forms at each grab sample station:

- Site name
- Date
- Time
- Co-ordinates
- Sample code
- Sampler type
- Ship anchored (Y/N)
- Weather & sea state
- Exposure
- Depth (m)
- Penetration depth (cm)
- Approximate sediment classification (mud/sand/gravel)
- Sediment colour

- Odour (presence of anoxic matter)
- Sample photograph

Marine Mammal Survey

A dedicated land-based marine mammal survey was carried out by BEC Consultants to collect site specific data to supplement the data obtained from the IWDG. Monthly constant effort watches were carried out following the IWDG guidelines. Each watch lasted 90 minutes and were made from the same location (the northern breakwater of the Boyne Estuary). The distance and bearing to any marine mammal sighted were recorded and used to calculate the sighting location. A spotting scope and binoculars were used to assist with sightings. Constant effort watches were carried out on the following dates:

- 20th March 2019
- 20th April 2019
- 12th May 2019
- 14th June 2019

In addition to sightings made during the constant effort watches, other sightings made while on-site were recorded. This included sightings during the subtidal survey and sightings of hauled-out seals within the estuary.

A log of sea craft activity during the marine mammal surveys and subtidal survey was recorded and is contained in the table below.

Date	Start	End	Activity	Porpoise sightings?
Marine Mammal Surveys				
20/03/2019	08:30	10:00	Clam dredgers working just off-shore, including x2 around the mouth of the estuary and x2 further south. Pilot boat went out and returned.	Y
20/04/2019	09:30	11:00	Clam dredgers working just off-shore, including x2 around the mouth of the estuary and x4 further south. Pilot boat carrying out hydrographic survey at river mouth for last hour of watch.	Y
12/05/2019	07:50	09:20	No vessel activity.	N
14/06/2019	07:25	08:55	Dredger 'Argus' on station at river mouth. Left after 15 minutes.	N
Subtidal Survey				
26/04/2019	NA	NA	Dredger 'Argus' on station at river mouth as we returned to port. Harbour porpoise sighted at same time.	Y

Table 8.1 *Sea craft activity log*

Little Tern Surveys

Little tern surveys were carried out at the known breeding colony at Baltray. Ten weekly visits were made to the survey area between 30th May and 9th August 2018. Surveys focussed on feeding behaviour of terns within the survey area which encompassed the Boyne Estuary and the breakwaters, c.3km upstream of the estuary mouth, up to 2km north and south of the breakwaters along the beach shoreline, and c.1km seaward of the beach shoreline. Within this survey area 6 vantage point locations were selected which were considered adequate to provide views of the entire survey area. Locations of these are illustrated in Figure 8.3. Appendix 8.1 provides details of the survey dates, times, tides and weather conditions. Although Little tern were the target species, other tern species were also recorded during surveys.

An hour watch from each of these vantage point (VP) locations was undertaken during each weekly visit. Observations were made using binoculars and a telescope. Terns were the target species, with Little tern being the priority species, however observations were also made of Roseate tern Sterna dougallii, Common tern S. hirundo, Arctic tern S. paradisaea and Sandwich tern Thalasseus sandvicensis. The surveyor observed a c.1km viewshed from each VP location recording tern species, number of birds, location and behaviour/activity. This information was tabulated, and location and flight lines of terns was drawn onto suitably scaled aerial maps, which would later be digitised.

The tide cycle and any disturbance events that occurred during the observations were recorded. In addition, every 15 minutes of each VP watch, all other seabirds and waders within the c. 1km VP viewshed was recorded. The results of these 15 minute activity surveys were tabulated by seabird/wader species, number of birds, behaviour/activity and location.

The presence or absence of a dredger within the estuary channel was also noted, if within the viewshed of the VP being undertaken. The operational zone of the dredger is within the navigable channel which is the area from VP5 east to the end of the breakwaters.

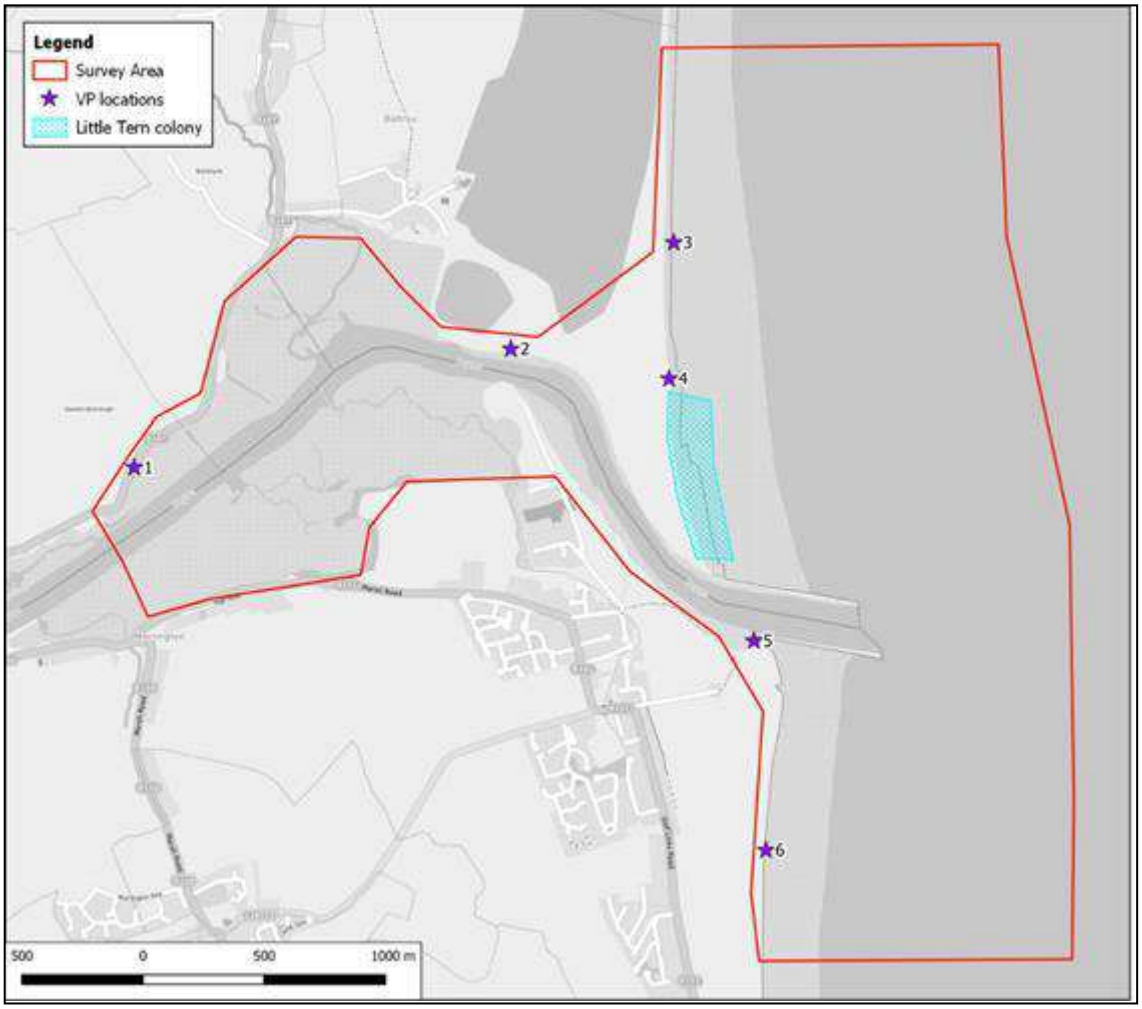

Figure 8.3: *Survey Area extent and Vantage Point (VP) locations*

Wintering Waterbird Surveys

2018-2019 winter waterbird surveys were carried out monthly between September 2018 and April 2019. A high tide count and low tide count of the entire estuary at 13

pre-defined count areas marked on Figure 8.4 was carried out during monthly visits. Appendix 8.2 provides details of the survey dates, times, tides and weather conditions.

Methodology was consistent with that used during previous winter bird surveys in 2007-2008 and 2008-2009, and which had been agreed with Bird Watch Ireland at the time. Wintering waterbird monitoring for DPC was undertaken between years 2002 and 2009 in connection with the Capital Dredging Programme.

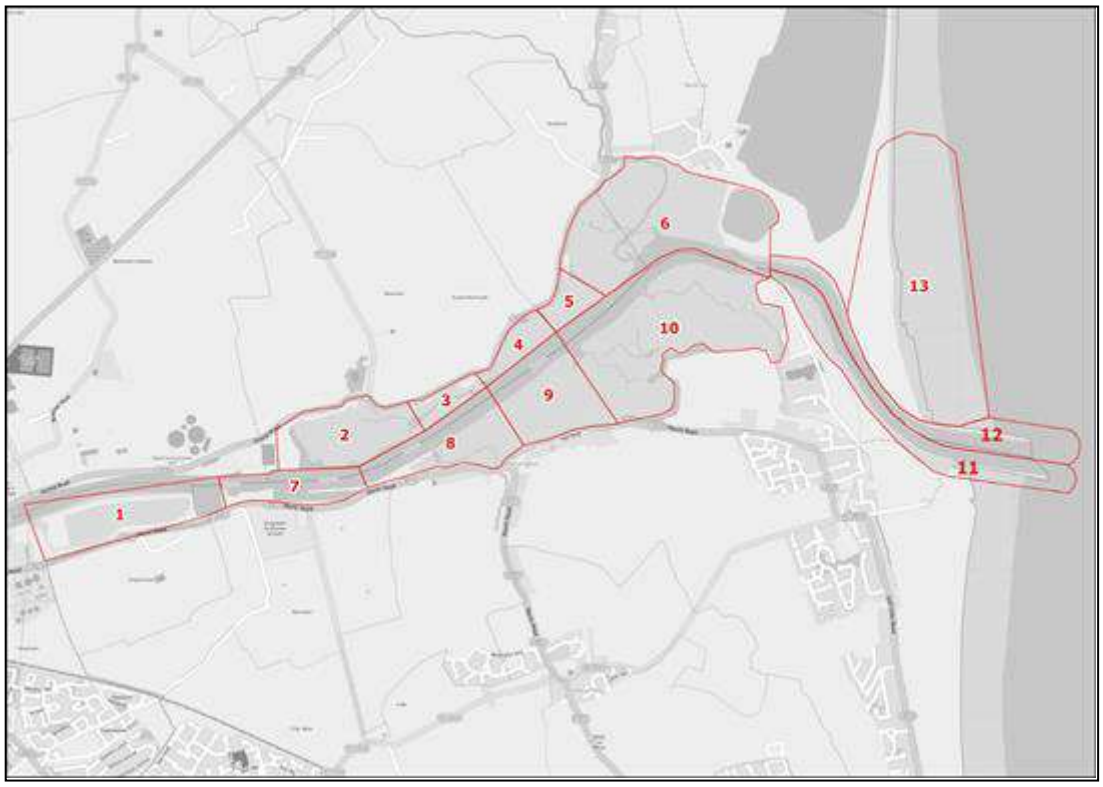

Figure 8.4: *Winter bird survey count areas*

Morning tide counts commenced at Mornington (count area 11) on the south side of the estuary and worked clockwise finishing at Baltray (count area 13) on the north of the estuary. Afternoon tide counts worked anti-clockwise from Baltray towards Mornington.

Low tide counts were carried out 1.5-2 hours either side of low tide. High tide counts will be carried out 1.5-1 hour either side of high tide. As much as possible survey start and finish times avoided 1 hour after sunrise and 1 hour to avoid low light levels which may hinder visibility, however during winter daylight hours this was often not possible.

Surveys were carried out using a telescope and binoculars. Species, numbers and location of birds were recorded on suitably scaled maps in the field. Some count areas were viewed from multiple locations to get full visual coverage of the area. Detailed bird usage maps of Stagrennan Polder and Tom Roes Point Polder were later analysed to provide detail constraints mapping of these areas to inform future development of the Drogheda Port Masterplan.

8.3 RECEIVING ENVIRONMENT

Overview

The maintenance dredging site is located in the main channel of the River Boyne estuary. From the upstream extent of the dredging at Drogheda town to beyond the seaward extent of the breakwater walls at the estuary mouth. This maintenance

dredging section is c.7.5km in length. There are two dump at sea sites, A1 and A2, A1 4km northeast of the breakwater and A2 c.4km east-northeast of the breakwater.

The River Boyne rises in the north midlands and exits to the sea at Mornington, Co. Meath. The river flows through the towns of Kells, Trim, Navan, Slane and finally Drogheda where international commercial shipping traffic uses the river to service Drogheda Port and third party facilities.

From Drogheda town to the sea at Mornington, the river has been hard engineered by means of training walls constructed around the 1850s by the then Drogheda Harbour Commissioners. The purpose of these training walls was to create estuarine polders either side of the main river channel. On the rising tide these estuarine polders fill up and retain the incoming water. On the ebb tide through designated “guts” the retained water is released.

The creation of the estuarine polders had two important effects i.e. through the release of water on the ebb tide it increased the tidal exit velocity thus producing a scouring or dredge effect. Following the immediate creation of the estuarine polder, the natural channel depth increased. In recent times, the original river walls constructed have fallen into dis-repair and the designed engineering effects of the polders have considerably diminished as the polders have largely silted up. Their effectiveness to cater for the modern freight vessel has long passed from that of the sailing ship or paddle steamer.

The fresh water flow and tidal exit velocities from the River Boyne were further enhanced in the late 1960s by the Boyne Drainage Scheme of the upper reaches between Kells, Trim and Navan.

The river maintains high ebb tide exit velocities during winter fresh flows supplemented with spring tides, however these exit velocities quickly fall off at the river mouth where the river exit flow meets the sea at Mornington.

The high velocities experienced allows the Boyne to carry a very substantial quantity of sediment and fluvial material out to the river mouth providing a natural scour to the estuary. However, while the river through engineering has an increased scour effect this does not eliminate the need for maintenance dredging particularly at the berths, artificial berth pockets, ship turning basins, river bends and locations where river flow ebb/exit velocities drop due to increased channel width.

Maintenance dredging at the berths, ship swing basins, artificial dredged pockets, etc, would be at a higher frequency than the maintenance dredging within the defined navigation channel due in part to the localised effects of ships’ propeller wash and bow thruster wash, where the river silts are agitated and displaced locally within the ship manoeuvring radius. The manoeuvring of ships is a twice daily activity.

The high ebb/exit velocities have little or no effect at the river mouth or port approaches, where the exit stream meets the sea, hence maintenance dredging is required and at a higher frequency than within the main estuary, berth, artificial berth pockets and swing basins. This is primarily due to silt deposition where the exit velocities very quickly fall to zero.

The soft shallow entrance to the Boyne estuary lies roughly midway within the coastal cell between the hard rock outcrops of Clogherhead in the north and Bremore to the south. The coastline characteristic is one of a shallow shoaling sandy horseshoe bay where there is net annual nearshore sediment transport movement of material from south to north.

Since the late 1960’s the Drogheda Port Company and formally the Drogheda Harbour Commissioners have carried out a considerable amount of coastal process and sediment movement analysis, studies and elevations, including the construction of a full physical river entrance simulation model (HR Wallingford 1969) and numerous

modern day mathematical models with the latest modelling software lead by HR Wallingford (UK) Delft Hydraulics (Belgium) and KMM/RPS (Northern Ireland). A deep and detailed understanding of the coastal process and sediment transport regime of the shallow shoaling coastline within the coastal cell from Bremore in the south to Clogherhead in the north has been garnered.

This knowledge and understanding is absolutely essential to maintaining the port entrance safe for navigation from the impact of the (a) flood plain siltation but more importantly (b) the weather impacts and tidal surges.

In 1970 the Drogheda Harbour Commissioner constructed the training walls both north and south at the river mouth. At that time it was forecasted that the reserve capacity of the south training wall to retain sand would have a time frame or life span of circa 30-40 years, before full sediment bypassing would take place across the river entrance.

Zone of Influence

The Zone of Influence (ZoI), or distance over which a likely significant effect may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken have established the habitats and species present within, and in the vicinity of, the proposed dredging and dump at sea sites. The ZoI was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the proposed activity.

Designated Areas for Nature Conservation

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

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

The locations of designated areas for nature conservation in the vicinity of the proposed development are illustrated in Figure 8.5 (SAC and SPA sites) and Figure 8.6 (pNHA and NHA sites), below.

A list of European and nationally designated sites within the ZoI of the proposed activity along with their qualifying interests or reasons for designation, is included in Appendix 8.3.

European sites (SACs and SPAs) are assessed as being of international importance; nationally designated sites (pNHAs and NHAs) are assessed as being of national importance.

European Sites

The maintenance dredging operation site lies within three European sites; the River Boyne and River Blackwater SAC, the Boyne Coast and Estuary SAC, and the Boyne Estuary SPA.

There are two other European sites in the vicinity. The next closest European sites to the operation are the River Boyne and River Blackwater SPA c.3.5km upstream and west of the closest extent of the operation in Drogheda town, and the River Nanny and Estuary SPA c.3.7km south of the breakwaters in the estuary mouth.

Nationally Designated Sites

The maintenance dredging operation site lies within one proposed Natural Heritage Area (pNHA) European sites; the Boyne Coast and Estuary pNHA. Three additional pNHAs are within the vicinity of the dredging operation and include; the Boyne River Islands pNHA c.4.2km upstream, the Dowth Wetland pNHA c.6.1km upstream, and the Laytown Dunes/Nanny Estuary pNHA c.3.7km south of the nearest dredging operation.

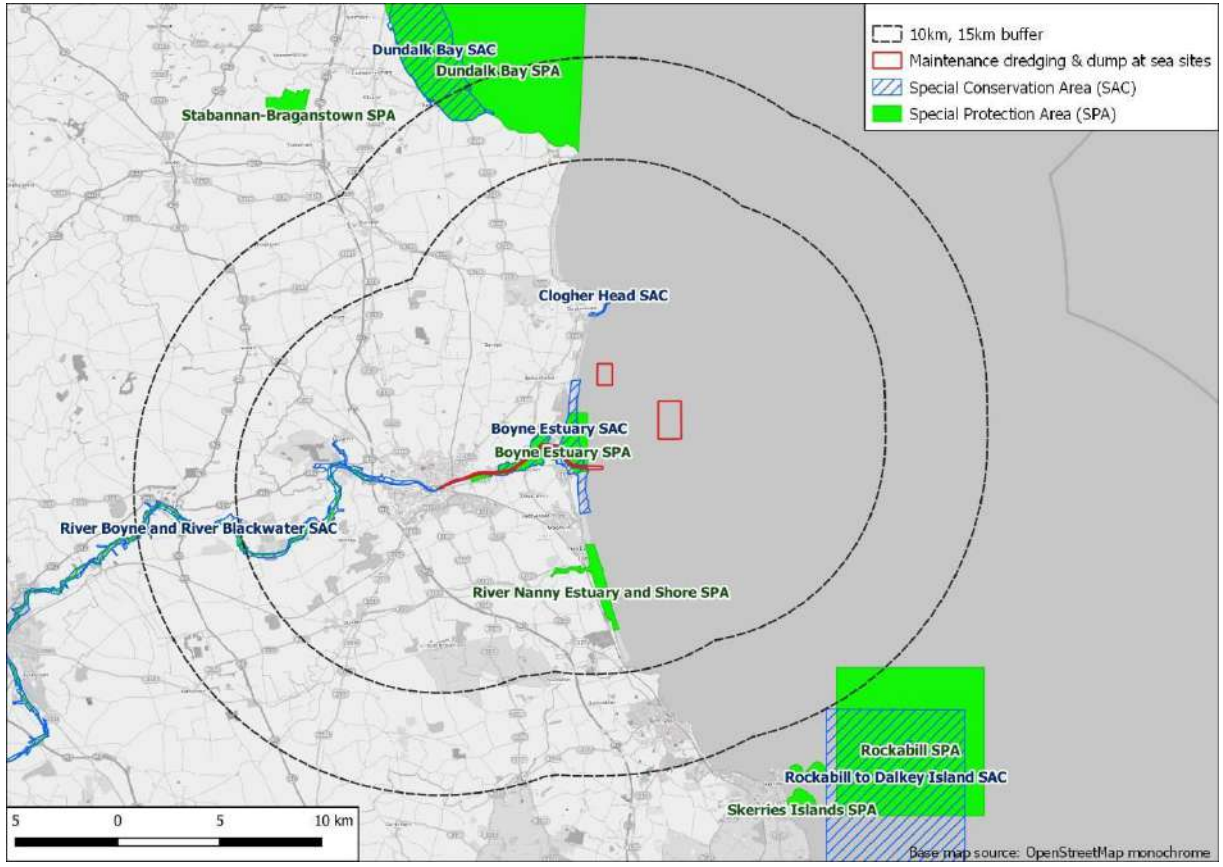

Figure 8.5: *European sites in the vicinity of the proposed activity and in the surrounding region*

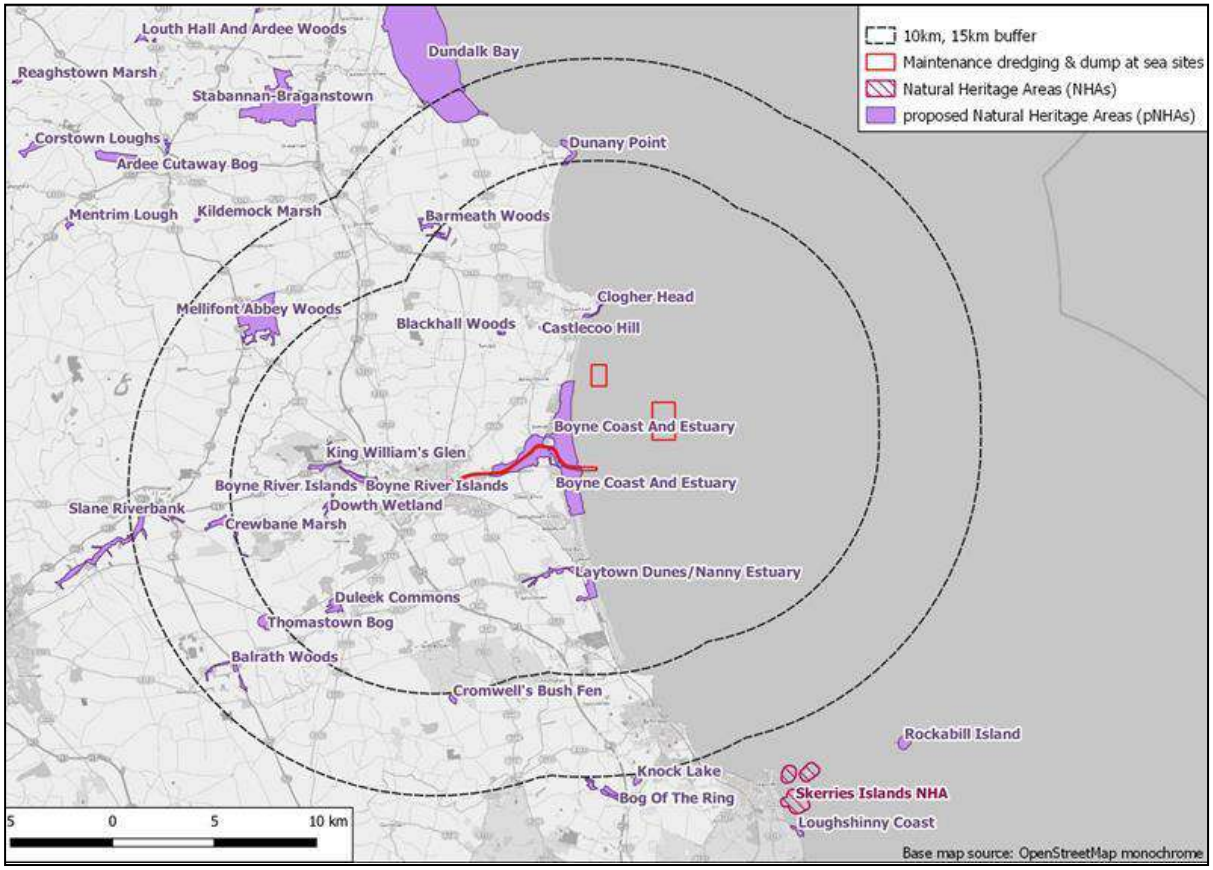

Figure 8.6: *Nationally designated sites in the vicinity of the proposed activity and in the surrounding region*

Habitats

The estuarine habitat of the Boyne Estuary encompasses two Annex I habitats: Estuaries [1130] and Mudflats and sandflats not covered by seawater at low tide [1140]. The site comprises mainly a river channel that supports subtidal habitat. Mudflats and sandflats to the north and south of the river channel within the estuary are outside the dredge site. The dredge site is dominated by sedimentary habitats, with muddier sediment found upstream within the estuary, becoming more sand-dominated close to the river mouth and outside the breakwaters. The ecology of benthic marine habitats is described through a combination of the substratum and the fauna living within or on it. A more detailed description of the biotopes (habitat plus faunal community) is presented in Section 1.3.5.

Fauna

Little Tern and other Terns

Internationally important numbers of breeding Little tern occur at a shingle beach at Baltray. Little tern have bred here since at least 1984. In the intervening years breeding numbers and fledgling success has varied significantly. During the 2018 surveys, a maximum count of 32 Little tern were recorded at the colony, and a total of 7 chicks fledged (Louth Nature Trust, 2018)[11].

Little tern surveys carried out in 2018 focussed on foraging behaviour of birds. Table 8.2 below provides a summary of Little tern activity recorded at each VP location. Little tern were recorded during every visit between 30th May and 9th August 2018. The table also includes observations of other tern species including Roseate tern, Common tern and Sandwich tern recorded during the surveys.

VP	Location and Activity
1	A single Little tern was recorded foraging as far inland as VP1 (*c.* 3km upstream of the estuary mouth) on one occasion in June during a survey at low tide. No further observations of Little tern were recorded at VP1 during surveys. Up to four Sandwich terns (two adults and two juveniles) were recorded in August foraging in the river channel at low tide, the birds were also recorded roosting on navigation walls during this survey.
2	Small numbers of Little terns, one and two birds, were recorded during June and July surveys. Birds were recorded foraging along the river channel edge on the northern shore at low tide, closest to the colony. These birds were also recorded regularly commuting over the dune system to the colony *c.* 200-300m east. A congregation of up to 33 Sandwich terns were recorded in August in the mouth of the estuary and up to 2km upstream, at a rising tide. In addition, 25 Sandwich terns were recorded roosting on the polder wall west of the Fishmeal Jetty on the southern bank of the river channel.
4	This VP was located *c.* 700m north of the colony and recorded foraging Little tern and birds in transit to foraging grounds further north of the VP. Little tern were recorded foraging along the shoreline in shallow waters. A maximum count of 17 Little terns in June, 25 in July and 12 in August were counted during disturbance events in the colony which flushed terns north of the colony during these events. Up to 25 Sandwich tern and five Roseate terns and Common terns were recorded roosting along the shoreline in August. These birds also foraged along the shoreline at VP3, although in deeper waters further out to sea compared to Little terns. It is likely that larger congregations of mixed flocks of terns gathered in this area later in August prior to migration.

[11] Louth Nature Trust (2018) https://www.louthnaturetrust.org/end-of-season-2018/

VP	Location and Activity
3	This VP is closest to the colony, therefore activity captured included terns leaving the colony, foraging and returning back to the colony again. Birds foraged in shores adjacent to the colony and along the northern sea wall. This VP also captured events where the colony was flushed due to disturbance or as a result of social behaviour within the colony. A maximum count of 32 Little Tern were recorded during the June survey. There did not appear to be any variation in activity between high and low tide. Sandwich terns, Roseate terns and Common terns were also recorded during surveys at VP3. Maximum counts of 18 and 30 Sandwich terns were recorded during August surveys in transit or foraging in shallow waters close to the colony. A mixed flock of Common terns and Roseate terns with a maximum count of 66 birds were recorded in June foraging in shallow water close to the colony. In August a mixed flock of 32 Common terns and Roseate terns were recorded foraging to the north of the colony. Twenty-six roosting Sandwich tern and *c.* 120 mixed flock of roosting Roseate and Common tern were recorded along the northern beach shoreline and close to the northern breakwater during August surveys.
5	This VP had views over the estuary mouth towards the Little tern colony. Terns were regularly recorded foraging in the estuary mouth, close to the breakwaters, and the seaward side of the breakwaters. It was noted during surveys that greater numbers of beach users were recorded at VP5 as this area of the beach is readily accessible to the public via Mornington. A maximum number of 34 Little tern were recorded in July from this VP location. A mixed flock of Common terns (254), Roseate terns (127), and Sandwich terns (13) totalling 381 birds were recorded roosting on the northern sea wall in August.
6	This VP location faced seaward and was located *c.* 850m from the southern breakwater. Little tern foraging activity was lower at this location, with a maximum count of six Little tern recorded during any one survey. Like along the northern beach shoreline at Baltray, Little tern foraged in shallow waters within the VP6 viewshed. Common terns, Roseate terns and Sandwich terns were also recorded at this location, however similarly numbers appeared to be lower than in other parts of the survey area *e.g*. 1-5 birds during any one survey.

Table 8.1: *Summary of Little tern, Common tern, Roseate tern and Sandwich activity within the survey area recorded at each VP location*

Figure 8.7, below, summarises the areas of high Little tern activity as described in Table 8.2. The blue shaded area was created by overlaying Little tern foraging activity recorded during each survey, to show the area of highest use by foraging birds. The yellow shaded area shows the extent of all Little tern activity recorded within the survey area, this includes foraging birds, disturbance events close to the colony, and/or commuting birds moving between foraging grounds and the nesting area.

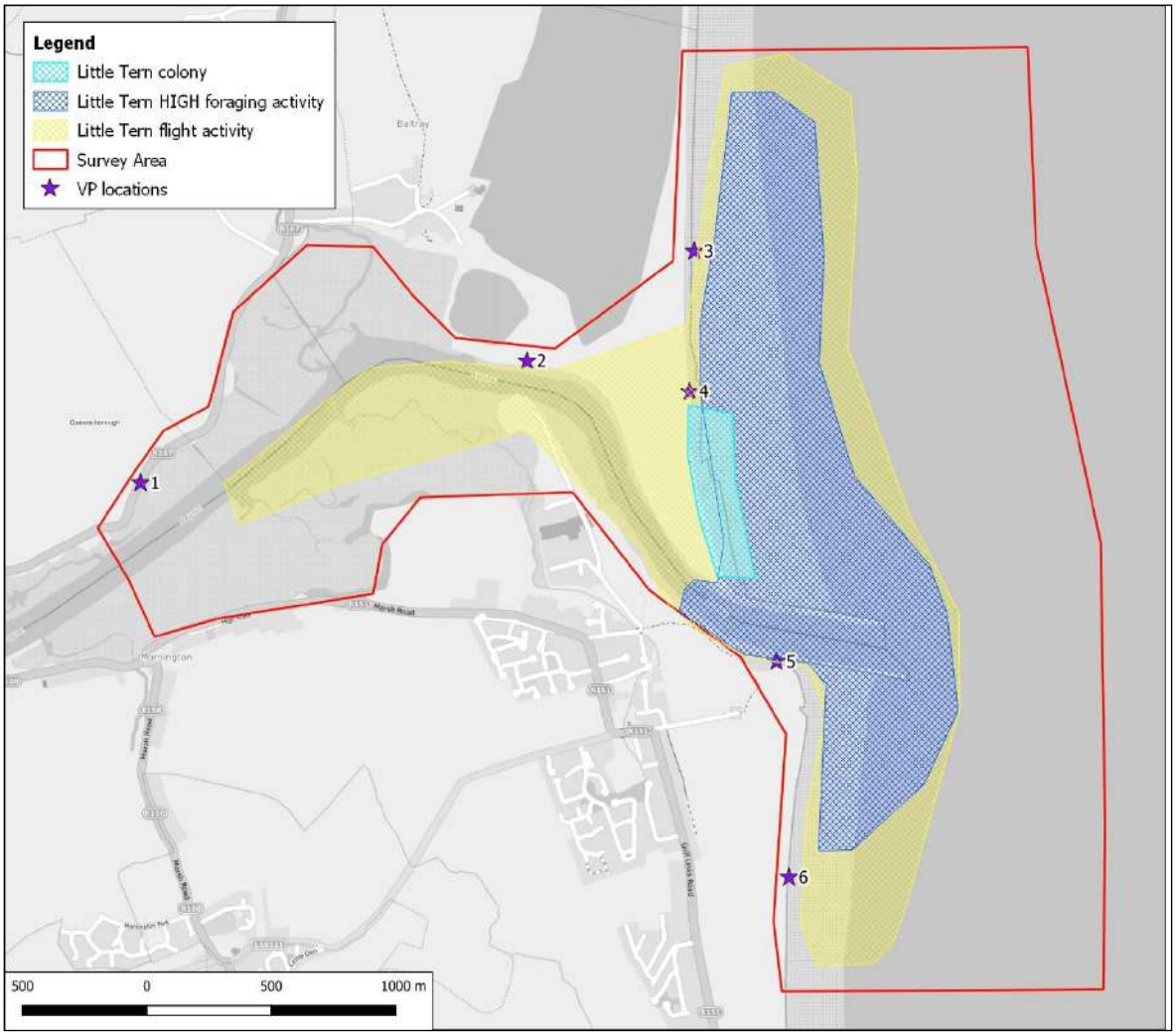

Figure 8.7: *Areas of high Little Tern activity and VP locations*

Disturbance was recorded during surveys to ascertain current levels within the survey area. It is important to note that disturbance is difficult to detect in some cases where the birds reaction is a subtle change in behaviour or flightpath which may go unnoticed.

Disturbance was lowest at VP1 with only two disturbance events noted across 10 surveys, both of which resulted from a single fisherman walking on navigation walls. Disturbance at VP2 largely related to dogs off the lead either in the river or along the shoreline, and to a hunting Kestrel. Disturbance at VP3 related entirely to dog walkers. VP4 disturbance was associated with dog walkers, people on the breakwaters, a hunting Kestrel, warden within the colony, and horse riders at the breakwaters. Disturbance at VP5 included recreational walkers, dog walkers, sun bathers, and general beach users. Disturbance at VP6 largely resulted from horse riders on the beach, recreational walkers and dog walkers. It was evident that numbers of people using the beach was greater south of the breakwaters at Mornington. Across the survey area walkers and dogs caused the majority of disturbance events.

Commercial vessels entering the river channel at the breakwaters, Drogheda Port pilot craft and fishing vessels off the coastline were not noted to cause detectable disturbance to birds, however it may be the case that disturbance to such craft and vessels is subtle and may have gone unnoticed.

A dredger was present during seven of the 10 visits carried out between 30th May and 9th August 2018 and operating in the navigation channel and east of VP5. The dredger

did not appear to cause disturbance to foraging birds, however again disturbance may be subtle, and during the survey on 30th May, Little terns were observed diving for prey items in the wake of the dredger.

Wintering Waterbirds

The wintering bird populations that occur within the Boyne Estuary use mudflats in the polders which are contained behind navigation walls that define the river channel. These polders become exposed at low tide and are used for feeding and roosting by wintering bird species.

Wintering bird surveys carried out between September 2018 and April 2019 recorded a total of 34 wintering waterbird species across 13 count areas. 20 of these are SCI species associated with the Boyne Estuary SPA, Nanny River and Estuary SPA and Dundalk Bay SPA, see table below. Peak counts of the 14 non-SCI wintering bird species are shown in Table 8.3.

Species	Date	Tide	Count Area	Peak count 2018-19	1% National[12]	1% International[13]
Light-bellied Brent Goose (*Branta bernicla hrota*)	25/01/2019	High	3	220	360	400
Shelduck (*Tadorna tadorna*)	25/01/2019	High	2	78	120	3000
Teal (*Anas crecca*)	25/01/2019	High	5	159	340	5000
Mallard (*Anas platyrhynchos*)	20/11/2018	Low	7	76	290	45000
Red-breasted Merganser (*Mergus serrator*)	20/12/2019	Low	11	4	20	1700
Oystercatcher (*Haematopus ostralegus*)	15/10/2018	High	10	950	690	8200
Ringed Plover (*Charadrius hiaticula*)	15/10/2018	High	13	34	100	730
Golden Plover (*Pluvialis apricaria*)	12/02/2019	Low	2	1200	1200	1700
Grey Plover (*Pluvialis squatarola*)	25/01/2019	Low	13	35	30	2500
Lapwing (*Vanellus vanellus*)	25/01/2019	Low	6	1260	1100	72300
Knot (*Calidris canutus*)	25/01/2019	Low	13	1600	280	4500
Sanderling (*Calidris alba*)	15/10/2018	High	13	165	60	1200
Black-tailed godwit (*Limosa limosa*)	20/09/2018	High	8	524	190	610
Bar-tailed Godwit (*Limosa lapponica*)	20/09/2018	Low	6	93	150	1200
Curlew (*Numenius arquata*)	25/01/2019	Low	6	83	350	8400
Redshank (*Tringa tetanus*)	25/01/2019	High	7	715	300	3900
Turnstone (*Arenaria interpres*)	20/09/2018	Low	13	1	95	1400
Black-headed Gull (*Chroicocephalus ridibundus*)	16/04/2019	High	6	300	-	20000
Common Gull (*Larus canus*)	20/11/2018	Low	13	60	-	16400
Herring gull (*Larus argentatus*)	20/11/2018	Low	13	220	-	10200

Table 8.3: *Peak counts of wintering SCI bird species recorded during 2018-19 winter bird surveys*

[12] Crowe, O., & Holt, C. 2013. Estimates of waterbird numbers wintering in Ireland, 2006/07 – 2010/11. Irish Birds 9, 545-552.
[13] Wetlands International (2019). *"Waterbird Population Estimates"* . Estimates available at http://wpe.wetlands.org/ [last accessed 19/08/2018]

Species	Date	Tide	Count Area	Peak count 2018-19	1% National [14]	1% International [15]
Black guillemot (*Cepphus grille*)	20/09/2018	High	12	11	-	-
Whimbrel (*Numenius phaeopus*)	20/09/2018; 16/04/2019	Low	13	2	-	2500
Pochard (*Aythya farina*)	15/10/2018	High	10	42	160	3000
Sandwich tern (*Sterna sandvicensis*)	16/04/2019	Low	13	8	-	-
Great black-backed gull (*Larus marinus*)	20/11/2018	Low	13	37	-	4200
Lesser black-backed gull (*Larus fuscus*)	20/11/2018	Low	4	16	-	5500
Greenshank (*Tringa nebularia*)	25/01/2019	High	11	15	20	2300
Dunlin (*Calidris alpina*)	12/02/2019	Low	2	140	570	13300
Snipe (*Gallinago gallinago*)	12/02/2019	High	13	21	-	5700
Little egret (*Egretta garzetta*)	16/04/2019	High	2	5	20	1300
Wigeon (*Anas Penelope*)	12/02/2019	High	1	175	630	15000
Mute swan (*Cygnus olor*)	20/09/2018	Low	7	10	90	2500
Grey heron (*Ardea cinerea*)	15/10/2018	Low	11	10	25	2700
Cormorant (*Phalacrocorax carbo*)	27/03/2019	Low	12	37	120	1200

Table 8.2: *Peak counts of wintering birds, non-SCI species, recorded during 2018-19 winter bird surveys*

Eight SCI species were recorded in numbers at or above 1% of the national population and included Oystercather, Golden plover, Grey plover, Lapwing, Knot, Sanderling, Black-tailed godwit and Redshank. None of the non-SCI species occurred in numbers at or above 1% of the national population. Black guillemot and Sandwich tern shown in Table 8.3 are not considered to be wintering bird species but are passage or post/pre-breeding birds and were both recorded at the fringes of the winter season, in September and April respectively.

Figures 8.8 and 8.9 below show the usage of wintering birds across the count areas at high and low tides. Count areas closer to the estuary mouth and the larger polders appear to hold greater numbers of birds which is not surprising. Over both tide cycles count areas 4, 5 and 7 held the least numbers of birds which also correspond to, not all but, some of the smaller polder and count areas.

[14] Crowe, O., & Holt, C. 2013. Estimates of waterbird numbers wintering in Ireland, 2006/07 – 2010/11. Irish Birds 9, 545-552.
[15] Wetlands International (2019). *"Waterbird Population Estimates"* . Estimates available at http://wpe.wetlands.org/ [last accessed 19/08/2018]

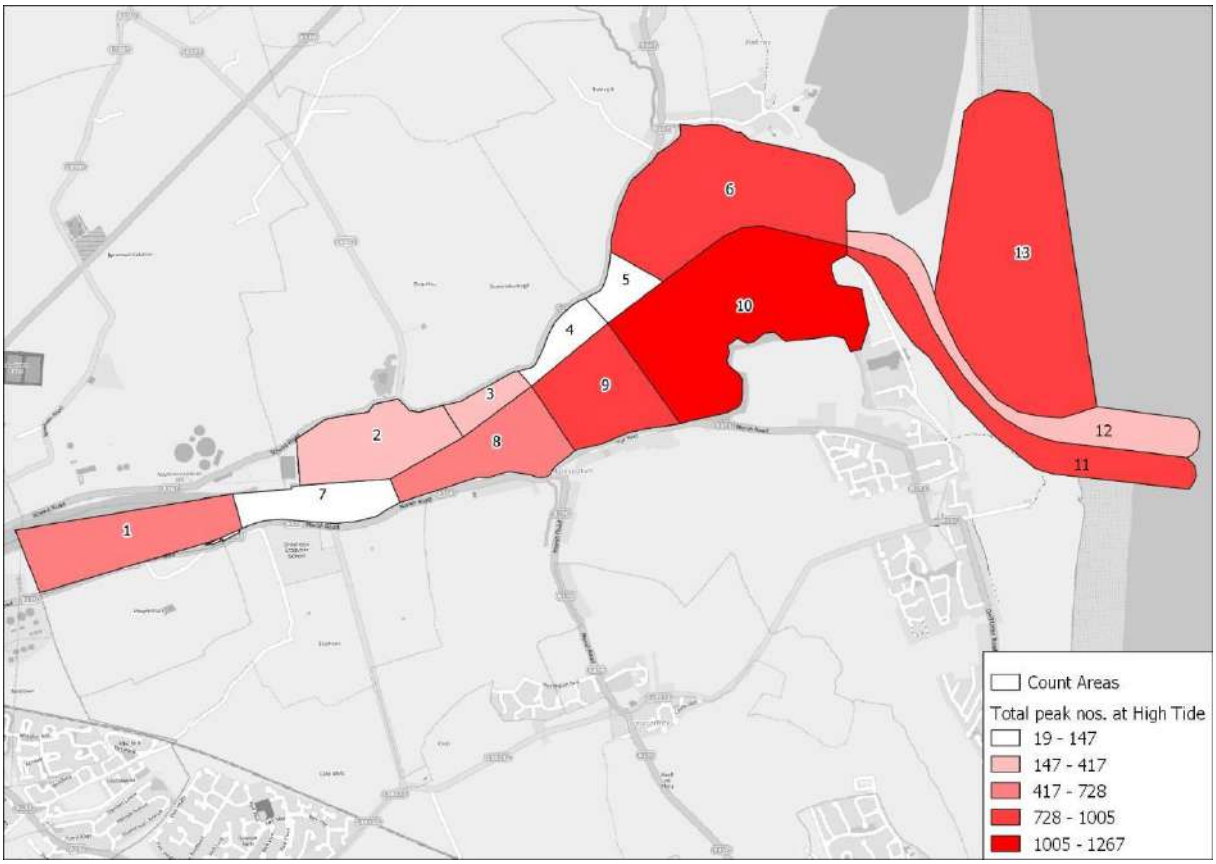

Figure 8.8: *Total wintering bird peak count numbers at low tide across count areas within the Boyne Estuary*

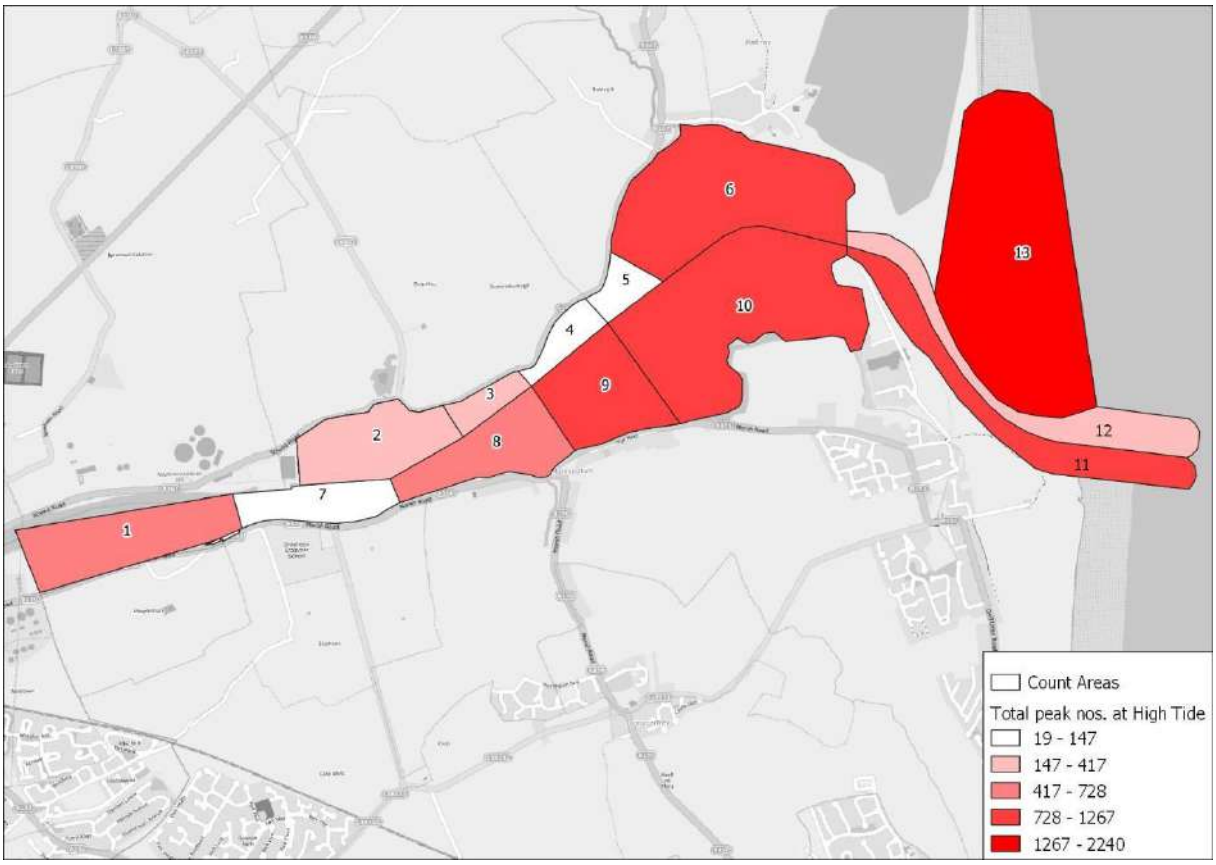

Figure 8.9: *Total wintering bird peak count numbers at high tide across count areas within the Boyne Estuary*

Intertidal Benthic Fauna

The intertidal zone comprises the sea shore between the highest and lowest astronomical tides. It is a variable habitat, depending on factors such as substratum type, salinity and exposure. In low energy areas, the intertidal zone tends to consist of mud, while in high energy zones the substratum is one of bedrock and boulders.

The intertidal zone of the Boyne Estuary and adjacent waters were surveyed by ASU (2011). The data collected were used to develop the Conservation Objectives for the Boyne Coast and Estuary SAC (NPWS, 2012a; 2012b). Following the classification of Connor *et al.* (2004), six biotopes were recorded across the mudflats and sandflats of the study area, with Stagrennan Polder classified only to Level 4 as Polychaete/bivalve dominated mid-estuarine mud shores (LS.LMu.MEst), and progressing downstream to *Hediste diversicolor*, *Macoma balthica* and *Scrobicularia plana* in littoral sandy mud (LS.LMu.MEst.HedMacScr), *Hediste diversicolor* and *Corophium volutator* in littoral gravelly sandy mud (LS.LMx.GvMu.HedMX.Cvol), Polychaete/bivalve dominated muddy sand shores (LS.LSa.MuSa) and *Hediste diversicolor*, *Macoma balthica* and *Eteone longa* in littoral muddy sand (LS.LSa.MuSa.HedMacEte) within the estuary, while the beaches to the north and south were classified as Polychaetes and *Angulus tenuis* in littoral fine sand (LS.LSa.FiSa.Po.Aten). The intertidal core survey recorded a total of 42 species or higher taxa from the phyla Annelida (19), Crustacea (13), Mollusca (9), and Nemertea (1). Polychaete worms were the most species-rich group with 16 species recorded.

The benthic survey carried out as part of the current study recorded a total of 532 individuals represented by 21 species or higher taxa (Table 8.5). Macroinvertebrate groups recorded were Annelida (9 taxa), Mollusca (6 taxa) and Crustacea (6 taxa). The ragworm (*Nereis diversicolor*) was the most frequently occurring species, being present at eight sample locations within the estuary and absent from those taken

outside. The peppery furrow shell (*Scrobicularia plana*) was the next most frequently occurring species, with a very similar distribution to that of the ragworm; however, it was not recorded at sample station IT02. The oligochaete worm *Tubificoides benedii* was the most common species, with 139 individuals recorded; however 134 of these were recorded at one site (IT08). Sample station IT10 was the most species-rich of the stations sampled with eight species, while IT02 and IT03 were the least species-rich with two species (Table 8.5). IT02 scored highest for evenness, but this was due to the very low number of species present. Higher species diversity was recorded outside the estuary on the sandy beaches (IT09-IT12).

Site	IT01	IT02	IT03	IT04	IT05	IT06	IT07	IT08	IT09	IT10	IT11	IT12	Total
ANNELIDA													
Polychaeta													
Owenia fusiformis	-	-	-	-	-	-	-	-	-	1	-	-	1
Hediste diversicolor	71	20	8	2	2	9	2	13	-	-	-	-	127
Nephtys cirrosa	-	-	-	-	-	-	-	-	-	3	2	3	8
Pygospio elegans	-	-	-	-	-	-	-	1	-	-	-	-	1
Scolelepis foliosa	-	-	-	-	-	-	-	-	2	-	-	-	2
Scolelepis squamata	-	-	-	-	-	-	-	-	5	-	-	-	5
Oligochaeta													
Tubificoides benedii	-	-	-	-	-	-	-	134	3	1	1	-	139
Tubifex tubifex	1	-	-	-	-	-	-	-	-	-	-	-	1
Tubificidae indet.	2	-	-	-	-	-	-	-	-	-	-	-	2
CRUSTACEA													
Crangon crangon	-	-	-	-	-	-	1	-	-	1	-	-	2
Bathyporeia elegans	-	-	-	-	-	-	-	-	-	-	-	1	1
Bathyporeia pilosa	-	-	-	-	-	-	-	-	36	1	-	-	37
Corophium volutator	19	19	-	-	-	-	-	-	-	-	-	-	38
Eurydice pulchra	-	-	-	-	-	-	-	-	56	-	1	-	57
Haustorius arenarius	-	-	-	-	-	-	-	-	-	1	-	-	1
MOLLUSCA													
Macoma balthica	-	-	-	2	10	7	3	8	-	-	-	-	30
Cerastoderma edule	-	-	-	-	-	-	-	1	-	-	-	-	1
Donax vittatus	-	-	-	-	-	-	-	-	-	2	-	4	6
Mya arenaria	1	-	-	-	-	-	-	-	-	-	-	-	1
Scrobicularia plana	16	-	6	6	3	7	9	11	-	-	-	-	58
Tellina tenuis	-	-	-	-	-	-	-	-	-	2	2	10	14
Total individuals	**110**	**39**	**14**	**10**	**15**	**23**	**15**	**168**	**102**	**12**	**6**	**18**	**532**
Total species	**6**	**2**	**2**	**3**	**3**	**3**	**4**	**6**	**5**	**8**	**4**	**4**	**21**

Table 8.3: *Macroinvertebrate species results from intertidal survey within the Boyne Estuary and surrounds on 8-9th April 2019*

Station	Number of species	Abundance (per 0.03m^2)	Pielou's evenness	Shannon-Wiener diversity (natural logarithm base)
IT01	6	110	0.57	1.03
IT02	2	39	1.00	0.69
IT03	2	14	0.98	0.68
IT04	3	10	0.86	0.95
IT05	3	15	0.78	0.86
IT06	3	23	0.99	1.09
IT07	4	15	0.78	1.08
IT08	6	168	0.42	0.76
IT09	5	102	0.77	1.24
IT10	8	12	0.95	1.98
IT11	4	6	0.96	1.33
IT12	4	18	0.81	1.12

Table 8.4: *Univariate ecological indices calculated from the intertidal macroinvertebrate community*

The univariate statistics scores are represented graphically in Figure 8.10.

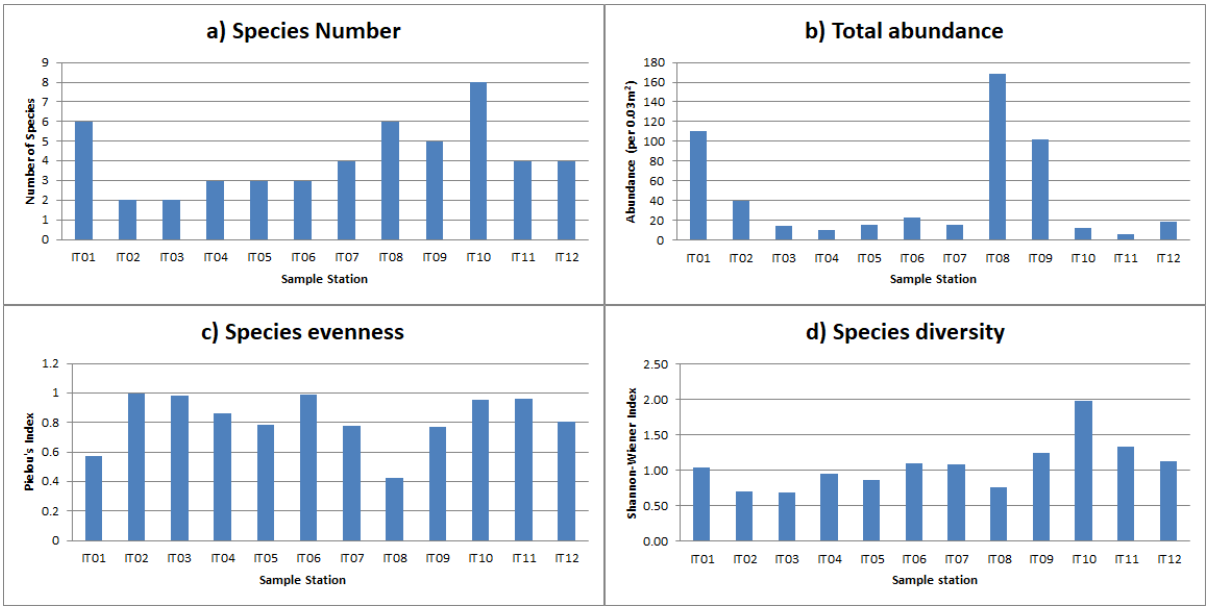

Figure 8.2: *Univariate ecological indices calculated from the intertidal macroinvertebrate community. a) Number of Species b) Total abundance (per 0.0.03m2) c) Species evenness (Pielou's index) d) Species diversity (Shannon-Wiener Index)*

The three groups of sample stations, based on the statistical analysis of the macroinvertebrate species present, were stations IT01 & IT02, stations IT03 – IT08 and stations IT09 – IT12 (Figure 8.11). Stations IT01 and IT02 were within Stragrennan Polder and so are likely to be still recovering from the effects of historical spoil dumping, which has since been reversed. IT03 – IT08 were all within the mudflats of the Boyne Estuary, while IT09 – IT12 were located on the sandy beaches outside the estuary.

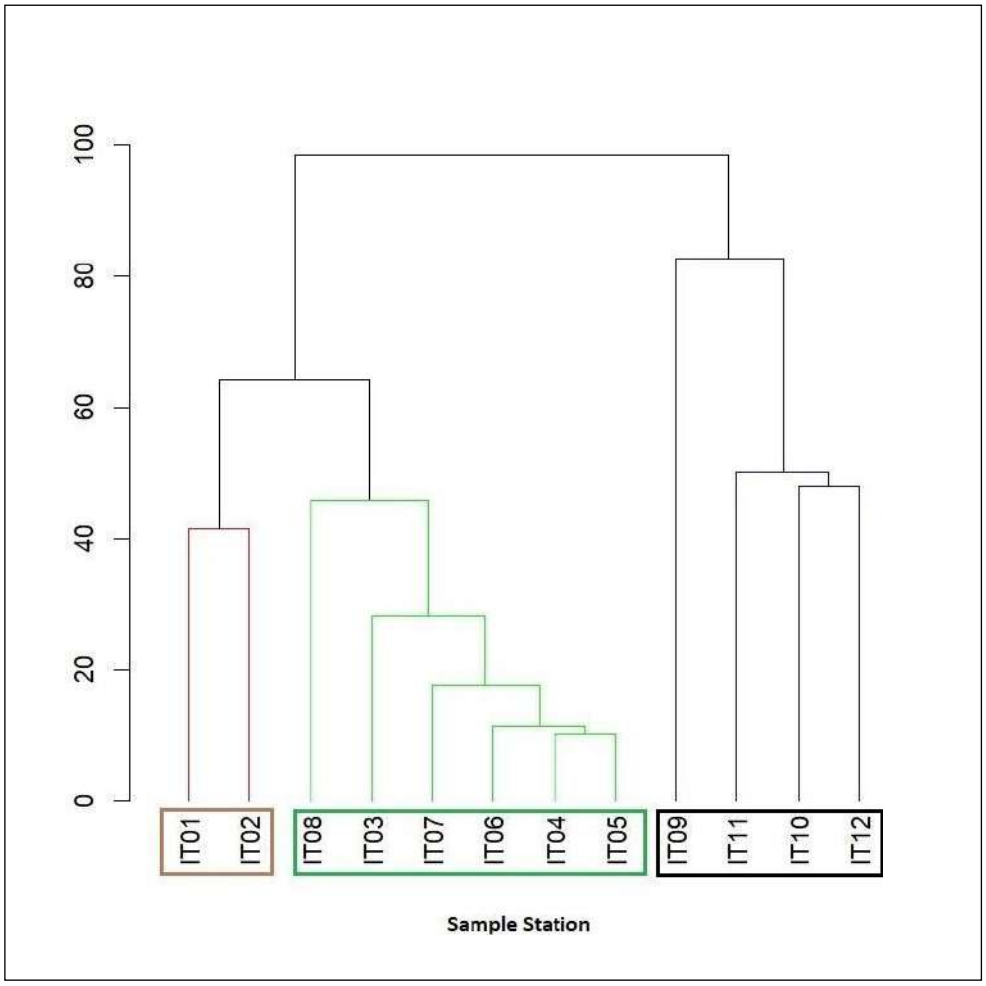

Figure 8.11: *Cluster analysis showing significant (SIMPROF, P<0.05) macroinvertebrate community structure groupings among sampling stations (indicated by coloured boxes) based on Bray-Curtis similarities*

The intertidal benthic macroinvertebrate community of the Boyne Estuary and the surrounding waters is largely dependent on the salinity, sediment type and height on the shore. Within the upper estuary (IT01 & IT02), where the salinity would be lowest and where the sediment was classed as muddy sand, the community was quite different from the remaining stations within the estuary (IT03-IT08), where the salinity would gradually increase and the sediment was mostly sandy mud. Those sites outside the estuary (IT09-IT12) where sandy sediment was recorded and salinity would be closer to fully marine were different again. The sediment analysis revealed a pattern broadly similar to the macroinvertebrates, as would be expected, with three grouping: stations IT09-IT10 & IT12, stations IT01-IT02, IT04, IT06 & IT08, stations IT03, IT05 & IT07, with Station IT11 separated out by itself (Figure 8.12). The first group is predominantly sand, the second predominantly sandy mud and the third mainly muddy sand. The changes to the grouping as compared to the macroinvertebrates relates to height on the shore, which is enough to change the sediment profile, but not to change the macroinvertebrates community.

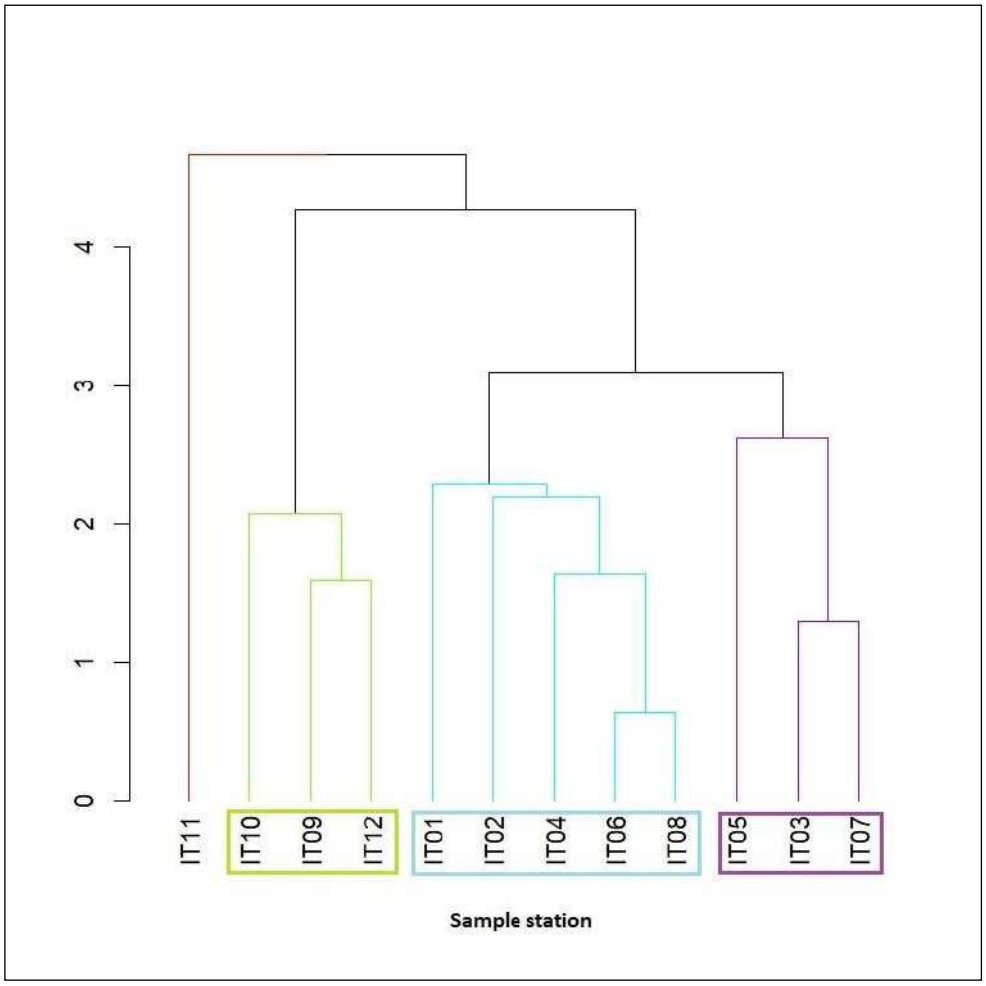

Figure 8.12: *Cluster analysis showing significant (SIMPROF, P<0.05) sediment characteristics groupings among sampling stations (indicated by coloured boxes) based on Euclidean distances*

The *Hediste diversicolor* and *Corophium volutator*-dominated community present at the most upstream sample sites IT01 and IT02 within Stagrennan Polder were classified as *Hediste diversicolor* and *Corophium volutator* in littoral mud (LS.LMu.UEst.Hed.CVol) (Connor *et al*., 2004). Sample sites IT03-IT08, all within the Boyne Estuary, which were dominated by *Hediste diversicolor* and *Scrobicularia plana*, were classified as *Hediste diversicolor*, *Macoma balthica* and *Scrobicularia plana* in littoral sandy mud (LS.LMu.MEst.HedMacScr). Of the remaining four intertidal sites, located outside the estuary on the sandy beaches, IT09 was classified as *Eurydice pulchra* in littoral mobile sand (LS.LSa.MoSa.AmSco.Eur), while IT10-IT12 were classified as Polychaetes and *Angulus tenuis* in littoral fine sand (LS.LSa.FiSa.Po.Aten). In this instance, the macroinvertebrate cluster analysis coincided very closely with the pattern of assigned biotopes.

Subtidal Benthic Fauna

The subtidal zone is the area of the seabed below the lowest astronomical tide and so is permanently covered in water. The habitats and species (biotopes) present depend on a range of biotic and abiotic factors, including current speeds, sediment type, freshwater inputs and occurrence of species. In an estuary, the interaction between the river and the sea creates a gradient of subtidal biotopes, with varying communities and sediment types.

The subtidal zone of the Boyne Estuary and adjacent waters were previously surveyed by EcoServe (2011), by means of a 0.1 m^2 Day grab and a Rallier-du-Baty dredge.

The data collected were used to develop the Conservation Objectives for the Boyne Coast and Estuary SAC (NPWS, 2012a; 2012b). Following the classification of Connor *et al.* (2004), EcoServe (2011) recorded four biotopes within the study area, ranging from low energy, variable salinity mud at the most upstream site (SS.SMu.SMuVS), through moderate energy, variable salinity sand (SS.SSa.SSaVS.NcirMac) to high energy mixed sediment (SS.SCS.ICS.Slan) in the lower estuary and moderate energy slightly gravelly sand (SS.SSa.IMuSa.FfabMag) found at the estuary mouth and beyond. The survey recorded a total of 45 species of macroinvertebrate from the phyla Annelida, Mollusca, Crustacea and Echinodermata. Polychaete worms were the most species-rich group with 23 species recorded. The grab samples contained 31 species, while the dredge samples had 26 species.

ASU (2006) presents the results of a subtidal grab survey undertaken as part of a capital dredging application in the upper part of the Boyne Estuary. This survey did not identify the biotopes present, but the most common species recorded were *Nereis diversicolor*, *Nephtys hombergii*, *Streblospio benedicti* and Oligochaeta.

The subtidal survey carried out as part of the current study recorded a total of 1201 individuals represented by 65 species or higher taxa (Table 8.7). Major invertebrate groups present included Annelida (22 taxa), Mollusca (20 taxa), Crustacea (18 taxa) and Echinodermata (3 taxa), with Nemertea, also present. The brittlestar *Ophiura ophiura* was the most frequently occurring species, being present at 10 of the 12 sample locations outside the estuary and absent from those taken within the estuary. The bivalve *Nucula nitidosa* was the next most frequently occurring specie and was present at 8 of the 12 sample stations outside the estuary, while being absent from within. The banded wedge shell (*Donax vittatus*) was the most common species, with 465 individuals recorded; however the majority of these (456) of these were recorded at just three sites (S05-S07). Sample station S10 was the most species-rich of the stations sampled with 20 species, while S02 was the least species-rich with two species (Table 8.8). S02 scored highest for evenness, but this was due to the very low number of species present. Higher species diversity was recorded outside the estuary, including within the spoil dump sites (S08-S16).

Species	Abundance (individuals per sample)																Total
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	
ANNELIDA																	
Polychaeta																	
Chaetozone gibber	-	-	-	-	-	-	-	-	3	1	1	-	1	1	-	-	**7**
Eumida sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	**2**
Glycera alba	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	**3**
Glycera rouxi	-	-	-	-	-	1	2	2	2	2	1	-	1	-	-	4	**15**
Kefersteinia cirrata	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Lanice conchilega	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Lumbrineris tetraura	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	**2**
Magelona mirabilis	-	-	-	-	-	-	-	4	2	2	1	1	-	2	-	3	**15**
Malmgrenia arenicolae	-	-	2	-	-	-	-	2	-	-	-	-	-	-	-	-	**4**
Melinna palmata	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	**2**
Nephtys hombergii	1	5	-	-	-	1	-	-	-	-	1	3	2	1	-	-	**14**
Owenia fusiformis	-	-	-	-	1	8	1	5	-	2	12	-	-	1	2	-	**32**
Phyllodoce groenlandica	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	**2**
Phyllodoce sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	**3**
Scoloplos armiger	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	**1**
Sigalion mathildae	-	-	-	-	1	-	-	-	-	1	-	-	1	-	1	-	**4**
Spiophanes bombyx	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	1	**3**
Sthenelais limicola	-	-	-	-	-	-	-	-	-	3	-	-	2	-	-	-	**5**
Terebellides stroemi	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	**1**
Maldanidae indet	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	**11**
Oligochaeta																	
Tubificoides benedii	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8**
Tubificidae indet.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2**
CRUSTACEA																	
Ampelisca brevicornis	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	1	**3**
Ampelisca sp. (male)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	**1**
Anomalocera patersoni	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	**1**
Atylus guttatus	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	**1**
Bathyporeia elegans	-	-	-	-	-	-	21	2	-	-	-	-	-	-	-	-	**23**
Bathyporeia tenuipes	-	-	-	-	-	-	-	-	1	3	2	-	1	3	1	-	**11**
Carcinus maenas	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	**3**
Corophium volutator	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Crangon crangon	1	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	**3**
Elminius modestus	-	-	-	56	-	-	-	-	-	-	-	-	-	-	-	-	**56**
Gammarus salinus	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	**3**
Iphinoe trispinosa	-	-	-	-	-	-	2	16	3	4	1	-	-	2	-	-	**28**
Melita palmata	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	**30**
Orchomene nana	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	**2**
Perioculodes longimanus	-	-	-	-	-	-	1	-	1	2	-	-	-	-	-	-	**4**
Pontocrates arenarius	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	**1**
Siphonoecetes kroyeranus	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	**1**
Decapoda megalopa indet.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	**1**
ECHINODERMATA																	
Amphiura chiajei	-	-	-	-	-	-	-	-	-	-	-	25	5	-	-	-	**30**
Echinocardium cordatum	-	-	-	-	-	-	-	1	-	1	-	8	1	3	2	-	**16**
Ophiura ophiura	-	-	-	-	4	1	11	5	10	6	12	-	-	10	15	11	**85**
MOLLUSCA																	
Abra prismatica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	**1**
Chamelea striatula	-	-	-	-	-	-	-	-	-	5	15	2	1	9	10	-	**42**
Corbula gibba	-	-	-	-	-	-	-	-	-	1	-	1	-	2	-	1	**5**
Donax vittatus	-	-	1	-	238	36	182	-	3	2	2	-	-	1	-	-	**465**
Dosinia lupinus	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	**2**
Ensis ensis	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	4	**9**
Euspira catena	-	-	-	-	-	-	-	3	1	1	1	-	-	-	3	-	**9**
Macoma balthica	-	-	2	-	1	2	-	-	-	-	-	-	-	-	-	-	**5**
Mysia undata	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	-	**3**
Mytilus edulis	-	-	-	2	1	1	-	-	-	-	-	-	-	-	-	-	**4**
Nucula hanleyi	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	2	**4**
Nucula nitidosa	-	-	-	-	-	-	-	10	1	20	34	3	10	21	10	26	**135**
Scrobicularia plana	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3**
Tellimya ferruginosa	-	-	-	-	-	-	-	7	-	1	1	-	-	1	-	-	**10**
Tellina fabula	-	-	-	-	-	-	3	3	-	2	2	-	2	8	3	4	**27**
Tellina tenuis	-	-	-	-	-	1	-	2	1	-	1	-	1	3	1	1	**11**
Thracia phaseolina	-	-	-	-	-	-	-	-	-	-	1	-	2	8	3	2	**16**
Thyasira flexuosa	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	**1**
Turritella communis	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	**3**
Venus casina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	**1**
NEMERTEA																	
Tubulanus nothus	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	**1**
Nemertea indet.	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	**2**
Total individuals	**7**	**13**	**7**	**96**	**247**	**52**	**225**	**65**	**33**	**61**	**90**	**66**	**34**	**82**	**57**	**66**	**1201**
Total species	4	2	5	7	7	9	10	16	14	20	18	17	17	21	15	18	**65**

Table 8.5: *Macroinvertebrate species results from subtidal survey within the Boyne Estuary and surrounds on 25-26th April 2019*

Station	Number of species	Abundance (per 0.1m^2)	Pielou's evenness	Shannon-Wiener diversity (natural logarithm base)
S01	4	7	0.92	1.28
S02	2	13	0.97	0.67
S03	4	6	0.96	1.33
S04	7	96	0.55	1.07
S05	7	247	0.11	0.21
S06	9	52	0.51	1.12
S07	10	225	0.34	0.78
S08	15	65	0.87	2.36
S09	14	33	0.88	2.33
S10	20	61	0.83	2.49
S11	17	90	0.70	1.99
S12	17	66	0.75	2.13
S13	15	31	0.85	2.30
S14	20	82	0.81	2.43
S15	14	57	0.83	2.20
S16	17	66	0.74	2.11

Table 8.6: *Univariate ecological indices based on macroinvertebrate community*

The univariate statistics scores are represented graphically in Figure 8.13.

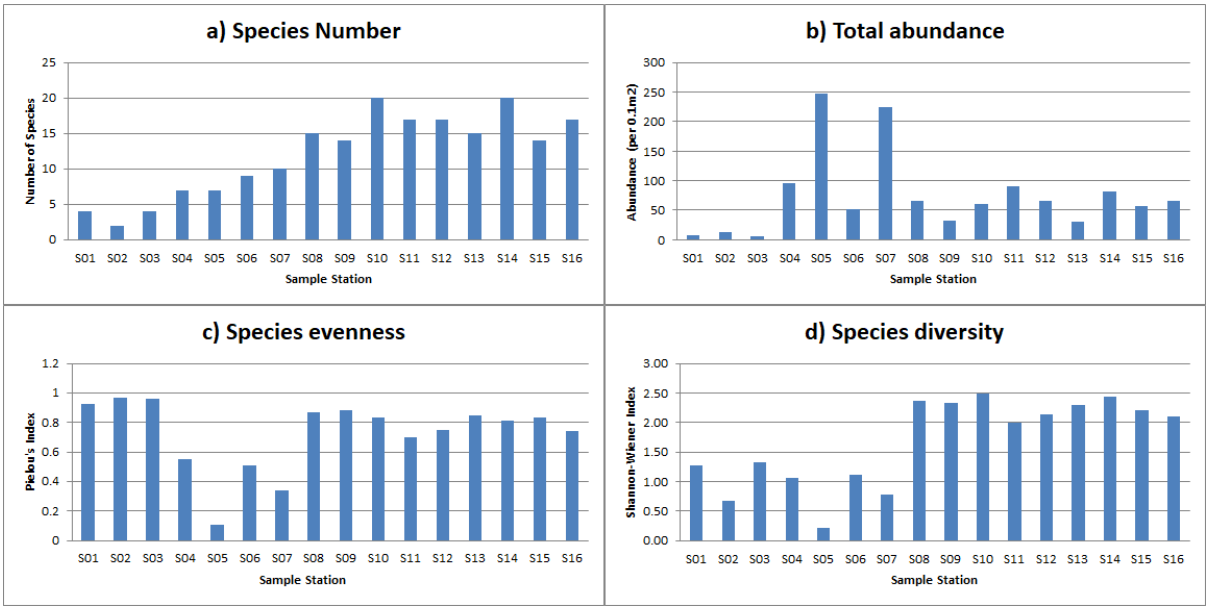

Figure 8.13: *Univariate ecological indices based on macroinvertebrate community. a) Number of Species b) Total abundance (per 0.1m2) c) Species evenness (Pielou's index) d) Species diversity (Shannon-Wiener Index)*

Thirteen of the sample stations were split into four groups based on the statistical analysis of the macroinvertebrate communities present (Figure 8.14). These groups comprised stations S01-S02, stations S03 & S05-S07, stations S08-S11 & S14-S15, and stations S12-S13. The remaining two stations were separated out individually. Stations S01 & S02 represent the mid-upper estuarine communities, with its variable salinity and muddy substratum. Stations S03 & S05-S07 represent conditions closer to the river mouth, with a sandier substratum and stronger currents. Stations S08-S11 & S14-15 were sandy, open-coast sites, while S12-S13 were located within the in-use spoil dumpsite and likely affected by the spoil dumping operations on-going at the time of survey. S04 is an outlier from the rest of the sites owing to the stony substratum,

with a related epifauna. The separation of S16 appears to be due to a reduced diversity of crustacean species compared to the other sandy sites.

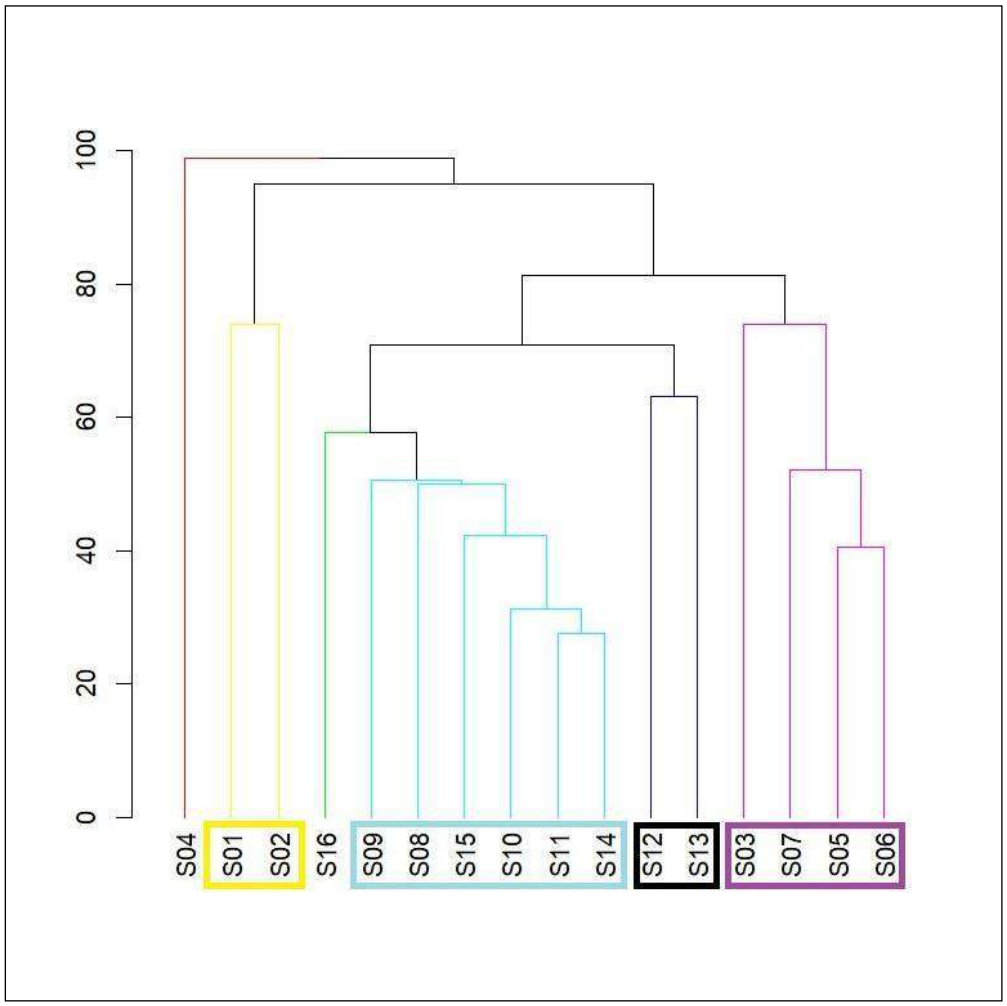

Figure 8.14: *Cluster analysis showing significant (SIMPROF, P <0.05) macroinvertebrate community structure groupings among sampling sites (indicated with broken lines) based on Bray-Curtis similarities*

The subtidal macroinvertebrate community of the Boyne Estuary and the surrounding waters is largely dependent on the salinity, sediment type, current and exposure. Within the upper estuary (S01 & S02), where the salinity was lowest and where the sediment was classed as muddy sand, the community was quite different from the remaining stations within the estuary (S03 & S04), where the salinity would gradually increase, and the conditions were affected by stronger tidal currents. Those sites outside the estuary (S05-S16) where sandy sediment was recorded and salinity would be closer to fully marine were different again. The sediment analysis revealed a pattern broadly similar to the macroinvertebrates, as would be expected, but with some further differentiation. There were three grouping: stations S01-S03 & S12-S13, stations S08, S11, S14-S16 and stations S05, S07, S09-S10, with Station S06 separated out by itself (Figure 8.15). S04 was not included in the sediment analysis due to the stony substratum comprising pebble and cobble. The first group is predominantly muddy sand, the second and third groups predominantly sand. The changes to the grouping as compared to the macroinvertebrates can relate to additional factors such as salinity, depth, current, *etc*.

It is notable that from a sediment perspective, stations S12 and S13, located within the offshore spoil dumpsite, grouped with the upper estuarine stations S01-S03.

Dredging was on-going at the time of the survey and so the recently deposited estuarine sediment may have been influencing the sediment profile.

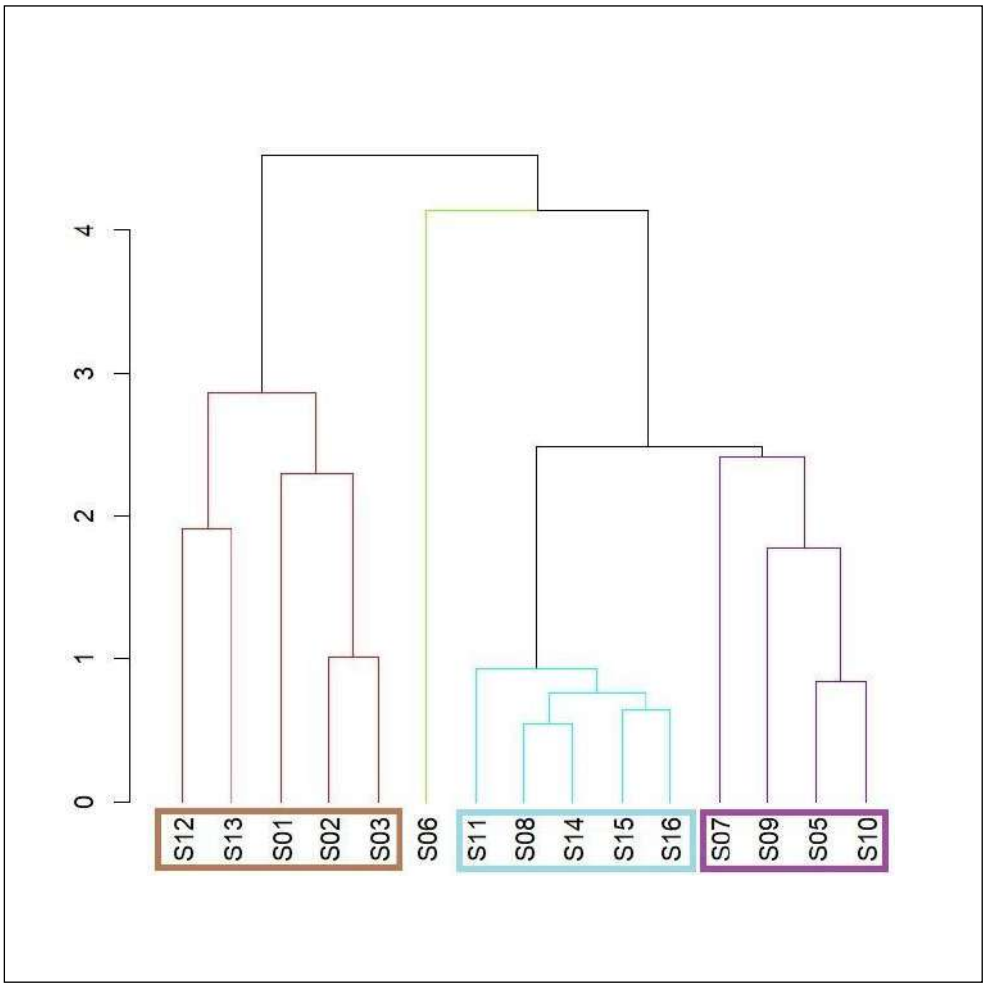

Figure 8.15: *Cluster analysis showing significant (SIMPROF, P<0.05) sediment characteristics groupings among sampling sites (indicated with broken lines) based on Euclidean distances*

All the stations outside the Boyne Estuary (S05-S16) were classified as *Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand (SS.SSa.IMuSa.FfabMag) (Connor *et al*., 2004). Station S04 was classified as *Mytilus edulis* beds on sublittoral sediment (SS.SBR.SMus.MytSS), with the fauna differing greatly due to the stony substratum, and likely strong currents. Station S03 was classified as Dense *Lanice conchilega* and other polychaetes in tide-swept infralittoral sand and mixed gravelly sand (SS.SCS.ICS.SLan), with *Lanice conchilega* casts abundant in the sediment. Stations S01 and S02 were classified as *Nephtys hombergii* and *Tubificoides* spp. in variable salinity infralittoral soft mud (SS.SMu.SMuVS.NhomTubi), which reflected the low salinity, muddy conditions.

Fish

The Irish Sea and its estuaries are home to a range of commercial and recreational fishing activities. Commercial fisheries include trawlers, dredgers and potters exploiting numerous species of fish and shellfish, while recreational fishing comprises shore-based and boat-based angling. Migratory fish also move through estuaries on their journey from spawning grounds to feeding grounds.

Five migratory fish species have been recorded from the Boyne River system: Atlantic salmon (*Salmo salar*), Sea trout (*Salmo trutta*), European eel (*Anguilla anguilla*), Sea

lamprey (*Petromyzon marinus*) and River lamprey (*Lampetra fluviatilis*) (O'Connor, 2006; Kelly *et al*., 2015; 2017; Noel McGloin, IFI, pers. comm.). Salmon and Sea trout spawn in freshwaters and migrate to sea to feed and grow before returning to freshwaters. European eel spawn in the Sargasso Sea in the western North Atlantic, with young eels migrating up rivers as glass eels before metamorphosing into elvers. River lamprey spawn in freshwater, but migrate to transitional waters to feed as adults for one to two years, while Sea lamprey spawn in freshwater and migrate to the sea to mature (Maitland, 2003). Salmon and River lamprey are listed under Annex II of the Habitats Directive and Salmon is a Qualifying Interest in the River Boyne and River Blackwater SAC (site code: 002299) upstream of the Boyne Estuary.

As well as these migratory, other fish species make use of the estuaries for all or part of their life cycle. Surveys by Inland Fisheries Ireland (IFI, previously the Central and Regional Fisheries Boards) recorded 23 species (counting Sea trout and Brown trout as different species) in the Boyne Estuary in both 2009 and 2012, with only slight difference is the species list between the two years (Table 8.9).

Scientific name	Common name	2009 Total	2012 Total	Habitat
Sprattus sprattus	Sprat	2232	5	M, B
Platichthys flesus	Flounder	114	164	M, B, F
Taurulus bubalis	Long-spined sea scorpion	99	5	M, B
Gadus morhua	Cod	86	46	M, B
Pomatoschistus minutus	Sand goby	41	66	M, B
Ammodytes tobianus	Lesser sandeel	36	1159	M, B
Anguilla anguilla	Eel	27	32	M, B, F
Pleuronectes platessa	Plaice	20	8	M, B
Clupea harengus	Herring	16	-	M, B
Pholis gunnellus	Gunnel (Butterfish)	10	3	M, B
Chelon labrosus	Thick-lipped grey mullet	9	-	M, B, F
Syngnathus acus	Greater pipefish	8	1	M, B
Ciliata mustela	Five-bearded rockling	6	31	M
Gasterosteus aculeatus	Three-spined stickleback	5	17	M, B, F
Pollachius pollachius	Pollack	5	2	M
Salmo trutta	Sea trout	3	5	M, B, F
Agonus cataphractus	Pogge	3	1	M
Rutilus rutilus	Roach	3	1	B, F
Merlangius merlangus	Whiting	3	-	M
Salmo salar	Salmon	2	13	M, B, F
Myoxocephalus scorpius	Short-spined sea scorpion	2	1	M, B
Salmo trutta	Brown trout	1	12	B, F
Phoxinus phoxinus	Minnow	1	829	B, F
Gobiusculus flavescens	Two-spotted goby	-	5	M, B
Spinachia spinachia	Fifteen-spined stickleback	-	1	M, B
Barbatula barbatula	Stone loach	-	1	F

Table 8.7: *Fish species recorded from the Boyne Estuary in 2009 and 2012 (adapted from CRFB, 2009; IFI, 2012). Habitat from Froese & Pauly (2019) M = Marine, B = Brackish, F = Freshwater*

Of the migratory species mentioned above, only River lamprey were not recorded in the course of the estuarine survey. Four species (Cod, Whiting, Herring and Plaice) recorded are of interest to commercial sea fisheries and are covered by quotas (Marine Institute, 2018).

Bass (*Dicentrarchus labrax*) has also been recorded from the Boyne Estuary, as has Twaite Shad (*Alosa fallax*) (Noel McGloin, IFI, pers. comm.). The latter is not known to have established a population in the Boyne (*ibid.*) and the only known spawning area is at the upper tidal limit of the River Barrow (Doherty *et al*., 2004).

Basking sharks have been occasionally sighted in the coastal waters off Cos Louth, Meath and Dublin (IWDG, 2019); however, these sightings are infrequent and generally around headlands and islands.

The inshore waters outside the Boyne Estuary, and the northwest Ireland Sea in general, are home to a Razor clam (*Ensis siliqua*) dredge fishery (Clarke & Tully, 2011). Numerous Razor clam dredgers were observed operating along the coast outside the Boyne Estuary during the current survey.

Draft netting for Salmon returning to the River Boyne used to take place within the Boyne Estuary, but licences are no longer issued for this fishery due to declining Salmon stocks. The estuary also once supported a Mussel (*Mytilus edulis*) fishery, with Mussels being harvested from the bottom with rakes from small boats either side of low tide (EcoServe, 2011) This fishery no longer operates following capital dredging of the channel into Drogheda Port. A population of mussels continues to occur within the estuary (EcoServe, 2011; current survey) and the spawning effort from the Boyne Estuary is thought to have influence as far south as Howth Head (Maguire *et al*., 2007).

Marine Mammals

Two groups of marine mammal regularly frequent Irish waters: cetaceans (whales, dolphins and porpoises) and pinnipeds (seals). A total of 26 cetacean and three seal species have been recorded across all Irish waters from sightings or strandings, though not all these are resident or even regularly occurring (Table 8.10).

Common name	Scientific name	Status
Whales, dolphins & porpoises	**Cetacea**	
Atlantic White-sided Dolphin	*Lagenorhynchus acutus*	Present year-round
Beluga	*Delphinapterus leucas*	Vagrant
Blainville's Beaked Whale	*Mesoplodon densirostris*	Vagrant
Blue Whale	*Balaenoptera musculus*	Seasonally present
Bottlenose Dolphin	*Tursiops truncatus*	Present year-round
Bowhead Whale	*Balaena mysticetus*	Vagrant
Common Dolphin	*Delphinus delphis*	Present year-round
Cuvier's Beaked Whale	*Ziphius cavirostris*	Possibly present year-round
False Killer Whale	*Pseudorca crassidens*	Vagrant
Fin Whale	*Balaenoptera physalus*	Seasonally present
Gervais' Beaked Whale	*Mesoplodon europaeus*	Seasonally present
Harbour porpoise	*Phocoena phocoena*	Present year-round
Humpback Whale	*Megaptera novaeangliae*	Migratory
Killer Whale	*Orcinus orca*	Present year-round
Long-finned Pilot Whale	*Globicephala melas*	Present year-round
Minke Whale	*Balaenoptera acutorostrata*	Present year-round
Northern Bottlenose Whale	*Hyperoodon ampullatus*	Present year-round
Northern Right Whale	*Eubalaena glacialis*	Vagrant
Pygmy Sperm Whale	*Kogia breviceps*	Vagrant
Risso's Dolphin	*Grampus griseus*	Present year-round
Sei Whale	*Balaenoptera borealis*	Seasonally present

Sowerby's Beaked Whale	*Mesoplodon bidens*	Possibly present year-round
Sperm Whale	*Physeter macrocephalus*	Present year-round
Striped Dolphin	*Stenella coeruleoalba*	Seasonally present
True's Beaked Whale	*Mesoplodon mirus*	Vagrant
White-beaked Dolphin	*Lagenorhynchus albirostris*	Present year-round
Seals	**Pinnipedia**	
Common Seal	*Phoca vitulina*	Present year-round
Grey Seal	*Halichoerus grypus*	Present year-round
Walrus	*Odobenus rosmarus*	Vagrant

Table 8.8: *Marine mammals recorded in Ireland waters (adapted from NPWS, 2008; 2013)*

The spatial distribution of cetacean and seal species around Ireland varies by species and time of year. The following description of the marine mammals recorded in the vicinity of the Boyne Estuary was based on a desk study and dedicated field survey. Only Harbour porpoise and Harbour seal were recorded in the current survey.

Cetaceans

The desk study collected data on cetaceans from two main sources: the Irish Whale and Dolphin Group sightings database (IWDG, 2019) and Berrow *et al*. (2011).

The sightings data analysed show validated records of whale and dolphin sightings off the coasts of Louth, Meath and North Dublin in the period 2000-2019 (IWDG, 2019). There were 397 separate records, comprising 1,494 individuals. In this period, nine species were confirmed as being sighted within the study area: Harbour porpoise, Bottlenose Dolphin, Minke Whale, Common Dolphin, Humpback Whale, Killer Whale, Fin Whale, Northern Bottlenose Whale and Bowhead Whale. There is a further sighting of a Sei or Blue Whale, with a number of other sightings unable to be confirmed below a higher classification such as ‘dolphin species’ or ‘large whale’. Of the confirmed species, only the first five were sighted more than once in the period considered. Harbour porpoise was the most commonly sighted species, with 326 sightings totalling 1101 individuals (including those recorded as ‘possible Harbour porpoise’), followed by Bottlenose Dolphin (23 sightings, 228 individuals), Minke Whale (18 sightings, 22 individuals), Common Dolphin (6 sightings, 87 individuals) and Humpback Whale (3 sightings, 3 individuals). The distribution of these sightings is illustrated in Figure 8.16.

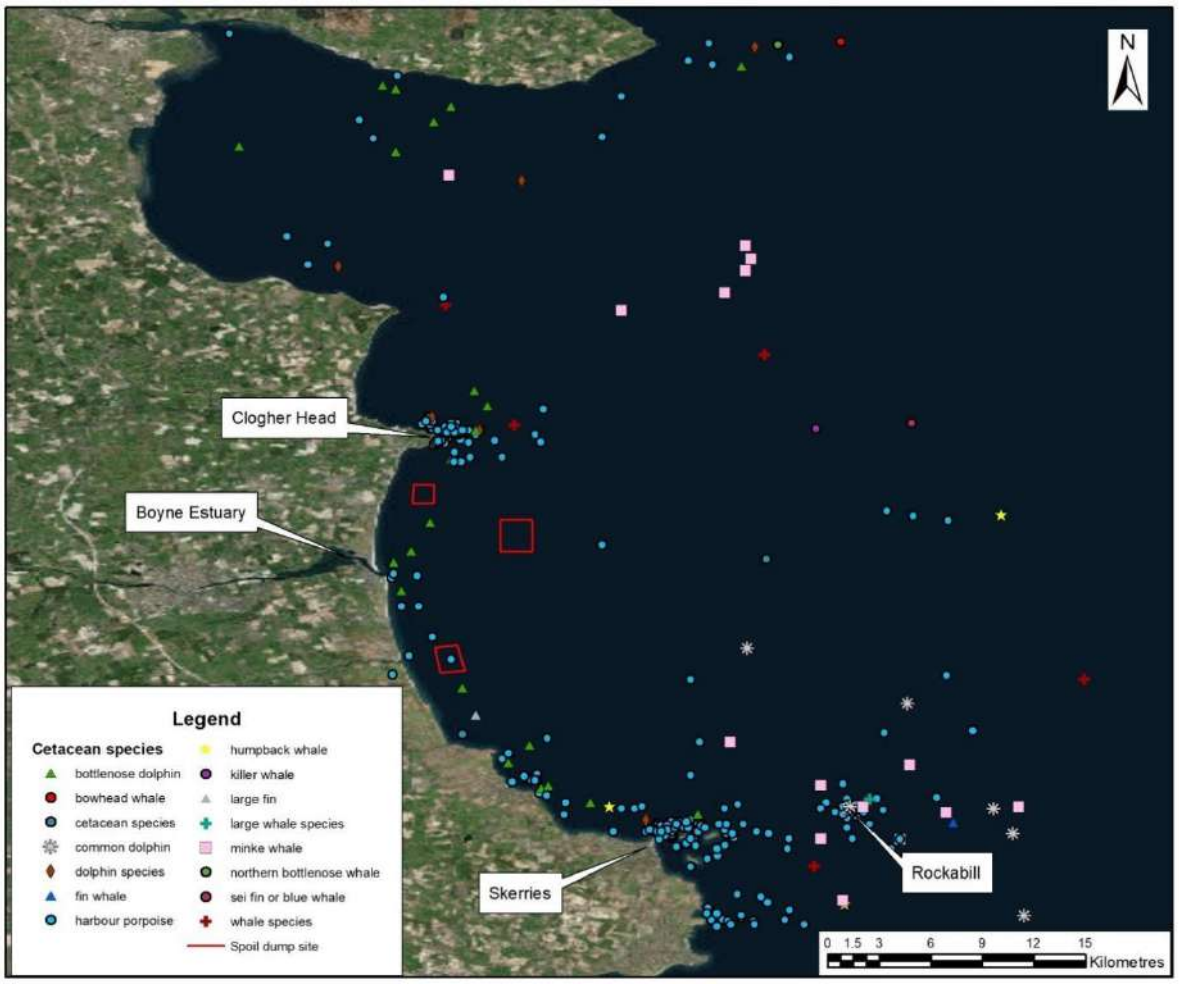

Figure 8.16: *All cetacean sightings within the wider study area in the period 2000-2019 (data from IWDG, 2019). Note: All sightings listed as "dolphin species possibly harbour porpoise", were presumed to be Harbour porpoise, and mapped as such*

Focusing on the area from the Boyne Estuary out to the three spoil dump sites, and the immediate surrounds, there are confirmed sightings for only two cetacean species: Harbour porpoise (88 sightings, 360 individuals) and Bottlenose dolphin (10 sightings, 149 individuals) (Figure 8.17) . There are a small number of records for other species that could not be identified to a species level ('whale species' and 'large fin' species).

Harbour porpoise, Bottlenose dolphin and Minke whale will be discussed in further detail as the most likely species of cetacean to occur in the vicinity of the Boyne Estuary and the dredge spoil dump sites.

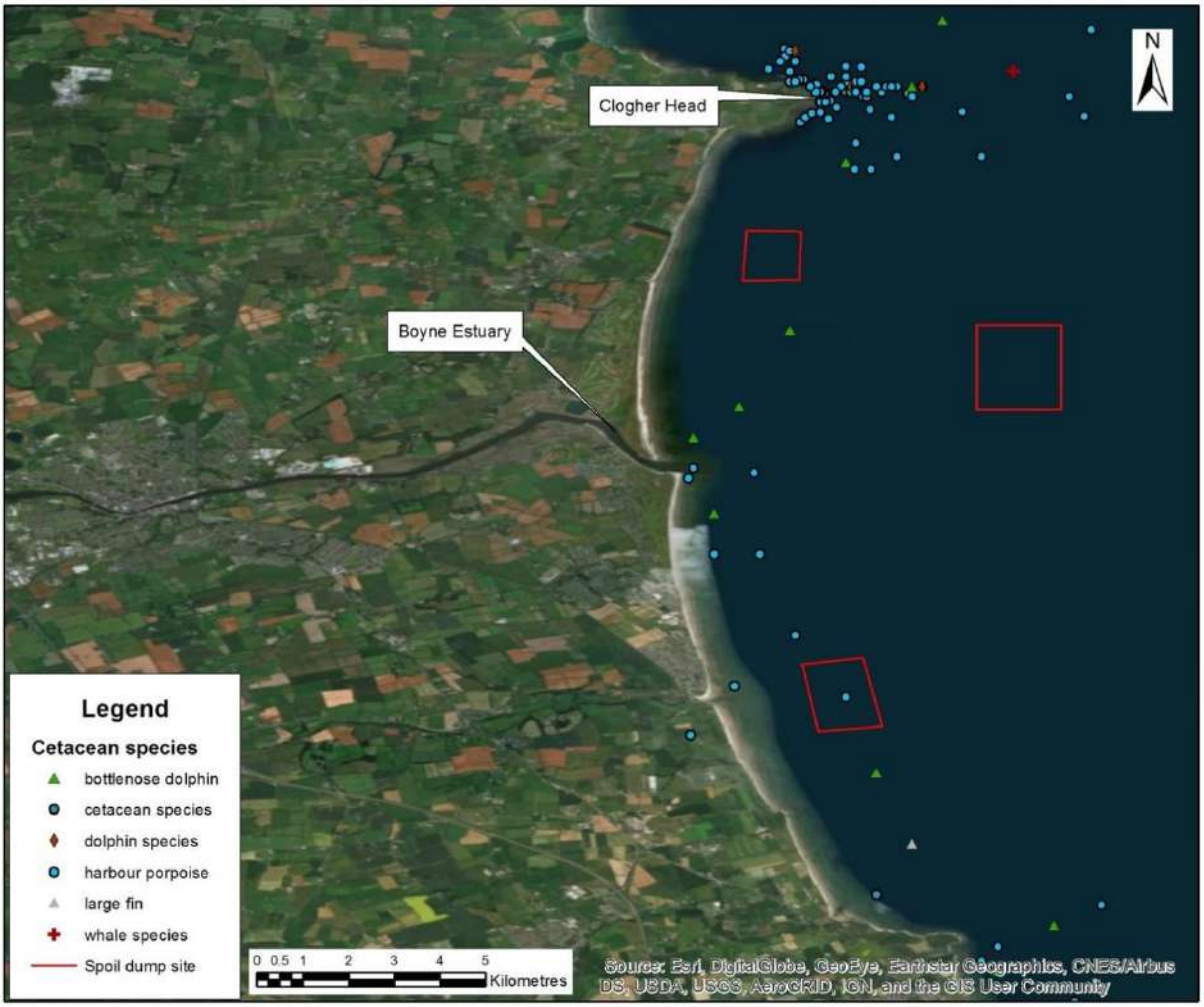

Figure 8.17: *All cetacean sightings within the Boyne Estuary to spoil dump sites area in the period 2000-2019 (data from IWDG, 2019). Note: All sightings listed as "dolphin species possibly harbour porpoise", were presumed to be Harbour porpoise, and mapped as such*

Harbour porpoise

The Harbour porpoise is the most commonly recorded cetacean species in Irish waters and is present all around the coast, predominately in inshore waters.

Berrow *et al.* (2011) carried out a visual and hydro-acoustic survey in a block within the northern Irish Sea, extending from Carlingford Lough, Co. Louth in the north to Bray Head, Co. Wicklow in the south. Harbour porpoise was by far the most commonly recorded marine mammal species, with 51 sightings comprising 83 individuals. It is clear from the distribution of the sightings, that the marine mammal activity in the inshore area was concentrated in the section from Skerries, Co. Dublin down to Bray Head, Co. Wicklow. Only a small number of Harbour porpoise sightings were made north of Skerries, with no sightings recorded directly offshore from the Boyne Estuary.

The main concentrations of validated Harbour porpoise sightings are around Clogher Head, Co. Louth, and Skerries Islands and Rockabill, Co. Dublin (Figure 8.17). The pattern of sightings may be due, in part, to vantage points, as marine mammals are more visible from elevated points, such as Clogherhead. Level of recording effort is also important, as evidenced by the number of records by the same people around Rockabill. However, Harbour porpoise are known to focus around islands, headlands, or restricted channels due to current flows creating enhanced foraging opportunities by concentrating prey (Johnston *et al.*, 2005). This behaviour suggests that the

distribution pattern seen in the data reflects the typical distribution of the species in the vicinity of the Boyne Estuary.

Harbour porpoises were recorded in the course of the current survey. Three sightings of an individual animal were made (Table 8.11). Two of these sightings were as part of the constant effort watch survey, while the other was a casual sighting made while carrying out the subtidal grab survey from the M.V. Sharpshooter.

Date	Location	Latitude	Longitude	Comment
20-03-19	Outside Boyne Estuary	53.72373°	-6.23617°	Constant effort watch. 1 adult.
20-04-19	Outside Boyne Estuary	53.72389°	-6.23467°	Constant effort watch. 1 adult.
26-04-19	Mouth of Boyne Estuary	53.72176°	6.236848°	Casual sighting. 1 Adult observed from M.V. Sharpshooter just after dredger had left.
12-05-19	N/A	N/A	N/A	Constant effort watch. No Harbour porpoise sightings.
14-06-19	N/A	N/A	N/A	Constant effort watch. No sightings.

Table 8.11: *Harbour porpoise sightings recorded during the current survey*

Harbour porpoises are listed under Annex II and IV of the Habitats Directive. There are three SACs in Ireland designated for the protection of the species: Blasket Islands SAC (site code: 002172), Roaringwater Bay and Islands SAC (site code 000101) and Rockabill to Dalkey Island SAC (003000). Harbour porpoises are also protected by the Whale Fisheries Act 1937 and the Wildlife Acts 1976-2012.

Bottlenose Dolphin

Bottlenose dolphins are regularly recorded around the Irish coast, with a resident population in the Shannon Estuary, an inshore population focused around Connemara-Mayo and an offshore, or pelagic, population off the west coast (Ingram & Rog, 2002; Mirimin *et al*., 2011; Louis *et al*., 2014). This species is occasionally sighted in the Irish Sea and three individuals were regularly sighted in the Killiney Bay area around 2010. However, Bottlenose dolphins species do not form a resident part of the cetacean community of the Irish Sea.

There have been nine validated sightings of Bottlenose dolphins between Clogherhead and Skerries (IWDG, 2019). These sightings mainly occurred between 2007 and 2011, with one sighting of 50 individuals occurring in 2014. Bottlenose dolphins are a large, active species that often move in pods, which means they are unlikely to be missed when present in an area.

Bottlenose dolphins are listed under Annex II and IV of the Habitats Directive. There are two SACs in Ireland designated for the protection of the species, both on the west coast: Lower River Shannon SAC (site code: 002165) and West Connacht Coast SAC (site code: 002998). Bottlenose dolphins are also protected by the Whale Fisheries Act 1937 and the Wildlife Acts 1976-2012.

Minke Whale

Minke whale is the only baleen whale that is present year-round in Irish inshore waters.

Berrow *et al.* (2011) carried out a visual and hydro-acoustic survey in a block within the northern Irish Sea, extending from Carlingford Lough, Co. Louth in the north to Bray Head, Co. Wicklow in the south. Minke whale were the second most commonly sighted species (after Harbour porpoise), with six sightings totalling six individuals. All sightings of Minke whale were south of Lambay Island.

Validated sightings of Minke whale in the broader inshore area around the Boyne Estuary (Figure 8.16) were east of Dundalk Bay and in the vicinity of Rockabill (IWDG, 2019). There have been no confirmed sightings in the vicinity of the Boyne Estuary or the spoil dump sites (Figure 8.17).

Minke whales are listed under Annex IV of the Habitats Directive and are also protected by the Whale Fisheries Act 1937 and the Wildlife Acts 1976-2012.

Seals

Grey seals and Harbour seals are commonly recorded along the east coast of Ireland. The most important areas around the Irish coasts for Grey seals are located on the west coast and are designated as SACs, owing to the fact that Grey seals are listed under Annex II of the Habitats Directive. The only SAC designated for the protection of Grey seals in the Irish Sea is at Lambay Island, Co. Dublin (site code: 000204). While certain localities are of particular importance as moulting and breeding sites, Grey seals travel widely when foraging and can be recorded all along the coast and some distance offshore.

Grey seals are also protected under the Wildlife Acts 1976-2012.

Harbour seals are also recorded all around the coast of Ireland, with the west coast providing the best habitat, though Carlingford Lough is also a notable Harbour seal site (Duck & Morris, 2017). Harbour seals are listed under Annex II of the Habitats Directive and there are thirteen SACs designated for their protection. Of these SACs, only Lambay Island SAC (site code: 000204) is located in the Irish Sea. Harbour seals are also protected under the Wildlife Acts 1976-2012.

A review of records on the mapping system of the National Biodiversity Data Centre (NBDC, 2019) returned four records for Harbour seal within the Boyne Estuary in the period 2014-2018, totalling 19 individuals. Outside of the estuary, the nearest record was at Clogherhead, Co. Louth. No Grey Seals were recorded in the vicinity of the Boyne Estuary, with the closest records at Clogherhead to the north and Cardy Rocks, Balbriggan, to the south (NBDC, 2019).

In the course of the current survey, Harbour seals were observed swimming in the Boyne Estuary on three occasions as part of the constant effort watch. Harbour seals were also observed hauled out on the mudflats to the north and south of the channel. A particularly notable haul-out was within Baltray Bay, where up to 15 individuals were recorded.

Summary

The data collected in the course of the desk study and the field survey suggests that the Boyne Estuary and adjacent marine waters are of low importance for marine mammals, with the exception of Common seals which use the estuary for hauling out.

Otter

Otter can be found throughout the River Boyne and are known to occur within the main channel and estuary within which the dredging operation occurs. It is likely that there are breeding sites River Boyne, although no holts were identified during surveys. It is unlikely that holts would be located either within or immediately adjacent to the maintenance dredging works as there is a lack of suitable habitat for holts along the river channel which is enclosed by training walls. Due to the likely presence of Otter within the vicinity of the dredging operation they have been considered as a KER in this assessment.

8.3.1 Summary of Biodiversity Evaluation

Table 8.12 below summarises the ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identifies the Key Ecological Receptors (KERs). Species, habitats and features not qualifying as KERs are not subjected to impact assessment in line with current best practice of assessing the impacts on what are determined to be important ecological or biodiversity features: CIEEM and TII guidelines (CIEEM, 2018 and National Roads Authority, 2009).

Biodiversity Receptor	Valuation	KER?
Designated Areas for Nature Conservation		
Boyne Coast and Estuary SAC	International	**Yes**
River Boyne and River Blackwater SAC	International	**Yes**
Rockabill to Dalkey Island SAC	International	**Yes**
Boyne Estuary SPA	International	**Yes**
River Boyne and River Blackwater SPA	International	**Yes**
River Nanny and Estuary SPA	International	**Yes**
Dundalk Bay SPA	International	**Yes**
Rockabill SPA	International	**Yes**
Laytown Dunes/Nanny Estuary pNHA	National	**Yes**
Boyne Coast and Estuary pNHA	National	**Yes**
Dowth Wetland pNHA	National	**Yes**
Boyne River Islands pNHA	National	**Yes**
European sites (SACs and SPAs)	International	No
Other NHAs and pNHAs	National	No
Habitats		
Estuarine	International	**Yes**
Fauna species		
Wintering waterbirds	International	**Yes**
Little tern	International	**Yes**
Other terns	International	**Yes**
Otter	International	**Yes**
Harbour porpoise	International	**Yes**
Harbour seals	International	**Yes**
Other marine mammals	Local importance (higher value)	**Yes**
Atlantic salmon	International	**Yes**
River lamprey	International	**Yes**

Table 8.9: *Summary of the biodiversity evaluation*

8.4 CHARACTERISTICS OF THE PROPOSED ACTIVITY

The commercial estuary of the River Boyne and seaward approaches is located at Drogheda Port, Drogheda, Co. Louth and extends along the coastline of counties Louth and Meath. The river under the jurisdiction of the Drogheda Port Company is approximately 7.5km in length from St. Mary Bridge in the town of Drogheda to the river mouth at Mornington. The proposed dredging of the estuary and the seaward approaches will be carried out to maintain the navigability of the channel.

Drogheda Port Company currently holds a Dumping at Sea Permit (S0015-02) for the period 2013 – 2021 and is applying for a Dumping at Sea permit for the period 2021 – 2029 for the sea disposal of the dredged material. Dredged material will be deposited at either the north inshore site A2, or the seaward site A1. There is a third dump site to the south which is redundant. A portion of the dredged material will be dumped 2.5km from the shore in 14m of water. Drogheda Port Company will also be engaging in a beneficial re-use option whereby a portion of the dredged material up to 60,000 m^3 may be beneficially reused within the construction industry in compliance with the OSPAR convention. This beneficial reuse option is necessitated by the need to dredge the river entrance and seaward approaches to restore safe navigational water depths and meets the requirements of the OSPAR Convention.

The characteristics of the activity (dredging and dumping) that are relevant in terms of waste management are summarised below.

Dredging Operations

The primary locations for maintenance dredging are the commercial estuary including all berths and ship swing basins, channel and the river mouth and seaward approaches. However, dredging can take place at any location within the commercial estuary. Maintenance dredging at Drogheda Port is primarily trailer suction dredging however the plant used depends on availability of plant and location of dredging. Typical plant which would be used for the dredging would be:

- Trailer suction dredger;
- Backhoe dredger;
- Split barge;
- Grab dredger;
- Bed levelling; and
- Plough.

Drogheda Port maintains an open 24 x 7 x 365 maintenance dredging policy for the river mouth and seaward approaches in order to maintain safe navigational depths for port operations.

Dumping Operations

See Figure 8.18 below for the location of the two dumpsites and the redundant dumpsite.

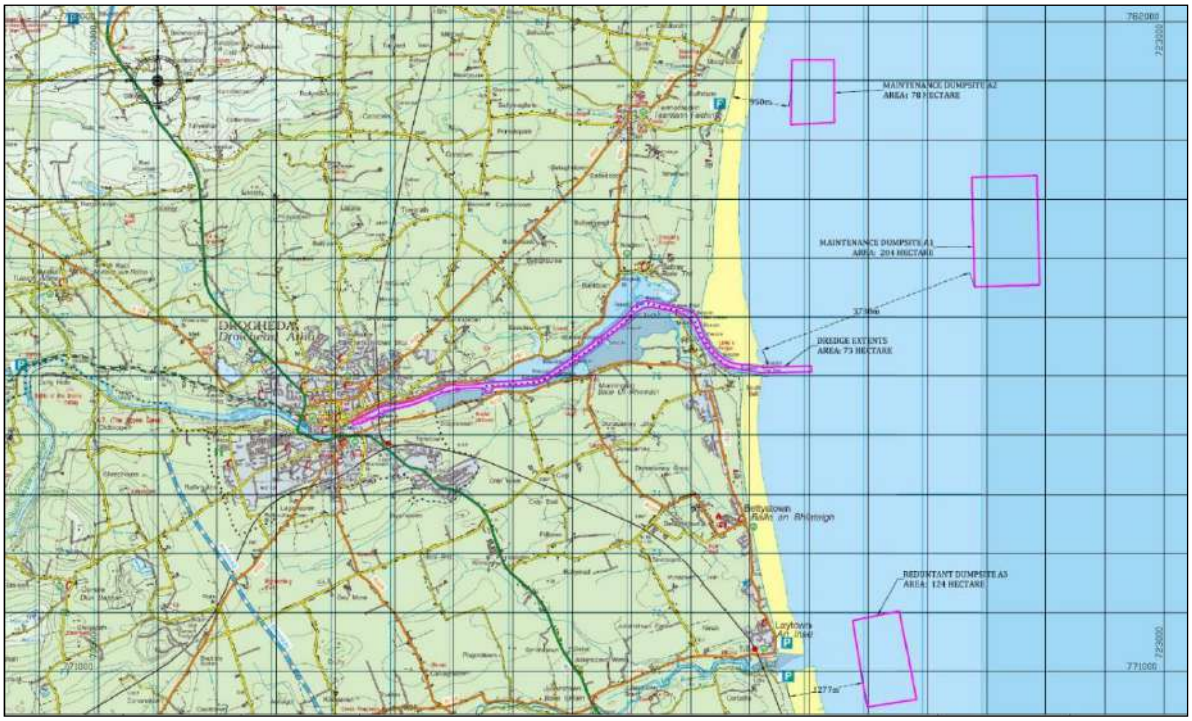

Figure 8.18: *Dumpsite locations*

The seaward Dumpsite 'A1' has been used as the primary all material dumpsite for over the past three decades by Drogheda Port Company for maintenance and capital dredging material disposal. Drogheda Port Company is the only permit holder in respect of the 'A1' dump site. The site is located within the designated anchorage of Drogheda Port approximately 2.5km from the shore in a depth of 13-15 metres of water at Chart Datum.

The near shore Dumpsite 'A2' is used only for sand dredged at the channel entrance and seaward approaches. The site is close to the surf zone and the depth at this site is shallow with only 4 metres of water at Chart Datum.

Dredging and dumping is carried out by the same plant, which is usually a trailer suction dredger. This dredging vessel, while underway, drags a pipe on the river bed and material is sucked up into the hold of the vessel. The material settles in the hold and excess water from the suction operation is returned to the sea as the hold reaches capacity. Once the hold is full, the vessel proceeds to the approved spoil dump site and discharges the material through bottom doors in the hull that open to release the hold contents.

The A3 site is redundant and is not for consideration in this application.

8.5 POTENTIAL IMPACT OF THE PROPOSED ACTIVITY

Based on the baseline ecological environment and the extent and characteristics of the proposed activity the following potential impacts have been identified:

- Habitat loss and disturbance impacts
- Effects from siltation
- Fauna disturbance and displacement impacts
- Mortality as a result of a pollution event
- Reduced prey availability
- Mortality as a result of entrapment

- Mortality as a result of collision

The following section presents the assessment of impacts on biodiversity within the Zone of Influence (ZoI) of the proposed activity. As outlined in Section 1.2.2, this is focused on the Key Ecological Receptors (KERs) identified in Section 1.3.1 above (see Table 8.9).

Designated Areas for Nature Conservation

This section describes and assesses the potential for the proposed activity to result in likely significant effects on designated areas for nature conservation that lie within the ZoI of the proposed activity. In the context of European sites this is focused on the habitats and species for which the sites are selected (QIs for SACs and SCIs for SPAs) and the conservation objectives supporting their conservation status in each site. This assessment is directly related to the assessment methodology for European sites required under the Habitats Directive, which is presented in the Natura Impact Statement (NIS) report prepared for the dredging operation that accompanies this Environmental Report.

In the case of NHAs and pNHAs the assessment considers whether the integrity[16] of any such site would be affected by the proposed activity with reference to the ecological features for which the site is designated, or is proposed

European Sites

Boyne Coast and Estuary SAC

As described in Section 5 of the NIS, the dredging and dump at sea operation has the potential to affect the conservation objectives, and therefore the integrity, of the Boyne Coast and Estuary SAC because of:

- Habitat loss or disturbance
- Effects of siltation

As discussed in the NIS, a limited area of Estuaries [1130] will be disturbed and there will be no permanent loss of the habitat, which is resilient to disturbance due to the dynamic nature of the estuarine and marine system. The sediment plume created by the dredging operation has been modelled by RPS (2019) and is shown to be localised to the dredger, to be of low concentration and to disperse relatively quickly in the tidal conditions. An accidental pollution event is unlikely to occur, however if occurs at a sufficient magnitude, and in the absence of mitigation, it could affect the quality of the intertidal habitats and integrity of the Boyne Coast and Estuary SAC an international to local geographical scale.

River Boyne and River Blackwater SAC

As described in Section 5 of the NIS, the dredging operation has the potential to affect the conservation objectives, and therefore the integrity, of the River Boyne and River Blackwater SAC because of:

- Disturbance and displacement impacts
- Mortality as a result of a pollution event
- Reduced prey availability
- Mortality as a result of entrapment

[16] Refer to Section 6.1.1.2 for definition and impact assessment methodology

As discussed in the NIS, there will be no impact on spawning habitat of QI fish species, the temporary nature of the works means that there is limited potential for effects on fish migrating through the Boyne Estuary, and the risk of entrainment by the suction dredger is negligible. An accidental pollution event is unlikely to occur, however if occurs at a sufficient magnitude, and in the absence of mitigation, it could affect the quality of the intertidal habitats within which Otter occur and the integrity of the River Boyne and River Blackwater SAC an international to local geographical scale.

Rockabill to Dalkey Island SAC

As described in Section 5 of the NIS, the dredging operation has the potential to affect the conservation objectives, and therefore the integrity, of the Rockabill to Dalkey Island SAC because of:

- Disturbance and displacement impacts
- Mortality as a result of collision
- Effects of siltation

As discussed in the NIS, there will be no impact on QI reef habitat as it is too distant from the area of dredging operations for there to be any adverse effect. Low usage of the coast in the vicinity of the operation by Harbour porpoise and slow speeds at which the dredger travels, along with the avoidance behaviour of Harbour porpoise, means that the risk of collision is negligible to individuals travelling outside the site beyond minor avoidance.

Spawning habitat of QI fish species, the temporary nature of the works means that there is limited potential for effects on fish migrating through the Boyne Estuary, and the risk of entrainment by the suction dredger is negligible. An accidental pollution event is unlikely to occur, however if occurs at a sufficient magnitude it could affect the quality of the intertidal habitats within which Otter occur and the integrity of the Rockabill to Dalkey Island SAC a local geographical scale.

The dredging operation will not affect the integrity of the Rockabill to Dalkey Island SAC at any geographic scale.

Boyne Estuary SPA,

As described in Section 5 of the NIS, the dredging operation has the potential to affect the conservation objectives, and therefore the integrity, of the Boyne Estuary SPA because of:

- Disturbance and displacement impacts
- Mortality as a result of a pollution event
- Reduced prey availability

As discussed in the NIS, the wintering SCI species are not at risk to disturbance from the dredging works as there will be no dredging activity within the polders where roosting and feeding occurs, in addition the river channel is regularly frequented by commercial shipping and fishing activity associated with Drogheda Port, this baseline condition will not change as a result of the application. Breeding Little terns at Baltray did not show any disturbance at the colony towards dredging activity during 2018 surveys. Breeding tern colonies at Rockabill are a significant distance, c.20km, from the dredging operations and are not at risk to disturbance impacts.

SCI tern species are shallow diving feeders, their feeding efficacy and prey item abundance could be impacted by the dredging operation. As discussed in the NIS, hydraulic modelling carried out has shown that the total suspended sediment concentrations are very low and disperse relatively quickly with the tidal flow (RPS,

2019). There is some overlap of the sediment plume and area used by feeding terns, however suspended sediments will not impede tern feeding by way of reduced visibility. The dredging operation will not result in the removal of any perceptible numbers of prey items to cause any reduction of prey biomass available to feeding terns.

An accidental pollution event is unlikely to occur, however if occurs at a sufficient magnitude it could affect the quality of the intertidal habitats within which roosting and feeding wintering and/or breeding SCI species occur and could affect the integrity of the Boyne Estuary SPA, at an international to local geographical scale.

Nanny River and Estuary SPA, Dundalk Bay SPA and Rockabill SPA

As described in Section 5 of the NIS, the dredging operation has the potential to affect the conservation objectives, and therefore the integrity, of the Nanny River and Estuary SPA, Dundalk Bay SPA, Rockabill SPA because of:

- Disturbance and displacement impacts
- Mortality as a result of a pollution event

As discussed in the NIS, the wintering SCI species are not at risk to disturbance from the dredging works as there will be no dredging activity within the polders where roosting and feeding occurs, in addition the river channel is regularly frequented by commercial shipping and fishing activity associated with Drogheda Port, this baseline condition will not change as a result of the application.

An accidental pollution event is unlikely to occur, however if occurs at a sufficient magnitude it could affect the quality of the intertidal habitats within which roosting and feeding wintering and/or breeding SCI species occur and could affect the integrity of the Boyne Estuary SPA, Nanny River and Estuary SPA, Dundalk Bay SPA, Rockabill SPA, at an international to local geographical scale.

Nationally Designated Sites

Boyne Coast and Estuary pNHA

See inputs above for Boyne Coast and Estuary SAC. In the absence of mitigation, an accidental pollution event is unlikely to occur, however if occurs at a sufficient magnitude, and in the absence of mitigation, it could affect the quality of the intertidal habitats and associated fauna, and therefore, the integrity of the Boyne Coast and Estuary pNHA which could result in a likely significant effect at a national to local geographic scale.

Laytown Dunes/Nanny Estuary pNHA

See inputs above for Nanny River and Estuary SPA. In the absence of mitigation, an accidental pollution event is unlikely to occur, however if occurs at a sufficient magnitude, and in the absence of mitigation, it could affect the quality of the intertidal habitats used by wintering bird species which are associated with this pNHA, and therefore, the integrity of the Laytown Dunes/Nanny Estuary pNHA which could result in a likely significant effect at a national to local geographic scale.

Boyne River Islands pNHA

This designated site does occur within the tidal extent of the Boyne Estuary, however is c.4.2km upstream of the dredging works. Hydraulic modelling of the dredging works shows the sediment plume does not extend more than 600m upstream (RPS, 2019), and therefore the dredging operation is not at risk of affecting the integrity of the Boyne River Islands pNHA at any geographical extent.

Dowth Wetland pNHA

This designated site is located beyond the extent of the tidal influence of the Boyne Estuary, and therefore the dredging operation is not at risk of affecting the integrity of the Dowth Wetland pNHA at any geographical extent.

Habitats

Estuary Habitats

The potential impact on the proposed dredging on the estuarine habitats is considered in the context of the benthic fauna in Section 0. As the dredging operation is limited to the subtidal zone, there will be no direct impact on intertidal habitats from the proposed activity.

Fauna

Intertidal Benthic Fauna

As the dredging operation is limited to the subtidal zone, there will be no direct impact on intertidal habitats from the proposed activity. However, dredging operations will result in the creation of a temporary sediment plume. Within the plume, coarser material will settle out quickly, while fine silts will take longer to re-deposit. Hydraulic modelling carried out by RPS (2019) has shown that, apart from the area around the dredger, the suspended sediment plume concentrations are generally low with values typically less than about 60-80mg/l and they further disperse relatively quickly. Benthic sedimentary communities are adapted to live in an environment where levels of suspended solids vary and the rate of sediment deposition changes. Communities can be impacted if the rate of deposition is higher than that with which the fauna can cope. Suspended solids levels of 380mg/l are known to occur in the area around the bar during regular storm events, which is higher than the levels predicted for the proposed dredging. This shows the levels of suspended solids, and the associated re-settlement, that the communities present are adapted to cope with. Modelling by RPS (2019) shows that the sediment deposition thickness level of sediment suspended during dredging operations will range from 0.0002–0.0025mm, which will have no appreciable impact on benthic communities.

Fine sediments are particularly prone to accumulating pollutants. Although highly unlikely, an accidental pollution event, such as a large hydrocarbon spill, could have a significant impact on the intertidal benthic community at an international to local geographical scale.

Subtidal Benthic Fauna

The proposed dredging operations will result in occasional disturbance of the existing subtidal benthic communities, as the upper layers of sediment are removed from the site. The sediment that has to be removed from the shipping channel comes from two sources: that washed downstream by the River Boyne from the catchment of the River Boyne, and sediment from marine sources, including longshore drift of coastal sediment moving north. The movement of sediment parallel to the shore is of particular concern from an operational point of view, as this sediment forms a sandbar across the mouth of the estuary. Based on figures for dredged material from 2000 to 2019, 82% of the material was dredged from the bar at the mouth of the estuary and so would mainly comprise sand that has been deposited from further offshore or from longshore drift.

As the mouth of the estuary is a dynamic habitat, the fauna present are adapted to some level of disturbance. Dredging operations will have a temporary impact on the habitat, with the recovery aided by fauna washed back in through run-off from the dredger and also from adjacent habitats through migration, colonisation and sediment

movement. The recovery of benthic communities from disturbance has been shown to be faster for sandy habitats, owing to the more mobile nature of the habitat (Dernie *et al*., 2003).

The dumping of dredge spoil within the defined spoil dump sites has the potential to alter the subtidal benthic community through smothering of the existing community, changes to the sediment particle size profile, and the introduction of species from other communities. Only sediment dredged from the bar at the mouth of the estuary, which comprises sand, can be dumped at the inshore dump sites north and south of the estuary (though the southern site has not been use in recent years). Given the sandy nature of the sediment in the bar area, which is similar to that of the north and south spoil dump sites, the disposal of dredged material at these sites will have a limited impact on the benthic community. This has been shown in studies on similar spoil dumping exercises (Roberts & Forrest, 1999; Smith & Rule, 2001) and is evidenced in the current survey by the cluster analysis, which groups the sites within the inshore disposal site samples with the inshore control sites.

The sediment recorded in the offshore spoil dump site has a slightly higher silt content than the inshore sites, but this does not alter the biotope. The higher proportion of silt may be due to the spoil disposal that was on-going at the time of the survey or it may be the natural condition as the seabed grades into the Western Irish Sea Mud Belt (Ward *et al*., 2015). This shows that the historical dredge spoil disposal is having limited to no impact on the subtidal benthic community and so the proposed future dredging would be similarly expected to have limited to no impact.

Fine sediments are particularly prone to accumulating pollutants. Although highly unlikely, an accidental pollution event, such as a large hydrocarbon spill, could have a significant impact on the subtidal benthic community at an international to local geographical scale.

Fish

Dredging operations can have a number of impacts on fish species ranging from minor behavioural change to increased mortality or reduced hatching success through effects related to increased suspended solids, noise, and physical interaction with the dredger (Wenger *et al.*, 2017).

Maintenance dredging at Drogheda Port is primarily by means of a Trailing Suction Hopper Dredger (TSHD). Hydraulic modelling carried out by RPS (2019) has shown that, apart from the area around the dredger, the suspended sediment plume concentrations are generally low with values typically less than about 60-80 mg/l and they further disperse relatively quickly.

Of the fish species recorded in the Boyne Estuary the most important from a conservation point of view are Atlantic salmon and River lamprey, which are listed under Annex II of the Habitats Directive and a Qualifying Interest of the River Boyne and River Blackwater SAC (site code: 002299) upstream, and Eel, which is the only critically endangered fish species in Ireland (King *et al*., 2011). All three species travel through the Boyne Estuary as part of their migration, albeit with Salmon and River lamprey spawning in freshwaters while Eels spawn in the Sargasso Sea off the coast of North America.

Due to their mobile nature, fish are unlikely to suffer lethal effects from events such as high sediment loads in the water column. Salmonids have been shown to preferentially avoid sediment plumes (Kjelland *et al*., 2015) and all fish living within estuarine systems will be adapted to deal with occasional high levels of suspended solids. The plume associated with the dredging will be temporally and spatially limited due to the episodic nature of the dredging operation, and also due to the water flows

within the estuary. For this reason, any significant impact on the fish populations within the study area as a result of the proposed activity will be minor in magnitude and at a local geographical scale.

Interaction between the dredger and fish within the estuary has the potential to result in mortality. The suction dredger could potentially entrain fish and deposit them into the hold of the ship with the sediment. Carlson (2001) found that the area of effect of the suction head is small and the risk of such entrainment is negligible and not significant at any geographical scale.

The noise generated by the dredging operations may impact on fish in a range of ways, both physiological and behavioural. Spiga *et al*. (2012) calculated a conservative generic fish response to a TSHD of 9 m, with this distance being even shorter for many species. This limited range of effect, combined with the temporary and occasional nature of the dredging operations, means that there is potential for a significant impact arising from the effect of noise on the fish population minor in magnitude and at a local geographical scale.

Marine Mammals

Dredging operations within the Boyne Estuary shipping channel will mainly be undertaken by a TSHD. Potential impacts from the operation of the dredger on marine mammals are related to noise and collision.

The noise levels generated during dredging operations depends on the characteristics of the vessel used, as well as the nature of the dredged material, with gravel being noisier than sand (Robinson *et al*., 2011). Given that the material to be dredged is predominately sand with some silt, the noise generated by the dredger will be similar to that generated by a normal vessel of a similar size, and in the region of 180 dB re 1 µPa (DAHG, 2014, Robinson *et al*., 2011). Noise in the water column attenuates due to a range of factors including distance from source, water temperature, salinity, water depth and sediment type. Using a simple mixed spreading model, the noise levels likely to cause a temporary threshold shift (TTS) in Harbour porpoise hearing would only occur within 200m of the dredger. Defra (2003) found that the TSHD *Arco Adur* was not detectable above ambient levels at a range of 500m. Short-term avoidance by Harbour porpoises at ranges of 600m from a TSHD operating to the west of Sylt (Germany) was recorded by Diederichs *et al.* (2010). Richardson *et al.* (1995) summarised Harbour porpoise avoidance of ships as possible from a distance of 1-1.5km, with a stronger reaction within 400m. The noise signature of a TSHD is generally above those of the other dredgers that may be used in the proposed activity (MMO, 2015) and so the impact of the other dredger types can be considered to be lower.

The distribution data available for Harbour porpoise in the vicinity of the Boyne Estuary mouth and adjacent waters suggests there is likely to be limited exposure of Harbour porpoises to noise generated by the dredger due to low occurrence of the species. This, combined with the tendency of Harbour porpoises to avoid ships within 400m, means that any physical effect on Harbour porpoises in the form of TTS is highly unlikely. The only likely effect of the proposed dredging is an avoidance of the immediate vicinity of the dredger, which will not have any significant impact on the species at any geographical scale.

Harbour porpoises are considered to be particularly sensitive to noise, and are the most commonly occurring cetacean in the waters off Louth/Meath, therefore, the impact of the proposed dredging on other species of cetacean that may occur in the area is also considered to be not significant at any geographical scale.

Harbour seals frequent the Boyne Estuary, with up to 15 individuals recorded hauled out near Baltray during the current survey. Harbour seals could be disturbed by the

dredging operations due to the presence of the dredger and the associated noise. The site represents a secure resting location, protected by mudflats and shallow water, but does not serve as a nursery area, which tend to be in more remote locations, such as on islands. Harbour seals have shown habituation to boat traffic (Richardson *et al*., 1995) and the fact that Harbour seals continue to be recorded within the Boyne Estuary despite current shipping and dredging activity, suggests that they have habituated to such operations, and therefore no significant impacts are expected at any geographical scale from the continuation of dredging operations.

The sediment plume from the dredging and spoil disposal may interfere with Harbour seal foraging through reduced visibility underwater; however, modelling by RPS (2019) shows that the dredging plume will have a limited and transient extent and Harbour seals are known to range widely when foraging (up to 60km) (Thompson *et al*., 1996). Given the wide area available to Harbour seals for foraging, and the short-term and transient nature of the effects of dredging, the effect on Harbour seals from the continuation of dredging operations is not expected to be significant at any geographical scale.

Grey seals, which have rarely been recorded in the area, and have an even greater foraging range (Thompson *et al*., 1996), therefore there will be no measureable or significant impact at any geographical scale.

Marine mammals can suffer injury, or even death, as a result of collision with boats and ships. Various factors affect the likelihood of collision, including species, age and sex, habitat, vessel size, vessel speed, shipping density (Van Waerebeek *et al*., 2007). A study by Baker & Martin (1992) on 41 stranded Harbour porpoises found no evidence of vessel collision, while Jepson (2005) reported one stranded Harbour porpoise with injuries consistent with boat collision for the period 2000-2004, and other with blunt trauma that may be attributable to watercraft collision, but also bycatch and Bottlenose dolphin attacks.

Collision impacts on small marine mammals tend to be from smaller, faster watercraft, including jet skis. The slow speeds at which the dredger will be operating during dredging and transit to the spoil dump site, and the limited presence of large cetaceans in the area, means that the risk of collision with any marine mammal is negligible and not significant at any geographical scale.

As no significant impacts at any geographical scale were identified on marine mammals from the proposed dredging, no mitigation measures are required to protect these species. This conclusion is in line with the possible outcomes of the risk analysis as set out in *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* (DAHG, 2014).

Otter

Foraging and/or commuting Otter are likely to occur within the vicinity of the dredging operation, and could potentially be at risk to disturbance and displacement impacts. Although no holts were recorded during surveys, if present, the dredging works do not occur in the immediate proximity to suitable riparian habitat, therefore there is no risk to disturbance or displacement at Otter resting places. The river channel is frequented regularly by fishing and cargo vessels, pilot boats, and current dredging operations. There is no predicted change in volumes of commercial fishing or shipping traffic using the river channel as a result of the renewed maintenance dredging licence. The continuation of existing dredging operations is not predicted to cause any disturbance to Otter occurring within the area of the dredging operation at any geographical scale.

There is potential for reduced prey availability as a result of increased turbidity in the water column and deteriorating the detection of prey items. As provided in the

hydraulic modelling the sediment plume created by the dredging works will be localised to the dredger, will be very low concentrations of suspended sediments and will disperse relatively quickly with the tidal flow (RPS, 2019). When the River Boyne is in full spate, suspended materials in the water column exceed levels of suspended solids created by the dredging works. Reduced visibility in the localised area of the sediment plume will not reduce the feeding efficacy of Otter in the River Boyne.

Otter occurring in the vicinity of the dredging operations could be vulnerable to a pollution incident affecting the water quality in the receiving environment. It is unlikely that the dredging operations will result in a significant hydrocarbon or chemical spill, however if occurs at a sufficient magnitude it could result in a significant impact on Otter at a local geographical scale.

Little Tern

The dredging works will not result in direct impacts to nesting Little terns however indirect impacts could occur through disturbance and displacement, reduced foraging efficacy, and hydrological impacts affecting habitats within which they utilise for feeding or roosting.

From surveys carried out in 2018, disturbance events at the colony resulted from walkers and dogs in the majority of cases. The dredger was present on 10 surveys between 30th May and 9th August 2018, however did not appear to cause disturbance to foraging Little terns. Disturbance shown by foraging terns towards the dredger may have been subtle and could have gone unrecorded, however due to the temporary and infrequent nature of the dredging operation any disturbance impacts of foraging Little terns to the operation is considered unlikely and not significant at any geographical scale.

Disturbance events at the colony during 2018 surveys resulted from walkers and dogs in the majority of cases, and noted that the dredger, which was present on 10 surveys between 30th May and 9th August 2018, did not appear to cause disturbance to foraging Little terns. Although disturbance shown by foraging terns towards the dredger may have been subtle and could have gone unrecorded, Figure 8.7 shows the area of highest foraging activity which overlaps with the dredging site in the river channel and at the breakwaters. The continuation of existing dredging operations will not cause any disturbance to breeding Little tern at the Baltray colony or feeding within the aquatic and marine habitats.

Hydraulic modelling carried out for the maintenance dredging works has shown that the total suspended sediment concentrations are very low and the plume does not approach the shoreline immediately adjacent to where the Little terns nest on the northern side of the breakwaters, and which appears to be their preferred feeding area, in any modelled scenario (RPS, 2019). Therefore suspended sediments will not impede Little tern feeding by way of reduced visibility. Additionally, during easterly weather conditions, wave action causes suspended sediments and greater turbidity in the water column over an extensive shoreline area compared to that produced from dredging operations. Dredging operations will not increase as a result of the continuation of maintenance dredging works under a renewed licence. The dredging works and associated sediment plume is not predicted to cause any significant impact on foraging Little tern at any geographical scale.

Little tern occurring in the vicinity of the dredging operations could be vulnerable to a pollution incident affecting the water quality in the receiving environment. It is unlikely that the dredging operations will result in a significant hydrocarbon or chemical spill, however if occurs at a sufficient magnitude it could result in a significant impact on Little tern at an international to local geographical scale.

Other terns

Roseate and Common terns were recorded foraging within the Little tern survey area during surveys in 2018, and were noted to feed in a similar area to Little terns but further seaward in deeper waters, and roost on breakwaters. Sandwich tern were recorded throughout the survey area upstream near Tom Roes Point and along coastal feeding areas. Small numbers were recorded roosting on exposed polder walls and on the shoreline at Baltray.

Similar to Little tern, Roseate, Common and Sandwich terns are shallow water feeders and dive to catch their prey. The sediment plume created by dredging operations is not predicted to impact feeding efficacy of tern species as the suspended sediment concentrations will be very low and will disperse relatively quickly as a result of the tidal flow (RPS, 2019).

Roseate, Common and Sandwich terns foraging and roosting in the vicinity of the dredging operations could be vulnerable to a pollution incident affecting the water quality in the receiving environment. It is unlikely that the dredging operations will result in a significant hydrocarbon or chemical spill, however if occurs at a sufficient magnitude it could result in a significant impact on Common tern, Roseate tern or Sandwich tern at an international to local geographical scale.

Wintering Waterbirds

There will be no dredging activity within the polders and so there will be no direct impact on wintering birds. The river channel is frequented regularly by fishing and cargo vessels, pilot boats, and current dredging operations. There is no predicted change in volumes of craft using the river channel as a result of the renewed maintenance dredging licence. The continuation of existing dredging operations will not cause any disturbance to wintering waterbirds occurring within intertidal habitats of the Boyne Estuary at any geographical scale.

Foraging or roosting wintering waterbirds occurring in the vicinity of the dredging operations could be vulnerable to a pollution incident affecting the water quality in the receiving intertidal environment. It is unlikely that the dredging operations will result in a significant hydrocarbon or chemical spill, however if occurs at a sufficient magnitude it could result in a significant impact on wintering waterbirds at an international to local geographical scale.

8.6 MITIGATION MEASURES

This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the proposed activity on biodiversity. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.

Measures to protect the receiving water quality

Mitigation measures to protect water quality in the receiving environment which includes the tidal reach of the River Boyne, Boyne Estuary and the Irish Sea during the dredging operation include:

- Drogheda Port Company will maintain its Tier 1 pollution response unit and equipment for immediate deployment. Drogheda Port Company as part of its pollution plan has a contract call up facility for additional resources and expertise. Drogheda Port Company is the Harbour Authority for Drogheda Port as defined in the Harbour Act 1996 and Harbours (Amendment) Act 2009. Drogheda Port through the powers of the Harbourmaster is the Local Competent Authority for pollution response as per the Sea Pollution Act 1991,

Sea Pollution (Amendment) Act 2009 and the Merchant Shipping (Salvage and Wreck) Act 1993. Under the provisions of the International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 Harbour Authorities must have a contingency plan and requirements for a Tier 1 response in the event of a pollution incident. Drogheda Port has an Emergency Plan (updated June 2014) that includes its Pollution Response Plan (attached in Appendix 8.4 of the Environmental Report). A Tier 1 level equipment stock is retained on site in a fixed and mobile unit for immediate deployment. Drogheda Port also maintains a contract with a pollution contractor for expertise, labour and equipment response if and when required, supplementing its internal resources. The Emergency Plan (including Pollution Response Plan) is the port's generic document for all activities within the port including dredging vessels (these being subject to the same risks as commercially trading vessels).

- Dredging vessels also have their own approved Pollution Plans with retained pollution response equipment on board.
- An emergency spill kit and oil spill containment equipment will be held on board by dredging operators to be able to deal with potential oil spills during dredging operation.
- An Environmental Liabilities Risk Assessment (2015) has been prepared by Aquafact International Services Ltd and is in-use for existing dredging and disposal operations (S00015-02) at Drogheda Port. This document identifies potential risks, e.g. a pollution event, likelihood of risks and mitigation measures to be taken is event occurs, and is contained in Appendix 8.4 of the Environmental Report.

Appendix 8.4 contains the Drogheda Port Company Emergency Plan (including Pollution Response Plan) document and the Environmental Liabilities Risk Assessment (2015) prepared by Aquafact International Services Ltd.

8.7 CUMULATIVE IMPACTS

Maintenance dredging operations are currently in existence at the dredging site. The renewal licence application does not propose to change the operations in any way. The purpose of the maintenance dredging operations at Drogheda Port is to maintain the safe navigation depths for the commercial traffic, fishing and leisure users of the River Boyne, Drogheda Port Company and its facilities and the town of Drogheda. Continuation of maintenance dredging operations will not increase the level of traffic in the River Boyne, estuary and Irish Sea. Existing baseline conditions in the main channel and estuary, the intermittent and transient nature of noise generated by routine traffic into and out of Drogheda Port, combined with the sporadic and time-limited nature of the dredging operations are not predicted to change as a result of a renewed maintenance dredging

Razor clam fishing occurs off the coast of Drogheda under licence from the Sea Fisheries Protection Authority and are discourage from fishing within the shipping fairway to and from Drogheda Port. These fishing methods create suspended solids and turbidity in the water column which are part of the current baseline.

There will be no significant cumulative impacts on water quality in the receiving environment, as a consequence of the proposed activity acting in-combination with other plans and projects, assuming the mitigation measures outlined in Section 1.6 will be implemented in full.

There is potential for cumulative impacts as a consequence of the proposed activity acting in-combination with other plans and projects, on nearby European sites and pNHAs. In light of the above cumulative impact assessment, there is no risk of

cumulative habitat loss as the proposed activity does not overlap with any designated site, or potential impacts on water quality in the downstream surface water environment and designated sites in the receiving environment considering mitigation measures outlined in Section 1.6.

8.8 RESIDUAL IMPACTS

This section will describe impacts arising once mitigation measures are fully implemented.

Designated Areas for Nature Conservation

None of the potential impacts associated with the proposed activity will result in any perceptible residual effect on the receiving environment or on the qualifying interests/special conservation interests of the River Boyne and River Blackwater SAC, the Boyne Coast and Estuary SAC, the Rockabill to Dalkey Island SAC, the Boyne Estuary SPA, the River Nanny and Estuary SPA, the River Boyne and River Blackwater SPA, Rockabill SPA and Dundalk Bay SPA. Therefore, there will not be any residual impacts associated with the proposed activity that will adversely affect the conservation objectives supporting the conservation condition of the qualifying interests/special conservation interests of those European sites, or integrity of nationally designated pNHAs in the River Boyne, Boyne Estuary or receiving Irish Sea.

Habitats

Estuary Habitats

The residual impact on the proposed dredging on the estuarine intertidal and subtidal habitats is considered in the context of the benthic fauna in Section 0.

Fauna

Intertidal Benthic Fauna

Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on intertidal benthic fauna at any geographical scale.

Subtidal Benthic Fauna

Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on subtidal benthic fauna at any geographical scale.

Fish

Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on the fish populations at any geographical scale.

Marine Mammals

Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on marine mammals at any geographical scale.

Otter

Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on Otter at any geographical scale.

Little terns

Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on Little tern at any geographical scale.

Other terns

Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on Roseate tern, Common tern and Sandwich tern at any geographical scale.

Wintering waterbirds

Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on wintering waterbirds at any geographical scale.

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APPENDIX 2.1

ENVIRONMENTAL REPORT SCOPING DOCUMENT

awnconsulting

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

ENVIRONMENTAL SCOPING REPORT

FOR

MAINTENANCE DREDGING AT DROGHEDA PORT,

DROGHEDA, CO. MEATH

Technical Report Prepared For

Captain Martin Donnelly Master Mariner, F.N.I.
Harbour Master Drogheda Port Company

Technical Report Prepared By

Ashley O' Toole, BA (Hons) MCIWM, Senior Consultant

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Title	Senior Consultant	Director
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CONTENTS

1.0 INTRODUCTION

At the request of Drogheda Port Company, AWN Consulting Ltd (AWN) has prepared the following Environmental Scoping Report to accompany the Dumping at Sea permit application for the maintenance dredging operation at Drogheda Port.

This scoping document has been prepared to show the proposed scope of the Environmental Report which will be included in the documentation supporting the permit application. The list of topics is based on the requirements of the Planning and Development Act and Regulations; the EPA Guidelines, the EIA Directive including amendment 2014/52/EU and on previous experience.

An indication of potential significant issues is given under each proposed chapter heading below. Direct, indirect, secondary, cumulative, short, medium and long-term, permanent, temporary, positive and negative effects as well as impact interactions with other topics will all be examined under each topic heading, as relevant and applicable.

As required by the Regulations, any difficulties encountered in preparing the Environmental Report will be indicated.

2.0 SCOPING

This chapter will discuss the scoping process i.e. the basis for the determination of the issues that are to be addressed in the Environmental Report. It will also explain the format of the Environmental Report and the relationship of the section headings in the Environmental Report to the headings prescribed in the Regulations, EPA Guidelines and the new EIA Directive.

It will show that the specialist sections (sections 2.1 to 2.14 below) will generally be arranged as follows:

- Introduction;
  - Methodology;
- Project Description;
  - Principal aspects of relevance to the specific topic;
  - Dredging and dumping phases;
  - Both of the above will rely on details included in the project description and will generally only include additional details where required for assessment of impacts under the specific topic;
- Receiving Environment;
  - Description of the baseline / receiving environment during the dredging and dumping phases of the development;
- Potential Impacts;
  - Assessment of impacts during dredging and dumping phases;
- Mitigation and Monitoring Measures;
  - Description of mitigation and monitoring measures considered necessary to enable the development to proceed without exceeding environmental limits and to keep impacts within acceptable ranges;
- Residual Impacts; and

- Actual impacts that are predicted to occur after taking ameliorative effects of the proposed mitigation measures into account.

2.1 ALTERNATIVES

This chapter will set out the need for the proposed operations and the consideration of alternatives at need, site and design levels, explaining the decisions that led to the selection of the proposed operations and how environmental considerations were taken into account. It will include adequate detail on alternatives and adequate assessment of their impacts to meet the increased emphasis on alternatives arising from Directive 2014/52.

2.2 PROJECT DESCRIPTION

The principal elements of the application will be described, with focus on elements which have greatest potential to cause environmental impacts. This section will generally set out the details of relevance to the environmental assessment process. It will describe the physical characteristics of the project. While aspects that are more relevant under specialist topics rather than for general descriptive purposes, e.g. data on emissions to water and air, will be described in more detail in subsequent specialist sections, they will generally be referred to in outline in this section. All of the subsequent Environmental Report sections will refer to details that are included in this section.

2.3 AIR QUALITY AND CLIMATE

It is expected that assessment of impacts on air quality and climate will not be required for this operation due to the nature of the activity taking place – these elements will be addressed in a screening assessment under this chapter heading.

2.4 BIODIVERSITY

Scott Cawley will prepare the Biodiversity Chapter of the Environmental Report. The methodology for this section will involve review of desk based information from the previous application, relevant ecological publications and databases. Field surveys of the site will be reviewed and updated as appropriate. This will need to address, but may not be limited to, the following ecological issues:

- Impacts on estuarine/marine habitat and fauna in the dredge zone;
- Impacts on marine flora and fauna at the proposed dump at sea site;
- Impacts on marine mammals from operation of dredging equipment and ships;
- Impacts on fish species (focus on, but may not be limited to the following species; salmon, lamprey which are qualifying interests for the SAC); and
- Impacts on winter and breeding (i.e. Little Tern) bird SPA Special Conservation Interest species from dredging and associated activities.

Following this baseline assessment; an impact assessment will be carried out with mitigation and monitoring measures proposed where necessary.

A separate Natura Impact Statement (NIS) will also be prepared in compliance with the specific requirements for this under the Habitats Directive. This will assess potential impacts on relevant European sites.

2.5 CULTURAL HERITAGE, ARCHITECTURE AND ARCHAEOLOGY

It has been determined that the proposed maintenance dredging operations will not have an impact on marine archaeology as the operation does not involve breaking ground. It has been confirmed by the Department of Communications, Climate Action and Environment in writing previously that there is no requirement for archaeological monitoring as part of maintenance dredging at Drogheda Port. Therefore assessment of the impact of the operation on cultural heritage, architecture and archaeology will not be required but will be addressed by reference to this letter, under this chapter heading, in the Environmental Report.

2.6 LAND AND MATERIAL ASSETS

The types of issues that would typically be addressed in this section include likely impacts on the surrounding public infrastructure and physical resources in the environment which may be of either human or natural origin (e.g. water infrastructure, electricity, telecommunications, waste disposal facilities etc.). Water issues will be covered in the Water and Hydrology chapter of the Environmental Report and Waste Management will be dealt with in the Waste Management chapter. There will be no electrical infrastructure demand associated with the dredging operation so there will be no need for an assessment of impact on land and material assets as part of the Environmental Report.

2.7 LANDSCAPE AND VISUAL IMPACT

It is expected that assessment of impacts on landscape and visual impact will not be required for this operation due to the nature of the activity taking place, this topic will be addressed by way of a screening assessment under this chapter heading.

2.8 MAJOR ACCIDENTS

It is expected that the assessment of impacts of major accident hazards will not be required for this operation due to the nature of the activity taking place this topic will be addressed by way of a screening assessment under this chapter heading.

2.9 NOISE AND VIBRATION

It is expected that assessment of noise and vibration impacts will not be required for this project due to the nature of the activity taking place this topic will be addressed by way of a screening assessment under this chapter heading.

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2.10 POPULATION AND HUMAN HEALTH

It is expected that assessment of impacts on population and human health in the surrounding environment will not be required for this project due to the nature of the activity taking place this topic will be addressed by way of a screening assessment under this chapter heading.

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2.11 LAND, SOILS, GEOLOGY AND HYDROGEOLOGY

This section will deal with issues relevant to land, soils, geology and hydrogeology within the dredging location, dumping area and in the surrounding area.

2.11.1 Soil and Geology

A description of the receiving environment will be provided. Information will be presented on bedrock geology as well as overlying quaternary geology. Maps will be provided to illustrate the geology of the area.

The characteristics of the dredging operation, with reference to potential impacts on the marine sediment environment, will be provided. Proposed mitigation measures during the dredging and dumping phases will be discussed. Residual impacts will be assessed and monitoring requirements for the dredging and dumping phases will be specified.

2.11.2 Groundwater

The receiving environment will be assessed and described.

The characteristics and impact of the dredging operation will be discussed in terms of impacts on the groundwater environment during the dredging and dumping phases.

Mitigation measures (during both dredging and dumping) will be proposed and residual impacts following implementation of mitigation measures will be assessed. Any monitoring requirements that are identified for the dredging and dumping phases will be specified.

2.12 TRAFFIC AND TRANSPORTATION

There is limited potential for traffic impacts as the dredging and dumping operation forms part of normal port traffic and is part of general Drogheda Port operations. Therefore it is expected that assessment of traffic and transportation impacts will not be required for this project due to the nature of the activity taking place this topic will be addressed by way of a screening assessment under this chapter heading.

2.13 WATER AND HYDROLOGY

The receiving environment in terms of surface water, water quality, groundwater and the estuarine/marine water body will be assessed and described. The study will include:

- An inspection of the existing water quality analysis data held by Drogheda Port, EPA records and Local Authority records for surface water quality in the vicinity of the site;
- Reference to the River Basin Management Plan for the River Basin District in which the site is located with respect to surface water management.

Mitigation measures (during both dredging and dumping) will be proposed and residual impacts following implementation of mitigation measures will be predicted. Any

monitoring requirements identified for the dredging and dumping phases will be specified. A Stage 1 Flood Risk Assessment will also be carried out.

2.14 WASTE MANAGEMENT

A description of the quantities of sediment to be taken from the dredging sites and subsequently dumped at the dumping sites will be provided. Procedures and systems for managing the sediment during the dredging and dumping phases will be described. Beneficial reuse of the sediment such as inter-tidal beach nourishment and use as sand for recycling will also be discussed.

3.0 CONCLUSIONS

As discussed in sections 2.3 to 2.14 above, the issues which will not require further assessment and which will be addressed in the Environmental Report by way of a screening assessment are impacts related to:

- Air and Quality;
- Cultural Heritage, Architecture and Archaeology;
- Land and Material Assets;
- Landscape and Visual Impact;
- Major Accidents;
- Noise and Vibration;
- Population and Human Health; and
- Traffic and Transportation.

The main issues which will require further assessment and will be discussed in detail in the Environmental Report are impacts related to:

- Biodiversity;
- Land, Soils, Geology and Hydrogeology;
- Water and Hydrology; and
- Waste Management.

APPENDIX 2.2

LIST OF RECIPIENTS/CONSULTEES

LIST OF CONSULTEES/RECIPIENTS

Environmental Pillar Members
An Taisce
Bat Conservation Ireland
Birdwatch
CELT - Centre for Environmental Living and Training
Coastwatch
Coomhola Salmon Trust
Department of Agriculture, Food and the Marine
Department of Transport, Tourism and Sport
ECO UNESCO
Friends of the Earth
Global Action Plan
Gluaiseacht (for Global Justice)
Good Energies Alliance Ireland
Green Economy Foundation
Green Foundation Ireland
Hedge Laying Association of Ireland
Irish Peatlands Conservation Council
Irish Seed Savers Association
Irish Whale & Dolphin Group
Louth County Council
Louth Nature Trust
Marine Institute
Meath County Council
National Parks and Wildlife Service
Native Woodland Trust
Ports Association
Sea Fisheries Ireland

Sonairte (Visitor Eco-centre and Gardens)
Sustainable Ireland (Cultivate)
The Organic Centre
Voice (Voice of Irish Concern for the Environment)
Zero Waste Alliance

APPENDIX 5.1

NRA CRITERIA FOR RATING THE MAGNITUDE AND SIGNIFICANCE OF IMPACTS AT EIA STAGE

NATIONAL ROADS AUTHORITY (NRA, 2009)

Table 1 Criteria for rating site importance of Geological Features (NRA, 2009)

Magnitude of Impact	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale.	Contaminated soil on site with previous heavy industrial usage Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Well drained and/or high fertility soils Moderately sized existing quarry or pit Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance or value on a local scale Degree or extent of soil contamination is moderate on a local scale Volume of peat and/or soft organic soil underlying route is moderate on a local scale	Contaminated soil on site with previous light industrial usage Small recent landfill site for mixed wastes Moderately drained and/or moderate fertility soils Small existing quarry or pit Sub-economic extractable mineral resource
Low	Attribute has a low quality, significance or value on a local scale Degree or extent of soil contamination is minor on a local scale Volume of peat and/or soft organic soil underlying route is small on a local scale	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

Table 2 Criteria for rating impact magnitude at EIS stage – Estimation of magnitude of impact on soil / geology attribute (NRA, 2009)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Table 3 Criteria for rating Site Attributes - Estimation of Importance of Hydrogeology Attributes (NRA, 2009)

Magnitude of Impact	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple well fields Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source

High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers Locally important potablewater source supplying >1000 homes Outer source protection area for regionally important water source Inner source protection area for locally important water source
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying>50 homes Outer source protectionarea for locally important water source
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes

Table 4 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeology Attribute (NRA, 2009)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >2% annually.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Removal of moderate proportion of aquifer. Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems.

		Potential medium risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >1% annually.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer. Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >0.5% annually.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident <0.5% annually.

Table 5: Rating of Significant Environmental Impacts at EIS Stage (NRA, 2009)

Importance of Attribute	**Magnitude of Importance**			
	Negligible	**Small Adverse**	**Moderate Adverse**	**Large Adverse**
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

APPENDIX 5.2

SAMPLING AND ANALYSIS OF SEDIMENTS FROM DROGHEDA PORT FEBRUARY 2019

AQUAFACT (JUNE, 2019)

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00221
Issue Version	2
Customer	Aquafact International Services Ltd, 12 Kilkerrin Park, Liosbaun, Tuam Rd, Galway, H91 FW7V
Customer Reference	Drogheda DaS Sediment
Date Sampled	28-Feb-19
Date Received	06-Mar-19
Date Reported	05-Apr-19
Condition of samples	Cold Satisfactory

This is a revised report containing the additional CRM information and replaces all previously issued versions

Authorised by: Marya Hubbard

Position: Laboratory Manager

Any additional opinions or interpretations found in this report, are outside the scope of UKAS accreditation.

Client Reference:	SOCOTEC Ref:	Matrix	Visual Description

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00221
Issue Version 2

Customer Reference Drogheda DaS Sediment

ST.3	MAR00221.001	Sediment	Brown slightly sandy slightly gravelly organic SILT
ST.4	MAR00221.002	Sediment	Black slightly sandy organic SILT
ST.5	MAR00221.003	Sediment	Black slightly sandy organic SILT
ST.6	MAR00221.004	Sediment	Black slightly sandy organic SILT
ST.7	MAR00221.005	Sediment	Black slightly sandy slightly gravelly organic SILT
ST.8	MAR00221.006	Sediment	Black slightly sandy organic SILT
ST.9	MAR00221.007	Sediment	Black slightly sandy organic SILT
ST.10	MAR00221.008	Sediment	Dark brown slightly sandy organic SILT
ST.11	MAR00221.009	Sediment	Black slightly sandy organic SILT
ST.12	MAR00221.010	Sediment	Black slightly sandy organic SILT with rare rootlets
ST.13	MAR00221.011	Sediment	Light brown slightly sandy organic SILT
ST.14	MAR00221.012	Sediment	Light grey slightly sandy SILT
ST.15	MAR00221.013	Sediment	Black slightly sandy slightly gravelly organic SILT
ST.16	MAR00221.014	Sediment	Brown slightly gravelly slightly silty SAND
ST.17	MAR00221.015	Sediment	Brown SAND with rare shell
ST.18	MAR00221.016	Sediment	Dark brown SAND with rare shell
ST.19	MAR00221.017	Sediment	Light brown SAND with rare shell

		Units	%	%	%	%	%	%
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	SUB_02*
		Limit of Detection	0.2	0.2	N/A	N/A	N/A	N/A
		Accreditation	UKAS	UKAS	N	N	N	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Total Moisture**	**Total Solids**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**	**Density**
ST.3	MAR00221.001	Sediment	63.7	36.3	39.6	12	48.3	2.61
ST.4	MAR00221.002	Sediment	70.8	29.2	0.0	17.5	82.5	2.55
ST.5	MAR00221.003	Sediment	61.8	38.2	0.0	31.0	69.0	2.59
ST.6	MAR00221.004	Sediment	62.4	37.6	0.0	14.0	86.0	2.61
ST.7	MAR00221.005	Sediment	44.3	55.7	12.1	46.5	41.5	2.67
ST.8	MAR00221.006	Sediment	65.7	34.3	0.0	20.4	79.6	2.59
ST.9	MAR00221.007	Sediment	64.4	35.6	0.0	21.7	78.3	2.61
ST.10	MAR00221.008	Sediment	67.5	32.5	0.0	22.5	77.5	2.56
ST.11	MAR00221.009	Sediment	63.6	36.4	0.0	30.8	69.2	2.60
ST.12	MAR00221.010	Sediment	61.6	38.4	0.0	24.7	75.3	2.57
ST.13	MAR00221.011	Sediment	63.4	36.6	0.0	25.5	74.5	2.62
ST.14	MAR00221.012	Sediment	52.6	47.4	0.0	38.3	61.7	2.66
ST.15	MAR00221.013	Sediment	47.6	52.4	8.4	34.1	57.5	2.67

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Test Report ID MAR00221
Issue Version 2

Customer Reference Drogheda DaS Sediment

ST.16	MAR00221.014	Sediment	38.0	62.0	13.9	45.1	41.0	2.68
ST.17	MAR00221.015	Sediment	26.0	74.0	0.0	98.8	1.2	2.67
ST.18	MAR00221.016	Sediment	28.9	71.1	3.4	82.5	14.1	2.67
ST.19	MAR00221.017	Sediment	22.4	77.6	0.0	99.2	0.8	2.71
Reference Material (% Recovery)			N/A	N/A	N/A	N/A	N/A	N/A
QC Blank			N/A	N/A	N/A	N/A	N/A	N/A

* See Report Notes

			Units	%	% M/M
			Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*
			Limit of Detection	0.12	0.02
			Accreditation	N	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**		**Carbonate %**	**TOC**
ST.3	MAR00221.001	Sediment		12.2	4.51
ST.4	MAR00221.002	Sediment		17.3	2.16
ST.5	MAR00221.003	Sediment		8.16	2.45
ST.6	MAR00221.004	Sediment		9.12	2.34
ST.7	MAR00221.005	Sediment		6.72	1.28
ST.8	MAR00221.006	Sediment		7.44	2.33
ST.9	MAR00221.007	Sediment		14.9	2.18
ST.10	MAR00221.008	Sediment		12.5	2.79
ST.11	MAR00221.009	Sediment		7.20	2.63
ST.12	MAR00221.010	Sediment		10.6	2.27
ST.13	MAR00221.011	Sediment		12.0	2.19
ST.14	MAR00221.012	Sediment		8.40	1.61
ST.15	MAR00221.013	Sediment		7.44	1.50
ST.16	MAR00221.014	Sediment		10.3	0.93
ST.17	MAR00221.015	Sediment		4.08	0.14
ST.18	MAR00221.016	Sediment		2.40	0.30
ST.19	MAR00221.017	Sediment		2.16	0.09
Reference Material (% Recovery)				N/A	98
QC Blank				N/A	<0.02

* See Report Notes

Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
Limit of Detection	1	0.1	0.5	2	2	1	0.01
Accreditation	UKAS	N	N	UKAS	UKAS	N	N

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Test Report ID MAR00221
Issue Version 2

Customer Reference Drogheda DaS Sediment

Client Reference:	SOCOTEC Ref:	Matrix	Arsenic (HF-MS)	Cadmium (HF-MS)	Chromium (HF-MS)	Copper (HF-MS)	Lead (HF-MS)	Manganese (HF-MS)	Mercury (Tot.MS)
ST.3	MAR00221.001	Sediment	12.9	0.7	92.2	58.3	44.8	12102	0.05
ST.4	MAR00221.001	Sediment	12.2	0.4	52.9	35.7	27.1	1489	0.05
ST.5	MAR00221.001	Sediment	9.1	0.7	51.3	24.3	36.7	761	0.06
ST.6	MAR00221.001	Sediment	12.2	0.9	65.4	29.2	36.3	824	0.06
ST.7	MAR00221.001	Sediment	7.8	0.4	48.9	24.3	23.7	456	0.04
ST.8	MAR00221.001	Sediment	10.8	0.7	64.6	46.7	31.9	641	0.07
ST.9	MAR00221.001	Sediment	9.9	0.5	56.9	23.1	28.1	567	0.05
ST.10	MAR00221.001	Sediment	9.6	0.4	36.3	13.9	21	632	0.05
ST.11	MAR00221.001	Sediment	11.7	1.4	57.7	32.1	105	646	0.09
ST.12	MAR00221.001	Sediment	9.6	0.5	59.9	22.9	35.9	869	0.05
ST.13	MAR00221.001	Sediment	9.4	0.4	46.5	21.6	25.3	741	0.04
ST.14	MAR00221.001	Sediment	10.8	0.4	57.1	16.2	28.3	594	0.05
ST.15	MAR00221.001	Sediment	9.5	0.4	46.5	13.1	23.7	426	0.04
ST.16	MAR00221.001	Sediment	8.1	0.3	36.1	10.7	15.8	464	0.02
ST.17	MAR00221.001	Sediment	4.6	<0.1	16.7	6.4	7.5	216	<0.01
ST.18	MAR00221.001	Sediment	5.3	<0.1	24.2	6.6	11.8	266	<0.01
ST.19	MAR00221.001	Sediment	4.2	<0.1	17	4	7.5	229	<0.11
Certified Reference Material 2702 (% Recovery)			97	100	95	94	91	101	99
Certified Reference Material 2702			35.8	~ 2	~ 279	81.9	105	~ 1356	~ 0.02
QC Blank			<1	<0.1	<0.5	<2	<2	<1	<0.01

* See Report Notes

~ Indicates result is for an In-house Reference Material

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	0.5	3	10	0.5
		Accreditation	N	N	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Nickel (HF-MS)**	**Zinc (HF-MS)**	**Aluminium(HF-OES)**	**Lithium (HF-OES)**
ST.3	MAR00221.001	Sediment	32.9	77.7	54700	34.5
ST.4	MAR00221.001	Sediment	27.5	124	64900	26.9
ST.5	MAR00221.001	Sediment	27.8	135	65000	26.6
ST.6	MAR00221.001	Sediment	32.7	148	65200	36.0
ST.7	MAR00221.001	Sediment	28.0	129	45800	26.5
ST.8	MAR00221.001	Sediment	39.1	139	77600	43.5
ST.9	MAR00221.001	Sediment	28.4	128	61600	32.8
ST.10	MAR00221.001	Sediment	19.1	93.1	44200	21.7
ST.11	MAR00221.001	Sediment	30.4	247	56900	31.4

Certificate of Analysis

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Test Report ID MAR00221
Issue Version 2

Customer Reference Drogheda DaS Sediment

ST.12	MAR00221.001	Sediment	31.1	138	54600	27.6
ST.13	MAR00221.001	Sediment	25.3	114	54800	29.2
ST.14	MAR00221.001	Sediment	27.8	113	57000	34.3
ST.15	MAR00221.001	Sediment	22.6	92.9	47400	33.0
ST.16	MAR00221.001	Sediment	17.3	64.3	26600	20.7
ST.17	MAR00221.001	Sediment	8.0	34.7	15900	12.0
ST.18	MAR00221.001	Sediment	10.1	53.4	21000	16.2
ST.19	MAR00221.001	Sediment	7.1	33.7	15600	11.1
Certified Reference Material 2702 (% Recovery)			102	101	107	104
Certified Reference Material 2702			~ 60	~ 426	84900	~ 57
QC Blank			<0.5	<3	<10	<0.5

* See Report Notes

~ Indicates result is for an In-house Reference Material

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	N	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
ST.4	MAR00221.002	Sediment	<5	<5
ST.5	MAR00221.003	Sediment	<5	<5
ST.6	MAR00221.004	Sediment	<5	<5
ST.7	MAR00221.005	Sediment	<5	<5
ST.8	MAR00221.006	Sediment	<5	<5
ST.9	MAR00221.007	Sediment	<5	<5
ST.10	MAR00221.008	Sediment	<5	<5
ST.11	MAR00221.009	Sediment	<5	<5
ST.12	MAR00221.010	Sediment	<5	16.4
ST.13	MAR00221.011	Sediment	<5	<5
ST.14	MAR00221.012	Sediment	<5	<5
ST.15	MAR00221.013	Sediment	<5	<5
ST.16	MAR00221.014	Sediment	<5	<5
ST.17	MAR00221.015	Sediment	<5	<5
ST.18	MAR00221.016	Sediment	<5	<5
ST.19	MAR00221.017	Sediment	<5	<5
Certified Reference Material BCR-646 (% Recovery)			80	67

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

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Customer Reference Drogheda DaS Sediment

Certified Reference Material BCR-646			614	320							
QC Blank			<1	<1							
		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)			
		Method No	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303			
		Limit of Detection	1	1	1	1	1	1			
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS			
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**			
ST.4	MAR00221.002	Sediment	10.4	5.84	18.0	55.0	64.0	73.5			
ST.5	MAR00221.003	Sediment	8.99	8.76	29.5	107	106	131			
ST.6	MAR00221.004	Sediment	7.64	6.67	16.1	54.2	71.2	108			
ST.7	MAR00221.005	Sediment	4.24	2.74	9.71	27.1	32.9	41.4			
ST.8	MAR00221.006	Sediment	8.74	6.92	19.5	63.7	75.4	99.7			
ST.9	MAR00221.007	Sediment	7.17	6.18	15.8	54.5	67.3	77.2			
ST.10	MAR00221.008	Sediment	8.26	6.15	15.8	69.3	72.8	100			
ST.11	MAR00221.009	Sediment	10.0	5.73	17.5	60.5	70.9	91.6			
Certified Referen e Material CRM180013 1941b (% ecovery)			68	99	70	72	62	96			
Certified Reference Material CRM180013 1941b			25.9	52.9	128	241	223	433			
QC Blank			<1	<1	<1	<1	<1	<1			

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF**	**CHRYSENE**	**DBENZAH**	**FLUORANT**	**FLUORENE**
ST.4	MAR00221.002	Sediment	67.2	43.1	91.7	12.0	120	18.9
ST.5	MAR00221.003	Sediment	91.9	68.1	140	22.2	204	20.5
ST.6	MAR00221.004	Sediment	80.6	40.9	78.0	17.6	102	21.1
ST.7	MAR00221.005	Sediment	31.5	19.9	38.7	6.43	51.8	8.89
ST.8	MAR00221.006	Sediment	68.6	43.7	84.0	15.7	127	21.4
ST.9	MAR00221.007	Sediment	62.9	45.8	81.8	14.4	118	16.4
ST.10	MAR00221.008	Sediment	74.0	47.3	113	16.9	130	19.7
ST.11	MAR00221.009	Sediment	79.4	44.6	90.9	15.6	135	24.9
Certified Referen e Material CRM180013 1941b (% Recovery)			72	87	100	105	87	51
Certified Reference Material CRM180013 1941b			222	196	397	55.7	567	43.6
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

Certificate of Analysis

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Customer Reference Drogheda DaS Sediment

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		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
ST.4	MAR00221.002	Sediment	61.2	26.6	87.3	111	560000
ST.5	MAR00221.003	Sediment	96.0	26.3	110	170	548000
ST.6	MAR00221.004	Sediment	81.0	27.1	67.9	91.7	303000
ST.7	MAR00221.005	Sediment	34.0	13.6	30.4	51.8	128000
ST.8	MAR00221.006	Sediment	70.3	30.1	73.5	112	232000
ST.9	MAR00221.007	Sediment	64.4	24.4	77.4	99.2	205000
ST.10	MAR00221.008	Sediment	75.3	29.4	78.7	116	280000
ST.11	MAR00221.009	Sediment	82.6	29.7	80.1	115	271000
Certified Referen e Material CRM180013 1941b (% Recovery)			75	60	76	76	116~
Certified Reference Material CRM180013 1941b			257	507	310	444	N/A
QC Blank			<1	<1	<1	<1	<100

For full analyte name see method summaries

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		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
ST.12	MAR00221.010	Sediment	63.6	7.93	34.0	34.0	42.8	72.9
ST.13	MAR00221.011	Sediment	11.6	5.49	16.3	50.9	55.7	77.3
ST.14	MAR00221.012	Sediment	9.33	8.95	29.6	93.8	102	123
ST.15	MAR00221.013	Sediment	50.9	99.9	81.9	177	449	552
ST.16	MAR00221.014	Sediment	11.4	11.7	30.0	111	113	115
ST.17	MAR00221.015	Sediment	<1	<1	<1	1.16	1.38	1.69
ST.18	MAR00221.016	Sediment	<1	<1	1.29	4.91	5.55	7.61
ST.19	MAR00221.017	Sediment	<1	<1	<1	<1	<1	<1
Certified Referen e Material CRM180013 1941b (% Recovery)			68	99	70	72	62	96
Certified Reference Material CRM180013 1941b			25.9	52.9	128	241	223	433
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

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Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
Method No	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

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Customer Reference Drogheda DaS Sediment

		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF**	**CHRYSENE**	**DBENZAH**	**FLUORANT**	**FLUORENE**
ST.12	MAR00221.010	Sediment	49.7	36.8	59.2	11.1	266	61.9
ST.13	MAR00221.011	Sediment	59.6	33.2	73.1	12.3	107	22.2
ST.14	MAR00221.012	Sediment	84.1	51.6	119	19.8	165	18.5
ST.15	MAR00221.013	Sediment	387	318	647	70.3	1660	69.5
ST.16	MAR00221.014	Sediment	78.2	55.8	127	20.7	191	16.5
ST.17	MAR00221.015	Sediment	1.83	1.42	1.96	<1	2.63	<1
ST.18	MAR00221.016	Sediment	5.93	4.45	7.08	1.17	9.16	1.33
ST.19	MAR00221.017	Sediment	<1	<1	<1	<1	1.06	<1
Certified Referen e Material CRM180013 1941b (% Recovery)			72	87	100	105	87	51
Certified Reference Material CRM180013 1941b			222	196	397	55.7	567	43.6
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

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		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	ASC/SOP/303	
		Limit of Detection	1	1	1	1	100	
		Accreditation	UKAS	UKAS	UKAS	UKAS	N	
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**	
ST.12	MAR00221.010	Sediment	52.6	27.5	522	130	210000	
ST.13	MAR00221.011	Sediment	64.9	28.9	86.7	91.5	158000	
ST.14	MAR00221.012	Sediment	95.9	27.7	93.2	139	111000	
ST.15	MAR00221.013	Sediment	422	248	2020	1240	128000	
ST.16	MAR00221.014	Sediment	86.0	28.6	90.2	173	79200	
ST.17	MAR00221.015	Sediment	1.97	<1	2.10	2.27	6930	
ST.18	MAR00221.016	Sediment	6.65	2.38	4.95	8.00	11900	
ST.19	MAR00221.017	Sediment	<1	<1	<1	<1	3490	
Certified Referen e Material CRM180013 1941b (% Recovery)			75	60	76	76	106~	
Certified Reference Material CRM180013 1941b			257	507	310	444	N/A	
QC Blank			<1	<1	<1	<1	<100	

For full analyte name see method summaries

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Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	
Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	
Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	
Date Analysed	25/03/2019	25/03/2019	25/03/2019	25/03/2019	25/03/2019	25/03/2019	
Accreditation	N	N	N	N	N	N	

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Customer Reference Drogheda DaS Sediment

Client Reference:	SOCOTEC Ref:	Matrix	PCB28	PCB52	PCB101	PCB118	PCB138	PCB153
ST.4	MAR00221.002	Sediment	0.419	0.386	0.228	0.254	0.270	0.292
ST.5	MAR00221.003	Sediment	0.401	0.364	0.241	0.256	0.323	0.301
ST.6	MAR00221.004	Sediment	0.491	0.449	0.264	0.277	0.313	0.319
ST.7	MAR00221.005	Sediment	0.139	0.132	0.089	0.091	0.111	0.103
ST.8	MAR00221.006	Sediment	0.366	0.285	0.204	0.317	0.305	0.337
ST.9	MAR00221.007	Sediment	0.329	0.276	0.210	0.235	0.304	0.275
ST.10	MAR00221.008	Sediment	0.367	0.303	0.183	0.263	0.253	0.282
ST.11	MAR00221.009	Sediment	0.298	0.241	0.146	0.176	0.185	0.205
ST.12	MAR00221.010	Sediment	0.509	0.438	0.224	0.246	0.271	0.266
ST.13	MAR00221.011	Sediment	0.395	0.299	0.186	0.231	0.252	0.245
ST.14	MAR00221.012	Sediment	0.269	0.184	0.108	0.151	0.147	0.144
ST.15	MAR00221.013	Sediment	0.246	0.166	0.109	0.151	0.176	0.162
ST.16	MAR00221.014	Sediment	0.373	1.35	2.56	2.08	3.44	3.60
ST.17	MAR00221.015	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
ST.18	MAR00221.016	Sediment	0.162	0.161	<0.08	<0.08	<0.08	<0.08
ST.19	MAR00221.017	Sediment	0.092	<0.08	<0.08	<0.08	<0.08	<0.08
Certified eference Material SRM 1941b (% Recovery)			73	103	104	102	118	102
Certified Reference Material SRM 1941b			3.30	5.42	5.34	4.33	4.24	5.59
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries

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		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.1	0.1	0.1	0.1	0.1	0.1
		Date Analysed	25/03/2019	25/03/2019	25/03/2019	25/03/2019	25/03/2019	25/03/2019	25/03/2019
		Accreditation	N	N	N	N	N	N	N
Client Reference:	SOCOTEC Ref:	Matrix	PCB180	AHCH	BHCH	GHCH	DIELDRIN	HCB	DDE
ST.4	MAR00221.002	Sediment	0.110	<0.1	<0.1	<0.1	0.435	0.147	0.373
ST.5	MAR00221.003	Sediment	0.112	0.113	<0.1	0.133	0.359	0.190	0.441
ST.6	MAR00221.004	Sediment	0.129	<0.1	<0.1	<0.1	0.391	0.125	1.19
ST.7	MAR00221.005	Sediment	<0.08	<0.1	<0.1	<0.1	0.126	0.058	0.159
ST.8	MAR00221.006	Sediment	0.111	<0.1	<0.1	<0.1	0.361	0.115	0.414
ST.9	MAR00221.007	Sediment	0.149	<0.1	<0.1	<0.1	0.322	0.119	0.348
ST.10	MAR00221.008	Sediment	0.106	<0.1	<0.1	<0.1	0.266	0.176	0.303
ST.11	MAR00221.009	Sediment	0.094	<0.1	<0.1	<0.1	0.362	0.094	0.299
ST.12	MAR00221.010	Sediment	0.105	<0.1	<0.1	<0.1	0.158	0.184	0.282

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ST.13	MAR00221.011	Sediment	0.115	<0.1	<0.1	<0.1	0.191	0.159	0.271
ST.14	MAR00221.012	Sediment	<0.08	<0.1	<0.1	<0.1	<0.1	0.105	0.136
ST.15	MAR00221.013	Sediment	<0.08	<0.1	<0.1	<0.1	0.142	<0.1	0.153
ST.16	MAR00221.014	Sediment	1.85	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ST.17	MAR00221.015	Sediment	<0.08	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ST.18	MAR00221.016	Sediment	<0.08	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ST.19	MAR00221.017	Sediment	<0.08	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Certified eference Material SRM 1941b (% Recovery)			102	119~	117~	127~	157~	132	103
Certified Reference Material SRM 1941b			3.32	N/A	N/A	N/A	N/A	7.73	3.32
QC Blank			<0.08	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

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		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.1	0.1
		Date Analysed	25/03/2019	25/03/2019
		Accreditation	N	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**DDT**	**DDD**
ST.4	MAR00221.002	Sediment	<0.1	0.426
ST.5	MAR00221.003	Sediment	<0.1	0.399
ST.6	MAR00221.004	Sediment	<0.1	2.12
ST.7	MAR00221.005	Sediment	<0.1	0.179
ST.8	MAR00221.006	Sediment	0.111	0.623
ST.9	MAR00221.007	Sediment	<0.1	0.333
ST.10	MAR00221.008	Sediment	<0.1	0.321
ST.11	MAR00221.009	Sediment	<0.1	0.329
ST.12	MAR00221.010	Sediment	<0.1	0.316
ST.13	MAR00221.011	Sediment	<0.1	0.415
ST.14	MAR00221.012	Sediment	<0.1	0.244
ST.15	MAR00221.013	Sediment	<0.1	0.223
ST.16	MAR00221.014	Sediment	<0.1	0.160
ST.17	MAR00221.015	Sediment	<0.1	<0.1
ST.18	MAR00221.016	Sediment	<0.1	<0.1
ST.19	MAR00221.017	Sediment	<0.1	<0.1
Certified eference Material SRM 1941b (% Recovery)			113~	122
Certified Reference Material SRM 1941b			N/A	5.69

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	QC Blank	<0.1	<0.1

For full analyte name see method summaries

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Test Report ID

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Drogheda DaS Sediment

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
SOCOTEC Env Chem*	MAR00221.001-.017	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR00221.001-.017	Analysis was conducted by an approved subcontracted laboratory.
SUB_02*	MAR00221.001-.017	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR00221.001-.017	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted to improve the signal to noise ratio but in doing so, the detection limit for this test has been elevated.
ASC/SOP/303	MAR00221.001-.017	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.

DEVIATING SAMPLE STATEMENT

Deviation Code	Devation Definition	Sample ID	Deviation Details. The following information should be taken into consideration when using the data contained within this report
D1	Holding Time Exceeded	N/A	N/A
D2	Handling Time Exceeded	N/A	N/A
D3	Sample Contaminated through Damaged Packaging	N/A	N/A
D4	Sample Contaminated through Sampling	N/A	N/A
D5	Inappropriate Container/Packaging	N/A	N/A
D6	Damaged in Transit	N/A	N/A
D7	Insufficient Quantity of Sample	N/A	N/A
D8	Inappropriate Headspace	N/A	N/A
D9	Retained at Incorrect Temperature	N/A	N/A
D10	Lack of Date & Time of Sampling	N/A	N/A
D11	Insufficient Sample Details	N/A	N/A

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Drogheda DaS Sediment

Method	Sample and Fraction Size	Method Summary
Total Solids	Wet Sediment	Calculation (100%-Moisture Content).Moisture content determined by drying a portion of the sample at 105°C to constant weight.
Total Organic Carbon (TOC)	Air dried and seived to <2mm	Carbonate removal and sulphurous acid/combustion at 800°C/NDIR.
Carbonate %	Air dried and seived to <2mm	Quantitative digestion with Hydrochloric Acid back titration with 1M Sodium Hydroxide to pH 7
Metals	Air dried and seived to <2mm	HF/Boric extraction followed by ICP analysis.
Mercury	Air dried and seived to <2mm	Nitric/peroxide extractin followed by ICPMS analysis.
Organotins	Wet Sediment <2mm	Solvent extraction and derivatisation followed by GC-MS analysis.
Polyaromatic Hydrocarbons (PAH)	Wet Sediment <2mm	Solvent extraction and clean up followed by GC-MS analysis.
Total Hydrocarbon Content (THC)	Wet Sediment <2mm	Solvent extraction and clean up followed by GC-FID analysis.
Polychlorinated Biphenyls (PCBs)	Air dried and seived to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.
Organochlorine Pesticides (OCPs)	Air dried and seived to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.

Analyte Definitions

Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name

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Test Report ID

Issue Version

Customer Reference

ACENAPTH	Acenaphthene	CHRYSENE	Chrysene	THC	Total Hydrocarbon Content
ACENAPHY	Acenaphthylene	DBENZAH	Diben[ah]anthracene	AHCH	alpha-Hexachlorcyclohexane
ANTHRACN	Anthracene	FLUORANT	Fluoranthene	BHCH	beta-Hexachlorcyclohexane
BAA	Benzo[a]anthracene	FLUORENE	Fluorene	GHCH	gamma-Hexachlorcyclohexane
BAP	Benzo[a]pyrene	INDPYR	Indeno[1,2,3-cd]pyrene	DIELDRIN	Dieldrin
BBF	Benzo[b]fluoranthene	NAPTH	Naphthalene	HCB	Hexachlorobenzene
BENZGHIP	Benzo[ghi]perylene	PHENANT	Phenanthrene	DDE	p,p'-Dichorodiphenyldicloroethylene
BKF	Benzo[k]fluoranthene	PYRENE	Pyrene	DDT	p,p'-Dichorodiphenyltrichloroethane
				DDD	p,p'-Dichlorodiphenyldichloroethane

APPENDIX 6.1

CRITERIA FOR RATING SITE ATTRIBUTES – ESTIMATION OF IMPORTANCE OF HYDROLOGY ATTRIBUTES

NATIONAL ROADS AUTHORITY (NRA, 2009)

Table 1 Criteria for rating Site Attributes - Estimation of Importance of Hydrology Attributes (NRA)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes Quality Class B (Biotic Index Q3-4) Flood plain protecting between 5 and 50 residential or commercial properties from flooding Locally important amenity site for wide range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2- 3) Flood plain protecting between 1 and 5 residential or commercial properties from flooding
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of local people

APPENDIX 6.2

THE MARINE STRATEGY FRAMEWORK DIRECTIVE PROGRAMME OF MEASURES SUMMARY REPORT RECOMMENDED MEASURES

SUSTAINABLE ENVIRONMENT ABUNDANT SEAS (SEAS, 2016)

Code	Measure	Relevant Descriptor(s)
M001	Continue to apply the *Natura* Directives (Birds Directive [2009/147/EC] and Habitats Directive [92/43/EEC]) and associated national regulations as laid down in S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011.	1, 4, 6
M002	Complete the identification of Special Areas of Conservation by the end of 2015.	1, 4, 6
M003	Continue the protection of species and habitats listed in Annex I and II of the Habitats Directive (92/43/EEC) through the designation of Ireland's network of Special Areas of Conservation.	1, 4, 6
M004	Continue implementing an appropriate monitoring and assessment strategy addressing the distribution, extent and condition of habitats and species to support conservation status assessment under the Habitats Directive (92/43/EEC).	1, 4, 6
M005	Continue to apply the requirement for Appropriate Assessment of activities within *Natura* sites as required under Article 6(3) of the Habitats Directive (92/43/EEC).	1, 4, 6
M006	Continue the protection of wild bird species through the designation of Ireland's network of Special Protection Areas under the Birds Directive (2009/147/EC).	1, 4, 6
M007	Update regional lists of protected plant species and propose protection status for other species and habitats on the scale of the marine subregion.	1, 4, 6
M008	Continued implementation of OSPAR recommendations for Threatened and/or Declining habitats and species.	1, 4, 6
M009	To continue to investigate the distribution of habitats through seabed surveys and monitoring through initiatives such as the INtegrated Mapping FOr the Sustainable Development of Ireland's MARine Resource (INFOMAR) Programme.	1, 4, 6
M010	To continue to report data on habitat distribution to the OSPAR habitat mapping database.	1, 6
M011	Implementation of the Water Framework Directive (2000/60/EEC) River Basin Management Plans which include measures aimed toward the achievement of Good Ecological Status of coastal and transitional intertidal waters bodies.	1, 4, 5, 6, 8, 9
M012	Maintain the Water Framework Directive River Classification Scheme and associated management measures.	1, 4, 5, 6, 8, 9
M013	Continue to implement Environmental Impact Assessment Directive (85/337/EEC) in order to identify, minimise and mitigate potential adverse environmental impacts.	1, 4, 5, 6, 7, 8, 10, 11
M014	Continue to implement the Strategic Environmental Assessment Directive (2001/42/EC) in order to identify, minimise and mitigate potential adverse environmental impacts.	1, 2, 3, 4, 5, 6, 7, 8, 10, 11
M015	Awareness and training of best practices in maritime and coastal activities and preservation of the marine environment.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
M016	Continue to ensure coherence of Ireland's network of marine protected areas by setting up increased protection areas using tools such as habitat protection orders, no-take zones etc.	1, 4, 6
M017	To continue to consider whether sites justify selection as Marine Protected Areas.	1, 3, 4, 6, 7
M018	Set up (temporary or permanent) Marine Protected Areas in functional zones for fish.	1, 3, 4, 6
M019	Develop a national strategy to create and manage Ireland's network of Marine Protected Areas.	1, 4, 6

M020	To continue to develop shellfish stock assessments which take into account requirements for protected bird species at national level within 6 nautical miles.	1, 4, 6
M021	Promote site-specific measures to protect island bird colonies from invasion by nonindigenous predatory mammals.	1, 2, 4
M022	Continue to be informed by the Action plans developed by BirdWatch Ireland.	1, 4, 6

Code	Measure	Relevant Descriptor(s)
M023	Continue to implement ongoing measures to protect sites important for marine waterbird species including Natural Heritage Areas, Wildfowl Sanctuaries and Irish wetlands designated under the Ramsar Convention on Wetlands.	1, 4, 6
M024	Continue to apply the Wildlife Acts 1976 to 2012.	1, 4, 6
M025	Fulfil the obligations for the protection of migratory waterbird species.	1, 4
M026	Continue to apply the regulations that enforce the Wildlife Acts and Regulations which makes it an offence to kill, injure or capture marine mammal species, and to cause damage to certain areas used by the species for shelter or protection, or to disturb animals occupying such areas.	1, 4
M027	Continue to enforce legislation which makes it an offence to intentionally kill, injure, take, disturb, possess or trade species listed under the Wildlife Act.	1, 4
M028	Continue to enforce Wildlife Acts and Regulations which makes it an offence to kill, injure or capture birds and to cause damage to and their nests and eggs.	1, 4
M029	Continue to implement the licensing process controlling the possession of certain birds or animals.	1, 2, 4
M030	Continue to implement the licensing process controlling the import/export trade of certain birds or animals.	1, 4
M031	Continue to implement the licensing process controlling hunting of certain birds or animals.	1, 4
M032	Continue to implement the licensing process governing disturbance of protected plant and animal species.	1, 4, 6
M033	To apply guidance in place for carrying out activities (e.g. pile driving, seismic survey) in Irish marine waters which have the potential to kill, injure or disturb a marine European species (i.e. any cetacean or bird species).	1, 11
M034	Promote wildlife watching Codes of Practice to minimise risk of disturbance to marine wildlife including birds and mammals.	1
M035	Continue to implement Ireland's Cetacean Conservation Plan.	1, 4, 10, 11
M036	Continue the National Marine Mammal By-catch Monitoring Programme.	1, 4
M037	Manage the risk posed by sea fisheries to protected cetaceans in accordance with the Risk Assessment for Special Areas of Conservation.	1, 4
M038	Maintain the use of acoustic deterrents ("pingers") in identified fisheries on vessels larger than 12m in accordance with EU regulations.	1
M039	Complete the designation process for proposed Special Areas of Conservation for harbour porpoise and bottle nosed dolphin in Irish waters.	1

M040	Maintain the moratorium on commercial whaling within the fisheries limits of the State (i.e. out to 200 miles from the coast) and to continue to prohibit the hunting by Irish registered ships of certain whales, including right whales and female whales accompanied by calves, outside the fisheries limits of the State.	1
M041	Continue to effectively control and promote compliance in accordance with the EU fisheries legislation.	1, 3, 4, 6
M042	To apply the Precautionary Principle to fisheries management to ensure that the exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the Maximum Sustainable Yield.	1, 3, 4
M043	Continue to support the development and implementation of Multi Annual Plans at EU level.	1, 3, 4
M044	Continue to develop fishery closure areas and seasonal closures in conjunction with the Regional Groups of Member States and Advisory Councils based on the best available advice.	1, 3, 4, 6

Code	Measure	Relevant Descriptor(s)
M045	Continue to examine and develop, where appropriate, closures of spawning and nursery grounds to preserve sensitive stocks at the national level, where sites are within the 6 nautical mile limit, and at the EU level.	1, 3, 4, 6
M046	Implementation of the Landing Obligation to help eliminate waste, protect young fish, rebuild fish stocks and ensure a sustainable future for the fishing industry.	1, 3, 4
M047	Setting and enforcing of annual Total Allowable Catches and quotas.	1, 3, 4
M048	Setting of conservation reference sizes to help lead to the reduction in overall fishing pressure on target species, including sensitive species.	1, 3, 4
M049	Continue to implement local conservation reference sizes stocks/species under national measures within the 6 nautical mile limit.	1, 3, 4
M050	Promote the use of selective fishing gear in order to reduce high levels of unwanted catches and to gradually eliminate discards.	1, 3, 4
M051	Promote activities that reduce catch of juvenile fish (e.g. avoidance of nursery/spawning grounds and juvenile fish aggregations). Supporting technical measures may include regulation of net size.	1, 3, 4
M052	To continue to examine and develop, where appropriate, the use of different types of fishing gear at the national level within the 6 nautical mile limit, and at the EU level.	1, 3, 4, 6
M053	To develop and implement fishery management measures for Marine Protected Areas (MPAs) at national level where sites are within the 6 nautical mile limit and at regional EU level for MPAs outside the 6 nautical mile limit.	1, 3, 4, 6
M054	To deliver compliance with legislation which prohibits the removal of shark fins at sea and other measures which support the conservation of elasmobranch species.	1, 3, 4
M055	Regulate recreational and commercial fisheries to support conservation and sustainable exploitation.	1, 3, 4
M056	Continue to implement the salmon licensing and log book reporting scheme.	1, 3, 4
M057	Apply the compulsory management schemes for species below their conservation objectives.	1, 3, 4

M058	Continued implementation of Ireland's Eel Management Plans in line with the requirements of Council Regulation (No. 1100/2007).	1, 3, 4
M059	Continue to manage the impacts of sea-fisheries and aquaculture in Special Areas of Conservation and Special Protection Areas.	1, 2, 3, 4, 5, 6
M061	Ensure that operators restore shellfish growing areas once production ends.	1, 3, 4, 6
M062	Continue to implement the EU fishery management measures for the protection of relevant habitats included on the OSPAR Threatened and/or Declining list.	1, 6
M063	Continue to implement the EU fishery management measures for the protection of relevant species included on the OSPAR Threatened and/or Declining list.	1, 3, 4
M064	To continue to support effective conservation methods for elasmobranch species delivering on the EU Action Plan for the Conservation and Management of Sharks.	1, 3, 4
M066	Apply Environmental Liability Directive (2004/35/EC) as appropriate.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
M067	Implementation of Directive 2013/30/EU on safety of offshore oil and gas operations within Irish Legislation. This ensures protection of the marine environment through implementation of safety measures/mechanisms for offshore oil and gas operations. This includes, *inter alia*, as per Article 8 of Directive 2013/30/EU, the appointment of the Commission of Energy Regulation (CER) as the competent authority responsible for regulatory functions in this regard.	1, 6, 8, 10, 11

Code	Measure	Relevant Descriptor(s)
M068	Ensuring on-going implementation of guidelines for the assessment of dredged material for disposal in Irish waters, the application of the Foreshore Acts and the licensing, permitting and enforcement of activities under the Dumping At Sea Act.	1, 6, 7, 8, 10
M070	Continue to enforce Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC) and associated national Regulations with respect to the control of invasive species.	2
M071	Continue to develop invasive species action plans. Implement commitment to develop an (Aquaculture) Industry Code of Practice for Invasive Alien Species.	2, 6
M072	Continue to apply Council Directive 2006/88/EC & national regulations with regard to the movement of aquaculture species [European Communities (Health of Aquaculture Animals and Products) Regulations 2008 (S.I. No. 261 of 2008) as amended].	2
M074	Continue to apply to aquaculture licences for the cultivation of finfish and shellfish the condition that the Licensee shall comply with any regulations in force governing the movement of cultured marine species.	2, 3
M075	The implementation of the Regulation (EU) No. 1143/2014 of the European Parliament and of the Council on the prevention and management of the introduction and spread of invasive alien species.	2
M076	Continue to promote the Invasive Species Ireland's All-Island (Republic of Ireland and United Kingdom) Code of Practice for Water Users as a source of guidance on how to act responsibly within the law to prevent the introduction and manage the spread of alien invasive species.	2
M077	Maintain and expand as necessary a watch and alert system for non-indigenous species.	2

M078	Upon the ratification of the International Maritime Organization (IMO) Ballast Water Convention and its implementation under Irish law by statute Ireland will apply IMO and OSPAR Guidelines for the control and management of ship's ballast water to minimise the transfer of harmful aquatic organisms and pathogens.	2
M079	Continue to apply the Alien and Locally Absent Species in Aquaculture Regulations (708/2008).	2
M080	Continue to promote local action groups to engage the support of the third sector in controlling invasive non-indigenous species and in promoting key messages.	2
M081	Continue to promote awareness of invasive non-indigenous species to the public and marine/maritime professionals.	2
M082	Continue to apply Regulations which require land owners, or occupiers of a premise, to take action with respect to invasive species.	2
M083	To continue to apply the new Common Fisheries Policy (1380/2013) which entered into force on 1 January 2014.	3
M084	Continued regulation of fishing equipment, vessels, duration and species to regulate the pressures on the environment.	1, 3, 4, 6
M085	In accordance with the Common Fisheries Policy (1380/2013), through the application of the Precautionary Approach to fisheries management, to aim to ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the maximum sustainable yield.	3
M086	To implement a regional approach to fisheries management in line with Article 18 of the Common Fisheries Policy (1380/2013).	3
M087	Setting total annual catch at EU level with regard to scientific advice from scientists to provide for the protection of vulnerable marine ecosystems and species.	1, 3, 4
M088	Manage the fishing capacity of the fleet with regard to fishing opportunities over time in accordance with the Common Fisheries Policy (1380/2013).	3

Code	Measure	Relevant Descriptor(s)
M089	Continue to manage the sea-fishing fleet in line with the Entry/Exit Scheme as set out in the Common Fisheries Policy (1380/2013).	3
M090	Continue to ensure that the capacity of the sea-fishing fleet does not exceed the capacity ceiling set out in Regulation (EU) No. 1380/2013.	3
M091	To continue to support the Responsible Irish Fish (RIF) label and sustainability certification schemes (e.g. fisheries with Marine Stewardship Council certification).	1, 3, 4
M092	In co-operation with the European Commission, to utilise the European Maritime and Fisheries Fund to support the effective delivery of the reformed Common Fisheries Policy.	3
M093	To implement Council Regulation (EC) No. 2347/2002 establishing specific access requirements and associated conditions applicable to fishing for deep-sea stocks and support strengthened measures in any amendment to the Regulation.	3, 4
M098	Continue to prohibit drift netting at sea.	1, 3, 4
M100	Continue the precautionary management approach of prohibiting the commercial fishing and marketing of sea bass by Irish vessels. Support and implement measures adopted at EU Member State meetings to address the declining stocks of sea bass	3

M101	Replenishment of depleted inshore stocks in order to improve environmental sustainability.	1, 3, 4
M102	Continue to develop closure areas and seasonal closures in conjunction with the Regional Groups of Member States and Advisory Councils based on the best available scientific advice.	1, 3, 4
M103	To continue to work with the Regional Inshore Fisheries Forums and local stakeholders to develop and implement locally informed management plans for inshore fisheries within 6 nautical miles.	3
M104	To continue to work with the National Inshore Fisheries Forum to develop inshore fisheries policy within 6 nautical miles.	3
M105	Continue to implement effort management for crab fisheries in line with EU regulations.	1, 3, 4, 6
M106	To continue to enforce the protection measures for juvenile shellfish species set out in Council Regulation 850/98 as amended.	1, 3, 4, 6
M107	Continued effort management of Scallop fishing in line with EU legislation.	1, 3, 4, 6
M108	Implement national restrictions on fishing vessels participating in the scallop fishery, as follows. Vessels greater than or equal to 10m Length Overall must hold an Authorisation in order to retain on board or land a quantity of Scallop that is greater than 10% by live weight of the total quantity of all species of fish retained on board or landed on that occasion. To qualify for an Authorisation, a vessel must either have: (i) carried out scallop fishing activity for at least 50 days at sea in the two and a half years up to 30 June 2005, or (ii) have sourced 100% replacement capacity from a vessel(s) which carried out scallop fishing activity for at least 50 days at sea in the two and a half years up to 30 June 2005.	1, 3, 4, 6
M109	To continue to develop and to apply protection measures for shellfish species in accordance with EU and national legislation such as v-notching, minimum & maximum landing size for lobsters, minimum landing size for brown crab, spider crab crawfish, closed season for shrimp, monitoring, reporting & spawning closure for bivalve fisheries.	1, 3, 4, 6

Code	Measure	Relevant Descriptor(s)
M111	To continue to prevent pollution of surface waters from agricultural sources and to protect and improve water quality through the application of Ireland's Nitrates Action Programme. This will continue to promote more efficient and effective fertiliser and manure management and farm management practices to reduce nutrient run-off (applying codes of good agricultural practice).	5
M112	To continue to support the Agricultural Catchments Programme that aims to maximize the effectiveness of Nitrates Action Plan by encouraging farmer participation and disseminating information from the programme to a wide audience.	5
M113	To continue to reduce nutrient inputs arising from Waste Water Treatment Plants through the application of the EC Urban Waste Water Treatment Directive (91/271/EEC).	5

M114	To continue to reduce the emissions of nutrients to the atmosphere through the setting of appropriate emission limits through the Industrial Emissions Directive (2010/75/EU) which sets emission limits for nitrogen in line with the best available abatement technologies.	5
M115	To reduce emissions of nitrogen oxides and ammonia through the application of the National Emissions Ceiling Directive (2001/81/EC) which sets emission ceilings on forms of nitrogen (nitrogen oxides and ammonia).	5
M116	To continue to control Nitrogen Oxides emissions from ships through the application of the Sea Pollution (Prevention of Air Pollution from Ships) Regulations 2010 (S.I. No. 313/2010).	8
M117	Continue to support the Rural Development Programme (RPD); including its Knowledge Transfer schemes and the implementation of the GLAS (Green LowCarbon Agri-Environment Scheme) Scheme.	5
M118	To continue to apply PARCOM Recommendation 88/2 on the Reductions in Inputs of Nutrients to the Paris Convention Area (to reduce nutrient inputs to eutrophication problem areas by 50% relative to input levels in 1985, until new reduction targets are set for problem areas to move to non-problem area status).	5
M119	To continue to apply PARCOM Recommendation 89/4 on a Coordinated Programme for the Reduction of Nutrients.	5
M120	Continue to implement the Urban Wastewater Treatment regulations and review and amend as necessary the eutrophic sensitive waters designated under the regulations.	5
M121	Continued Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form implementation of Regulation laid out in MARPOL Annex III (entered into force 1 July 1992) and S.I. No. 510/2013.	8
M122	Continued Prevention of Pollution by Sewage from Ships through the implementation of Regulations laid out in MARPOL Annex IV (entered into force 27 September 2003) and S.I. No. 492/2012.	5
M124	Continue to implement national legislation to appropriately apply licensing, regulation and planning for the marine and coastal environment, including the requirement for applications to be accompanied by the materials necessary for a full assessment of the proposed plan, project or development.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
M125	Ensure that appropriate forms and levels of organisational governance are in place to support Foreshore Licensing, Petroleum Exploration/Appraisal/ Production Licensing, and proposed Maritime Option Licensing process.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
M126	Ensure that the consenting/ permitting processes, overseen by relevant regulatory bodies/statutory bodies, sufficiently account for the adequate protection of habitats and species.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
M127	Develop sector specific guidance documentation and regional strategy plans for renewable energy growth and impact control.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

Code	Measure	Relevant Descriptor(s)
M128	To apply the Environmental Impact Assessment Directive and associated legislation in relation to licences and consents.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

M129	Continue to develop and implement river basin and shoreline management plans to control impacts and improve environmental status.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
M130	Develop and implement marine plans for all of Irish waters by 31st March 2021 at the latest.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
M133	Ensure that environmental monitoring and mitigation measures stipulated in Environmental Impact Statements are fit for purpose and when/where deemed necessary are conducted appropriately.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
M134	Continue to enforce statutory codes of practice on the application and use of chemicals (e.g. good agricultural practice on agri-chemicals), which specify how various operations should be carried out to prevent chemicals entering surface waters.	8
M135	Continue to enforce River Basin Management Plans of which measures include legally binding codes of practice detailing storage requirements and nutrient controls (closed periods for manure spreading).	5
M136	Set up and run pollution prevention awareness campaigns, which provide targeted advice and information to householders and those in high risk areas on all rural diffuse pollution issues, in order to prevent and reduce chemicals from entering surface waters and groundwater.	5, 8
M137	Implement Water Framework Directive Environmental Quality Standards for specific pollutants used in assessment of water quality status.	8, 9
M138	To continue to enforce emission and discharge limits from industrial installations, in line with the best available technologies.	8
M139	To continue to prevent the use of legacy pesticide with persistent bioaccumulative toxic properties.	6, 8, 9
M140	Continue to enforce EU Directive on Ship-source pollution and criminal penalties Directive 2005/35/EC (as amended by Directive 2009/123/EC).	8
M141	Continue to register, evaluate, authorise or restrict chemicals in accordance with national and EU legislation.	8
M142	Continue to enforce the ban on production, placing on the market and use (some limited exceptions) of intentionally produced Persistent Organic Pollutants (POPs) substances listed in the Stockholm Convention (SC) and United Nations Economic Commission for Europe (UNECE) Protocol on POPs. Ensure the national action plan and implementation plan on how Ireland is meeting obligations under the SC is maintained and carried out.	8, 9
M143	To continue to review the River Basin Management Plans at the end of each 6-year cycle as outlined in the Water Framework Directive.	1, 3, 4, 5, 6, 8, 9
M144	To continue to implement the requirements of S.I. No. 272/2009, as amended by S.I. No. 386/2015.	8
M145	Ensure shellfish products are fit for human consumption by implementing the Shellfish Waters Directive and its Pollution Reduction Programmes.	9
M146	Ensure stormwater management is employed, particularly where excess loads can occur, by treating where and whenever necessary.	5
M147	To continue to regulate pesticides in accordance with relevant EU and national law.	8, 9

Code	Measure	Relevant Descriptor(s)
M148	Continue to control discharges through existing regulation procedures (licensing and permitting of activities) – Integrated Pollution Prevention and Control licences, Waste Water Discharge Licence, Local Authority Wastewater Authorisation (smaller discharges), Local Authority Waste Licences, Agricultural controls, Single Dwelling House Waste Water Systems and the implementation of Pollution Reduction Plans.	5, 7, 8, 9, 10
M149	Ensure dredging plans are incorporated into port master plans.	6, 7, 8
M150	Implement the OSPAR Hazardous Substances Strategy.	8, 9
M151	Progressively implement the OSPAR Offshore Oil and Gas Industry Strategy.	8, 10
M152	Implement OSPAR Decision 2000/2 on a Harmonised Mandatory Control System for the Use and Reduction of the Discharge of Offshore Chemicals (as amended by OSPAR Decision 2005/1).	8
M153	Implement the OSPAR Recommendation 2005/2 on environmental goals for the use and discharge of OSPAR Priority Chemicals.	8
M154	Apply OSPAR Recommendation 2006/3 on environmental goals for the phasing-out of discharges of substances identified as candidates for substitution.	8
M155	Implement OSPAR Recommendation 2001/1 for the Management of Produced Water from Offshore Installations (as amended by OSPAR Recommendation 2006/4).	8
M156	Implement OSPAR Recommendation 2003/5 promoting the use and implementation of environmental management systems by the offshore industry.	8, 10
M157	Ensure operators take all necessary measures to prevent major accidents and limit their consequences for human health and the environment.	1, 6, 8, 9
M158	Continue to enforce the Dumping at Sea Act 1996 (as amended), which specifically prohibits the dumping of certain materials at sea and requires any person who wishes to dispose of material at sea to apply to the EPA for a Dumping at Sea permit.	6, 8, 10
M159	Continue to enforce the Sea Pollution Act 1991 to prevent pollution of the sea by oil and other substances.	8
M160	Continue Prevention of Pollution by Oil through the implementation of Regulations laid out in MARPOL Annex I and S.I. No. 542/2010.	8
M161	Continued Control of Pollution by Noxious Liquid Substances in Bulk through the implementation of Regulations laid out in MARPOL Annex II (entered into force 2 October 1983) and S.I. No. 217/2008.	8
M162	Continued Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form implementation of Regulation laid out in MARPOL Annex III (entered into force 1 July 1992) and S.I. No. 510/2013.	8
M164	Continued Prevention of Pollution by Garbage from Ships through the implementation of regulations laid out in MARPOL Annex V (entered into force 31 December 1988) and S.I. No. 372/2012	10
M165	Continued Prevention of Air Pollution from Ships through the implementation of Regulations laid out in MARPOL Annex VI (entered into force 19 May 2005) and S.I. No. 313/2010).	8
M166	Continue to implement the International Convention for the Safety of Life at Sea (SOLAS), 1974. The objective of the SOLAS regard is to attain minimum standards for the construction, equipment and operation of ships, compatible with their safety.	8

M167	Continued provision of port waste reception facilities in commercial and fishing ports.	8, 10
M170	To continue to apply EU and national regulations setting maximum levels for certain contaminants in foodstuffs.	9
M171	To continue to apply EU and national regulations laying down the general principles and requirements of food law.	9

Code	Measure	Relevant Descriptor(s)
M172	To continue to apply EU and national regulations laying down specific hygiene rules for food of animal origin.	9
M173	To continue to apply EU and national regulations on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules.	9
M174	To continue to apply the EU Water Framework Directive (2000/60/EC).	1, 3, 4, 5, 6, 8, 9
M175	Continue to implement CLAMS – Coordinated Local Aquaculture Management Systems to ensure adequate supervision and management of shellfish practices, and to empower aquaculture operators to undertake voluntary improvements and facilitate them to recognise and report incidents.	8, 9
M176	Continue to implement the EU Water Framework Directive, Dangerous Substances Directive and associated national legislation in land use planning and for issues relating to single and multi-dwelling unit, waste water collection and treatment.	8
M177	Regulate and appropriately monitor of dredging and disposal under the Foreshore Act 1993 (as amended)	6, 7, 8
M178	Continue to implement EC (Health of Aquaculture Animals and Products) Regulations 2008 (S.I. No. 261/2008) and Council Directive 2006/88/EC.	9
M181	To continue to enforce the Litter Pollution Acts 1997 to 2009, which make littering an offence.	10
M182	To continue to implement regional waste management plans and a national hazardous waste management plan.	8, 10
M183	To continue to promote the use of packaging substitution.	10
M184	To continue to provide appropriate infrastructure for proper litter disposal and recycling including signage and bins.	10
M185	To continue to support initiatives which promote public pride in local amenity/natural beauty or reinforce social norms against littering.	10
M186	To continue to apply disincentives to litter (e.g. fines).	10
M187	To continue to implement the OSPAR Regional Action Plan on Marine Litter	10
M188	To continue to apply Waste Prevention Programmes.	10
M189	To continue efforts to improve business attitudes and behaviours around marine and coastal litter.	10
M190	Continue beach cleaning (with Local Authority operational cleaning of the foreshore) and litter enforcement.	10
M191	To continue to contribute to a low carbon economy by treating “waste as a resource”.	10

M192	Promote greater reuse and recycling of goods and materials and management of waste.	10
M193	To continue to charge for single use carrier bags through the applications of the Plastic Bag (Amendment) (No.2) Regulations (S.I. No. 167/2007), amending Plastic Bag Regulations (S.I. No. 605/2001).	10
M194	To promote the use of the National Environmental Complaints Line and the reporting of environmental pollution, fly-tipping and illegal dumping of waste; including the National Litter Pollution Monitoring System, funded by DECLG, including www.litter.ie.	10
M195	To encourage the reuse and recycling of waste and the reduction of the amount of waste destined for landfill through the application of Waste Management (Landfill Levy) Regulations 2002-2013.	10
M196	To continue to enforce the requirement to put in place a site waste management plan at marine-related developments through the application of the EU Directive 2000/59/EC on port reception facilities for ship-generated wastes and cargo residues.	10

Code	Measure	Relevant Descriptor(s)
M197	Combined Storm Overflow Control (screening & limiting of spills) and application of the discharge licensing requirements set by the Environmental Protection Agency under the Waste Framework Directive and Urban Waste Water Treatment Directive and the Integrated Pollution Prevention and Control Directive.	5, 8, 10
M198	To reduce litter entering rivers and other water bodies by addressing pollution from surface water runoff and drainage through the application of the Water Framework Directive (2000/60/EC).	10
M201	Measures to maintain restrictions on the range of material that can be disposed of at sea from ships; and increase and improve port reception facilities for shipgenerated waste; and extend port waste reception facilities to fishermen.	10
M202	To continue to raise awareness to tackle the sources of litter through the Blue Flag Beach and Green Coast Award programmes.	10
M203	Continue to implement the Producer Responsibility Initiative to increase the recycling of waste electrical and electronic equipment.	10
M204	Continue to enforce legislation (S.I. No. 513/2012) restricting the use of hazardous substances in electrical and electronic equipment.	10
M205	To continue to implement the Producer Responsibility Initiative to increase the recycling of farm plastic waste through the application of the farm plastics recovery scheme.	10
M206	Maintain and expand the Fishing for Litter Scheme.	10
M207	Continue to promote and support An Taisce's programme on Ocean Literacy.	1, 4, 6, 10
M208	Maintain sea users' awareness of waste issues and encourage compliance with existing rules.	5, 8, 10
M209	Continue to promote the waste management service in order to provide alternative methods for the disposal of discarded fishing gear.	10
M212	To continue to apply the BIM Responsibly Sourced Standard for wild capture fisheries.	1, 3, 4, 6, 8, 9, 10

M213	To continue to raise awareness to tackle the sources of litter through the international environmental education programme Eco-Schools. This includes developing an international Eco-School module on marine litter with the Celtic Seas Partnership, Eco Schools (FEE - Copenhagen) and An Taisce.	10
M214	On-going implementation of the #2minutebeachclean/#Glantra2noimead initiative and expansion across all blue flag beaches in Ireland.	10
M215	Continue to implement the Producer Responsibility Initiative to increase the recycling of batteries and accumulators.	10
M216	Continue to implement the Producer Responsibility Initiative to increase the recycling of construction and demolition waste.	10
M217	Continue to implement the Producer Responsibility Initiative (PRI) to increase the recycling of packaging waste; and to continue to promote, co-ordinate and finance the collection and recovery of packaging waste in order to achieve the objectives set out in the Packaging Waste Directive.	10
M218	Continue to implement the Producer Responsibility Initiative to increase the recycling of tyres.	10
M219	To continue to implement the Producer Responsibility Initiative to increase the recycling of end – of - life vehicles.	10
M220	Continue to promote the Bord Iascaigh Mhara Environment Management System (EMS) to assist fishermen to implement practices to help minimise the impact of fishing effort on the marine environment.	1, 3, 4, 6, 8, 10
M221	Continue to promote the implementation of the Environment Management System on fish and shellfish farms through the Environment Management System for Aquaculture initiative.	1, 3, 4, 5, 6, 8, 9, 10
M223	To establish and maintain a register of noise in the Irish Marine Assessment Area.	11
Code	**Measure**	**Relevant Descriptor(s)**
M224	To continue to apply the Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (NPWS 2014).	11
M225	To apply the IMO I817:2014 Code On Noise Levels On Board Ships.	11
M227	Support the Origin Green Initiative National programme to improve sustainability and environmental performance within the Irish Food Sector.	1, 2, 3, 4, 6

APPENDIX 7.1

DROGHEDA PORT COMPANY PORT WASTE MANAGEMENT PLAN

Drogheda Port Company Port Waste Management Plan

Personnel/Organisations will be issued an electronic copy of the Drogheda Port Company Waste Management Plan.

Amendments and revisions of the Drogheda Port Waste Management Plan will be issued periodically. All updates will result in a new electronic copy issue to the plan holders or CD issue by request.

The following Personnel/Organisations hold read only electronic copies of this document.

HOLDER	**COPY NO.**
The Harbourmaster, Drogheda Port Company	1
Ship-Source Pollution Prevention Division, Department of Transport	2 & 3
Marine Survey Office, Department of Transport, Tourism and Sport	4
Veterinary Officer, District Veterinary Offices, Department of Agriculture, Food and the Marine, Navan Co. Meath	5
Indaver Ireland (Duleek Plant)	6

The person responsible for the implementation of the plan is the Harbourmaster Drogheda Port Company.

AMENDMENTS TO DPC WMP

This plan & amendments to this plan are forwarded electronically by email or CD by request.

Amendment No.	Date of Issue	Paragraphs Amended	Pages substituted or added
Original Issue	18.11.2003	Ministerial approval	
1	04.01.2005	All	2
2	12.01.2006	All	2
3	13.03.2007	All	2
4	15.01.2008	All	2
5	03.02.2009	All	2
6	15.05.2009	All	1
7	29.01.2010	All	2
8	23.05.2010	Ministerial approval (review)	Entire Plan Review
9	18.01.2011	All	2
10	05.11.2012	All	2
11	17.07.13	Ministerial approval (review)	Entire Plan and Legislation Review
12	07.01.16		Permit Renewals & overview
13	July 17	Ministerial Review (general)	Entire Plan and Legislation Review
14	June 18	Ministerial Review	Dept. Agri, Food & Marine permit renewals x 2

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2.12 **Directive 2002/59/EC establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC**

2.13 **Directive 2009/17/EC amending Directive 2002/59/EC establishing a Community vessel traffic monitoring and information system**

2.14 **S.I. No. 573 of 2010: European Communities (Vessel Traffic Monitoring and Information System) Regulations 2010**

2.15 **Commission Directive 2011/15/EU amending Directive 2002/59/EC of the European Parliament and of the Council establishing a Community vessel traffic monitoring and information system**

2.16 **S.I. No. 71 of 2012: European Communities (Vessel Traffic Monitoring and Information System) (Amendment) Regulations 2012**

2.17 **Commission Directive 2014/100/EU amending Directive 2002/59/EC establishing a Community vessel traffic monitoring and information system**

2.18 **S.I. No. 367 of 2016: European Communities (Vessel Traffic Monitoring and Information System) (Amendment) Regulations 2016**

2.19 **Directive 2012/33/EU amending Council Directive 1999/32/EC as regards the sulphur content of marine fuels**

2.20 **S.I. No. 361 of 2015: European Union (Sulphur Content of Marine Fuels) Regulations 2015**

2.21 **Sea Pollution Act, 1991**

2.22 **Sea Pollution (Amendment) Act, 1999**

2.23 **Sea Pollution (Miscellaneous Provisions) Act, 2006**

[Statutory Instrument(s) giving effect to MARPOL Annex I]

2.24 **S.I. No. 788 of 2007: Sea Pollution (Prevention of Oil Pollution) Regulations 2007**

2.25 **S.I. No. 282 of 2008: Sea Pollution (Prevention of Oil Pollution) (Amendment) Regulations 2008**

2.26 **S.I. No. 664 of 2010: Sea Pollution (Prevention of Oil Pollution) (Amendment) Regulations 2010**

2.27 **S.I. No. 365 of 2011: Sea Pollution (Prevention of Oil Pollution) (Amendment) Regulations 2011**

2.28 **S.I. No. 275 of 2014: Sea Pollution (Prevention of Oil Pollution) (Amendment) Regulations 2014**

2.29 **S.I. No. 461 of 2016: Sea Pollution (Prevention of Oil Pollution) (Amendment) Regulations 2016**

2.30 **S.I. No. 578 of 2016: Sea Pollution (Prevention of Oil Pollution) (Amendment) (No. 2) Regulations 2016**

2.31 **S.I. No. 582 of 2016: Sea Pollution (Prevention of Oil Pollution) (Amendment) (No. 3) Regulations 2016**

[Statutory Instrument(s) giving effect to MARPOL Annex II]

2.32 **S.I. No. 217 of 2008: Sea Pollution (Control of Pollution by Noxious Liquid Substances in Bulk) Regulations 2008**

[Statutory Instrument(s) giving effect to MARPOL Annex III]

2.33 **S.I. No. 510 of 2013: Sea Pollution (Harmful Substances in Packaged Form) Regulations 2013**

2.34 **S.I. No. 459 of 2016: Sea Pollution (Harmful Substances in Packaged Form) (Amendment) Regulations 2016**

[Statutory Instrument(s) giving effect to MARPOL Annex IV]

2.35 **S.I. No. 269 of 2006: Sea Pollution (Prevention of Pollution by Sewage from Ships) Regulations 2006**

2.36 **S.I. No. 281 of 2008: Sea Pollution (Prevention of Pollution by Sewage from Ships) (Amendment) Regulations 2008**

2.37 **S.I. No. 372 of 2008: Sea Pollution (Prevention of Pollution by Sewage from Ships) (Amendment) (No.2) Regulations 2008**

2.38 **S.I. No. 492 of 2012: Sea Pollution (Prevention of Pollution by Sewage from Ships) (Amendment) Regulations 2012**

[Statutory Instrument(s) giving effect to MARPOL Annex V]

2.39 **S.I. No. 372 of 2012: Sea Pollution (Prevention of Pollution by Garbage from Ships) Regulations 2012**

[Statutory Instrument(s) giving effect to MARPOL Annex VI]

2.40 **S.I. No. 313 of 2010: Sea Pollution (Prevention of Air Pollution from Ships) Regulations 2010**

2.41 **S.I. No. 383 of 2011: Sea Pollution (Prevention of Air Pollution from Ships) (Amendment) Regulations 2011**

2.42 **S.I. No. 596 of 2011: Sea Pollution (Prevention of Air Pollution from Ships) (Amendment) (No. 2) Regulations 2011**

2.43 **S.I. No. 35 of 2013: Sea Pollution (Prevention of Air Pollution from Ships) (Amendment) Regulations 2013**

[Statutory Instrument(s) giving effect to other international legislation]

2.44 **S.I. No. 82 of 2008: Sea Pollution (Control of Harmful Anti-fouling Systems on Ships) Regulations 2008**

[Other legislation]

2.45 **Waste Management Act 1996 [No. 10 of 1996]**

2.46 **Waste Management (Amendment) Act 2001 [No. 36 of 2001]**

2.47 **Protection of the Environment Act 2003 [No. 27 of 2003]**

2.48 **Diseases of Animals Act 1966**

2.49 **S.I. No. 153 of 1985: Diseases of Animals (Feeding and Use of Swill) Order 1985**

2.50 **S.I. No. 133 of 1987: Diseases of Animals (Feeding and Use of Swill) (Amendment) Order 1987**

2.51 **S.I. No. 597 of 2001: Diseases of Animals Act, 1966 (Prohibition on the Use of Swill) Order, 2001**

2.52 **S.I. No. 252 of 2008: European Communities (Transmissible Spongiform Encephalopathies and Animal By-Products) Regulations 2008**

2.53 **S.I. No. 12 of 2009: Diseases of Animals Act 1966 (Prohibition On the Use of Swill) (Amendment) Order 2009**

2.54 **Regulation (EC) No 1069/2009 of the European Parliament and of the Council of 21 October 2009 laying down health rules as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 (Animal by-products Regulation)**

2.55 **Commission Regulation (EU) No 142/2011 of 25 February 2011 implementing Regulation (EC) No 1069/2009 of the European Parliament and of the Council laying down health rules as regards animal by-products and derived products not intended for human consumption and implementing Council Directive 97/78/EC as regards certain samples and items exempt from veterinary checks at the border under that Directive**

2.56 **Animal Health and Welfare Act 2013**

2.57 **S.I. No. 187 of 2014: European Union (Animal By-Products) Regulations 2014**

2.58 **S.I. No. 126 of 2011: European Communities (Waste Directive) Regulations 2011**

3. **Definition of Wastes**

3.1 **Marpol Annexes**

4. **Process Undertaken by Drogheda Port Company to achieve Legislative Compliance**

4.1 **Consultation**

PREAMBLE

AIMS AND OBJECTIVES

The overall aim of this Port Waste Management Plan for Drogheda Port Company (DPC) is to protect the marine environment by reducing discharges into the sea of ship-generated waste and cargo residues; to improve the availability and use of reception and re-cycling facilities and to strengthen the enforcement regime.

Its objectives are:

To reduce illegal discharge of waste from vessels

To fulfil legal duties with regard to waste management

To consult with users, agents, operators, contractors and regulators in the development and implementation of waste management strategies and measures

To minimise the production of waste wherever possible

To re-use or recycle waste wherever possible

To dispose of waste so as to minimise negative environmental effects

1. THE PORT

OVERVIEW OF PORT ACTIVITIES

1.1 Constitution

The Harbours Act 1996 reconstituted DPC as a commercial semi state port company operating under company law.

DPC was established on 3 March 1997.

1.2 Jurisdiction and Conservancy

The jurisdiction or limits as defined in S.I. No. 238 of 2004 as follows:

the northern limit commencing at the north east angle of the bridge at Shop Street and running in an easterly direction along the North Quays to the eastern extremity of Donor's Green, from there along the Baltray Road to the village of Baltray, from there to Aleria Beacon and along the line of the high water mark bounding the eastern shores of the town land of Baltray and terminating at Duff's Farm, thence in a direction of 090degrees from true north for 5,380 metres, thence in a direction of 180 degrees from true north for 7,271 metres, and thence in a direction of 270 degrees from true forth for 5,120metres to the southern limit of the town land of Bettystown, from there along the high water mark to the eastern shore of the town land of Mornington, from there along the high water mark to the maiden tower, from there in a westerly direction along the high water mark to the south east angle of the bridge at Shop street and running in a northerly direction along the east side of the said bridge to its north east angle.

1.3 Facilities

Drogheda Port is one of Ireland's premier multi modal ports with a recorded annual cargo throughput of up to 1.4m tonnes. The port is situated on the River Boyne on Ireland's east coast with direct access to both Dublin and Belfast on Euroroute E01. The port handles vessels up to 130mtrs length overall with cargos of SRF & RDF (waste) hydrocarbons, timber, steel, paper and bulk for construction and agricultural process.

The port is tidal and operates 24/7.

There are two public dock areas, inner dock Drogheda Port town quays (general cargoes) and Tom Roe's Point deep water terminal multi modal cargoes i.e. RDF & SRF (waste), timber, steel and bulk mineral & agri traffic.

A liquid gas facility is operated by Flogas Ltd.

Premier Periclase Ltd is a private facility exporting magnesite.

The Fish Meal Quay owned by Department of Housing, Planning, Community & Local Government is used exclusively for the handling of IMGD Class 1 hazardous materials.

2. LEGISLATIVE SUMMARY (framework)

[This list is not intended to be exhaustive – it is for reference purposes only.]

2.1 EU Directive 2000/59/EC on port reception facilities for ship generated wastes and cargo residues

2.2 S.I. No. 117 of 2003: European Communities (Port Reception Facilities for Ship-Generated Waste and Cargo Residues) Regulations 2003

2.3 Directive 2002/84/EC amending the Directives on maritime safety and the prevention of pollution from ships

2.4 S.I. No. 659 of 2003: European Communities (Port Reception Facilities for Ship-Generated Waste and Cargo Residues) (Amendment) Regulations 2003

2.5 Commission Directive 2007/71/EC of 13 December 2007 amending Annex II of Directive 2000/59/EC of the European Parliament and the Council on port reception facilities for ship-generated waste and cargo residues

2.6 S.I. No. 376 of 2009: European Communities (Port Reception Facilities for Ship-Generated Waste and Cargo Residues) (Amendment) Regulations 2009

2.7 Commission Directive (EU) 2015/2087 amending Annex II to Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues

2.8 S.I. No. 550 of 2016: European Communities (Port Reception Facilities for Ship-Generated Waste and Cargo Residues) (Amendment) Regulations 2016

2.9 Directive 2005/35/EC on ship-source pollution and on the introduction of penalties for infringements

2.10 Directive 2009/123/EC amending Directive 2005/35/EC on ship-source pollution and on the introduction of penalties for infringements

2.11 S.I. No. 542 of 2010: European Communities (Ship-Source Pollution) Regulations 2010

2.12 Directive 2002/59/EC establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC

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[Statutory Instrument(s) giving effect to MARPOL Annex IV]

2.35 S.I. No. 269 of 2006: Sea Pollution (Prevention of Pollution by Sewage from Ships) Regulations 2006

2.36 S.I. No. 281 of 2008: Sea Pollution (Prevention of Pollution by Sewage from Ships) (Amendment) Regulations 2008

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2.38 S.I. No. 492 of 2012: Sea Pollution (Prevention of Pollution by Sewage from Ships) (Amendment) Regulations 2012

[Statutory Instrument(s) giving effect to MARPOL Annex V]

2.39 S.I. No. 372 of 2012: Sea Pollution (Prevention of Pollution by Garbage from Ships) Regulations 2012

[Statutory Instrument(s) giving effect to MARPOL Annex VI]

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2.56 Animal Health and Welfare Act 2013

2.57 S.I. No. 187 of 2014: European Union (Animal By-Products) Regulations 2014

2.58 S.I. No. 126 of 2011: European Communities (Waste Directive) Regulations 2011

3. DEFINITION OF WASTES

Use the definitions in MARPOL 73/78 Regulations

3.1 MARPOL ANNEXES

■**Annex I** Oily Wastes (bilges, sludge, ballast, slops).

■**Annex II** Noxious Liquid Substances Carried in Bulk (dirty ballast, slops, tank washings).

■**Annex III** Pollution by Harmful Substances Carried by Sea in Packaged Form.

■**Annex IV** Prevention of Pollution by Sewage from Ships.

■**Annex V** Garbage, which includes - hazardous waste, food waste, glass, metal, plastics, paper/cardboard, wood, paint tins, batteries.

■**Annex VI** Prevention of Air Pollution from Ships.

The categories considered by Drogheda Port Company are Annexes I, II, IV and V, there being no general requirement for Annex III (such pollution would be dealt with by way of an isolated incident). Annex IV has been adopted and Drogheda Port can provide facilities by request from specialist contractors.

4. PROCESS UNDERTAKEN BY DROGHEDA PORT COMPANY TO ACHIEVE LEGISLATIVE COMPLIANCE

4.1 CONSULTATION

Purpose

To ensure that the needs of potential users and waste regulators are taken into account when planning and operating port waste reception facilities; to ensure that all mariners are aware of the location, cost and procedures for using the facilities, and also of the consultation arrangements for the future development of adequate facilities within the port.

Objective

DPC has taken its obligations seriously and has engaged in a consultation exercise with all links in the waste management chain in order to discuss and explain the implications of the Directive and the Statutory Instrument bringing it into effect nationally. The objective has been to affect an exchange of information and to gain an understanding of the perspective of other parts of the waste management chain in order to devise a flexible and workable system.

To ensure the adequacy of the process, Drogheda Port Company has consulted
Ships' Masters
Ships' Agents
Waste Contractors
Waste Regulators
Central Government

Process

Ships' masters have been consulted as part of the exercise to analyse types and quantities of wastes landed. This information has been obtained by questionnaires issued by DPC and through ships' agents as described in the appropriate paragraph below. Ships' Agents, Government agencies and waste contractors were contacted by letter rather than consultative meeting and a copy of the correspondence is available for inspection by the Department of Transport, Tourism & Sport (DTTAS).

On-going Liaison, Procedural Waste Collection Changes and Notification

It is recognised within the waste plan that on-going discussion with the shipping industry, regulators and contractors is most important. Similarly, with advances in waste management handling procedures will change to become more streamlined and efficient.
To facilitate this several methods of information exchange have been adopted to facilitate the various links in the waste management chain from the ship/shore interface to the regulatory bodies and to the disposal operators both at the tip head and re-cycling facilities.

These include:

- Notification and guidance to Ships' Masters in publications such as the Drogheda Port Notices to Mariners and Drogheda Port website www.droghedaport.ie
- Port liaison industry group meetings (Ports Forum) in line with government policy.
- Regular consultation and meetings with the regulatory bodies and licence renewals such as the Department of Agriculture, Food and the Marine (DAFM) and DTTAS.
- On-going meetings and operational reviews with re-cycling contractors.
- Local level meetings and daily liaison with port operators and ship owner's representatives.
- Inter port discussions on waste handling within ports through the Harbourmaster Technical Sub-committee of the Irish Ports Association.
- The DPC approved Waster Management Plan will be available on the DPC website www.droghedaport.ie

All port users are written/emailed individually when changes to charges or procedures are implemented

5. STUDY OF WASTE HANDLING CHAIN

Stakeholder's consultation has revealed that the existing system of port waste management raises no concerns.

The Department of Agriculture, Food and the Marine (DAFM) has confirmed that DPC has a valid licence to remove and dispose of swill from Drogheda Port and has approved the receptacle used to transport waste for safe disposal. The DTTAS has approved the current Waste Management Plan.

6. THE PORT WASTE MANAGEMENT SYSTEM

6.1 INTRODUCTION

Drogheda Port Company Waste Management Plan and system of handling has been complied to achieve compliance with the EU and domestic legislation.

The measures adopted are appropriate to the trade and waste handling requirements within the port jurisdiction, the activity is licenced and the wastes are received at a licence landfill facility.

The adopted management system which controls charging, chain of custody and disposal mechanism is available for audit by both EU and domestic authorities.

The Waste Management Plan is available for inspection by all shipping interest and members of the public. The system is fully transparent.

Since the introduction of the Waste Management Plan and handling operations at Drogheda Port in 2003, no complaints have been received to date from ships Masters, port operators, DAFM veterinary officers or disposal reception facility in respect of the port activities on waste.

7.0 PROCEDURES FOR THE USE OF THE PORT WASTE RECEPTION FACILITIES AT DROGHEDA PORT COMPANY

7.1 Mandatory Provision

Drogheda Port Company makes available the following system of port reception facilities for ship generated waste.

7.2 Mandatory Discharge

All vessels (including fishing vessels and recreational craft) **MUST** discharge ship-generated waste before leaving Drogheda Port unless it can be demonstrated that storage space for such waste is sufficient. If retaining waste on-board, a legitimate reason for not using the port reception facilities must be given. Failure to do so may

result in detention in port until waste has been discharged, after consultation with the Minister for the DTT&S. The Marine Survey Office carries out inspections of ships in port to determine compliance.

Grounds for detention may also be considered if there is reason to believe that there is a risk of waste being discharged into the sea because adequate facilities are not available at the next port of call, or if that port of call is unknown.

7.3 Definition of an Exempt Ship

Applications for exemptions from the Port Waste Management System must be made in writing to the Harbourmaster. They are not automatic. There are three grounds for the granting of an exemption and they must **ALL** be satisfied:

SCHEDULED traffic operating along a regular route
Evidence of **DELIVERY** in one port along the route
Evidence of **PAYMENT** in one port along the route

Currently there are not exempted ships operating to/from Drogheda Port.

7.4 Notification Requirement

The following information is required from **ALL** vessels (excluding recreational craft authorised to carry 12 or fewer passengers and fishing vessels) prior to arrival. Pre arrival information concerning onboard generated waste is made in advance via www.safeseas.ie

Name/call sign/IMO number
Flag state
ETA/ETD
Previous/next port of call
Last port and date when ship-generated waste was delivered
Whether delivering all/some/none of ship generated waste into facilities

Type and amount of waste to be delivered/stored on board plus maximum storage capacity.

The unit of measurement is cu m/kg.

7.5 Notification Mechanism

The checklist is to be completed by the Master and submitted to the DTTAS and Drogheda Port Company directly or via the ship's agent:

- at least 24 hours prior to arrival, if the port of call is known,
- as soon as the port of call is known, if this information is available less than 24 hours prior to arrival, or

- at the latest upon departure from the previous port, if the duration of the voyage is less than 24 hours.

Transmission electronic means at www.safeseas.ie

DPC will retain **ALL** notification records for three years in order to comply with the audit requirements of the Directive. Failure to submit a checklist **MAY** result in delay in entry.

7.6 Charging System

The EU Directive says that each vessel must contribute "significantly" to the cost of port waste reception facilities for ship-generated waste, without that cost providing a disincentive to use. To comply with the legislation DPC will continue to facilitate the disposal of waste on a non-profit basis. All ships are charged indirectly a percentage of the ships' dues (€0.05 per rateable tonnage), paid by the ships agent on behalf of the Master/owners, which cover the use of reception facilities, and there is no disincentive to use. The amount that each vessel pays within the dues is adequate to fund the system and the system is apportioned to all ships equally irrespective of the quantity discharged. The system will be subject to annual review. The caveat is for vessels where manning/passenger levels are above that of normal/expected levels of discharge, where separate charges will be made. Additional charges will be applied where specialist handling of particular wastes is required.

8. Type and Capacity of Facilities

8.1 Purpose

Facilities which are suitable for the types and amounts of waste are located at the various quays and jetties (public & private).

Two sealed swill bins of 1.6kl capacity appropriately marked Flogas & Premier Periclase.

One sealed swill trailer (approved by DAFM), $9m^3$ capacity.

One open top stevedoring waste trailer, $15m^3$ capacity.

Waste Oil contractor's tanker, capacity to suit collection requirements.

Sewage waste contractors tanker, capacity to suit collection requirements.

9. Location, Ease of Use, Collection & Disposal

9.1 Purpose

`

To provide facilities which, so far as reasonably practical, avoid disincentives towards their use.

Flogas Jetty (LPG installation), 1 x sealed 1.6kl bin, appropriately marked.

Premier Periclase Jetty (bulk jetty), 1 x sealed 1.6kl bin, appropriately marked.

Drogheda Port town quays, Tom Roe's Point terminal, Fishmeal Quay, one approved swill trailer of $9m^3$ capacity, one general stevedoring waste trailer $15m^3$ capacity.

Drogheda Port town quays, one contractors steel re-cycling skip.

Specialist contractor waste oil collection at designated berth by ship request.

Specialist contractor sewage waste for collection at designated berth by ship request.

10. Giving effective information to users

10.1 Purpose

As with any consultation exercise, to ensure that all mariners are aware of the location, cost and procedures for using the facilities, and also of the consultation arrangements for future development of adequate facilities within the port.

10.2 System

The Master of a ship bound for a port located in the State is obliged to complete the form set in Schedule 1 of the Regulations and notify that information to the national competent authority at least 24 hours prior to arrival in Drogheda Port or at the latest on departure from the previous port if the duration of the voyage is less than 24 hours. This information is directed to the DTTAS and DPC via www.safeseas.ie

The Master of a ship in Drogheda Port must deliver the ship-generated waste and cargo residues before leaving Drogheda Port unless it follows that there is enough capacity left on the ship to hold the existing waste plus the waste that will be accumulated until the ship reaches the next port of delivery. This is monitored by officers of the Marine Survey Office of the DTTAS.

The DPC Waste Management Plan incorporates a daily collection of ship-generated waste by DPC staff at the town quays, Tom Roes Point terminal and Fishmeal quay. At Flogas and Premier Periclase the ship crew deposit the waste directed to dedicated sealed skips provided. These are in turn emptied by DPC staff. All ship catering waste collected is deposited to a sealed trailer and later disposed of under supervision of the DAFM Veterinary Officer to the Indaver Ireland incinerator facility in Duleek Co. Meath, an EPA licensed facility. This operation is approved and licensed by the DAFM.

Stevedoring waste and cargo residues are collected daily by DPC. Non-recyclable materials are stored in an open trailer and disposed of at the Govista Facility (trading as Orange Skips), also licenced by the EPA. Recyclable materials are stored on site in a designated area in contractor-supplied skips and collected periodically for disposal at a licensed recycling facility.

Waste landed and rejected by DPC is returned to the vessel as local reception facilities will not accept certain wastes. Example of such waste are paint dums etc.

A specialist licensed contractor carries out waste oil disposal or hazardous waste collection and disposal by arrangement.

A specialist licensed contractor carries out sewage collection and disposal by arrangement.

Pre-treatment of waste is not employed within the Drogheda Port Waste Management Plan

11. Duty of Care/Waste Transfer/Waste Disposal

11.1 System

Reception and storage are the key elements to the successful management of port waste reception facilities.

An overriding principle is that Drogheda Port Company will under no circumstances entertain the use of common user skips.

Improper disposal of waste classified as "Special" or "Hazardous" into common user skips can render Drogheda Port Company liable to prosecution for breach of domestic Irish legislation without having recourse to an untraceable waste producer, *i.e.* the vessel concerned.

Throughout the waste disposal chain a documented chain of custody has been employed.

Ship-generated waste landed for disposal is recorded and copies are available for the ship's Master. Ship-generated waste/swill and stevedoring waste disposed of at licensed facilities is recorded by load to that facility. Stevedoring materials and cargo residues collected by the licensed contractor for beneficial re-use and re-cycling are documented with re-cycling certificates per collection.

Records are retained by DPC for inspection/audit purpose.

Waste returns are submitted to the DTTAS by request.

12. Grievance Procedure and Inadequate Reception Facilities Reporting

General complaints should be made immediately an issue arises through the ship's agent to Drogheda Port Company's Authorised Officer. The Master of a ship having encountered difficulties in discharging waste to reception facilities should forward the information (on the relevant form, see Appendix 3), together with any supporting documentation, to the administration of the ships flag state and if possible, the competent authorities in the port state. Drogheda Port Company through the ships agent should also be advised and copied with the documentation.

13. Audit and Review

13.1 Purpose

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To ensure that port waste management facilities are relevant and are up to date and that plans are implemented effectively.

13.2 Compliance and Monitoring

Spot checks can be undertaken on vessels deemed unlikely to use facilities, and there will be an inspection of a fixed proportion of vessels by authorised officers of the National Competent Authority. Vessel logbooks of all waste generated during a voyage, plus disposal data, will form part of the inspection.

Annex 1

CONTACT DIRECTORY

(a) Drogheda Port – Local Competent Authority

Harbourmaster Drogheda Port Company
Harbourville Mornington Road Drogheda
Co Louth, Tel 00353 41 9838378, Fax 00353 41 9832844
Email: maritimehouse@droghedaport.ie
Web: www.droghedaport.ie

(b) Local Shipping Agencies

Patrick Monahan's (Drogheda) Ltd
Tom Roe's Point
Baltray Road
Drogheda,
Co Louth, Tel: 00353 41 9838887
Email: agency@monahansdrogheda.ie

Web: www.mainport.ie
Martin Butterly & Co Ltd
Newtownstalaban
Drogheda, Co Louth, Tel: 00353 41 9831024
Email: agency@butterlyireland.com

KC Shipping Ltd
Duleek
Co Louth, Tel: 00353 41 9847291
Email: agency@kcshipping.ie

Fast Shipping Ltd
North Quay
Drogheda, Co Louth, Tel: 00353 41 9842797
Email: info@fastshipping.ie
Web: www.fast-lines.com

Premier Periclase Ltd
Boyne Road
Drogheda, Co Louth, Tel: 00353 41 9870700

Hamilton Shipping
Dublin Port Centre
01.8559011
Email: dublinagency@hamiltonshipping.com
Web: www.hamiltonshipping.com

(c) Waste Contractors

Atlas Oils
Clonminam Industrial Estate
Portlaoise, Co Laois, Tel: 00353 502 74747

Keegan Oils
Toberona
Castletown
Dundalk, Co Louth, Tel: 00353 42 9331145
Email: alliedtankanddraincleaning@gmail.com

McBreen Environmental
Lismagratty, Cootehill Road,
Cavan, H12 FP44
Tel: 00353 49 4326306

(d) Regulators – National – Regional – Local

Department of Transport, Tourism & Sport
Lesson Lane
Dublin 2, Tel: 00353 1 6783422/6783461
Contacts: Ms. Eithne Gore/Ms. Siobhan Kelly
Email: ShipsourcePollutionPrevention@dttas.ie
Web: www.transport.ie

Environmental Protection Agency
PO Box 3000
Johnstown Castle estate
Co Wexford, Tel: 00353 53 60600
Email: info@epa.ie
Web: www.epa.ie

Dept. of Agriculture, Food & the Marine
Animal By-products Section
Gratton Business Park
Portlaoise Tel: 00353 57 8694346
Email: info@agriculture.gov.ie
Web: www.agriculture.gov.ie

Louth County Council
County Hall
Millennium centre
Dundalk, Co Louth, Tel: 00353 42 93353130
Email: info@louthcoco.ie
Web: www.louthcoco.ie

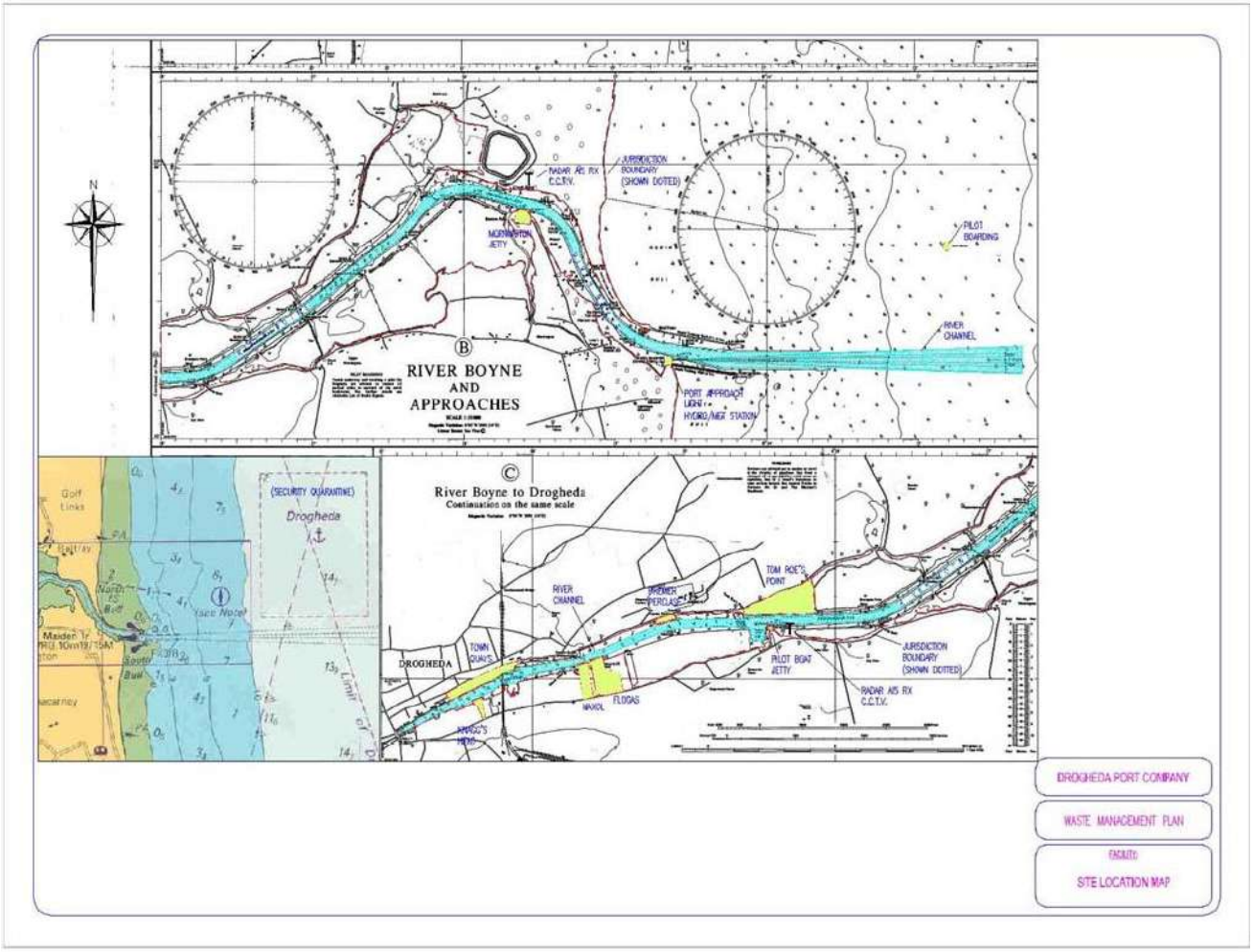
Meath County Council
Area Office Duleek
Duleek, Co Meath, Tel: 00353 41 9880700
Email: info@meathcoco.ie
Web: www.meathcoco.ie

Dept. of Agriculture, Food & the Marine
Drogheda District Veterinary Office
Navan
Co. Meath Tel: 00353 46 9082936

Indaver Ireland
4th Floor, Block 1,
West Pier Business Campus, Old Dunleary Road,
Dun Laoghaire, Co. Dublin, Ireland - Phone: +353 1 280 4534

Appendix 1

Maps & Photographs



Town Quays: Collect by Drogheda Port at Ships Berth

Tom Roe's Point: Collect by Drogheda Port at Ships Berth

Flo Gas: 1.6KL Swill Bin on Jetty. Emptied and collected by Drogheda Port

Fishmeal: Collect by Drogheda Port at Ships Berth

Premier Periclase: 1.6KL Bin on Jetty. Emptied and collected by Drogheda Port

Appendix 2

Permits to land and transport International Catering Waste issue by the Department of Agriculture, Food & Marine

An Roinn
Talmhaíochta,
Bia agus Mara
Department of
Agriculture,
Food and the Marine

Certificate of Registration

Registration under the European Union (Animal By-Products) Regulations 2014 (S.I. No 187 of 2014) and Authorisation to Land International Catering Waste in accordance with Regulation (EC) No. 1069 of 2009 and Regulation (EU) No. 142 of 2011

Company	Drogheda Port Company		
Address	Harbourville, Mornington Road, Drogheda, Co Meath		
Registration No.	L06		
Landing address	Drogheda Port and associated berths and quays.		
CRO No.	262361		
VAT No.	IE8262361R		
Map coordinates			
Operator	Captain Martin J Donnelly	**Title**	Harbour Master
Phone	041 9838378	**Mobile**	
Email	martindonnelly@droghedaport.ie		
Plant Description	**Section XIII**: Other registered operators in accordance with Article 23(1) of Regulation EC No. 1069/2009.		
ABP/derived product	Category 1 animal by-products as set out in Article 8 (f) of Regulation (EC) No. 1069 of 2009		
Activities	OTHER: Lander of International Catering Waste		
Product	Not applicable (Disposal Only)		
Remarks	This authorisation is subject to the conditions set out in the document "*CN25A: Ministerial Conditions for Authorisation to Land International Catering Waste*" and all other relevant EU and national legislation. This certificate of registration supersedes all other certificates of registration issued previously.		
Valid from	03 May 2018 to 02 May 2023		

Dated 03 May 2018

For the Minister of Agriculture, Food and the Marine

Mairéad Broderick

Mairéad Broderick

An Officer Authorised by the said Minister

Department of Agriculture, Food and the Marine
IRELAND

Stamp of Competent Authority

An Roinn
Talmhaíochta,
Bia agus Mara
Department of
Agriculture,
Food and the Marine

Certificate of Registration

Registration under the European Union (Animal By-Products) Regulations 2014 (S.I. No 187 of 2014) and Authorisation to Move International Catering Waste in accordance with Regulation (EC) No. 1069 of 2009 and Regulation (EU) No. 142 of 2011

Company	Drogheda Port Company		
Address	Harbourville, Mornington Road, Drogheda, Co. Meath		
Registration No.	M03		
Location (from where ICW is to be removed	Drogheda Port and associated Berths and Quays		
CRO No.	262361		
VAT No.	IE8268361R		
Contact details			
Operator	Martin J. Donnelly	**Title**	Harbour Master
Phone	041 9838378	**Mobile**	N/A
Email	martin.donnelly@droghedaport.ie		
Plant Description	Section XIII: Registered transporter in accordance with Article 23(1) of Regulation (EC) No. 1069 of 2009.		
ABP/derived product	Category 1 animal by-products as set out in Article 8 (f) of Regulation (EC) No. 1069 of 2009		
Activities	TRANS: Transport of ABP and derived products		
Product	Not applicable (Disposal Only)		
Remarks	This authorisation is subject to the conditions set out in the document *CN25: Ministerial Conditions for Authorisation to Move International Catering Waste"* and all other relevant EU and national legislation. This certificate of registration supersedes all other certificates of registration issued previously.		
Valid from	26 April 2018 to 25 April 2023		

Dated 26 April 2018

For the Minister of Agriculture, Food and the Marine

Mairéad Broderick

Mairéad Broderick

An Officer Authorised by the said Minister

Department of Agriculture, Food and the Marine
IRELAND

Stamp of Competent Authority

Appendix 3

Format For Reporting Alleged Inadequacies of Port Reception Facilities

FORMAT FOR REPORTING ALLEGED INADEQUACIES OF PORT RECEPTION FACILITIES[1]

The master of a ship having encountered difficulties in discharging waste to reception facilities should forward the information below, together with any supporting documentation, to the Administration of the flag State and, if possible, to the competent Authorities in the port State. The flag State shall notify IMO and the port State of the occurrence. The port State should consider the report and respond appropriately informing IMO and the reporting flag State of the outcome of its investigation.

1 SHIP'S PARTICULARS

1.1 Name of ship: _____

1.2 Owner or operator: _____

1.3 Distinctive number or letters: _____

1.4 IMO Number[2]: _____

1.5 Gross tonnage: _____

1.6 Port of registry: _____

1.7 Flag State[3]: _____

1.8 Type of ship:

☐ Oil tanker ☐ Chemical tanker ☐ Bulk carrier

☐ Other cargo ship ☐ Passenger ship ☐ Other (specify) _____

2 PORT PARTICULARS

2.1 Country: _____

2.2 Name of port or area: _____

2.3 Location/terminal name: _____
(e.g. berth/terminal/jetty)

2.4 Name of company operating
the reception facility (if applicable): _____

2.5 Type of port operation:

☐ Unloading port ☐ Loading port ☐ Shipyard

☐ Other (specify) _____

2.6 Date of arrival: __/__/____ (dd/mm/yyyy)

2.7 Date of occurrence: __/__/____ (dd/mm/yyyy)

2.8 Date of departure: __/__/____ (dd/mm/yyyy)

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1 This format was approved by MEPC 53.

2 In accordance with the *IMO ship identification number scheme*, adopted by the Organization by Assembly resolution A.1078(28).

3 The name of the State whose flag the ship is entitled to fly.

3 INADEQUACY OF FACILITIES

3.1 Type and amount of waste for which the port reception facility was inadequate and nature of problems encountered

Type of waste	**Amount for discharge (m^3)**	**Amount <u>not</u> accepted (m^3)**	**Problems encountered** Indicate the problems encountered by using one or more of the following code letters, as appropriate. A No facility available B Undue delay C Use of facility technically not possible D Inconvenient location E Vessel had to shift berth involving delay/cost F Unreasonable charges for use of facilities G Other (please specify in paragraph 3.2)
MARPOL Annex I-related Type of oily waste:			
Oily bilge water			
Oily residues (sludge)			
Oily tank washings (slops)			
Dirty ballast water			
Scale and sludge from tank cleaning			
Other (please specify .....)			
MARPOL Annex II-related Category of NLS[4] residue/water mixture for discharge to facility from tank washings:			
Category X substance			
Category Y substance			
Category Z substance			
MARPOL Annex IV-related Sewage			
MARPOL Annex V-related Type of garbage:			
A. Plastics			
B. Food wastes			
C. Domestic wastes (e.g. paper products, rags, glass, metal, bottles, crockery, etc.)			
D. Cooking oil			
E. Incinerator ashes			
F. Operational wastes			
G. Cargo residues			
H. Animal carcass(es)			
I. Fishing gear			
MARPOL Annex VI-related			
Ozone-depleting substances and equipment containing such substances			
Exhaust gas-cleaning residues			

[4] Indicate, in paragraph 3.2, the proper shipping name of the NLS involved and whether the substance is designated as "solidifying" or "high viscosity" as per MARPOL Annex II, regulation 1, paragraphs 15.1 and 17.1 respectively.

3.2 Additional information with regard to the problems identified in the above table.

3.3 Did you discuss these problems or report them to the port reception facility?

☐ Yes ☐ No

If Yes, with whom (please specify)

If Yes, what was the response of the port reception facility to your concerns?

3.4 Did you give prior notification (in accordance with relevant port requirements) about the vessel's requirements for reception facilities?

☐ Yes ☐ No ☐ Not applicable

If Yes, did you receive confirmation on the availability of reception facilities on arrival?

☐ Yes ☐ No

4 ADDITIONAL REMARKS/COMMENTS

Master's signature

Date: __/__/____ (dd/mm/yyyy)

Appendix 4

INDAVER

Drogheda Port Company
Harbourville,
Mornington Road,
Drogheda,
Co. Meath

Date: 19.09.2013

Dear Captain Martin Donnelly

RE: IMPORTANT INFORMATION

Your Unique Reference Number(s) for the Recovery of waste at Indaver's Waste-to-Energy facility

Following our recent correspondence regarding the recovery of your waste at Indaver's Waste-to-Energy facility and receipt of all necessary information for our system, please find below details of your **Unique Reference Number(s)** which are required for entry into the Indaver facility and acceptance of your waste for treatment.

Please note that, where relevant, one customer reference number is used for each customer site supplying waste to the Indaver facility. Furthermore, a waste description reference number item has been assigned to each waste type to help distinguish between your different waste streams.

Customer Ref Number		**20027363**
Collection Address:		Drogheda Port Company Harbourville, Mornington Road, Drogheda, Co. Meath
Waste Item & Description	**10**	Municipal Waste 200301

Please note:

1. Your Unique Reference Numbers must be quoted to Security by all your drivers and any third party drivers upon arrival at the Waste-to-Energy

facility in order to gain entry. This will ensure that only your waste deliveries are invoiced to your company and that they are correctly assigned to waste streams and sites.

2. It will not be possible for drivers to enter the Waste-to-Energy facility without your Unique Reference Numbers.
3. The Unique Reference Numbers are valid for the type & tonnage of waste as set out in the Offer agreed with Indaver Ireland Ltd only.

Our Waste-to-Energy facility can treat a wide range of waste types and we are happy to discuss, agree a new Offer and provide you with a Quotation Number for the treatment of alternative waste streams.

Also, please find enclosed a brief note on delivery and acceptance of waste at the facility which will help inform your drivers of the process involved in advance of first deliveries.

Kind regards,

Ger Walsh

Indaver Ireland Ltd

0.0 PREFACE

0.2 REVISION PAGE No 1

Please acknowledge receipt by signing and dating, and faxing a copy of the page to Fax No:

Issue No. 1 Copy No…….. Distributed on ……...	Received by:	Date:
Amendments:		

Date	Remove pages	Insert page	Inserted by:	Date

Drogheda Port Company Port Waste Management Plan

0.0 PREFACE

0.2 REVISION PAGE No 1

Please acknowledge receipt by signing and dating, and faxing a copy of the page to Fax No:

Issue No. 1 Copy No…….. Distributed on ……...	Received by:	Date:
Amendments:		

Date	Remove pages	Insert page	Inserted by:	Date

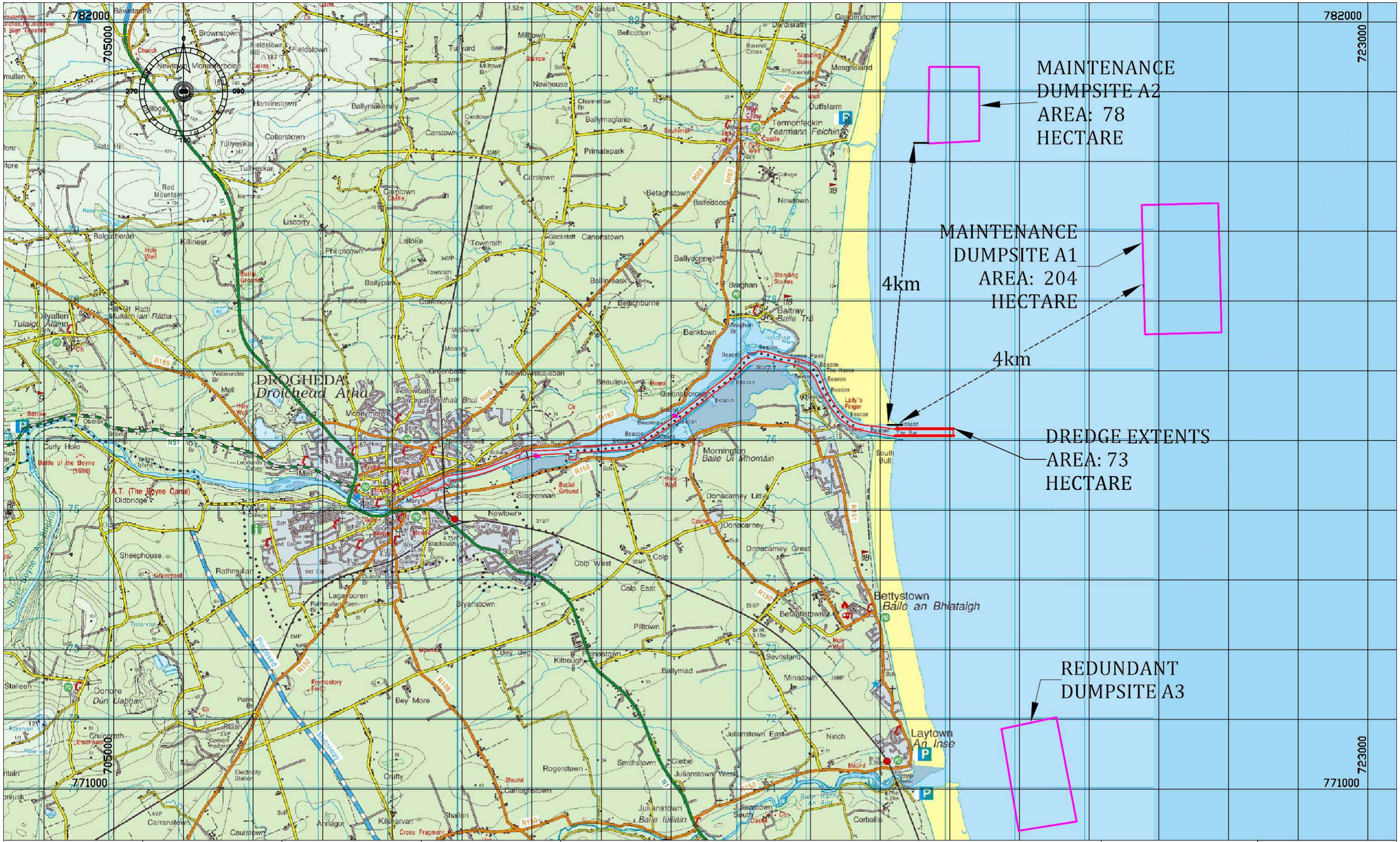
APPENDIX 7.2

DREDGING AREA LOCATIONS

SITE: RIVER BOYNE, DROGHEDA	CLIENT: Drogheda Port Company	JOB NUMBER: PH19002S	DRAWN BY: Hugh Power DATE OF ISSUE: 27/11/2019	MEMOIR 1. Constructed on Irish Transverse Mercator. 2. Ordnance Survey Discovery Series (1:50k) raster images used as background mapping, converted to ITM, blue lines on raster image relate to Irish National Grid (ING), additional black lines relate to ITM. 3. Limits of dredge area shown as red line.	
SHEET TITLE: FORESHORE LICENCSE DRAWINGS - DREDGE AREA - OVERVIEW MAP	PRODUCED BY: HYDROGRAPHIC SURVEYS LTD The Cobbles Crosshaven Co. Cork tel: +353 21 4831184	DRAWING NUMBER: PH19002S_D01	SCALE: 1:25k ON A3 REVISION: Rev.02 APPROVED: J.B.J.		HYDROGRAPHIC SURVEYS LTD.

APPENDIX 7.3

LOCATION OF MAINTENANCE DREDGING DUMPSITES



SITE: RIVER BOYNE, DROGHEDA	CLIENT: Drogheda Port Company	JOB NUMBER: PH19002S	DRAWN BY: Hugh Power DATE OF ISSUE: 27/11/2019	MEMOIR 1. Constructed on Irish Transverse Mercator. 2. Ordnance Survey Discovery Series (1:50k) raster images used as background mapping, converted to ITM, blue lines on raster image relate to Irish National Grid (ING), additional grey lines relate to ITM. 3. Limits of dredge area shown as red line ,proposed dump sites shown as magenta lines.	Hydrographic Surveys Site Site Location
SHEET TITLE: FORESHORE LICENCSE DRAWINGS - DREDGE AREA AND OFFSHORE DUMP SITES	PRODUCED BY: HYDROGRAPHIC SURVEYS LTD The Cobbles Crosshaven Co. Cork tel: +353 21 4831184	DRAWING NUMBER: PH19002S_D02	SCALE: 1:50k ON A3 REVISION: Rev.02 / APPROVED: J.B.J.		HYDROGRAPHIC SURVEYS LTD.

APPENDIX 8.1

LITTLE TERN SURVEY DATES, TIMES, TIDE TIMES AND CYCLE AND WEATHER CONDITIONS

Date	VP	Start time	End time	Tide time high water[1]	Tide movement[2]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (X/8)	Visibility
30/05/2018	1	14:00	14:30	13:32	Ebb	Low	17	4	E	None	0	Good
30/05/2018	2	14:30	15:00	13:32	Ebb	High	17	4	E	None	0	Good
30/05/2018	3	15:00	16:00	13:32	Ebb	High	17	4	E	None	0	Good
30/05/2018	4	16:00	17:00	13:32	Ebb	High	17	4	E	None	0	Good
30/05/2018	5	10:15	11:30	13:32	Flow	Low	17	4	E	None	0	Good
30/05/2018	6	09:00	10:00	13:32	Flow	Low	17	4	E	None	0	Good
07/06/2018	1	09:30	10:30	06:13	Ebb	Low	19.5	2	E	None	2	Good
07/06/2018	2	10:45	11:45	06:13	Ebb	Low	19.5	2	E	None	0	Mod. (heat haze)
07/06/2018	3	13:15	14:15	06:13	Flow	Mid	20	2	E	None	1	Mod. (heat haze)
07/06/2018	4	12:05	13:05	06:13	Slack	Low	19	2	E	None	1	Mod. (heat haze)
07/06/2018	5	15:30	16:30	19:05	Flow	Mid	22	2	E	None	1	Mod. (heat haze)
07/06/2018	6	16:40	17:40	19:05	Flow	High	22	1	E	None	1	Good
13/06/2018	1	16:00	17:00	11:42	Ebb	Low	19	5	S	Light showers	8	Good
13/06/2018	2	14:50	13:50	11:42	Ebb	Mid	18	5	S	None	8	Good
13/06/2018	3	12:20	13:20	11:42	Ebb	High	16.5	3	S	Light showers	8	Good
13/06/2018	4	13:32	14:32	11:42	Ebb	Mid	16	4	S	None	8	Good
13/06/2018	5	10:20	11:20	11:42	Flow	High	17	2	S	None	8	Good
13/06/2018	6	09:05	10:05	11:42	Flow	High	17	2	S	None	8	Good
20/06/2018	1	11:30	12:35	05:24	Ebb	Low	15	3	N	None	6	Good
20/06/2018	2	12:40	13:40	18:09	Flow	Mid	16	4	N	None	8	Good
20/06/2018	3	15:15	16:15	18:09	Flow	High	15	4	N	None	6	Good
20/06/2018	4	14:05	15:05	18:09	Flow	Mid	16	4	N	None	7	Good
20/06/2018	5	08:45	09:45	05:24	Ebb	Low	13	5	N	None	8	Good
20/06/2018	6	09:55	10:55	05:24	Ebb	Low	13	4	N	None	8	Good
27/06/2018	1	12:45	13:30	12:02	Ebb	High	23	2	NE	None	2	Mod. (heat haze & sun reflection)
27/06/2018	2	11:25	12:25	12:02	Flow/Slack	High	23	2	NE	None	2	Mod. (heat haze & sun reflection)
27/06/2018	3	10:10	11:10	12:02	Flow	High	22	2	NE	None	2	Mod. (heat haze & sun reflection)
27/06/2018	4	09:00	10:00	12:02	Flow	Mid	20	3	N	None	2	Mod. (heat haze)
27/06/2018	5	13:50	14:50	12:02	Ebb	Mid	23	2	NE	None	2	Mod. (heat haze)
27/06/2018	6	15:00	16:00	12:02	Ebb	Low	23	2	NE	None	2	Mod. (heat haze)

[1] Drogheda Tide Tables 2018, high tide times for Tom Roes Point

[2] Ebb tide is a falling tide; flow tide is a flooding tide; and, slack tide is the short period when the tides are turning and there is neither an ebb or flow movement

Date	VP	Start time	End time	Tide time high water[1]	Tide movement[2]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (X/8)	Visibility
04/07/2018	1	11:45	12:30	16:22	Flow	Mid	23	2	E	None	0	Good
04/07/2018	2	12:40	13:40	16:22	Flow	Mid	23	2	E	None	0	Good
04/07/2018	3	14:00	15:00	16:22	Flow	Mid	22	3	E	None	0	Good
04/07/2018	4	15:10	16:10	16:22	Flow	High	22	3	E	None	0	Good
04/07/2018	5	09:05	10:05	16:22	Ebb	Low	20	1	E	None	0	Good
04/07/2018	6	10:15	11:15	16:22	Ebb/Slack	Low	22	2	E	None	0	Good
16/07/2018	1	07:50	08:50	14:51	Ebb/Slack	Low	17	1	E	None	3	Good
16/07/2018	2	09:15	10:15	14:51	Flow	Low	17	1	E	None	3	Good
16/07/2018	3	10:40	11:40	14:51	Flow	Low	20	1	N	None	4	Good
16/07/2018	4	11:50	12:50	14:51	Flow	Mid	20	1	N	None	6	Good
16/07/2018	5	14:00	15:00	14:51	Flow/Slack	High	20	3	SE	None	7	Good
16/07/2018	6	15:15	16:15	14:51	Ebb	Mid	17	4	SE	None	8	Good
23/07/2018	1	12:15	13:15	09:18	Ebb	Mid	20		SE	None	7	Good
23/07/2018	2	13:30	14:30	09:18	Ebb	Mid	23	2	NE	None	8	Good
23/07/2018	3	14:40	15:40	09:18	Ebb/Slack	Low	20	5	SE	None	6	Good
23/07/2018	4	15:50	16:50	09:18	Flow	Low	20	5	SE	None	6	Good
23/07/2018	5	09:03	10:03	09:18	Flow/Slack	High	20	1	S	None	8	Good
23/07/2018	6	10:20	11:20	09:18	Ebb	High	20	2	SE	None	8	Good
03/08/2018	1	09:15	10:15	04:01	Ebb	Low	20	2	W	None	6	Good
03/08/2018	2	10:30	11:30	04:01	Flow	Mid	20	2	W	None	7	Good
03/08/2018	3	12:00	13:00	04:01	Flow	Mid	19	2	W	None	6	Good
03/08/2018	4	13:15	14:15	16:33	Flow	Mid	19	1	W	None	6	Good
03/08/2018	5	15:30	16:30	16:33	Flow/Slack	High	20	1	W	None	4	Good
03/08/2018	6	16:40	17:40	16:33	Ebb	High	20	1	W	None	4	Good
09/08/2018	1	12:15	13:15	10:20	Ebb	Mid	19	2	S	None	4	Good
09/08/2018	2	13:25	14:25	10:20	Ebb	Mid	19	4	SW	None	5	Good
09/08/2018	3	14:45	15:15	10:20	Ebb	Low	19	2	S	None	4	Good
09/08/2018	4	15:15	15:45	10:20	Ebb	Low	19	2	S	None	4	Good
09/08/2018	5	10:45	11:45	10:20	Ebb	Mid	19	2	S	None	3	Good
09/08/2018	6	09:35	10:35	10:20	Flow/Slack	High	17	2	S	None	2	Good

APPENDIX 8.2

WINTERING BIRD 2018- - 2018 SURVEY DATES, TIMES, TIDE TIMES AND CYCLE, AND WEATHER CONDITIONS

Date	Count Area	Start time	End time	Tide time high water[3]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
20/09/2018	1	15:15	15:40	09:24	Low	9	3	SE	Heavy rain	8	Good
20/09/2018	3	14:50	15:05	09:24	Low	9	3	SE	Heavy rain	8	Good
20/09/2018	4	14:10	14:15	09:24	Low	9	3	SE	Heavy rain	8	Good
20/09/2018	5	13:50	14:10	09:24	Low	9	3	SE	Heavy rain	8	Good
20/09/2018	7	16:00	16:20	09:24	Low	9	3	SE	Heavy rain	8	Good
20/09/2018	8	10:30	11:40	09:24	High	12	3	SE	None	8	Good
20/09/2018	9	10:30	11:40	09:24	High	12	3	SE	None	8	Good
20/09/2018	10	09:30	10:30	09:24	High	11	3	SE	None	8	Good
20/09/2018	11	09:10	09:25	09:24	High	11	3	SE	None	8	Good
20/09/2018	12	08:20	09:00	09:24	High	10	3	SE	None	8	Good
20/09/2018	13	08:20	09:00	09:24	Low	10	3	SE	Light rain	8	Good
20/09/2018	2	14:25	14:50	09:24	Low	9	3	SE	Heavy rain	8	Poor
20/09/2018	6	13:00	13:50	09:24	Low	9	3	SE	Heavy rain	8	Poor
15/10/2018	1	10:20	10:45	16:25	Low	12	2	SW	None	1	Good
15/10/2018	2	12:40	12:50	16:25	Low	12	2	SW	None	1	Good
15/10/2018	3	12:30	12:35	16:25	Low	12	2	SW	None	1	Good
15/10/2018	4	12:25	12:30	16:25	Low	12	2	SW	None	1	Good
15/10/2018	5	12:20	12:25	16:25	Low	12	2	SW	None	1	Good
15/10/2018	6	11:45	12:15	16:25	Low	12	2	SW	None	1	Good
15/10/2018	7	08:45	10:10	16:25	Low	12	2	SW	None	1	Good
15/10/2018	8	08:45	10:10	16:25	Low	12	2	SW	None	1	Good
15/10/2018	9	08:45	10:10	16:25	Low	12	2	SW	None	1	Good
15/10/2018	10	08:45	10:10	16:25	Low	12	2	SW	None	1	Good
15/10/2018	11	08:30	08:40	16:25	Low	12	2	SW	None	1	Good
15/10/2018	12	08:00	08:15	16:25	Low	12	2	SW	None	1	Good
15/10/2018	13	11:15	11:35	16:25	Low	12	2	SW	None	1	Good
15/10/2018	1	05:00	05:10	16:25	High	12	2	SW	None	1	Good
15/10/2018	2	04:30	04:40	16:25	High	12	2	SW	None	1	Good
15/10/2018	3	04:25	04:30	16:25	High	12	2	SW	None	1	Good
15/10/2018	4	04:20	04:25	16:25	High	12	2	SW	None	1	Good
15/10/2018	5	04:15	04:20	16:25	High	12	2	SW	None	1	Good

[3] Drogheda Tide Tables 2018, high tide times for Tom Roes Point

Date	Count Area	Start time	End time	Tide time high water[3]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
15/10/2018	6	03:50	04:15	16:25	High	12	2	SW	None	1	Good
15/10/2018	7	05:10	05:15	16:25	High	12	2	SW	None	1	Good
15/10/2018	8	05:15	05:30	16:25	High	12	2	SW	None	1	Good
15/10/2018	9	05:15	05:30	16:25	High	12	2	SW	None	1	Good
15/10/2018	10	05:30	05:45	16:25	High	12	2	SW	None	1	Good
15/10/2018	11	05:45	05:50	16:25	High	12	2	SW	None	1	Good
15/10/2018	12	05:50	06:00	16:25	High	12	2	SW	None	1	Good
15/10/2018	13	15:25	15:45	16:25	High	12	2	SW	None	1	Good
20/11/2018	1	09:50	10:05	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	2	10:10	10:15	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	3	10:15	10:20	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	4	10:20	10:25	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	5	10:25	10:30	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	6	10:30	10:45	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	7	09:35	09:45	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	8	09:25	09:35	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	9	09:05	09:25	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	10	08:30	09:05	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	11	08:05	08:25	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	12	08:05	08:25	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	13	10:45	11:00	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	1	14:50	15:10	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	2	14:25	14:35	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	3	14:15	14:25	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	4	14:05	14:15	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	5	14:00	14:05	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	6	13:40	13:55	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	7	15:15	15:30	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	8	15:30	15:45	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	9	15:45	16:00	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	10	16:00	16:15	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	11	16:15	16:20	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	12	16:15	16:20	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	13	13:10	13:30	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility

Date	Count Area	Start time	End time	Tide time high water[3]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
20/12/2018	1	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	2	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	3	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	4	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	5	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	6	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	7	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	8	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	9	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	10	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	11	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	12	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	13	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	1	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	2	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	3	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	4	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	5	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	6	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	7	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	8	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	9	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	10	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	11	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	12	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	13	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
25/01/2019	1	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	2	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	3	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	4	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	5	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	6	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	7	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	8	08:05	12:00	14:30	Low	8	2	S	None	8	Good

Date	Count Area	Start time	End time	Tide time high water[3]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
25/01/2019	9	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	10	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	11	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	12	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	13	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	1	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	2	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	3	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	4	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	5	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	6	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	7	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	8	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	9	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	10	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	11	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	12	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	13	13:15	15:40	14:30	High	8	2	S	None	8	Good
12/02/2019	1	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	2	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	3	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	4	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	5	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	6	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	7	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	8	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	9	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	10	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	11	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	12	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	13	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	1	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	2	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	3	13:40	17:00	16:12	High	7	4	SW	None	5	Good

Date	Count Area	Start time	End time	Tide time high water[3]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
12/02/2019	4	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	5	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	6	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	7	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	8	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	9	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	10	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	11	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	12	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	13	13:40	17:00	16:12	High	7	4	SW	None	5	Good
27/03/2019	1	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	2	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	3	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	4	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	5	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	6	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	7	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	8	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	9	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	10	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	11	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	12	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	13	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	1	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	2	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	3	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	4	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	5	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	6	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	7	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	8	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	9	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	10	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	11	08:30	12:50	16:06	Low	10	3	SE	None	5	Good

Date	Count Area	Start time	End time	Tide time high water[3]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
27/03/2019	12	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	13	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
16/04/2019	1	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	2	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	3	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	4	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	5	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	6	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	7	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	8	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	9	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	10	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	11	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	12	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	13	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	1	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	2	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	3	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	4	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	5	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	6	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	7	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	8	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	9	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	10	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	11	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	12	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	13	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate

APPENDIX 8.3

EUROPEAN AND NATIONALLY DESIGNATED SITES WITHIN THE ZOI OF THE PROPOSED ACTIVITY (SEE FIGURE 8.5 AND 8.6)

Site name and code	Distance from Operation	Reasons for designation[4] (*= Priority Annex I Habitat)[5] (Sourced from NPWS online Conservation Objectives)
Special Areas of Conservation (SACs)		
Boyne Coast and Estuary SAC [001957]	The dredging operation overlaps with the European site boundary	[1130] Estuaries [1140] Mudflats and sandflats not covered by seawater at low tide [1310] *Salicornia* and other annuals colonizing mud and sand [1320] *Spartina* swards (*Spartinion maritimae*) [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1410] Mediterranean salt meadows (*Juncetalia maritimi*) [2110] Embryonic shifting dunes [2120] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2130] *Fixed coastal dunes with herbaceous vegetation (grey dunes) NPWS (2012) *Conservation Objectives for Boyne Coast and Estuary SAC [001957].* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
River Boyne and River Blackwater SAC [002299]	The dredging operation overlaps with the European site boundary	[7230] Alkaline fens [7230] [91E0] *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [1106] Atlantic Salmon *Salmo salar* [1099] River Lamprey *Lampetra fluviatilis* [1355] Otter *Lutra lutra* NPWS (2018) *Conservation objectives for River Boyne and River Blackwater SAC [002299].* Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.
Clogher Head SAC	c.8.2km north	[1230] Vegetated sea cliffs of the Atlantic and Baltic coasts [4030] European dry heaths NPWS (2017) *Conservation Objectives for Clogher Head SAC [001459].* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
Dundalk Bay SAC	c.13.5km northwest	[1130] Estuaries [1140] Mudflats and sandflats not covered by seawater at low tide [1220] Perennial vegetation of stony banks [1310] Salicornia and other annuals colonizing mud and sand [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1410] Mediterranean salt meadows (*Juncetalia maritimi*) NPWS (2011) *Conservation Objectives for Dundalk Bay SAC [000455] and Dundalk Bay SPA [004026].* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
Rockabill to	c.15km	[1170] Reefs

[4] "Qualifying Interests" for SACs and "Special Conservation Interests" for SPAs based on relevant Statutory Instruments for each SPA, and NPWS Conservation Objectives for SACs downloaded from www.npws.ie in September 2018. Data on NHA/pNHA sites from the site synopsis documents published by the NPWS (where available).

[5] Priority Annex I habitat types are denoted with an "*" and are habitat types which are in danger of disappearance at a European level – from the definition of "priority natural habitat types" in Article 1(d) of the Habitats Directive

Site name and code	Distance from Operation	Reasons for designation[4] (*= Priority Annex I Habitat)[5] (Sourced from NPWS online Conservation Objectives)
Dalkey Island SAC [003000]	southeast	[1351] Harbour porpoise *Phocoena phocoena* NPWS (2013a) *Conservation Objectives for Rockabill to Dalkey Island SAC [003000]*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
Special Protections Areas (SPAs)		
Boyne Estuary SPA [004080]	The dredging operation overlaps with the European site boundary	[A048] Shelduck (*Tadorna tadorna*) [A130] Oystercatcher (*Haematopus ostralegus*) [A140] Golden Plover (*Pluvialis apricaria*) [A141] Grey Plover (*Pluvialis squatarola*) [A142] Lapwing (*Vanellus vanellus*) [A143] Knot (*Calidris canutus*) [A144] Sanderling (*Calidris alba*) [A156] Black-tailed Godwit (*Limosa limosa*) [A162] Redshank (*Tringa totanus*) [A169] Turnstone (*Arenaria interpres*) [A195] Little Tern (*Sterna albifrons*) [A999] Wetland and Waterbirds NPWS (2013) *Conservation Objectives for Boyne Estuary SPA [004080].* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
River Boyne and River Blackwater SPA [004232]	c.3.5km upstream and west	[A229] Kingfisher (*Alcedo atthis*) NPWS (2018) *Conservation Objectives for River Boyne and River Blackwater SPA [004232].* Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.
River Nanny and Estuary SPA [004158]	c.3.7km south	[A130] Oystercatcher (*Haematopus ostralegus*) [A137] Ringed Plover (*Charadrius hiaticula*) [A140] Golden Plover (*Pluvialis apricaria*) [A143] Knot (*Calidris canutus*) [A144] Sanderling (*Calidris alba*) [A184] Herring Gull (*Larus argentatus*) [A999] Wetland and Waterbirds NPWS (2012) *Conservation Objectives for River Nanny Estuary and Shore SPA [004158].* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
Dundalk Bay SPA	c.11km north	[A005] Great Crested Grebe *Podiceps cristatus* [A043] Greylag Goose *Anser anser* [A046] Light-bellied Brent Goose *Branta bernicla hrota* [A048] Shelduck *Tadorna tadorna* [A052] Teal *Anas crecca* [A053] Mallard *Anas platyrhynchos* [A054] Pintail *Anas acuta* [A065] Common Scoter *Melanitta nigra* [A069] Red-breasted Merganser *Mergus serrator* [A130] Oystercatcher *Haematopus ostralegus*

Site name and code	Distance from Operation	Reasons for designation[4] (*= Priority Annex I Habitat)[5] (Sourced from NPWS online Conservation Objectives)
		[A137] Ringed Plover *Charadrius hiaticula* [A140] Golden Plover *Pluvialis apricaria* [A141] Grey Plover *Pluvialis squatarola* [A142] Lapwing *Vanellus vanellus* [A143] Knot *Calidris canutus* [A149] Dunlin *Calidris alpina* [A156] Black-tailed Godwit *Limosa limosa* [A157] Bar-tailed Godwit *Limosa lapponica* [A160] Curlew *Numenius arquata* [A162] Redshank *Tringa totanus* [A179] Black-headed Gull *Chroicocephalus ridibundus* [A182] Common Gull *Larus canus* [A184] Herring Gull *Larus argentatus* [A999] Wetlands & Waterbirds NPWS (2011) *Conservation Objectives for Dundalk Bay SAC [000455] and Dundalk Bay SPA [004026].* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
Rockabill SPA	c.13.5km southeast	[A148] Purple Sandpiper *Calidris maritima* [A192] Roseate Tern *Sterna dougallii* [A193] Common Tern *Sterna hirundo* [A194] Arctic Tern *Sterna paradisaea* NPWS (2013) *Conservation Objectives for Rockabill SPA [004014]*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Designated Site Name [Code] and its nature conservation features	Distance from Operation
proposed Natural Heritage Area (pNHA)	
Boyne Coast and Estuary pNHA [001957] This site is designated for the same features for which the Boyne Coast and Estuary SAC and the Boyne Estuary SPA have been: estuarine intertidal and dune habitats, a wide range of wintering and passage birds and breeding Little tern.	The dredging operation overlaps with the European site boundary
Laytown Dunes/Nanny Estuary pNHA [000554] This site consists of a mosaic of habitats including freshwater marsh, salt-marsh, sandy beach and muddy estuary and is important for wintering water birds for which the River Nanny and Estuary SPA have been designated.	c.3.7km south
Boyne River Islands pNHA [001862] This site is designated for alluvial and riparian woodland for which the River Boyne and River Blackwater SAC has been designated. The islands were formed by the build-up of alluvial sediment in this part of the river where water movement is sluggish.	c.4.2km west
Dowth Wetland pNHA [001861] This site is located 4km east of Slane along the northern bank of the River Boyne and is designated for the best remaining example of a floodplain marsh on the	c.6.1km west

Designated Site Name [Code] and its nature conservation features	Distance from Operation
River Boyne.	

APPENDIX 8.4

DROGHEDA PORT COMPANY EMERGENCY PLAN (INCLUDING POLLUTION RESPONSE PLAN); AND,

ENVIRONMENTAL LIABILITIES RISK ASSESSMENT. DROGHEDA PORT; DREDGING & DISPOSAL OPERATIONS (S00015-02) (2015) PREPARED BY AQUAFACT INTERNATIONAL SERVICES LTD

The DPC Emergency Plan can be accessed at:
www.droghedaport.ie
User Name: emergency
Password: DP002

EMERGENCY PLAN

(Including Pollution Response Plan)

JUNE 2019

Update No: 13

Next Review Due: December 2020

EMERGENCY PLAN

(Including Pollution Response Plan)

Contents

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AMENDMENTS TO PLAN

Amendment No.	Date of Issue	Paragraphs amended	Pages substituted or added	Approved by:
1	6/1/97	Various	Nil	M. Donnelly
2	6/3/98	Various	4 Sheet Revised Appendix 5	M. Donnelly
Overall Plan Revision 3	March 99			M. Donnelly
Overall Plan Revision 4	December 2000	Appendix amended	Distribution List, Appendix 4, 6,7,8,10	M. Donnelly
Overall Plan Revision 5	May 2004	Complete Revision	Complete Revision	M. Donnelly
Overall Plan Revision 6	Sept 2007	Complete Revision	Complete Revision	M. Donnelly
Overall Plan Revision 7	Jan 2010	Complete Revision	Complete Revision	M. Donnelly
Overall Plan Revision 8	July 2011	Minor Amendments	Minor Amendments	M. Donnelly
Overall Plan Revision 9	Jan 2013	Minor Amendments	Minor Amendments	M. Donnelly
Overall Plan Revision 10	April 2014	Minor Amendments	Minor Amendments	M. Donnelly
Overall Plan Revision 11	June 2016	Minor Amendments	Minor Amendments	M. Donnelly
Overall Plan Revision 12	Oct 2017	Minor Amendments	Minor Amendments	M Donnelly
Overall Plan Revision 13	June 2019	Minor Amendments	Minor Amendments	M Donnelly

DISTRIBUTION LIST

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Fast Shipping Ireland Ltd.

Fast Terminals Ltd.

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Pollution & Waste Services Ltd

EMERGENCY PLAN

(Including Pollution Response)

INTRODUCTION

For the purpose of interpreting this plan the Drogheda Port Company define an emergency as "**An event that occurs within the jurisdiction of the port with little or no warning, causes or threatens":**

- **Death or injury**
- **Serious disruption to port services**
- **Damage to property**
- **Damage to the environment**
- **Terrorist threat or attach**
- **Pollution incident**

As a result of a marine/or marine related incident, or a serious incident adjacent to the port, impacting on the port or its environs requiring activation of the plan".

1. This plan, agreed to by all existing appropriate authorities in the Port, sets out the AGREED ACTIONS to be taken during ANY EMERGENCY/ POTENTIAL EMERGENCY in the Port. The success of this plan rests on the willing and faithful compliance of all.

2. The plan takes the form of a chapter dealing with emergencies in general, followed by separate chapters giving the actions to be taken in each particular type of emergency. There are also a number of appendices on the various factors affecting different types of emergency.

3. The purpose of this plan is to provide an overall plan of actions to be taken by all authorities in an emergency or potential emergency. Each undertaking or authority will be responsible for issuing their own detailed instructions within the general provisions of this Plan. Drogheda Port Company issue annually "Notice to Masters" (Appendix 1) "Considerations on affecting all types of Emergency's", displayed on www.droghedaport.ie and issued to Ships Agents in Drogheda Port.

4. It is intended that exercises should be held at least annually to test out the efficiency and practicability of the plan and a general meeting will be convened after these exercises to review the plan.

5. The production of this plan and the general co-ordination of all interested parties has been undertaken by the Drogheda Port Company, acting in the general interests of all undertakings in the port.

6. It is important that this plan should be kept up to date and any changes, which affect the plan, should be notified without delay to the Harbourmaster, Harbourville, Mornington Road, Drogheda, Co. Meath who will be responsible for issuing the necessary amendments to the plan.

7. The appendices to the plan include maps of all jetties/quays, private and public within the jurisdiction of the port.

This plan has been produced by the Drogheda Port Company to cover emergencies within the jurisdiction of the Authority. The Drogheda Port Company recognises the existence of the following emergency plans Louth County Council, Meath County Council, Flogas and the North Eastern Health Board. This plan of the Drogheda Port Company is complementary to existing emergency plans.

GENERAL CHAPTER: Considerations affecting all Types of Emergencies.

1. Raising the Alarm and Control of Operations
2. Control of Shipping Movements
3. Responsibility for Fire Fighting Operations
4. Information to Public, Press etc

SECTION A: Fire or Explosion on Jetty/Quay

1. Raising the Alarm
2. Action by Jetty Owner involved
3. Action by Master
4. Action by Jetty Owner not involved
5. Action by Drogheda Port Company
6. Action by Fire Brigade
7. Action by Medical Services
8. Action by Gardaí
9. Action by ICG
10. Establishment of Control Posts
11. Control of Shipping Movements
12. Subsequent Action by all Personnel

SECTION B: Fire or Explosion on a Vessel alongside a Jetty/Quay

1. Raising the Alarm
2. Action by Master
3. Action by Jetty Owners Involved
4. Action by Jetty Owners Not Involved
5. Action by Drogheda Port Company
6. Action by Fire Brigade
7. Action by Medical Services
8. Action by Gardaí
9. Action by ICG
10. Establishment of Control Posts
11. Control of Shipping Movements
12. Subsequent Action by all Personnel

SECTION C: Fire or Explosion on a vessel at Anchor or Moored in the Roads or underway in the channel.

1. Raising the Alarm
2. Action by Master
3. Action by Drogheda Port Company
4. Action by Fire Brigade
5. Action by Medical Services
6. Action by Gardaí
7. Action by Jetty Owners
8. Action by ICG
9. Action by Other Marine Services
10. Establishment of Control Posts
11. Control of Shipping Movements
12. Subsequent Action by all Personnel

SECTION D: Collision or Emergency, other than Fire or Explosion, including oil pollution.

1. Raising the Alarm
2. Action by Master
3. Action by Drogheda Port Company
4. Action by Fire Brigade
5. Action by Medical Services
6. Action by Gardaí
7. Action by Jetty Owners
8. Action by ICG
9. Action by Other Marine Services
10. Establishment of Control Posts
11. Control of Shipping Movements
12. Severe Oil Pollution
13. Subsequent Action by all Personnel

SECTION E: Potentially Hazardous Situations occurring on a Ship or a Jetty.

1. General
2. Raising the Alarm
3. Action by Master
4. Action by Jetty Owner Involved
5. Action by Drogheda Port Company
6. Action by Fire Brigade
7. Control Posts and Situation Reports

SECTION F: Emergencies outside the jurisdiction of the port.

1. General
2. Action by Drogheda Port Company

SECTION G: Terrorist Attack or Threatened Terrorist Attack

1. General
2. Raising the Alarm
3. Action by the Master/Ships Security Officer
4. Action by the PFSO

SECTION H: Pollution Response

1. General
2. Action by Drogheda Port Company

General Chapter:

Considerations affecting all types of Emergency.

1. Raising the Alarm and Control of Operations.

1.1 When an emergency/potential emergency occurs, it is vital that the alarm should be raised immediately. Any person can raise the alarm.

1.2 All reasonable steps will be taken by those on the spot to render whatever aid is immediately available. Subsequent action will be co-ordinated through the control posts as set out in Appendix 9.

1.3 The decisions to designate an emergency/potential emergency and implementation of this Emergency Plan (Including Pollution Response) will be made by the Harbourmaster, acting Harbourmaster or senior officer of the company.

1.4 The Fire Brigade and other Emergency Services may be mobilised before an emergency is declared to deal with a minor incident on a ship or jetty. The Harbourmaster must always be informed immediately of any such incident.

1.5 The Emergency Plan will be activated in whole or in part in all incidents involving fire on board a vessel however minor.

2. Control of Shipping Movements

2.1 All decisions regarding the movements of shipping during an emergency will be made by the Harbourmaster and where necessary, he will decide the order in which ships are to be moved. In this context and throughout the Plan, the acting Harbourmaster will have the have authority to act for the Harbourmaster in the event of his absence ornon-availability.

2.2 During an emergency, no vessel will be allowed to enter the port without the specific authorisation of the Harbourmaster.

2.3 The regulation of port shipping movements will normally be executed through the Drogheda Port Company office.

2.4 No sea-going or cargo-carrying vessels are to be moved from jetties, quays or lay bys after the receipt of an alarm without the prior concurrence of the Harbourmaster unless the vessel is in immediate danger of being affected by the emergency and it is found to be impossible, owing to special circumstances, to obtain this concurrence. Movement without concurrence should only be adopted where grave risk exists by leaving the vessel in position and every effort has been made to contact theHarbourmaster.

2.5 If conditions permit, tankers not involved in the emergency but moored close to a jetty/quay where an emergency is taking place will be moved to sea or other berth at the firstopportunity.

2.6 Where a fire occurs in a vessel alongside a jetty/quay the vessel should, except in very special circumstances, be kept alongside the berth to facilitate fire-fighting operations and increase the safety of the ship's crew and the fire-fighting personnel.

2.7 UNDER NO CIRCUMSTANCES MAY ANY VESSEL ON FIRE OR IN DANGER OF SINKING BE MOVED WITHOUT THE SPECIFIC AUTHORITY OF THE HARBOURMASTER WHO WILL LAY DOWN THE AREA TO WHICH THE VESSEL WILL BE MOVED.

2.8 VESSELS IN ANY DANGER OF SINKING WILL NOT ENTER THE PORT LIMITS UNLESS DIRECTED TO DO SO BY THE HARBOURMASTER.

2.9 During emergencies the Harbourmaster will normally be at the Forward Control. (See Appendix 9)

2.10 On receipt of an alarm, all loading and discharging operations will cease at all jetties/quays (public and private). All cargo vessel hatches should be battened down, tanker hoses will be disconnected and all vessels will make ready their engines. Operations will not be resumed without the specific approval of the Harbourmaster. Such approval may be subject to conditions.

3. Responsibility for Fire Fighting Operations.

3.1 In all cases initial first aid fire fighting will be undertaken by personnel on the scene with whatever equipment is available.

3.2 For fires at jetties/quays direction of all available fire fighting aids, including the direction of the fire fighting resources of the tug, dredger and other craft available will be exercised by the Harbourmaster on the public quays, and on the private quays bye the quay owners/operators in consultation with the harbourmaster until the arrival of the Fire Brigade, when overall direction of fire fighting will be assumed by the Senior Officer of the Fire Brigade present.

3.3 For fire on vessels alongside jetties/quays, underway, or at anchor within the port limits the direction of all available fire fighting aids, including the direction of the fire fighting resources of the pilot boats and other craft available will be exercised by the Harbourmaster until the arrival of the Fire Brigade when overall direction of the fire fighting will be assumed by the Senior Officer of the Fire Brigade present.

3.4 Should any question concerning the safety or stability of a ship arise in the course of fighting the fire, the Harbourmaster, the vessels Master and the Senior Officer of the Fire Brigade present will pay strict attention to the stability of the vessel and, in conjunction with the above, will take the necessary steps to ensure the vessel's safety.

3.5 Should any question concerning the safety or future use of the port or jetty/quay arise, the Harbourmaster or the representative of the Jetty Owners, or both, as applicable, will be responsible for calling the attention of the officer directing fire fighting operations to this, and in conjunction with this officer take any steps necessary to ensure their safety and efficient working.

3.6 Any incident involving the jetties or shipping in Drogheda Port will present the Fire Service with difficult problems and may require the activation of the County Major Emergency Plan.

4. Information to the Public and Press.

4.1 Information to the Press will be channelled through the communications officer of the Drogheda Port Company with respect to emergencies within the estuary or on the Drogheda Port Company public quays. For incidents/emergencies at the private facilities a close liaison will be maintained between the private facility emergency controller and the Drogheda Port Company Communications Officer before any public information releases are made.

SECTION A: Fire or Explosion on Drogheda Port Company town quays, Tom Roes Point terminal and Fishmeal Quay

1. Raising the Alarm

1.1 The responsibility for raising the alarm rests with any person engaged on the quays. This may be a member of the Drogheda Port Company staff or stevedore employee.

1.2 Drogheda Port Company will issue instructions to its staff and stevedores who operate on its property on the lines given in para 1.3 below on raising the alarm.

Method of Raising Alarm.

1.3 By personnel on the jetty concerned, alarm should be raised by: -
(a) Sounding any local alarm signal, then
(b) Reporting the emergency as quickly as possible as follows: -
(1) Ringing Fire Brigade, Tel.No.999/112, and ask for Fire Brigade, giving a short message stating where the fire is and, if possible whether any casualties have occurred or are likely to occur.
(11) Ringing the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400 -1645hrs Mon-Fri) or VHF R/T Channel 11, or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087 2305950 passing the same message together with any information concerning shipping at the jetty, which may become affected.

2. Site action by Drogheda Port Company and or stevedores

2.1 Having raised the alarm the responsibility for fighting the fire will rest with the Drogheda Port Company or stevedores until the Fire Brigade arrives, when the Senior Officer of the Fire Brigade present will undertake overall control of fire fighting. (See General Chapter, section 3)

2.2 Evacuate all personnel to their assembly points, stop all cargo operations, disconnect hoses, close hatches and advise all vessels alongside to prepare for sea and maintain a listening watch on VHF R/T channel 11. Removal from the jetty will be subject to specific approval of the Harbourmaster or his deputy and the tidal conditions (See General Chapter, section 2).

2.3 The stevedores will inform the Drogheda Port Company office of details of type and quantities of cargo aboard all vessels alongside. This information will also be given to the Senior Officer of the Fire Brigade on attendance.

2.4 The Drogheda Port Company will set up CONTROL POSTS as detailed in paragraph 10 of this section..

2.5 Where hand portable VHF R/T radios are available then these should be handed to the Senior Officer Fire Brigade, if floating plant is required with portable fire fighting equipment.

2.6 Drogheda Port Company and the stevedores will take a head count at the assembly point and report to the Senior Fire Office of any missing persons.

2.7 If, after reporting a fire, casualties subsequently occur, the Drogheda Port Company or the stevedore will notify the need for ambulances as soon as possible, stating the urgency and likely number of casualties, to the Ambulance Control (Dial 999 / 112 and ask for "Ambulance").

3. Action by Master

3.1 On the alarm being raised the Master will be responsible for taking all immediate steps to safeguard his ship until assistance becomes available.

4. Action by Jetty Owners Not Involved

4.1 On receipt of an alarm, all loading and discharging operations will cease, hatches closed, cargo hoses disconnected and all vessels alongside prepared for sea and maintain a listening watch on VHF R/T channel 11. (See General Chapter, section 2)

4.2 Jetty Owners will, on request, inform the Drogheda Port Company Office of the quantities and type of cargo on board all vessels alongside.

4.3 Jetty Owners will maintain a continuous listening watch on VHF R/T channel 11 (if fitted) and will ensure that the direct line telephones to the Drogheda Port Company office are manned throughout the period of an emergency in order to received SITREPS and other information from the Drogheda Port Company Office.

5. Action by Drogheda Port Company

5.1 Overall control of shipping in the port will be exercised by the Harbourmaster. His instructions will usually be passed through the Drogheda Port Company office in case of vessels or jetties/quays not directly involved.

5.2 The Harbourmaster will contact each Jetty Operator/Owner by telephone and will make a broadcast on VHF R/T Channels 11 and 16 declaring an emergency, the purpose being to ensure that all persons concerned are alerted.

5.3 On receipt of the alarm, the Drogheda Port Company office will immediately inform all interested parties as detailed in Appendix 7.

5.4 The Drogheda Port Company office will be responsible for informing all vessels underway in the channel or at anchor and will pass any necessary instructions to them.

5.5 Drogheda Port Company floating plant may be used after crew mobilisation to transport Fire Brigade Officers, men and equipment to the river side scene of the fire, and for any other use.

5.6 The Drogheda Port Company pilot launches, if not required for rescue work, will be used to transport pilots as necessary.

5.7 The Drogheda Port Company office will be responsible for organising suitable small craft to convey Fire Brigade personnel and mobile pumps to the scene if required for close quarter fire fighting.

5.8 If it is necessary to take the Incident Medical Officer to the jetty by river or if casualties are to be evacuated by river the Drogheda Port Company office will organise the necessary launches.

5.9 The Drogheda Port Company office will inform ICG in Dublin as laid down in Appendix 7, and if deemed necessary by the Harbourmaster, request that ICG assist in the handling of the emergency.

5.10 Situation Reports may not be broadcast during the initial stages of an emergency but as soon as the level of VHF R/T communications permits, SITREPS will be broadcast on VHF Channels 11 & 16. SITREPS should not be acknowledged.

5.11 Tugs from adjacent ports may be employed.

5.12 River Pilots will be available throughout an emergency and Pilotage services will be co-ordinated through the Harbourmaster.

6. Action by Fire Brigade

6.1 Fire services will attend with their Pre-Determined attendance & equipment.

6.2 The Fire Officer in charge of the first attendance will contact the senior person present at the scene.

6.3 Following contact the Fire Officer in charge of the first attendance will request further backup if required.

7. Action by Medical Services

7.1 The North Eastern Health Board Ambulance Service will make available the necessary numbers of staff and vehicles to deal with whatever emergency arises within their remit on the request of the Drogheda Port Company.

8. Action by Gardaí

On becoming aware of an Emergency or Potential Emergency the Station Officer at Drogheda Garda Station will:

8.1 Direct a Garda with Radio to scene to set up Radio Base.

8.2 Ensure that Harbour Master, Drogheda Port Office, Fire Service and Ambulance Service are aware of the position.

8.3 (i) Organise cordon and or traffic control:

(ii) Ensure that only Emergency vehicles are allowed past these points.

8.4 If necessary, direct Patrol Car with Public Address System to the area to inform residents of the position.

8.5 In the event of fatality arising from the incident, arrange for a Garda on site to set up temporary morgue facilities where the question of identification etc. will be attended.

9. Action by ICG.

9.1 ICG will assist if requested by the Harbourmaster in providing helicopter assistance, lifeboat assistance, and local ICG boats with coast and cliff rescue services if required.

10. Establishment of Control Points.

10.1 The Base Control Point will be established by the Harbourmaster in the Drogheda Port Company office.

10.2 A Forward Control Point will be established by the Harbourmaster at a point closest to the scene (similar to the fire attendance post) of the incident with mobile or fixed VHF R/T equipment and a direct line telephone. (See appendix 9)

10.3 Where appropriate a representative of the ships Agents involved will be stationed at the Forward Control.

11. Control of Shipping Movements (See also General Chapter, Section 2).

11.1 If it is considered by the Harbourmaster that the emergency is such that shipping is likely to be involved, he will issue the necessary instructions through the Drogheda Port Company office.

11.2 If conditions permit, vessels moored to a jetty where an emergency is taking place will be moved to sea or to a vacant berth on another jetty at the first opportunity but only after instructions have been received from the Harbourmaster.

11.3 No vessels will enter the port whilst an emergency is in force without the specific approval of the Harbourmaster.

12. Subsequent Action by all Personnel.

12.1 After the alarm has been raised and all responsible officials are on the scene, future actions will be decided by them as circumstances dictate and all measures affecting the Port will be made known to ships and other establishments not directly involved through the Drogheda Port Office.

12.2 In case of minor fires, cargo operations will not be resumed until the Fire Brigade Officer and Harbourmaster have inspected the area involved and confirmed that it is safe.

For additional information refer to Appendix 1 – 12

SECTION B: Fire or Explosion on a Vessel alongside Drogheda Port town quays, Tom Roes Point terminal and Fishmeal Quay

1. Raising the Alarm.

All ship fires will be treated as potentially dangerous and this Plan will be activated. The decision to declare a full emergency will rest with the Harbourmaster, acting Harbourmaster or senior officer of the company.

1.1 The responsibility for raising the alarm rests with any person engaged on the quays or aboard the vessel.

1.2 Drogheda Port Company will issue instructions to its staff and stevedores who operate on its property on the lines given in para 1.3 below on raising the alarm.

Method of Raising Alarm.

1.3 By personnel on the ship concerned, alarm should be raised by:
(a) Continuous sounding of any fog signalling apparatus and/or other emergency signal and
(b) Reporting the emergency quickly as follows:-
(i) Informing responsible personnel on the jetty,
(ii) Calling the Drogheda Port Company office 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or VHF R/T Channel 11, or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087 2305950 giving a short message stating name of ship, where the fire is and whether any casualties have occurred or are likely to occur.

2. Action by Master

2.1 Having raised the alarm, the Master will be responsible for taking all immediate steps to safeguard his ship until assistance becomes available. The Master should therefore start fighting the fire with all available resources. When the fire brigade arrives overall control of fire fighting will be undertaken by the Senior Officer of the Fire Brigade present (see General Chapter, section 3).

2.2 A Senior Officer of the vessel involved will remain with the Senior Officer of the Fire Brigade present to provide detailed information on the ship and her equipment and cargo.

3. Site action by Drogheda Port Company and stevedores

3.1 Render all possible assistance to the Master in fighting the fire aboard ship.

3.2 Render all possible assistance to the Masters of other vessels alongside.

3.3 Drogheda Port Company and or the stevedore will start fighting any resulting fires, which may occur on the jetty until the Fire Brigade arrives, when overall control will be assumed by the Senior officer of the Fire Brigade (see General Chapter, section 3).

3.4 Evacuate all personnel to their assembly points, stop all cargo operations, disconnect hoses and advise all other vessels alongside to batten down and prepare for sea and maintain a listening watch on VHF R/T channel 11. Removal from the jetty will be subject to specific approval of the Harbourmaster or his deputy and tidal conditions (see General Chapter section 2).

3.5 The stevedores will inform the Drogheda Port Company office of the quantities and type of cargo on board all vessels alongside. This information, will be given to the Senior Officer of the Fire Brigade 0n attendance.

3.6 The Drogheda Port Company will set up CONTROL POSTS as detailed in paragraph 10 of this section.

3.7 Where hand portable VHF/RT radios are available than these should be handed to the Senior Officer Fire Brigade for use in direct communication with the floating plant that may be used to transport fire fighting personnel and equipment by river to the scene.

3.8 Drogheda Port Company and the stevedores will take a head count at the assembly point and report to the Senior Fire Office of any missing persons.

3.9 If, after reporting the fire, casualties subsequently occur, Drogheda Port Company will notify the need for ambulances as soon as possible describing the emergency and stating the likely number of casualties to the Ambulance Control (Dial 999/112 and ask for "AMBULANCE".).

4. Action by Jetty Owners not involved

4.1 On receipt of alarm the Jetty Owner will stop cargo operations, disconnect hoses, close hatches and advise vessels alongside to prepared for sea and maintain a listening watch on VHF R/T channel 11. Removal from the jetty will be subject to specific approval (See General Chapter, section 2).

4.2 Jetty Owners will, on request, inform the Drogheda Port Company office of the quantities and type of cargo on board all vessels alongside.

4.3 Jetty Owners will maintain a continuous listening watch on VHF R/T (if fitted) Channel 11 and will ensure that the direct line telephones to the Drogheda Port Office are manned throughout the period of an emergency in order to receive SITREPS and other information from the Drogheda Port Company office.

5. Action by Drogheda Port Company

5.1 Overall control of the port will be exercised by the Harbourmaster. His instructions will usually be passed through the Drogheda Port Company office in the case of jetties not directly involved.

5.2 The Harbourmaster will contact each Jetty Operator/Owner by telephone and will make a broadcast on VHF R/T Channels 11 and 16 declaring an emergency, the purpose being to ensure that all persons concerned are alerted.

5.3 On receipt of the alarm, the Drogheda Port Company office will immediately inform all interested parties as detailed in appendix 7.

5.4 The Drogheda Port Company office will be responsible for informing all vessels underway in the channel or at anchor and will pass any necessary instructions to them.

5.5 Drogheda Port Company floating plant may be used after crew mobilisation to transport fire brigade officers, men and equipment to the riverside scene of the fire, and for any other use.

5.6 The Drogheda Port Company pilot launches, if not required for rescue work, will be used to transport pilots as necessary.

5.7 The Drogheda Port Company office will be responsible for organising suitable small craft to convey fire brigade personnel and mobile pumps to the scene if required for close quarter fire fighting.

5.8 If is necessary to take the Incident Medical Officer to the scene by river or if casualties are to be evacuated by river the Drogheda Port Company office will organise the necessary launches.

5.9 The Drogheda Port Company office will inform ICG in Dublin as laid down in appendix 5, and if deemed necessary by the Harbourmaster, request that ICG assist in the handling of the emergency.

5.10 Situation Reports may not be broadcast during the initial stages of an emergency but as soon as the level of VHF R/T communications permits, SITREPS will be broadcast on Channels 11 & 16. SITREPS should not be acknowledged.

5.11 Tugs from adjacent port may be employed.

5.12 River pilots will be available throughout an emergency and Pilotage services will be coordinated through the Harbourmaster.

6. Action by Fire Brigade.

6.1 Fire services will attend with their Pre-Determined attendance & equipment.

6.2 The Fire Officer in charge of the first attendance will contact the senior person present at the scene e.g. Ships Master, Harbourmaster.

6.3 Following contact the Fire Officer in charge of the first attendance will request further backup if required.

7. Action by Medical Services.

7.1 The North Eastern Health Board Ambulance Service will make available the necessary numbers of staff and vehicles to deal with whatever emergency arises within their remit at the request of the Drogheda Port Company.

8. Action by Gardaí

On becoming aware of an Emergency or Potential Emergency the Station Orderly at Drogheda Garda Station will:

8.1 Direct a Gardaí with Radio to scene to set up Radio Base.

8.2 Ensure that Harbour Master, Drogheda Port Office, Fire Service and Ambulance Service are aware of the position.

8.3 (i) Organise cordon and or traffic control
(ii) Ensure that only Emergency vehicles are allowed past these points.

8.4 If necessary, direct Patrol Car with Public Address System to the area to inform residents of the position.

8.5 In the event of fatality arising from the incident, arrange for a Garda on site to set up temporary morgue facilities where the question of identification etc. will be attended.

9. Action by ICG.

9.1 ICG will assist if requested by the Harbourmaster in providing helicopter assistance, lifeboat assistance, and local ICG boats with coast and cliff rescue services if required.

10. Establishment of Control Posts

10.1 The Base Control Post will be established by the Harbourmaster in the Drogheda Port Office.

10.2 A Forward Control Post (similar to the forward fire attendance post) will be established by the Harbourmaster at a point closest to the scene of the incident with mobile or fixed VHF R/T equipment and a direct line telephone. (See appendix 9)

10.3 Where appropriate a representative of the ships Agents involved will be stationed at the Forward Control.

11. Control of Shipping Movements. (See General Chapter, section 2).

11.1 If it is considered by the Harbourmaster that the emergency is such that other shipping is likely to be involved, he will issue the necessary instructions concerning their movements through the Drogheda Port Company office.

11.2 If conditions permit, other vessels moored to a jetty/quay where an emergency is taking place will be moved to sea, to an anchorage or to a vacant berth on another jetty at the first opportunity but only after instructions have been received from the Harbourmaster.

11.3 Except in exceptional circumstances, a vessel, which is on fire, will be kept alongside the berth to facilitate fire-fighting operations and improve the safety of the ship's crew and fire fighting personnel.

11.4 No vessels will enter the Port whilst an emergency is in force without the specific approval of the Harbourmaster.

11.5 UNDER NO CIRCUMSTANCES MAY ANY VESSEL ON FIRE OR IN DANGER OF SINKING BE MOVED WITHOUT THE SPECIFIC AUTHORITY OF THE HARBOURMASTER WHO WILL LAY DOWN THE AREA TO WHICH THE VESSEL WILL BE MOVED.

12. Subsequent action by all Personnel.

12.1 After the alarm has been raised and all responsible officers are on the scene, further action will be taken by them as circumstances dictate and all measures affecting the port will be made known to ships and other establishments not directly involved through the Drogheda Port Company office

12.2 In the case of minor fires, cargo operations will not be resumed until the Fire Brigade Officer and Harbourmaster have inspected the area involved and confirmed that it is safe.

For additional information refer to Appendix 1 - 12

SECTION C: Fire or Explosion on a Vessel at Anchor or Underway in the Port.

1. Raising the Alarm

1.1 All ship fires will be treated as potentially dangerous and this Plan will be activated. The decision to declare a full emergency will rest with the Harbourmaster, acting Harbourmaster or senior officer of the company.

1.2. The responsibility for raising the alarm will rest with the Master or crew member of the vessel concerned. Any person other than personnel of the vessel involved who see a fire or explosion on board a vessel in the Port not alongside a jetty should report the fact to the Drogheda Port office only as outlined in para 1.5. below.

Method of Raising Alarm.

1.3 In cases of fire or other emergency, the vessel should raise the alarm immediately by one of the following methods:-
- (a) By plain language message on VHF R/T Channels 11 to the Drogheda Port Company office.
- (b) By visual message.
- (c) By exhibiting one or more of the Signals prescribed in Anne IV of the Collision Regulations (for vessels in distress and requiring assistance).
- (d) By calling the Irish Coast Guard on VHF R/T Channel 16 or tel 01 6620922/3.
- (e) By calling the Drogheda Port Company office by mobile telephone on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950.

1.4 As soon as possible after raising an alarm, an amplifying message should be sent giving details:
- (a) Fire - what is on fire - extent - possible dangers.
- (b) Damage - extent - effect on stability and seaworthiness.
- (c) Casualties - number - type of injury - number of stretchers required.
- (d) Oil spillage - if any danger of oil spillage exists this should be reported.

1.5 Persons seeing a fire or explosion on a vessel at anchor or underway in the channel should:
- (a) Ring the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400-1645hrs Mon-Fri) or VHF R/T Channel 11 or after hours the Harbourmaster on 041-9838385 /086-2547827 / 087-2305950.

ON NO ACCOUNT SHOULD THE INITIAL ALARM MESSAGE BE DELAYED IN ORDER THAT FULL DETAILS CAN BE PROVIDED.

2. Action by Master

2.1 Having raised the alarm, the Master having command at all times of the vessel under his charge will be responsible for taking all immediate steps to safeguard his ship until assistance arrives. When the Fire Brigade arrives, overall control of fire fighting will be undertaken by the Senior Officer of the Fire Brigade present (see General Chapter, section 3). Ship's personnel should therefore start fighting the fire with all appliances available.

2.2 The Master will report to the Drogheda Port Office the quantities, types and distribution of cargo aboard his vessel. This information will be passed to the Senior Officer of the Fire Brigade on his arrival.

3. Action by Drogheda Port Company

3.1 Overall control of the port will be exercised by the Harbourmaster. His instructions will usually be passed through the Drogheda Port Company office in the case of shipping and jetties not directly involved.

3.2 The Harbourmaster will after consultation with the vessels Master advise the Senior Fire Brigade Officer on what action should be taken to safeguard the ship in question and the port in general and will decide as to whether a full or partial emergency should be declared.

3.3. The Harbourmaster will contact each jetty owner/operator by telephone and will make a broadcast on VHF R/T Channels 11 and 16 declaring an emergency, the purpose being to ensure that all persons concerned are alerted. Dublin Radio may rebroadcast this message.

3.4. If circumstances make it necessary, orders will be issued by the Harbourmaster to stop cargo operations at individual jetties, to batten down hatches, disconnect hoses and vessels prepare for sea.

3.5. The Drogheda Port Company office will be responsible for informing all vessels underway in the channel or at anchor and will pass any necessary instructions to them.

3.6. The Harbourmaster will designate the position of the forward control post and will nominate the collection points for embarkation and disembarkation of all services. (see Appendix 9 and Portmap)

3.7. On receipt of the alarm the Drogheda Port Company office will immediately inform all interested parties as detailed in appendix 5.

3.8. The Drogheda Port Office will mobilise Port Authority launches and floating plant for the purpose of transporting personnel and equipment or other deployment as determined by the Harbourmaster and/or Senior Fire Brigade Officer.

3.9 The Drogheda Port Company office will inform ICG in Dublin as laid down in appendix 7, and if deemed necessary by the Harbourmaster, request that ICG assist in the handling of the emergency.

3.10 The Drogheda Port Company office will make available to the Senior Fire Brigade Officer portable VHF communication equipment if required.

3.11 Situation Reports may not be broadcast during the initial stages of and emergency but as soon as the level of VHF R/T communications permits, SITREPS will be broadcast on Channels 11 & 16. SITREPS should not be acknowledged.

4. Action by fire brigade

4.1 Fire services will attend with their Pre-Determined attendance & equipment.

4.2 A reconnaissance team consisting of a Senior Fire Officer will be sent to the vessel.

4.3 The reconnaissance team, following contact with the Harbourmaster will proceed to the vessel to assess the incident and request what assistance is necessary

5. Action by medical services

5.1 The North Eastern Health Board Ambulance Service will make available the necessary number of staff and vehicles to deal with whatever emergency arises within their remit at the request of the jetty owner or Drogheda Port Company.

6. Action by Gardaí

On becoming aware of an Emergency or Potential Emergency the Station Officer at Drogheda Garda Station will:

6.1 Direct a Gardaí with Radio to scene to set up Radio Base.

6.2 Ensure that Harbour Master, Harbour Office, Fire Service and Ambulance Service are aware of the position.

6.3 (i) Organise cordon and traffic controls.
(ii) Ensure that only Emergency vehicles are allowed past these points.

6.4 If necessary, direct Patrol Car with Public Address System to the area to inform residents of the position.

6.5 In the event of fatalities arising from the incident, arrange for a Garda on site to set up temporary morgue facilities where the question of identification etc, will be attended to.

7. Action by Jetty Owners.

7.1 If required by the Harbourmaster Jetty Owners will be requested to maintain a continuous listening watch on VHF R/T (if fitted) Channel 11 and will ensure that the direct line telephones to the Drogheda Port Office are manned throughout the period of an emergency in order to receive SITREPS and other information from Drogheda Port Office.

8. Action by ICG

8.1 ICG will assist if requested by the Harbourmaster by providing helicopter assistance, lifeboat assistance and local ICG boats with coast and cliff rescue services if required.

9. Action by other Marine services.

9.1 Volunteer services such as The R.N.L.I., The Drogheda River Rescue and Recovery Service and Civil Defence boating sections may be requested to assist in the handling of and emergency and as such will be required to comply with the directions of the Harbourmaster.

10. Establishment of Control Posts

10.1 The Base Control Post will be established by the Harbourmaster in the Drogheda Port Company office.

10.2 A Forward Control Post will be established by the Harbourmaster at a point closest to the scene of the incident with mobile or fixed VHF R/T equipment and a direct line telephone. (See appendix 9)

10.3 Where appropriate a representative of the ships Agents involved will be stationed at the Forward Control.

11. Control of Shipping Movements (see also Page 8, General Chapter, section 2)

11.1 If it is considered by the Harbourmaster that the emergency is such that other shipping is likely to be involved, he will issue the necessary instructions concerning their movements through the Drogheda Port Company office.

11.2 UNDER NO CIRCUMSTANCES MAY ANY VESSEL ON FIRE OR IN DANGER OF SINKING BE MOVED WITHOUT THE SPECIFIC AUTHORITY OF THE HARBOURMASTER WHO WILL LAY DOWN THE AREA TO WHICH THE VESSEL WILL BE MOVED.

12. Subsequent Action by all Personnel

12.1 When all responsible officers are at the scene, further action will be taken by them as circumstances dictate and all measures affecting the port will be made known to ships and other establishments not directly involved by the Drogheda Port Company office.

12.2 In the case of all fires, cargo operations will not be resumed until the Fire Brigade Officer and Harbourmaster have inspected the area involved and confirmed that it is safe.

For additional information refer to appendix 1 – 12

SECTION D: Collision or Emergency other than Fire or Explosion.

1. Raising the Alarm

1.1 All ship emergencies will be treated as potentially dangerous and this Plan will be activated. The decision to declare a full emergency will rest with the Harbourmaster, acting Harbourmaster or senior officer of the company.

1.2. The responsibility for raising the alarm will rest with the Master of the vessel or vessels concerned. Any person other than personnel of the vessel/vessels involved who see a collision or emergency on board a vessel/vessels in the Port not alongside a jetty should report the fact to the Drogheda Port Company office only as outline in para 1.5 below.

Method of Raising Alarm.

1.3. In cases of collision or emergency, the vessel/vessels should raise the alarm immediately by one of the following methods: -
(a) By plain language message on VHF R/T Channels 11 to the Drogheda Port Company office.
(b) By visual message.
(c) By exhibiting one or more of the Signals prescribed in Anne IV of the Collision Regulations (for vessels in distress and requiring assistance).
(d) By calling the Irish Coast Guard on VHF R/T Channel 16, tel 01 6620922/3.
(e) By calling the Drogheda Port Company office by mobile telephone on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950.

1.4. As soon as possible after raising an alarm, an amplifying message should be sent giving details:
(a) Collision - nature - extent - possible dangers.
(b) Emergency - nature - extent - possible dangers.
(c) Damage - extent - effect on stability and seaworthiness.
(d) Casualties - number - type of injury - number of stretchers required.
(e) Oil spillage - if any danger of oil spillage exists this should be reported.

1.5 Persons seeing a collision or emergency on a vessel at anchor or underway in the channel should
(a) Ring the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or VHF R/T Channel 11 or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950.

2. Action by Master

2.1 Having raised the alarm, the Master being in command at all times of the vessel under his charge will be responsible for taking all immediate steps to safeguard his ship.

2.2 The Master will provide the Drogheda Port Company office with details of the incident as quickly as possible and will make regular and frequent reports on the progress of any incident.

2.3 The Master will be responsible for co-ordinating and directing pilot launches, tugs and other services available until the arrival of the Harbourmaster where after consultation with the Master individual responsibilities will be determined depending on circumstances.

3. Action by Drogheda Port Company

3.1 Overall control of shipping in the port will be exercised by the Harbourmaster. His instructions will usually be passed through the Drogheda Port Company office in the case of vessels and jetties not directly involved.

3.2 The Harbourmaster will decide after consultation with the Master and/or the Owner's Agent what steps should be taken to safeguard the ship in question and port in general, and whether a full or partial emergency shall be declared.

3.3 The Harbourmaster will contact each jetty owner/operator by telephone and will make a broadcast on VHF R/T Channels 11 and 16 declaring an emergency, the purpose being to ensure that all persons concerned are alerted. Dublin radio may rebroadcast this message.

3.4 If circumstances make it necessary, orders will be issued by the Harbourmaster to stop cargo operations at individual jetties, to batten down hatches, disconnect hoses and for vessel to prepare for sea.

3.5 The Drogheda Port Company office will be responsible for informing all vessels underway in the channel or at anchor and will pass any necessary instructions to them.

3.6 The Harbourmaster will designate the position of the forward control post and will nominate the collect points for embarkation and disembarkation of all services (See Appendix 9 and Port Map).

3.7 On receipt of the alarm the Drogheda Port Company office will immediately inform all interested parties as detailed in appendix 5.

3.8 The Drogheda Port Company office will mobilise Port Authority launches and floating plant for the purpose of transporting personnel and equipment or other deployment as determined by the Harbourmaster.

3.9 The Drogheda Port Company office will inform ICG in Dublin as laid down in Appendix 7, and if deemed necessary by the Harbourmaster request that ICG assist in the handling of the emergency.

3.10 Situation reports may not be broadcast during the initial stages of an emergency but as soon as the level of VHF R/T communications permits SITREPS will be broadcast on VHF Channels 11 & 16. SITREPS should not be acknowledged.

4. Action by Fire Brigade

4.1 Fire services will attend with their Pre-Determined attendance & equipment.

4.2 The Fire Officer in charge of the first attendance will contact the senior person present at the scene e.g. Harbourmaster, Ships Master.

4.3 Following contact the Fire Officer in charge of the first attendance will request further backup if required.

4.4 The Fire services will inform Louth/Meath County Council Pollution Control Officers.

4.5 The Fire services will Inform Drogheda Corporation's water extraction Pumping Station.

5. Action by Medical Services

5.1 The North Eastern Health Board Ambulance Service will make available the necessary number of staff and vehicles to deal with whatever emergency arises within their remit at the request of the jetty owner or Drogheda Port Company.

6. Action by Gardaí

On becoming aware of an Emergency or Potential Emergency the Station Orderly at Drogheda Garda Station will:

6.1 Direct a Gardaí with Radio to scene to set up Radio Base.

6.2 Ensure that Harbour Master, Harbour Office, Fire Service and Ambulance Service are aware of the position.

6.3 (i) Organise cordon and traffic controls:

(ii) Ensure that only Emergency vehicles are allowed past these points.

6.4 If necessary, direct Patrol Car with Public Address System to the area to inform residents of the position.

6.5 In the event of fatality arising from the incident, arrange for a Garda on site to set up temporary morgue facilities where the question of identification etc. will be attended to.

7. Action by Jetty Owners

7.1 If requested by the Harbourmaster Jetty Owners will maintain a continuous listening watch on VHF R/T channel 11 (if fitted) and will ensure that the direct line telephones to the Drogheda Port Company office are manned throughout the period of an emergency in order to receive SITREPS and other information from the Drogheda Port Company office.

8. Action by ICG.

8.1 ICG will assist if requested by the Harbourmaster by providing helicopter assistance, lifeboat assistance, and local ICG boats with coast and cliff rescue services if required.

9. Action by other Marine services

9.1 Volunteer bodies such as the Drogheda River Rescue and Recovery Service and Civil Defence boat sections may be requested to assist in the handling of an emergency and if so will be required to work under the direction of the Harbourmaster.

10. Establishment of Control Posts

10.1 A Base Control Post will be established by the Harbourmaster in the Drogheda Port Company office.

10.2 A Forward Control Post will be established by the Harbourmaster at a point closest to the scene of the incident with mobile or fixed VHF R/T equipment and a direct line telephone (See Appendix9).

10.3 Where appropriate, a representative of the ship's Agent involved will be stationed at the and Forward Control.

11. Control of Shipping Movements

11.1 If it is decided by the Harbourmaster that the emergency is such that other shipping is likely to be involved he will issue the necessary instructions concerning their movement through the Drogheda Port Company office.

11.2 UNDER NO CIRCUMSTANCES MAY ANY VESSEL IN DANGER OF SINKING BE MOVED WITHOUT THE SPECIFIC AUTHORITY OF THE HARBOURMASTER WHO WILL LAY DOWN THE AREA TO WHICH THE VESSEL WILL BE MOVED.

12. Oil Pollution.

12.1 If oil pollution has occurred, this fact must be reported immediately to the Drogheda Port Company, who will co-ordinate arrangements for dealing with the spill as is considered most appropriate by the Harbourmaster at the time.

12.2 The Drogheda Port Company office will inform ICG in Dublin of the pollution.

13. Subsequent Action by all Personnel

13.1 After the alarm has been raised and all responsible Officers are on the scene, further action will be taken by them as circumstances dictate and all measures affecting the Port will be made known to ships and other establishments not directly involved through the Drogheda Port Company office.

For additional information refer to appendix 1 - 12

SECTION E: Potentially Hazardous Situations occurring on a Ship or on a Jetty/Quay.

1. General.

1.1. This section of the Plan sets out the steps to be taken whenever a potentially hazardous situation occurs upon a ship or on a jetty. The decision to declare an emergency and to activate the Plan in whole or in part will be made by the Harbourmaster, acting Harbourmaster or senior officer of the company after full consultation with the Jetty Owner or Master concerned in light of circumstances.

1.2 Should the potential emergency escalate into an actual emergency, Sections A, B, C, D or H of this Plan will apply and will be activated by the Harbourmaster, acting Harbourmaster or senior officer of the company.

2. Raising the Alarm

2.1 It is undesirable that the alarm should be raised in the case of potential emergencies in a manner, which would bring the incident to the immediate knowledge of the port in general, and a degree of confidentiality of communication should be observed wherever possible. It is essential, however, that the alarm should be raised without delay.

2.2. Responsibility for raising the alarm will rest with the Master of the vessel and/or the Jetty Owner involved, depending on the location of the incident. Immediate reports will be made to the Drogheda Port Company office.

Method of Raising the Alarm.

2.3. By personnel on the ship, the alarm should be raised as quickly as possible by: -
(i) Making an immediate report to responsible personnel on the jetty involved by the quickest possible means.
(ii) Telephone the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or VHF R/T Channel 11 or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950 stating name of ship and nature of incident.

2.4. By personnel on the jetty concerned. The alarm should be raised as quickly as possible by:-
(i) Ringing the Fire Brigade, telephone number 999 / 112 and asking for "Fire Brigade", giving a short message stating the name of the jetty or ship involved and the nature of the incident.
(ii) Ringing the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950 and passing a message containing information concerning other shipping at the jetty which might become involved.

3. Action by Master

3.1 Having raised the alarm the Master at all times in command of the vessel under his charge will be responsible for taking all immediate steps to safeguard his ship.

3.2 In the case of a vessel alongside the Master will report to the Jetty Owner details of the incident and the quantity, distribution and type of cargo aboard his vessel. He will ensure that regular and frequent reports on the progress of the incident are being made.

3.3 In the case of a vessel at anchor or underway, these reports will be made direct to the Drogheda Port Company office on VHF R/T channel 11or after hours contact the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950 stating name of ship and nature of incident.

4. Action by Jetty Owner Involved

4.1 If a potentially dangerous situation has occurred on board a ship alongside, the Jetty Owner will provide all available assistance to the Master of the ship.

4.2 If the potentially dangerous situation has occurred on the jetty itself, the Jetty Owner will be responsible for taking immediate action to minimise the risk of increased danger.

4.3 The Jetty Owner will be responsible for keeping the Harbourmaster fully and frequently informed on the progress of the incident and on receipt of a request from the Drogheda Port Company office, will ensure that a continuous listening watch is maintained on VHF channel 11, (if fitted), and the direct line telephones are manned throughout an emergency in order to receive SITREPS and other information from the Drogheda Port Company office.

5. Action by Drogheda Port Company

5.1 The Harbourmaster will immediately report to the scene of the incident.

5.2 On arrival at the incident he will consult with the Jetty Owner, and Master if involved, and a control and information point will be set up on the jetty.

5.3 If Required the Drogheda Port Company launches will be provided and directed by the Harbourmaster.

5.4 The Drogheda Port Company office will ensure that the Fire Brigade hasbeen notified.

5.5 Immediate steps will be taken to inform those listed in Appendix 7 if considered appropriate by the Harbourmaster or Jetty Owner involved.

5.6 The Drogheda Port Company office will take such preliminary steps as are considered necessary by the Harbourmaster to prepare for the activation of the full Emergency Plan.

6. Action by Fire Brigade

6.1 Fire services will attend with their Pre-Determined attendance & equipment.

6.2 The Fire Officer in charge of the first attendance will contact the senior person present at the scene e.g. Harbourmaster, Ships Master, Jetty Owner.

6.3 The fire service will be confronted by two basic situations:

1. An incident that can be contained and rendered safe with the pre-determined attendance within the Drogheda Port Emergency Plan.

2. An incident which has clearly, or is likely to, progress beyond that of a conventional incident and which requires the activation of another Emergency Plan. (Refer to Louth County Council Emergency Plan, Meath County Council Emergency Plan, Flogas Emergency Plan, Premier Periclase Emergency Plan, ICG Emergency Plan).

7. Control Posts and Situation Reports.

7.1 The decision to set up control posts or issue SITREPS will be made by the Harbourmaster and Jetty Owner involved, after consultation with the Fire Brigade, as circumstances demand. (see Appendix 9).

For additional information refer to appendix 1 - 12

SECTION F: Emergencies outside the Jurisdiction of the port.

1. General

1.1 All emergencies occurring outside the Jurisdiction of the Drogheda Port Company will be handled and co-ordinated by ICG in Dublin.
In the handling of the emergency ICG may request through the Harbourmaster to use part of or all of the facilities and floating equipment and general equipment within the port area.

2. Action by the Port Company

2.1 Following a request by ICG to the Harbourmaster to use the facilities at Drogheda Port the Harbourmaster will decide whether a partial or full emergency should be declared and will notify the appropriate authorities, companies, personnel accordingly. Thereafter the Drogheda Port Company Emergency plan will be implemented.

SECTION G: Terrorist threat or attack on a vessel or port facility

1. General

1.1 All terrorist threats or attacks on vessels or port facilities within the jurisdiction of the Drogheda Port Company will be handled in accordance with the provisions of the International Ship and Port Facility (ISPS Code).

2. Action by the Port Company

2.1 Following notification of a terrorist threat or in response to a terrorist attack the ISPS Port Security Pan will be activated. These plans will be operated in parallel to the Port Emergency Plan.

3. Action by the Ship or Port facility

3.1 The Ships Security Officer will implement the Ship Security Plan and will liaise with the Harbourmaster. The Port Facility Security Officer will implement the individual Port Facility Security Plans and will liaise with the Harbourmaster.

SECTION H: Pollution Response

1. General

1.1 A pollution incident may arise from any of the scenarios outline in Section A – G.

1.2 Reported pollution incident will be investigated by the Harbourmaster, acting Harbourmaster or officer of the company.

1.3 The decision to implement the pollution response will rest with the Harbourmaster, acting Harbourmaster or senior officer of the company.

2. Action by the Port Company

2.1 Actions by the Port Company if appropriate will be taken in conjunction with action from scenarios A – G.

2.2 An assessment will be made of the cause and extend of the pollution.

2.3 Where there is a pollution incident alone, the extent of the pollution and its severity may warrant the implementation of the full Port Emergency Plan or just the pollution response part of the plan at levels Tier 1, Tier 2 or Tier 3.

2.4 Inform the Irish Coast Guard of the pollution, the activated response level or request assistance.

2.5 Inform the Drogheda Port Company pollution response contractor Pollution and Waste Services requesting what level of response is required, if any.

APPENDIX 1: DROGHEDA PORT COMPANY NOTICE TO MASTERS

General considerations affecting all types of Emergency's
Drogheda Port Company Emergency Plan – "Appendix 1" - extract:

To: Agents, Operators Masters, Skippers, Pilots, Coxswains and persons in charge of marine plant

1. Control of Movements of Shipping

THE AUTHORITY RESPONSIBLE FOR THE REGULATION AND CONTROL OF SHIPPING WITHIN THE JURISDICTION OF THE PORT OF DROGHEDA IS THE **DROGHEDA PORT COMPANY**. The Port Office, which is the centre for all communications, is situated at Harbourville, Mornington Road, Drogheda, Co. Meath (opposite Tom Roes Point terminal). It is through this office, which is manned from 0900-1300 & 1400 -1645hrs Monday-Friday and throughout any emergency that shipping movements are programmed and the requirements of the Harbourmaster will be made known. A listening watch during working hours is maintained on VHF R/T channel 11, telephone 041-9838378 or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950.

1.1 All decisions regarding the movements of shipping during an emergency will be made by the Harbourmaster and, where necessary, he will decide the order in which ships are to be moved. In this context and throughout the Plan, the acting Harbourmaster will have the authority to act for the Harbourmaster in the event of his absence or non-availability.

2. Control of Emergency Operations

2.1 When an emergency or potential emergency occurs, it is vital that the alarm should beraised immediately.

2.2 All reasonable steps should be taken by those on the spot to render whatever aid is immediately available.

2.3 The decisions to designate an emergency or potential emergency and implementation of the Drogheda Port Company Emergency Plan will be made by the Harbourmaster.

2.4 The Fire Brigade and other Emergency Services may be mobilised before an emergency is declared to deal with a minor incident on a ship or jetty. The Harbourmaster must always be informed immediately of any such incident.

2.5 The Emergency Plan will be activated in whole or in part in all incidents involving fire on board a vessel, however minor. (A copy of the complete Drogheda Port Company Emergency Plan is available by request through your Agents or by request from the Drogheda Port Company Office).

3. Raising the Alarm

3.1 (a) Dial 999 / 112 and ask for the appropriate emergency service.
(b) Informing a responsible person on the jetty.
(c) Telephoning the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950 giving a short message stating the name of the vessel, the nature & location of the emergency and any other appropriate information to assist in theimmediate emergency response..
(d) Continuous sounding of any fog\signaling apparatus and or other emergency signal.
(e) Mayday on channel 16 VHF.
(f) By exhibiting one or more of the signals prescribed in Annex IV of the Collision Regulations.

3.2 As soon as possible after raising an alarm an amplifying message should be sent giving details:
(a) Fire - what is on fire - extent - possibledangers.
(b) Damage - extent - effect on stability andseaworthiness.
(c) Casualties - number - type of injury - number of stretchers required.
(d) Oil spillage - risk of - extent.

4. Action by the Master.

4.1 Having raised the alarm the master will be responsible for taking all immediate steps to safeguard his vessel until assistance arrives.

4.2 Overall control of fire fighting will be undertaken by the fire brigade senior attending officer.

A copy of the "**Drogheda Port Company Emergency Plan"** is available upon request to the Agent or direct to the Drogheda Port Company port office or www.droghedaport.ie

Capt. Martin J. Donnelly
Harbourmaster
01.01.19

APPENDIX 2: TIER 1, OIL POLLUTION RESPONSE EQUIPMENT STORED ON SITE

The following equipment placed in a mobile unit is positioned at Drogheda Port (Maxol Site), Marsh Road, Drogheda, serviced and maintained for deployment where and when required within the Port Company jurisdiction. The purpose of this equipment is to affect an immediate **Tier 1** response to a marine pollution, or marine related pollution. A full copy of the Drogheda Port Company pollution plan is available on request.

Item	Description	Quantity
1	Box covered galvanized trailer	1
2	Robin EY15D petrol 4 stroke water pump	1
3	Ryobi RSV 3100E petrol 2 stroke air inflator	1
4	Fastank	1
5	Skimmer for 3"hose	1
6	4mtr Drizit sea booms	10
7	Skirt booms	2
8	Beach sealing booms	5
9	Tow plates c/w tow bridles attached	2
10	16 kg anchor sets	2
11	20m x 12mm rope c/w eyes and shackles	4

Item	Description	Quantity
1	7.62m x 2.43 x 2.59m standard ISO Service container to house ancillary oil spill response equipment as listed below **(Static Unit)**	1
2	4mtr Drizit booms	42
3	Drizit Wood loose 10kg	26
4	Blue absorbent pads	
5	Heavy duty plastic bags for oily waste	50
6	Roll of 1000 gauge Visqueen	1
7	Squeegees	5
8	Shovels	5
9	Yard Brushes	5
10	Sledge Hammers	2
11	2" stakes	12
12	14mm Blue Rope	1
13	5ltr containers of oil free part 1	32
14	25ltr containers of oil free part 1	4
15	PVC Suits	6
16	Safety helmets	6
17	Clear safety goggles	6
18	PVC Gauntlets (18")	12
19	Safety Wellingtons	6
20	Sample box	1
21	Safety Torches	2
22	First aid box	1
23	Eye wash bottles	2

APPENDIX 3: RISK ASSESSMENT, BEACH CLEAN UP CLASSIFICATION AND GUIDELINES

Risk Assessment

Oil Types:

1. **Crude oil:** Crude oil is the term used for oil in its "raw" state, or in the form in which it exists as it issues from the production well. It can vary greatly in colour, viscosity, flash point and pour point. The qualities of the oil and constituents play a large role in the behaviour of the oil in the sea and have a great influence on the effects and persistence of the oil in the marine environment.

2. **Refined products:** is the term used for the various oils and by-products, which result from the refining process. The oils vary from premium and unleaded petrol's to asphalt's and bituminous products.

3. **Waste oils:** This term would cover oils or oily mixtures which are neither crude oil or refined products and includes oils in ships bilges, sludge tanks, cargo washings etc. This oil varies greatly in content depending on factors such as whether the oil is neat, has emulsified with water, whether cleaning chemicals or solvents have been used. Engine room oil will include diesel oil, hydraulic , lubricating oil and thermal oil

How oil may enter the marine environment

1. **Ship/shore interface:** Oil is stored ashore and received into the shore storage tanks from the ship. Storage tanks can overflow or leak, bund walls can fail and oil can flow into the drainage system. Discharge pipelines and hoses can leak or fail under pressure. Ship piping can fail or valves may be turned in the wrong direction allowing ships tanks to overflow. Failures can occur in the integrity of the ship tanks or hull. The may result from heavy contact damage during docking, weather damage or stress fracture.

2. **Transportation:** Risks are associated with the actual transportation such as collision, grounding or structural failure

3. **Operational/human errors:** Operational errors, negligence or deliberate action on board may also leak to pollution.

Types of oil spillage

Oil spill can vary in many ways, such as, the amount of oil released, rate of release, rate of spread, direction of spread. The spreading characteristics will depend on the type of oil, its viscosity, water and air temperature, tidal conditions and sea state. Where the leak is from a vessel the leakage rate may depend on the head oil and height of the tide. Where there is catastrophic failure the release may be instantaneous. Where the leak or release is as a result of human failure the quantity will depend on the response time to correct the mistake and the pumping rate involved.

Assessment of spillage and subsequent action

An effective oil spill response will depend on accurate information being received at the outset. In quantifying the problem and determining an efficie4nt response the following should be considered:

- Determine the exact status of the casualty, including damage assessment, ststus of power and pumping system,
- Establish oil on board and distribution on board,
- Establish the source of the leakage, approximate rate of outflow and direction of flow,
- Determine the rate of spreading, slick size and approximate thickness,
- Determine weather conditions, sea state, wind direction and speed, tidal state and duration of current tidal flow,
- Determine amenity areas and local resources that might be threatened as a result of the spillage,

The response plan will be based on two principles:

1. Stop orreduce the spillage,
2. Minimise the damage resulting from the spillage.

Action to stop /reduce flow

The action to achieve this end will depend on factors such as:

- Source of the leakage, shore or afloat,
- Type of oil and location of spillage,

Where the spillage is as a result of a collision in the channel or grounding the hull/tank damage may be under the waterline. The degree of spillage will depend on oil levels, draft and tidal height. Internal transfer, ship to ship or ship to shore installation or ship to road tankers must be considered. Additional consideration will be weather, location of suitable transfer vessels, casualty's ability to pump, type of oil and risk of fire, accessibility for shore mounted operation.

Where the spillage is as a result of a shore side failure at the ship/shore interface, than the supply must be isolated. Consideration must be given to minimise ground seepage or entry into the water via culverts and drains.

Where the oil is on the water consideration must be given to the basic movement characteristics of oil. Initially the oil will spread at a rate dependant on its viscosity, air and water temperature and agitation from wave or sea action. Without other influences the oil will spread in a concentric manner.

Lighter fraction will immediately begin to evaporate. The rate will depend on the oil type and chemical composition, air and water temperature. The

oil slick will move as a result of wind and current action. Movement rate may be considered as 100% of current speed and 3% of wind speed.

Beach Cleanup Guidelines

Index: **Shore Line Type:**

1. Boulders/Rock armour and Training Walls.
2. Sandy Beach.
3. Salt Marsh.
4. Rocks, Mud & Gravel.
5. Quay Walls : Port Area.

1. Bounders/Rock armour and Training Walls

Note:
Cleaning this area will be a difficult and dangerous operation confined to periods of calm sea. Access is possible to the North Break Waters at low water via Baltray shore side. Access to the South Breakwater south side is possible via the Mornington Beach at low tide. Access to The North Side is only possible by boat.

What to do:

- Hand cleaning is possible although extremely difficult and inefficient.
- Hose effected area with diluted dispersant (if authorised) use high pressure water jets. (Dispersants will only be effective on exposed surfaces).
- Run off oil from cleaning should be collected on rising tide.
- Pay attention to safety of personnel in tidal areas.

2. Sandy Beaches

Considerations:

- Decide clean up priorities by discussion with local authority taking into consideration the Season, Weather conditions, Amenity usage.
- With unfavourable conditions re-oiling may occur.
- Arrange for access to beach to be restricted before and during clean up operations.
- Establish collection points and disposal routes for oily waste.
- If dispersents or other chemicals are authorised, apply them with incoming tide.
- Consider use of earth moving equipment to gather oil and oily sand.
- Consider use of Sorbents in tided pools at low water.

3. Salt Marshes:

The salt marshes or estuarine polders have no amenity use, but are of national importance for wild birds and qualify as internationally important wet land on ornithological grounds. The areas are incorporated into the EU Bird Directive (79/409/EEU). There is a designated Wildfowl Sanctuary. The mudflats and developing salt marshes are of notable botanical interest.

Note:
For protection of the mudflats/salt marshes/estuarial polders consideration must be given to the location of the pollution sources, the tidal cycle (re Spring/Neaps) predictions and flow (ebb/flood). In certain circumstances a twelve-hour window of opportunity to locate booming defences may be available.

- Access to the various guts is the possible from the North and South shore roads, via the bund walls/walkways, except on large Spring tides.
- Pay attention to personnel safety over stony/rocky/uneven ground and for rising tides.
- Give priority to protection by booming etc. use propane gas can or similar device to scare away birds if oiling of a particular area appears inevitable.
- Consult with experts familiar with the wildlife and seasonal cycle.
- Consider use of organic Sorbent. Also one of dispersants (if authorised) for areas draining by out going tide.
- At low water use surface skimmers at gut/weir pool.
- Depending on damage extent a "leave alone" solution maybe the most ecologically desirable.

4. Rocks, Mud and Gravel

Note:
These areas are difficult to clean and may reveal oil even after clean up.

- Sorbent may be used in tidal pools at low water, and on muddy surfaces.
- Where appeared use light mechanical equipment for manual cleaning (shovels & spades).
- On River Walls pressure machines may be necessary.
- Hand cleaning possible although extremely difficult and inefficient.
- Dispersants can be used if authorised, but they are only effective on exposed surfaces.
- Where adjacent areas are ecologically sensitive or already cleaned, consider the deployment of booms, skimmers, sorbents to contain oil.
- Pay attention to safety of personnel affected by rising tides, especially Spring tides.
- Quay Wall – Port Area.
- In Portal Area where hazard of explosion or fire may exit, cause pollution with a layer of fire fighting foam.
- Use treatment chemicals (dispersants and sorbent) on any free-floating oil, if authorised.
- Hose quay walls with hot water and/or dispersants if authorised.
- Dispersant gels if authorised may also be used if appropriate.
- Arrange discussion with owners of ships installations on what clean up is required, involve insurance experts.

APPENDIX 4: MARINE SERVICES AVAILABLE

Drogheda Port Company

"Boyne Haveloc" 6 person (2 crew, 4 passengers) Dept. of Transport, Tourism & Sport P3 licensed passenger vessel. Licensed operational area not more than 15nm from Drogheda Bar and not more than 3nm from the coast. Specification, Aqua Star 38', single screw, 18kts, AIS, GPS, VHF, radar, EPIRB.

"Boyne Protector" 6 person (2 crew, 4 passengers) Dept. of Transport, Tourism & Sport P5 licensed passenger vessel. Licensed operational area not more than 15nm from Drogheda Bar and not more than 30nm from the coast. Specification, steel 48', single screw, 12ts, 6 tonne bollard pull/push, AIS, GPS, VHF, radar, EPIRB.

R.N.L.I. Clogherhead 041-9822600 / 087 2246361 / 087 8556059
(a) Shannon Lifeboat/ VHF

R.N.L.I. Skerries 01 8491692 / 087 2418967
(a) Atlantic Inshore/ VHF

Greencastle Tugs 0044 7831 680934

"Mourne Shore" 800hp/vhf - bollard pull 14 tonne
"Mourne Valley" 500hp/vhf - bollard pull 7 tonne
"Mourne Venture" 2300hp/vhf – bollard pull 32 tonne

Drogheda Coast Guard 086 3850677 / 087 2200572 / 086 3807507

2 x RIBs, vhf

Civil Defence Dundalk 042 9332272

Holy Head Towing 0044 1407760111

Meath Civil Defence
Mr. Michael Fitzsimons 0872450062/046 9097214

APPENDIX 5: MEDICAL SERVICES AVAILABLE

Arrangements for dealing with Major Accidents within the Port of Drogheda.

Notification of Major Accidents

Notification of a major incident should be made to the Gardaí and Drogheda Port Company office who will notify all the emergency response agencies for the purpose of responding to that emergency.

Ambulance Arrangements

The North Eastern Health Board Ambulance Service will be responsible for the conveyance of casualties from the site of the accident or landing location to the reception hospital or hospitals, including calling in any outside resources available as required.

Landing of Casualties

In the case of incident occurring on vessel underway in the channel or at anchor the necessary launches will be order by the Drogheda Port Company office. A suitable riverside location for landing will be determined by the Harbourmaster where the casualties will be conveyed thence to hospital by ambulance.

Incident Medical Officer

The first doctor on the scene will be the Incident Medical Officer until relieved. The Incident Medical Officer will be responsible for the co- ordination of medical services at the scene of the incident. The Incident Medical Officer will inform the Gardaí of casualties and arrange with the Gardaí for the custody of the dead.

Removal of Casualties

In the case of incidents occurring on vessels at anchor or underway in the port and not alongside jetties, it will be the Masters or Owners \ Agents responsibility to provide the necessary launches to bringing casualties to the shore. These launches will be ordered through the Drogheda Port Company office. In the case of vessel lying alongside in the port, casualties will whenever possible be moved by means of the North Eastern Health Ambulance Service. Where it is more convenient to move these casualties by boat, they will be taken to the landing place nominated by the Harbourmaster to which the ambulances will be directed.

Additional Assistance

Assistance by Red Cross/Order of Malta/Civil Defence and other voluntary bodies will be available by request.

APPENDIX 6: OTHER RESOURCES AVAILABLE

Company	Address	Contact Name	Telephone / Email	After hours
		PORTABLE EXTINGUSING FOAM		
Flogas Ireland	Knockbrack House, Matthews House, Donore Road Drogheda, Co. Louth	Mr. Paul O'Connell Mr. Chris Bermingham	041-9831041 poconnell@flogas.ie cbermingham@flogas.ie	087-2556001 086-8164851
		GENERATORS / GENERAL ITEMS		
J. Short Ltd.	Quay Street, Dundalk, Co. Louth	Mr. John Short	042-9331676 johnshorthire@eircom.net	042-9377296
Ace Hire	East Coast Business Park, Donore Rd, Drogheda, Co. Louth	Mr. Dean Costello Mr. Terry Matthews	041-9846464 dean@acehire.net terry@acehire.net	041-9846464
Drogheda Hire	Cement Road, Drogheda, Co. Louth	Mr. Danny Dunne	041-9841419 hire@droghedahire.com	086-3366861
RHI Magnesita (Premier Periclase)	Boyne Road, Drogheda, Co. Louth	Mr. Jason Synnott	041-9870700 (24hr) jcsynnott@premierpericlase.ie	041-9870722
Irish Cement	Platin Works, Drogheda, Co. Louth		041-9837641 (24hr)	041-9876000 (24hr)
		OIL POLLUTION EQUIPMENT		
Enva	Toberona, Castletown, Dundalk, Co. Louth	Mr. Gerry Keegan	042-9331145 alliedtankanddrain@gmail.com	087-2500341
Pollution & Waste Services	Unit 107, Baldoyle Ind. Est. Dublin 13	Mr. Brian McGonagle	01-8391000 bmcgonagle@msigroup.ie	087-2561869
		Mr. Brian Prendergast	01-8391000 bprendergast@msigroup.ie	087-2520498

APPENDIX 7: ACTION BY THE PORT AUTHORITY

On receipt of an alarm message the Drogheda Port Company office will contact the following listed below. The information given will state the nature of the alarm, its location, and will advise as to whether the Harbourmaster has declared a full or partial emergency. Additionally the Harbourmaster will contact each Jetty Owner advising of the requirements for each particular jetty. The Harbourmaster will make and initial situation broadcast on VHF R/T channels 16 & 11 and thereafter regular SITREPS will be issued by the Drogheda PortCompany.

Company	Title	Name	Email	Telephone	Fax
Drogheda Port	Harbourmaster / PFSO A.O	Capt. Martin Donnelly	martindonnelly@droghedaport.ie	041-9838378 086-2547827 041-9838385	041-9832844
Drogheda Port	Communications A.O	Mr. Paul Fleming	paulfleming@droghedaport.ie	041-9838378 087-2305950 041-9828509	041-9832844
Fire Brigade		24 hr		999 / 112	
Gardaí		24 hr		999 / 112	
Ambulance		24 hr		999 / 112	
Marine Emergency		24 hr		999 / 112	
Irish Coast Guard		24 hr		01-6620922/3	
Drogheda Port	Administration A.O	Mr. Andrew Murray	andrewmurray@droghedaport.ie		
Drogheda Port	Administration A.O	Ms. Anne Keegan	annekeegan@droghedaport.ie		
Drogheda Port	Administration A.O	Ms. Joan Wiseman	joanwiseman@droghedaport.ie		
Drogheda Port	Administration A.O	Ms. Michelle Dixon	maritimehouse@droghedaport.ie		
Drogheda Port	Administration A.O	Ms. Nessa Lally	nessalally@droghedaport.ie		
Drogheda Port	Pilots Coxswain	Mr. Dermot McConnoran	dermotmcconnoran@gmail.com	041-6852999 086-3850677 087-2200572	
Drogheda Port	Pilot Coxswain	Mr. Oliver Kirwan	oliver.kirwan@hotmail.com	0419822679 086-8307331	
Drogheda Port	Pilots Coxswain	Mr. Paul McKeown	Paulmck2010@live.ie	042-9329049 087-6633211	
Drogheda Port	Pilot A.O.	Capt. Andy Breech	andybreachirl@yahoo.co.uk	086-3628824	
Drogheda Port	Pilot A.O.	Capt. Barry Flood	beflood@hotmail.com	087-2442916	
Drogheda Port	Pilot A.O.	Capt. Laurence Kirwan	larkirwan@yahoo.ie	086-3586672	
Drogheda Pot	Pilot A.O.	Capt. Neal Myles	nmyles@compass-marine.com	087-2516938	
Drogheda Port	Pilotage Crew / Relief Crew	Mr. Paul O'Neill	buntyoneill@hotmail.com	087-2422355	
Drogheda Port	Pilotage Crew / Relief Crew	Mr. Brian Sharkey	briansharkey@hotmail.com	086-2324913	
Drogheda Port	Pilotage Crew / Relief Crew	Mr. Gerard Sharkey	gerrynewgrange@gmail.com	087-7550368	
RHI Magnesita (Premier Periclase)	Shipping Manager & PFSO	Mon-Fri 0830-1300 /1400-1700 excl. Bank & Public Holidays Shift Supervisor Mon-Sun 1300-1400 Incl. Bank & Public Holidays. Mr. F. Hanlon Shipping A.O Ms. Deirdre McCarthy Mr. Anthony McEneaney	 frank.Hanlon@rhi-ag.com Deirdre.McCarthy@rhi-ag.com Anthony.McEneaney@rhi-ag.com	041-9870700 041-9870750 041-9839448 087-2660210 041-9870712 086-3182348 041-9870767	
Flogas Ireland	Office & Security Ops Manager & PFSO	0900-1730 Mon-Fri & 24hr Mr. Chris Bermingham Mr. Paul O'Connell	 cbermingham@flogas.ie poconnell@flogas.ie	041-9831041 086-8164851 087-2556001	041-9834652

Company	Title	Name	Email	Telephone	Fax
Martin Butterly Ltd.	Office Ship Agents	0900-1700 Mon-Fri Mr. Tom O'Reilly Ms. Clodagh O'Reilly	 tom@butterlyireland.com clodaghoreilly@butterlyireland.com agency@butterlyireland.com	041-9831024 041-9838858	041-9833612 086-2572947 086-4181757
Drogheda Port Logistics	Office Ship Agent A.O.	0900-1700 Mon-Fri Ms. Paula Tealon Mr. Martin Fleming	 agency@droghedaportlogistics.ie	041-9838887 086-8110501 086-6684956 / 01-4423956	041-9835428
Fast Shipping	Office Manager Ships Agent	0900-1700 Mon-Fri Mr. Simon Mulvaney Mr. Anthony Duff	simon@fastshipping.ie Anthony@fastshipping.ie	041-9838545 086-2410759 086-4113010	041-9838684
Fast Terminals	Office Manager Ships Agent Ship Agent	0900-1700 Mon-Fri Mr. Simon Mulvaney Mr. Anthony Duff Ms. Elaine McKiernan	 simon@fastshipping.ie Anthony@fastshipping.ie elaine@fastshipping.ie	041-9838545 086-2410759 086-4113010	041-9838684
KC Shipping	Ship Agent	 Mr. Fergal McGuinness Ms. Maeve McGuinness	 kc.services@live.ie agency@kcshipping.ie	041-9847291 086-8049090 086-7734448	
Hamilton Shipping	Ship Agent	0900-1700 Mon-Fri Mr. Leo McParland Mr. Pawel Niciak Mr. Vlad Daineko	 DroghedaAgency@hamiltonshipping.com	01-8559011 087-2423049 087-9681967 087-967883	01-8559022
Iarnrod Eireann	Drogheda Station Station Master	0900-1700 Mon-Fri Mr. Tommy Finegan Mr. Connor Keane	Thomas.finegan@irishrail.ie Connor.keane@irishrail.ie	041-9838749 086-0430520 087-2853138	
RNLI Clogherhead	LOM A.O. DLA	Mr. Declan Levin's Mr. Jim Kirk Capt. James Byrne		041-9822600 Lifeboat station 087-8556059 087-2246361	
RNLI Skerries	DLA Ass. DLA	Mr. Niall McGrotty Mr. David May		087-2418967 01-8491940	
Drogheda Coast Guard Unit	Officer in Charge	Mr. Dermot McConnoran Mr. Andy O'Brien	dermotmcconnoran@gmail.com	041-6852999 086-3850677 087-2200572 086-3807507	041-6852999
Louth Co. Co	Office County Manager Director of Services Sen. Exec. Engineer	0900-1700 Mon-Fri Ms. Joan Martin Mr. Joe McGuinness Mr. John O'Hagan	Joan.martin@louthcoco.ie Joe.mcguinness@louthcoco.ie	042-9335457 086-8517360 042-9335457 086 3831245	042-9334549
Meath Co. Co	Office Chief Executive A.O Director of Infrastructure A.O	0900-1700 Mon-Fri Jacqui Maguire Mr. Des Foley	info@meathcoco.ie Margaret.carroll@meathcoco.ie dfoley@meathcoco.ie	046-9021581 046-9097000	046-9028497
Lourdes hospital	Office	24 hr		041-9837601	
Cottage hospital	Office	24 hr		041-9838628	
St. Mary's Hospital	Office	24 hr		041-9838680	
Meteorological Services	Duty Forecaster	24 hr 24 hr		01-8424655 01-8424411	
Civil Defence Dundalk	Offic	0900-1700 Mon-Fri Mr. Chris Connelly	chris.connelly@louthcoco.ie	042-9332272	
National Ambulance Service	Office	0900-1700 Mon-Fri Mon-Fri		046-9023333	
Health Service Executive		Mick O'Toole	Mick.OToole@hse.ie		
Pollution & Waste Ser.	Office	Mr. Brian McGonagle Mr. Brian Prendergas	bmcgonagle@msigroup.ie bprendergast@msigroup.ie	01-8391000 087-2561869	

APPENDIX 8: COMMUNICATIONS

1. General

1.1 Within the Port of Drogheda the allocated official marine frequency is VHF Channel 11 (156.55mhz) The general marine hailing frequency is VHF channel 16 (156.8mhz)

1.2 The importance of acknowledging immediately all messages received cannot be over-emphasised, even if the answer is not immediately available.

1.3 In order to reduce the number of messages transmitted on the VHF radio telephone to an acceptable level, land lines should be used wherever possible, particularly for arrangements concerning the general public which should not be discussed on official radio channels unless other method of communications (private VHF R/T channels, land lines) are notavailable.

1.4 Situation Reports may not be broadcast during the initial stages of an emergency but as soon as the level of the VHF R/T communications permits, the Drogheda Port Office will broadcast Situation Reports on Channels 11 and 16 in order to keep all parties informed. SITREPS should not be acknowledged and will be restricted to the shortest possible signal giving the salient points of the emergency. SITREPS will also be passed to the Gardaí Station in order that the Garda may answer any enquiries from the general public regarding the emergency.

2. List of Communications Available

Drogheda Port Company.

Port Office 041-9838378 (0900-1300 & 1400-1645 Mon-Fri)
Fax. 041-9832844
Email; maritimehouse@droghedaport.ie
VHF R/T Frequencies Channel 11 (156.55 MHz)

RHI Magnesita (Premier Periclase)

Office 041-9870700 (0830-1300 and 1400-1700 mon-fri excl Bank & Public Holidays.
041-9870767 (1300-14—mon-fri/sat-sun) incl. Bank & Public Holidays.
087-9049989 Head of Shift

VHF R/T Frequency Channel 11 (156.55mhz)

Flogas Plc

Office 041-9831041
Fax 041-9834652
Security 041-9831041 (24 Hours)
VHF Channel 11 Emergency use only

APPENDIX 9: CONTROL POSTS

Establishment of Control Posts.

1. Base Control Posts as shown below are nominated in order to provide a predetermined point where the various responsible officials can effect the necessary liaison to operate an efficient joint control, either by assembling there, or through representatives left at the post or by message relayed through communications available at the post. When a Forward Control Post, either mobile or otherwise, is established close to the actual scene of the emergency, it will normally be possible to contact this by obtaining its location from the known Base Control Post, or through communications available at the Base Control Post.

2. For emergencies within the estuary, at the anchorage or at the approach to the port the Harbourmaster will establish the position of the Forward Control Post.

3. Communications available at forward control will include either fixed or mobile telephones and fixed or portable VHF R/T equipment.

4. In the event that the nominated control post or it communications have been destroyed, or become inaccessible, a temporary forward control post will be established to the at a point nominated by the Harbourmaster at the nearest convenient point to the operations

5. Location of Control posts:

Base Control: Harbourville, Mornington Road, Drogheda, Co. Meath A92 K5RN

Forward Control:

5.1 Public Quays (town & Tom Roes Point terminal)
To be agreed at the time ofincident.

5.2 Estuary/Anchorage/Port Approaches
Pilot Station, Crook Road Mornington, Pilot Station, Harbourville, Mornington Road, Drogheda, Co, Meath (or as determined by the Harbourmaster).

5.3 Flogas
To be agreed at the time of incident.

5.4 Premier Periclase
The Emergency Control Centre at PPL will be the Central Control Room. The Emergency Controller will, in the normal course of events, be stationed here. The Emergency Team Leader and the Area Incident Controller will be in the forward position.

5.5 Fishmeal Jetty
To be agreed at the time of incident.

5.6 Afloat
If required a forward control can be established on board the Drogheda Port Company environmental launch Boyne Protector.

APPENDIX 10: ESTABLISHMENT OF INFORMATION CENTRE

The Information Centre will be established in the Drogheda Port Office in order to handle enquiries from Press, Radio and Television reporters. This Information Centre will be manned by an officer of the Drogheda Port Company.

An Information centre will be established by the Garda at their Drogheda headquarters to deal with enquiries from the general public regarding casualties in the Port.

Arrangements for Broadcasts of Warnings in emergency situations.

Broadcast warnings will be issued by the Port Authority Communications Officer.

RTE Newsroom	Television & Radio	24hrs Newsroom	Main Switchboard
01-2083434	01-2083111	01-2083111	01-2083111 Mon-Fri 9-5
info@rte.ie	info@rte.ie	info@rte.ie	info@rte.ie

LMFM Radio	Newsroom7am– 7pm	Main Switchboard	
	041-9836693	041-9832000	
Mr. Eamon Doyle	A.O 0862679163		

Drogheda Independent	041-9838658	
Drogheda Leader	041-9836100	
Irish Independent	01-7055333	01-7055801
Irish Times	01-6758000 mon-fri 9-6	01-6758894

Incidents directly involving the following companies a joint approach to communications will be undertaken.

Company	**Contact Name**	**Telephone**
RHI Magnesita	Mr. Christoph Stock	041-9870700
Flogas Ireland	Mr. Paul O'Connell	041-9831041 (24hr) 087-2556001

APPENDIX 11: ACTIVATION, EXERCISES

Activation:

Where the Harbourmaster has decided to implement the plan either fully or partially for an emergency or potential emergency the Drogheda Port Office will notify those persons/agencies/authorities as listed in appendix 5. Notification will be given by the following message:

THIS IS THE DROGHEDA PORT OFFICE. A MAJOR INCIDENT/POTENTIAL INCIDENT HAS OCCURRED AT ..... THE HARBOURMASTER HAS DECLARED A FULL/PARTIAL EMERGENCY AND THE EMERGENCY PLAN IS NOW IN PERATION. STANDBY FOR SITREPS.

Exercise:

Where an exercise to test the assumptions and procedures laid down in this plan is held, the messages activating the plan shall be preceded by the following statement:

"THIS IS AN EXERCISE"

Appraisal:

This plan issued September 2017 is valid until further notice. An exercise will be held annually to test the effectiveness of the plan, followed by a meeting of the various group for the purpose of updating the plan.

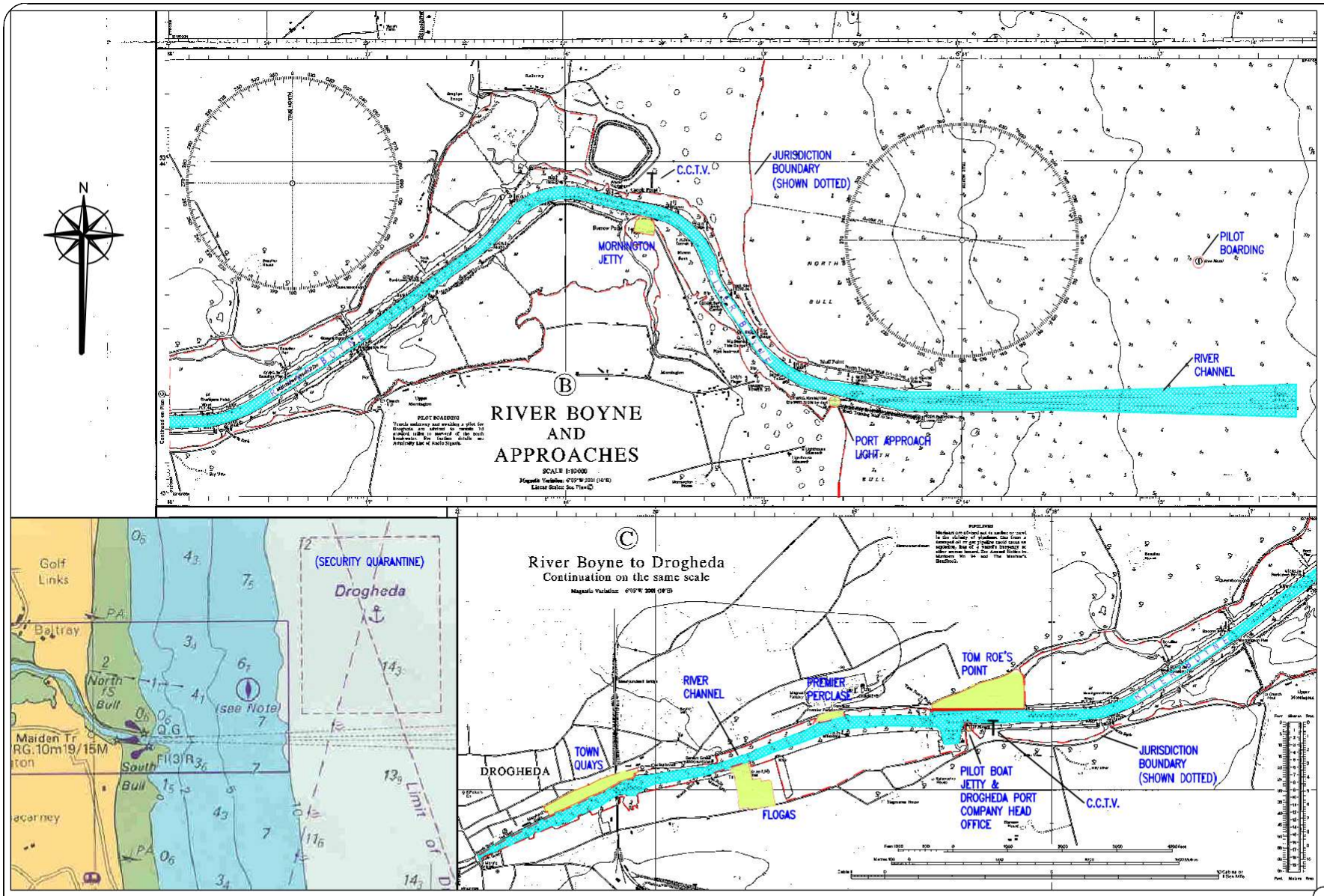
The Drogheda Port Office under the direction of the Harbourmaster will be responsible for:

a) distribution of the plan to all persons/agencies/authorities listed on the distribution list.
b) receiving detail of changes to the appendices and notifying all persons/agencies/authorities on the distribution list.
c) initiating the annual exercise and convening the annual meeting to update the plan.

Any amendments to the appendices should be notified to the Harbourmaster, email martindonnelly@droghedaport.ie, or by fax 041-9832844

APPENDIX 12: DETAILED PORT MAPS

- Site layout, port approach, estuary and facility locations
- Drogheda Port Company town quays
- Drogheda Port Company Tom Roes Point terminal
- RHI Magnesita (Premier Periclase)
- Flogas
- Fishmeal Quay



DROGHEDA PORT COMPANY

EMERGENCY PLAN

FACILITY:

SITE LOCATION MAP

DROGHEDA

NORTH STRAND

WAREHOUSE WALL

No. 2: Gate

NORTH STRAND

BALTRAY

WAREHOUSE

LIGHT SWITCH

WAREHOUSE

LIGHT SWITCH

WAREHOUSE

LIGHT SWITCH

SWITCH ROOM

WAREHOUSE

WAREHOUSE

SPEED RAMPS & SIGNAGE

CARPARKING

CARPARKING

AL

AL

BERTH NO. 4

BERTH NO. 3

BERTH NO. 2

ADMINISTRATION BUILDING

ASSEMBLY POINT

No. 1: Main Gate/Wicket Gate

YACHT MOORING

R I V E R B O Y N E

DROGHEDA

No. 3: Gate

No. 4: Gate.
Local DPC controlled access only.

NORTH STRAND

BALTRAY

WAREHOUSE

WAREHOUSE

AL

AL

BERTH NO. 2

BERTH NO. 1

Overlap with above

VIADUCT

PERIMETER OUTLINED IN RED

R I V E R B O Y N E

DROGHEDA PORT COMPANY

SUFFIX	REVISION	DATE	INL

TOWN QUAY EMERGENCY PLAN
SEPTEMBER 2017

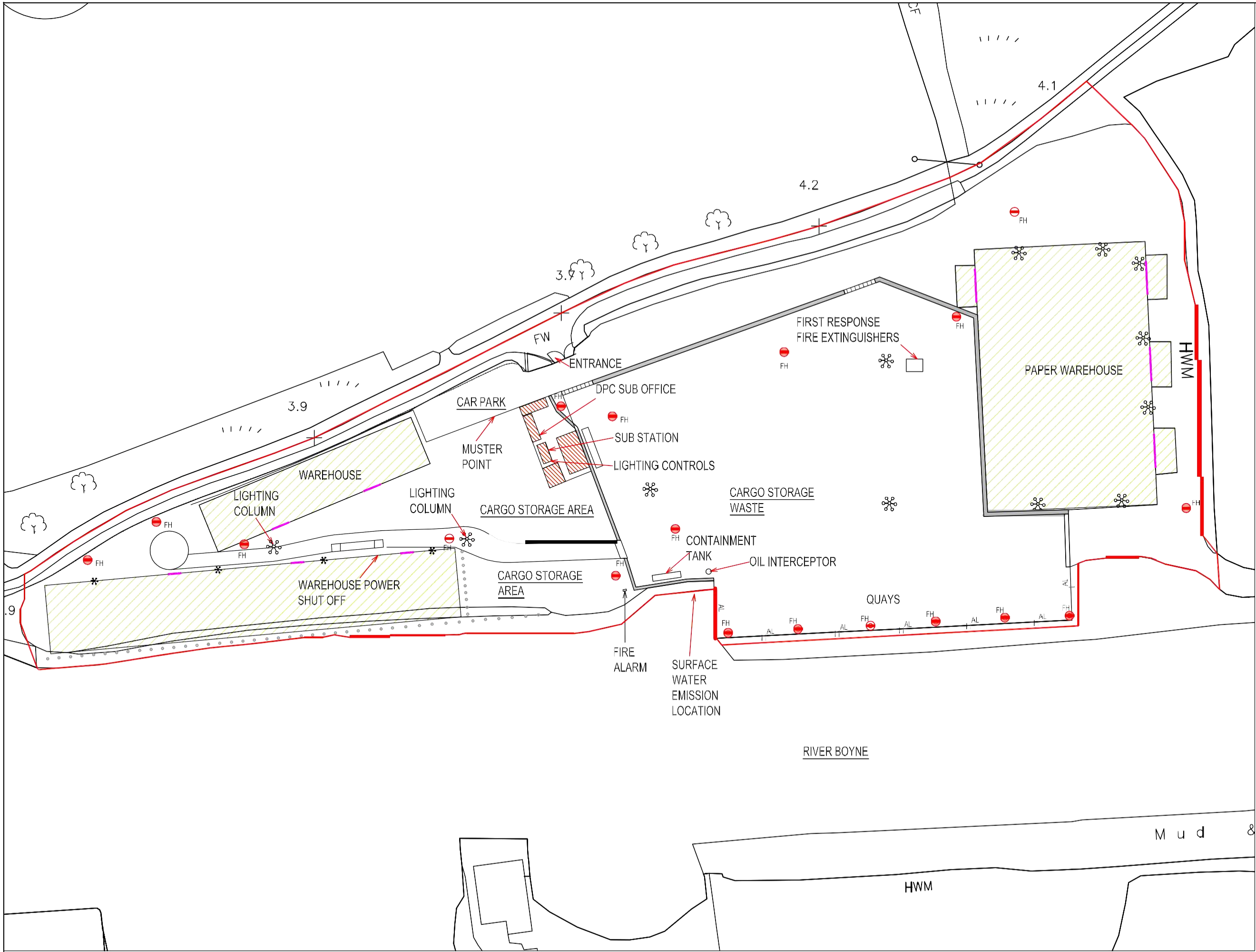
FACILITY:

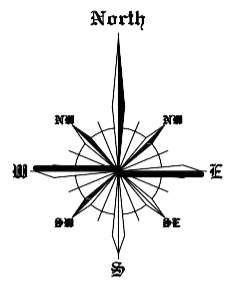
WORKING TOWN QUAYS

KEY

- EMERGENCY ACTIVATION POINT
- AL ACCESS LADDERS
- HYDRANT
- LIGHTING
- WAREHOUSE
- SPEED BUMP
- ADMINISTRATION BUILDING
- PEDESTRIAN WALKWAY

N





KEY

- AL — ACCESS LADDERS
- HYDRANT
- LIGHTING
- WAREHOUSE
- PEDESTRIAN CROSSING
- ADMINISTRATION BUILDING
- PEDESTRIAN WALKWAY

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES

Suffix	Revision	Date	Ini

Brady Hughes CONSULTING
26 Magdalene Street, Drogheda, Co. Louth
Tel. +353 (0) 41-9839379 (91), Fax. +353 (0) 41-9839422
e-mail: info@bradyhughes.com www.bradyhughes.com

PROJECT:
EMERGENCY PLAN
TOM PRES POINT, DROGHEDA, CO. LOUTH

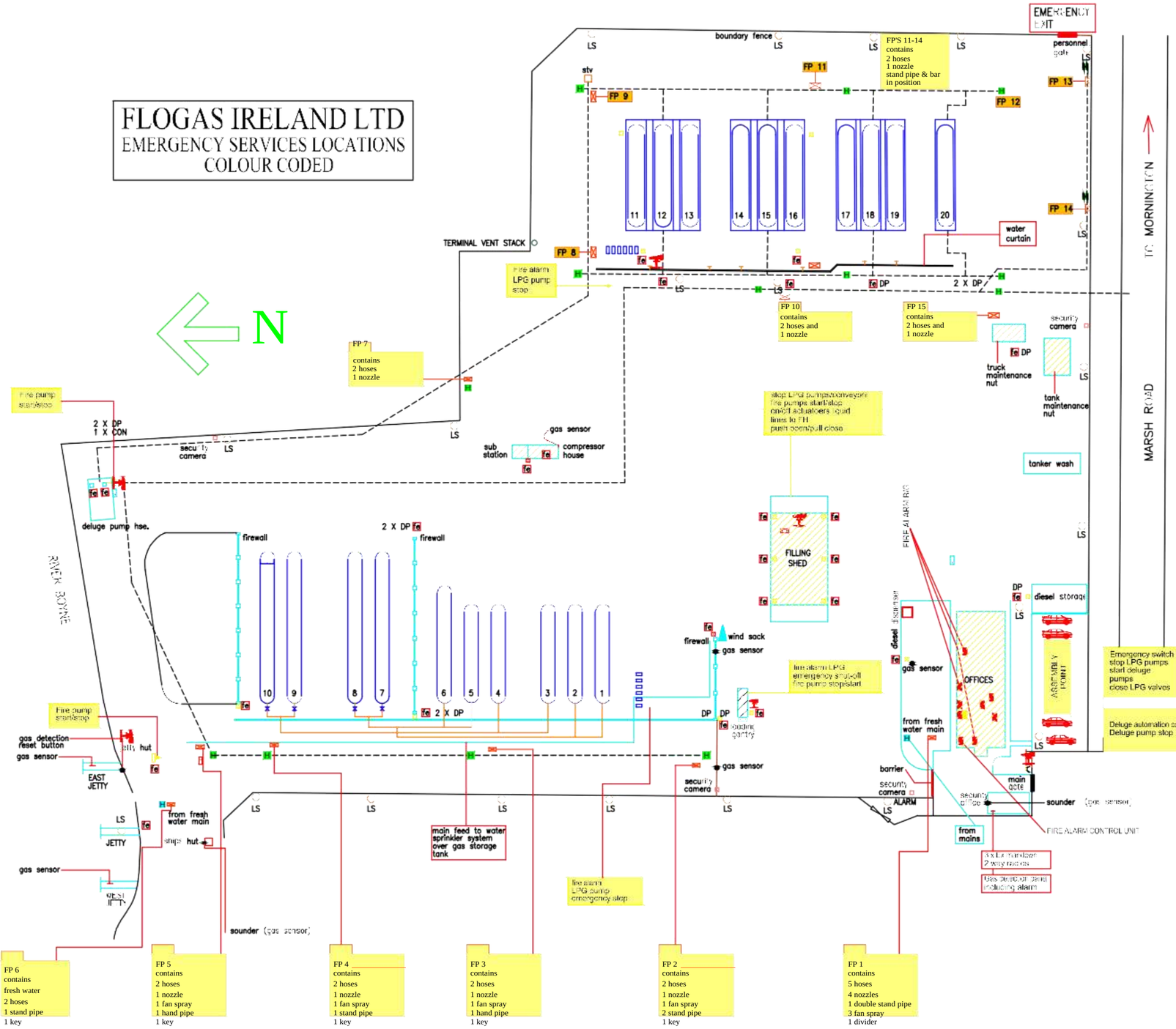
TITLE:
SITE LAYOUT PLAN
EMERGENCY PLAN

CLIENT:
DROGHEDA PORT COMPANY

Drawn by:	Scales:	Date:
HOD	nts	20/09/2017

Drawing No.	Rev. No.
019-18-001	

FLOGAS IRELAND LTD
EMERGENCY SERVICES LOCATIONS COLOUR CODED



DROGHEDA TERMINAL 'ON-SITE' EMERGENCY PLAN ON-SITE MAP

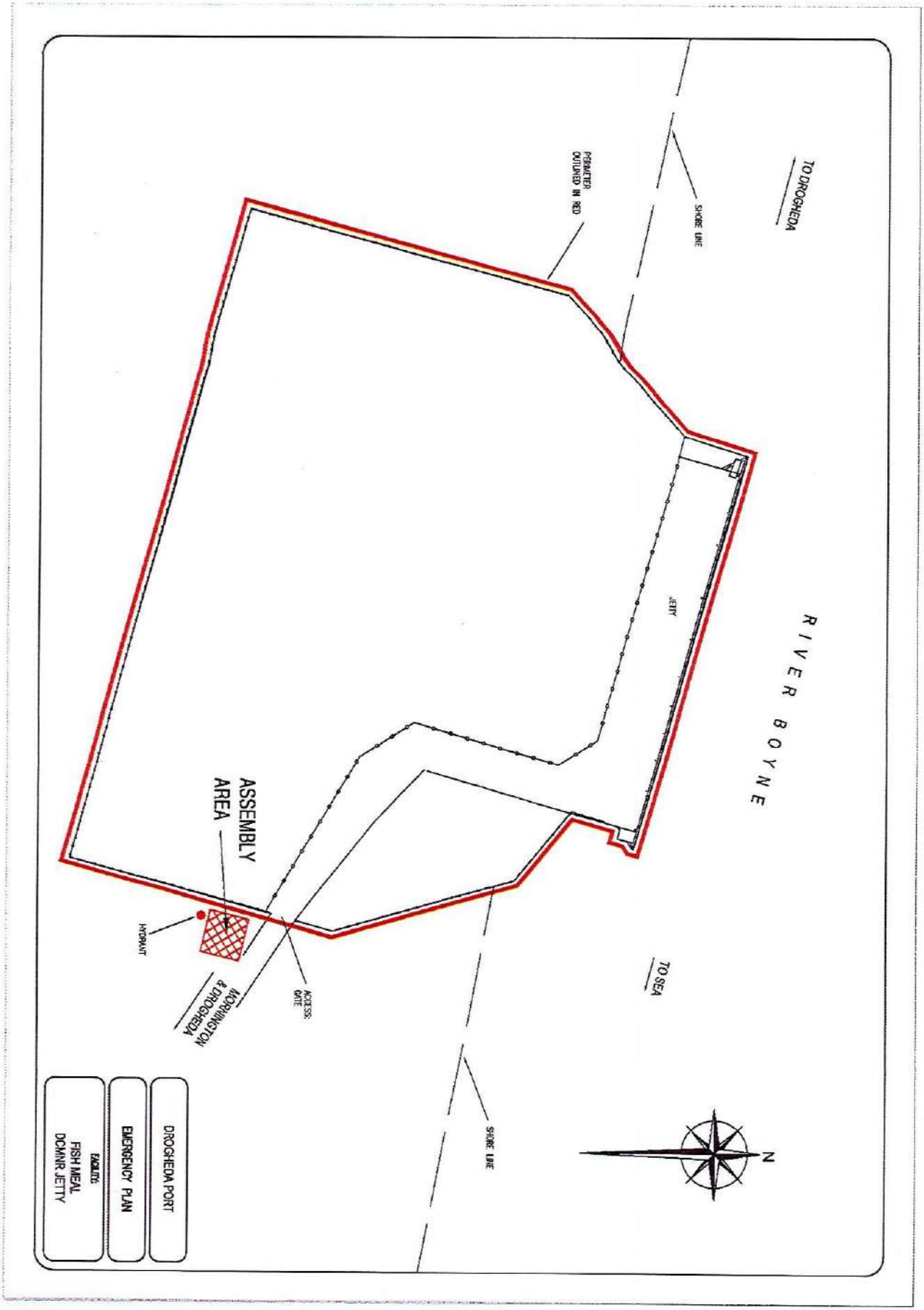
- RIVER WATER HYDRANT
- H FRESH WATER HYDRANT
- FE FIRE EXTINGUISHERS
- FP FIRE POINTS
- EMERGENCY SHUT DOWN LOCATIONS
- SECURITY BUILDING
- SECURITY CAMERAS
- LS LIGHTS
- PERSONNEL GATE
- TERMINAL VENT STACK
- ASSEMBLY POINT
- UNDERGROUND WATERMAIN
- EMERGENCY STOP

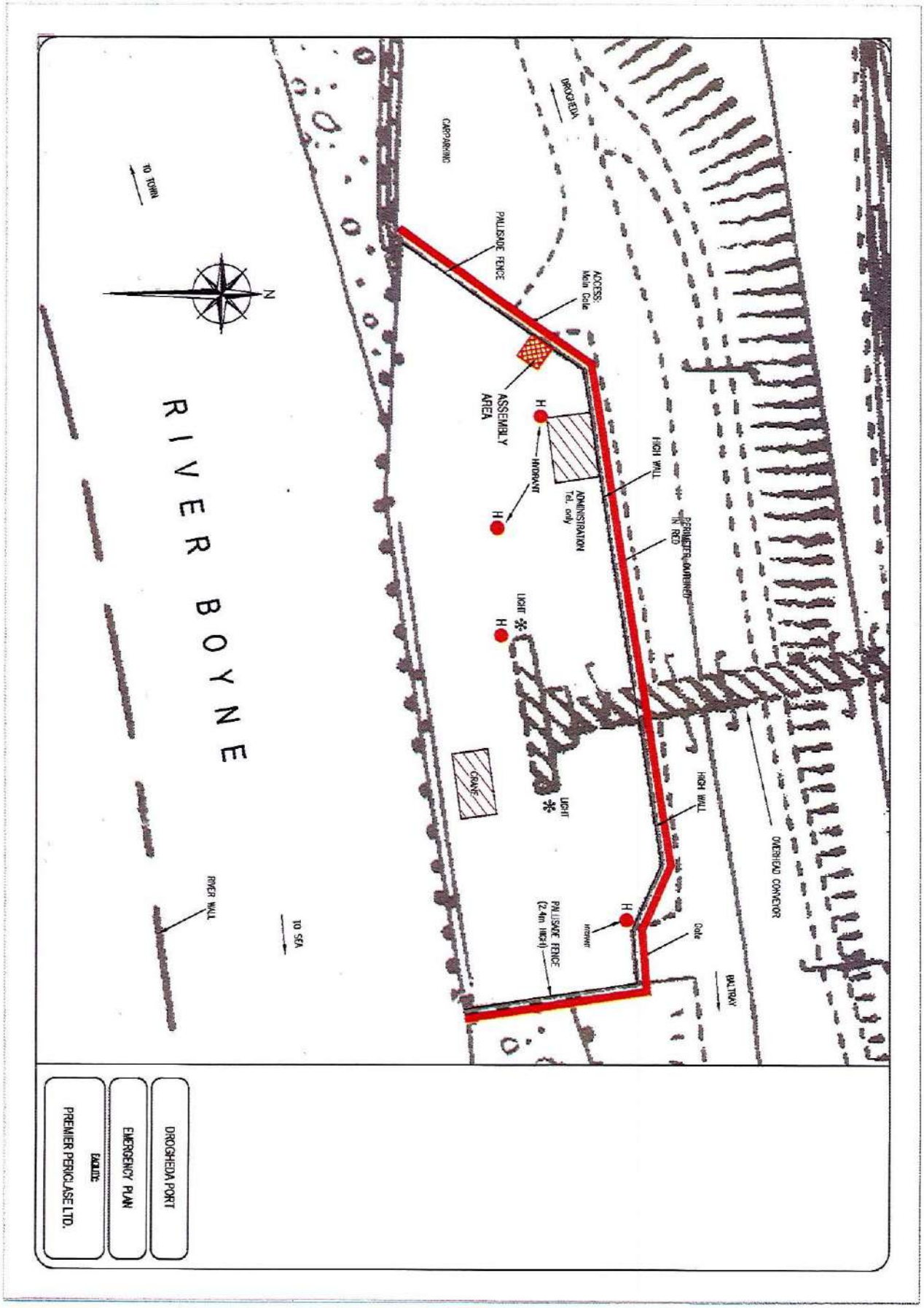
No.	DATE	REVISIONS

DRAWN	cad
CHECKED	CB
SCALE	1/1000
DATE	30-01-13
DRAWING TITLE	ON SITE EMERGENCY PLAN ON SITE MAP PLAN
DWG NO	16

PROJECT TITLE

DROGHEDA LPG MARINE TERMINAL
MARSH RD, DROGHEDA


TO DROGHEDA
PERIMETER OUTLINED IN RED
SHORE LINE
JETTY
RIVER BOYNE
ASSEMBLY AREA
HYDRANT
MORNINGTON & DROGHEDA
ACCESS GATE
TO SEA
SHORE LINE
N
DROGHEDA PORT
EMERGENCY PLAN
FACILITY:
FISH MEAL
DCMNR JETTY


RIVER BOYNE
TO TOWN
TO SEA
N
DROGHEDA
CARPARKING
PALISADE FENCE
ACCESS: Main Gate
ASSEMBLY AREA
HYDRANT
ADMINISTRATION Tel. only
HIGH WALL
PERIMETER GUARDRAIL IN RED
LIGHT
CRANE
OVERHEAD CONVEYOR
HIGH WALL
Gate
WALKWAY
PALISADE FENCE (2.4m HIGH)
RIVER WALL
DROGHEDA PORT
EMERGENCY PLAN
FACILITY:
PREMIER PERICLASE LTD.

Environmental Liabilities Risk Assessment

Drogheda Port

Dredging & Disposal Operations

(S0015-02)

Produced by

AQUAFACT International Services Ltd

On behalf of

Drogheda Port Company

March 2015

AQUAFACT INTERNATIONAL SERVICES ltd

12 KILKERRIN PARK

GALWAY

www.aquafact.ie

info@aquafact.ie

tel +353 (0) 91 756812

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1. Introduction

AQUAFACT International Services Ltd. was commissioned by the Drogheda Port Company to carry out an Environmental Liabilities Risk Assessment (ELRA) which is required as a condition of their Dumping at Sea permit (S0015-02).

AQUAFACT International Services Ltd. is an environmental consultancy established in Galway in 1986. We are highly experienced in carrying out a wide variety of marine, freshwater and terrestrial surveys and assessments, with a particular focus on areas and species of conservation importance. All AQUAFACT's staff are highly trained and educated with over half of the staff educated to Ph.D. level in a variety of disciplines. We have a long history of assessing the risks and impacts of a wide range of human activities on the marine environment e.g. dredging and dumping operations, discharges, port expansions, cables and pipelines, offshore renewable energy devices and aquaculture. We have prepared numerous Environmental Impact Assessments and Natura Impact Statements for these activities and we have prepared Environmental Liabilities Risk Assessment for a number of other Irish ports as part of their DaS permit requirements.

Drogheda Port Company is a semi state commercial port company established in 1997 under the Harbours Act 1996 and Amendments. Drogheda Port under the ages of the Minister for Transport has the statutory role for the management control and regulation of Drogheda Port. Parts 111 & IV of the Harbours Act 1996 detail the provision of the Act with respect to navigation, safety, pilotage etc. within the defined limits of Drogheda Port as defined in the Harbours (Amendment) Act 2009. The Harbourmaster appointed by the Drogheda Port Company is the authority for the control and regulation of these particular functions.

Other typical marine legislation that bestows specific powers on the Harbourmaster or Port Authority for the control and regulation of marine activities are:

- Merchant Shipping (Salvage & Wreck) Act 1993
- Sea pollution Act 1999
- Maritime Safety Act 2005
- Port Byelaws

2. Scoping

In order to maintain chartered depths in Drogheda Port, Drogheda Port Company must carry out maintenance dredging at a number of sites primarily and most frequently at the river mouth and seaward approaches (see Figure 2.1). In addition, maintenance dredging can take place at any location within the commercial estuary (*i.e.* the commercial channel berths and swing basins from Drogheda town quays to the sea at Mornington). Dredging at the river mouth and approaches usually occurs twice a year, although some years in the past decade saw three campaigns a year. The dredging in the river mouth and approaches area is typically in response to weather events and the timing of the dredging is dictated by the weather. A typical campaign lasts *c.* 3 weeks, working each tide, twice daily, generally from 3 hours before high water to *c.* 1 hour after high water. The dredged material will be disposed in one of two designated disposal sites (see Figure 2.1).

Dumpsite A1 is the site used for maintenance dredging from the berths, ship swinging basins and channel *etc., i.e.* from town to sea and for the sand material from the river mouth and seaward approaches. Dumpsite A1 is located within the defined port limits of the Drogheda Port Company. Dumpsite A2, to the northwest of Dumpsite A1, is located within the defined port pilotage limits of the Drogheda Port Company. This site is only suitable for sand from the river mouth and seaward approaches as this site is advantageous to aid the coastal processes and beach re-nourishment.

The EPA granted a Dumping at Sea permit (S0015-02) on the 11th February 2013 (as amended by Clerical Amendment No. S0015-02A dated 23rd April 2013). This permit covers the loading and dumping at sea of 2,816,000 tonnes of dredged material over an eight year period (2013-2021). The permit is subject to conditions set out in the Dumping at Sea Acts 1996 to 2010 under which Drogheda Port Company will carry out loading and dumping at sea. A condition of the permit requires Drogheda Port Company to assess their risks to the environment and set aside financial provision to cover for all of the environmental liabilities. This condition is stated below.

Condition 7.3 Environmental Liabilities

7.3.1 The permit holder shall as part of the AER, provide an annual statement as to the measures taken or adopted at the loading areas and dumping sites in relation to the prevention of environmental damage, and the financial provisions in place in relation to the underwriting of costs for remedial actions following anticipated events or accidents/incidents, as may be associated with loading and dumping at sea.

7.3.2 The permit holder shall arrange for the completion, by an independent and appropriate qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA) to address the liabilities from loading and dumping at sea. A report on this assessment, to the satisfaction of the Agency, shall be submitted as part of the second AER (required under Condition 6.7). The ELRA shall be reviewed as necessary to reflect any significant change to the volume or character of the material/substance to be loaded and dumped at sea, and in any case every three years following initial agreement. The results of the review shall be notified as part of the AER.

7.3.3 As part of the measures identified in Condition 7.3.1, the permit holder shall, to the satisfaction of the Agency, make financial provision to cover any liabilities identified in Condition 7.3.2. The amount of indemnity held shall be reviewed and revised as necessary, but at least triennially. Proof of renewal or revision of such financial indemnity shall be included in the annual 'Statement of Measures' report identified in Condition 7.3.1.

7.3.4 The permit holder shall have regard to the most recent Environmental Protection Agency Guidance on Environmental Liability Risk Assessment, Decommissioning Management Plans and Financial Provision when implementing Conditions 7.3.2 and 7.3.3 above.

This ELRA has been prepared in accordance with the EPAs '*Guidance on Assessing and Costing Environmental Liabilities*' (EPA, 2014a), '*Guidance on Assessing and Costing Environmental Liabilities – Unit Cost Rates for Verification*' (EPA, 2014b), '*Draft Guidance on Financial Provision*' (EPA, 2014c) and '*Environmental Liability Regulations Guidance Document*' (EPA, 2011).

The purpose of this ELRA is to identify and cost the risks posed to the environment (surface water, groundwater, atmosphere, land, flora, fauna and human health) from the loading and dumping at sea of material dredged from Drogheda Port.

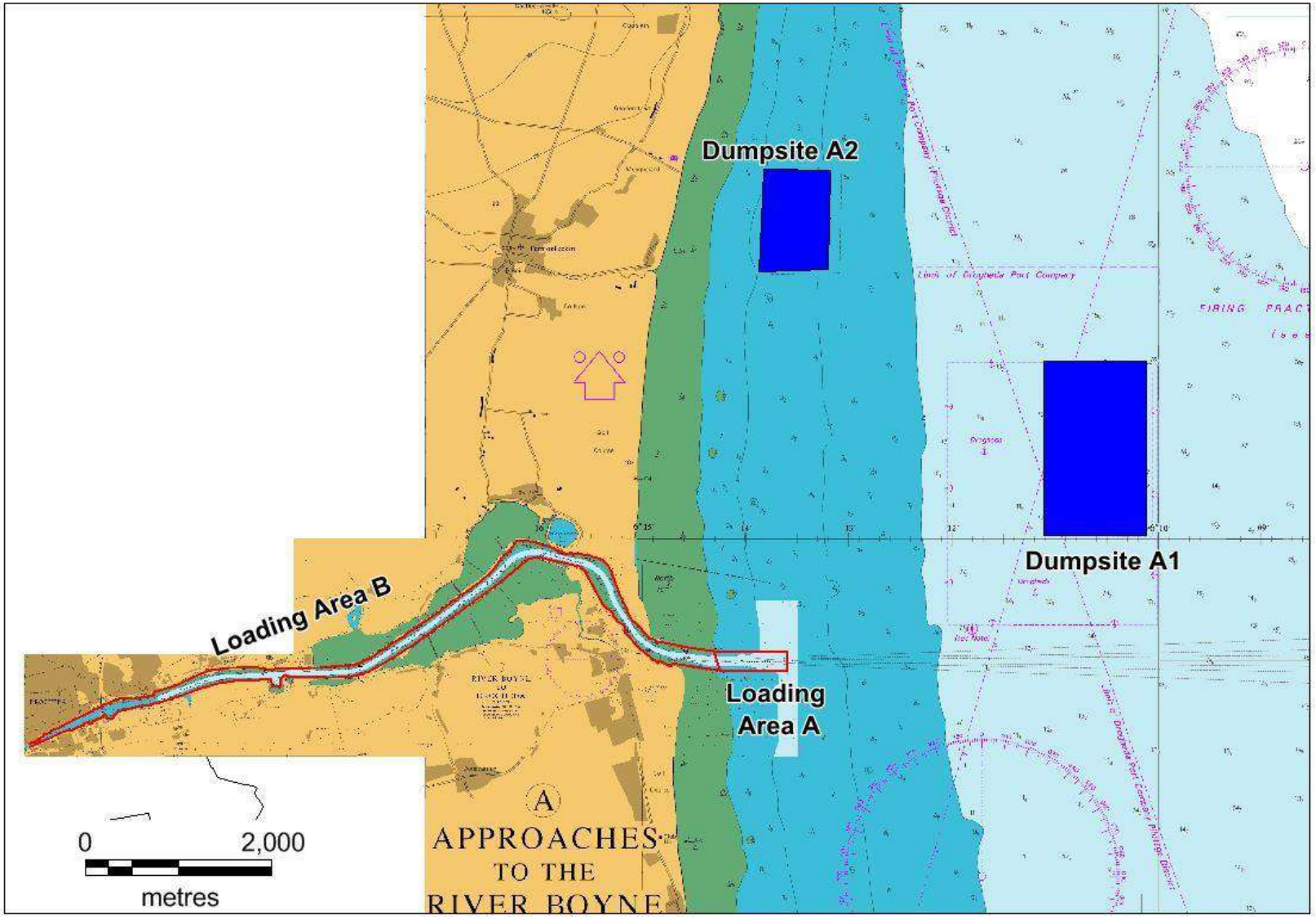

Figure 2.1: Locations of the dredge areas and the disposal sites.

3. Risk Assessment

3.1. Risk Identification

3.1.1. Site Operation

The dredging and disposal campaign for Drogheda Port Company consists of the following activities:

- Dredging and Loading
- Disposal of dredge spoil at 'Dumping Site A1' or 'Dumping Site A2'.

The Port of Drogheda handles over 1.2 million tonnes of cargo each year. The port has a wide balance of bulk and break bulk trade at *c.* 70% export i.e. cement, clinker magnesite and *c.* 30% import of paper, steel, timber, fertilizer, grains and liquefied petroleum gas (LPG). In 2014, the port has 330 cargo vessel calls.

The River Boyne flows through the town of Drogheda where commercial shipping traffic use the river to serve Drogheda Port. The river maintains high ebb tide exit velocities during winter fresh flows supplemented with spring tides, however these exit velocities quickly fall off at the river mouth (Scott Cawley, 2011). These high velocities allow the Boyne to carry substantial quantities of sediment out to the river mouth providing a natural scour to the estuary. However, this does not totally eliminate the need for maintenance dredging within the river particularly on the berths, ship turning basins and river bends. In addition, the high velocities have little effect at the river mouth and maintenance dredging is required at the approaches to the port, which are maintained at -2.2m CD. The entrance to the port is particularly vulnerable to gales from the northeast through to the southeast which deposit mobile sediments from the shallow gradient shoreline north and south into the deeper dredged port approach navigation channel.

The river under the jurisdiction of the Drogheda Port Company is approximately 7km in length from St. Mary's Bridge in the town of Drogheda to the river mouth at Mornington (Harbours (Amendment) Act 2009). There are five working berths in the town which are maintained at depths of approximately -1.6m CD. At low water vessels on these berths take the bottom in soft mud. From Drogheda town the river narrows to the point at Donors Green. Immediately east of this point on the south side of the river is the Flogas LPG terminal single berth. Here the berth is maintained at -3.0m CD within a dredged

pocket of 100m x 25m. From this location the river is wider and deeper with the channel being maintained at -2.2m CD over the full length of the navigation to the sea at Mornington.

The berths of RHI Premier Periclase Ltd, are found on the north shore. Depths are maintained at - 1.0m CD over the 180m quay immediately adjacent to the deeper navigation channel at -2.2m CD. At low water vessels on this berth take the bottom in soft sand/gravels. The berths at Tom Roe's Point to the north side of the channel lie within a deep-water dredged pocket of a length of 210m, width 25m excluding side slopes, maintained to a depth of -5.5m CD. To the east of this facility, 2km from the sea at Burrow Point is the Fish Meal Quay. This berth is used primarily for local fishing vessels and the discharge of Class 1 cargoes, classified under the International Maritime Dangerous Goods Code. The berth has a depth of -2.5m CD. The channel has been dredged to a uniform width of 50m with side slopes of 1:5 from the Flogas terminal (opposite Donors Green). At the South Point beacon, *c.* 500m west of Fish Meal Quay, the channel width increases to 60m to the Carrick beacon, *c.* 250m southeast of Fish Meal Quay. From this point the channel width is maintained at 50m to the Bull beacon where the channel width is increased to 100m with side slopes 1:10, and extends to a point 700m east of Lyons Light. There are three ship turning areas at the town quays that can accommodate vessels of lengths 90m, 95m and 105m; and at Tom Roe's Point ships of up to 130m.

Condition 3 of permit S0015-02 outlines the conditions that must be complied with in relation to loading and dumping at sea activities.

The estimated annual quantity of material to be dredged from the commercial channel, berths and swing basins from Drogheda town quays to the sea at Mornington is 30,000m^3 (48,000 tonnes). The quantity to be dredged from the seaward approaches is 90,000m^3 (144,000 tonnes). There is an additional annual contingency of 100,000m^3 (160,000 tonnes) to allow for the unexpected and unplanned events that may impede the navigation channel, such as unexpected weather events at the river mouth and seaward approaches and the collapse of the river retaining walls that create the estuarine polders. With contingency included, the annual average figure increases to 220,000m^3 (352,000 tonnes) and the total over 8 years is 1,760,000m^3 (2,816,000 tonnes). Dredging will primarily be carried out using a Trailer Suction Hopper Dredge (TSHD) with backhoe, grab and plough dredgers used in confined areas of berths and swinging basins that are inaccessible to the TSHD.

A typical dredging campaign lasts 3 weeks, working each tide, twice daily, generally from 3 hours before high water to *c.* 1 hour after high water. No dredging will be carried out at low water. The

dredged material will be disposed in one of two designated disposal sites (see Figure 2.1). Dumping Site A1 is located within the defined port limits of the Drogheda Port Company *c.* 4.2km northeast of Bluff Point. This site is used for maintenance dredging from the berths, ship swinging basins and channel *etc., i.e.* from town to sea and for the sand material from the river mouth and seaward approaches (Loading Area B). It has been used by the Port for the last decade and a half. Dumpsite A2, located *c.* 2.5km northwest of Dumpsite A1, is located within the defined port pilotage limits of the Drogheda Port Company. This site is only suitable for clean sand from the river mouth and seaward approaches (Loading Area A) and it has been used by the Port for the past 5 years. Disposal at Dumping Site A2 will be prohibited from the 1st June to 15th September inclusive for the protection of Bathing Waters. All material will be dumped at Dumping Site A1 during this period.

The disposal of spoil at either dumpsite will be effected by the release of the material through the hull of the TSHD vessel while the vessel is in motion. All reasonable practicable measures will be taken during loading to limit the generation and release of suspended solids into the water column. No loading will be carried out at periods of low tide. The annual contingency quantity can only be dredged if required to maintain navigable depths, as evidenced by pre-dredge and post-dredge bathymetric surveys. Dumping activities will be conducted to ensure uniform spread of material throughout the dumping sites. Emergency oil spill kit and oil spill containment equipment will be held on board by the dredging operator in the event of an oil spill during dredging operations. Drogheda Port Company will maintain its Tier 1 pollution response unit and equipment for immediate deployment. Drogheda Port Company as part of its pollution plan has a contract call up facility for additional resources and expertise. Drogheda Port will carry out a five yearly sediment analysis programme, consistent with the timing of previous sediment programmes and to the guidance of the Marine Institute. A daily log will be automatically recorded during each dumping voyage.

Prior to the commencement of dredging, the Marine Survey Office (MSO) of the Department of Transport will be consulted to ensure that all vessels used in connection with the loading and unloading activities meet the requirements of the MSO. The permit holder will ensure that the vessels used in connection with Permit No. S0015-02 are fully certified. The permit holder will permit authorised officers to be on board the vessel. They shall permit and facilitate the carrying out by the authorised officer of his functions under the Dumping at Sea Acts 1996-2010, and shall comply with the provisions of those Acts in relation to the authorised officer and those functions.

3.1.2. Operator Performance

Drogheda Port Company has held Dumping at Sea Permits since 1996. Dredging will primarily be carried out using a Trailer Suction Hopper Dredge (TSHD) for the bulk of the work in the channel and a small grab dredger for the berths and swinging basins that are inaccessible to the TSHD. Dredging generally occurs twice a year. Examples of TSHD used in the past include the *Lough Foyle*, the *UKD Dolphin, Amazone, Lesse* and *Albatross.* The *UKD Seahorse* has been used in the past for bed levelling and plough dredging. The port is currently contracted with Irish Dredging using the TSD Sospan Dau.

Dredging Notice to Mariners are issued in advance of operations to all parties and posted on the Drogheda Port Company website.

Condition 2.1 of the dumping at sea permit states that the permit holder shall adopt all reasonable practicable measures to minimise the noise impact of the permitted activities. Noise levels from the permitted activities shall not cause a nuisance at any noise-sensitive location (NSL).

In addition, these vessels have certification which provide security and certainty in relation to sea worthiness and ability to undertake dredging works with very little potential risk of an accident/incident. The procedure for vessels employed to dredge Drogheda Port is as follows:

- Prior to arrival in Irish waters, Ship's Agents send a 'Pre-Arrival Form' to the Department of Transport, Tourism & Sport (DTTAS) as part of 'Safe Seas Ireland' (SSI) notification. SSI provides for the electronic notification of i) ships arrival and departure notifications, ii) dangerous or polluting goods (DPG) notification; iii) ISPS (International Ship and Port Facility Security) notifications, iv) waste notifications and v) reporting requirements in the event of an accident or incident.
- It is Inspectors from the Marine Survey Office (MSO) who check ships certification, and check / issue 'Irish Loadline Certificates', where necessary.
- Port Company personnel advise the MSO if something is amiss; the authorities of the 'flag state' issue licences / certificates for their vessels. Vessels do not come on charter until all is in order.
- Ship's crew are all trained to STCW International Marine Standards.
- Contracted vessel with same crews have detailed knowledge of Drogheda Port.
- Prior to arrival the dredger, her Master and shore management are advised of any particular conditions at Drogheda that may give rise to concern and the dredge programme is agreed.

The dredger is included on the daily shipping circulation list of ship movements for the following 24hrs and is therefore up to speed with all port traffic.

- Daily at 1700hrs, the Harbourmaster communicates with the dredger the following 24hr ship traffic movement programme, times, berths, arrivals and departures.
- The same information is relayed to the port Pilots and Coxswains.
- All commercial traffic and traffic directed by the Harbourmaster must use a licence Drogheda Port Pilot.
- Prior to any vessel movements i.e. inward or outward, the ports Pilots and dredger Master communicate to determine the time of arrival at the dredge site and ship passing or meeting requirements and always in compliance with the International Collision Regulations.

All vessels employ best practice measures to minimise any possible impacts on the marine environment.

Drogheda Port Company operates a Port Pollution Plan. A Tier One pollution response unit is immediately available within the port. Port personnel have undergone approved training with the Irish Coast Guard. Annual pollution exercises are carried out. Drogheda port also maintains an annual contract for immediate additional equipment call up and advice. Dredging vessels engaged by Drogheda Port Company have their own pollution plans/equipment response kits and insurance.

There have been no ship or dredger incidents, no pollution and no environmental complaints reported during dredging and disposal operations in Drogheda Port.

3.1.3. Environmental Sensitivity

The environmental sensitivity is considered with respect to the following:

- Surface Waters: Dredging will occur within the Boyne Estuary Transitional Water Body and the Boyne Estuary Plume Zone Coastal Water Body. The water quality of the Boyne Estuary Transitional Water Body is 'Intermediate' and the Boyne Estuary Plume Zone Coastal Water Body is 'unpolluted'. Dumping site A2 is located in the Lough Coast Coastal Water Body which has an unpolluted status. Dumping Site A1 is located outside surface water body zone.
- Natural Habitats and Species: Dredging will occur within three Natura 2000 sites – the River Boyne and River Blackwater cSAC (Site Code: IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA (Site Code: IE004080). The proposed disposal

sites are not located within any Natura 2000 sites. These cSACs have a number of Annex I habitats and Annex II species that area Qualifying Interests of the cSACs. These habitats and species must be protected in order to maintain the favourable conservation status and integrity of the cSACs. The habitats and species present are: estuaries, mudflats and sandflats not covered by seawater at low tide, *Salicornia* and other annuals colonising mud and sand, *Spartina* swards (*Spartinion maritimae*), Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), Mediterranean salt meadows (*Juncetalia maritimi*), Embryonic shifting dunes, Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes), *Fixed coastal dunes with herbaceous vegetation (grey dunes), Alkaline fens, *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*), Atlantic Salmon *Salmo salar* (only in fresh water), River Lamprey *Lampetra fluviatilis* and Otter *Lutra lutra*. The Special Conservation Interests of the SPA include the following: wintering Shelduck *Tadorna tadorna*, wintering Oystercatcher *Haematopus ostralegus*, wintering Grey Plover *Pluvialis squatarola*, wintering Lapwing *Vanellus vanellus*, wintering Knot *Calidris canutus*, wintering Sanderling *Calidris alba*, wintering Black-tailed Godwit *Limosa limosa*, wintering Redshank *Tringa tetanus*, wintering Turnstone *Arenaria interpres*, breeding Little Tern *Sterna albifrons* and Wetlands & Waterbirds

- Human Beings: The dredging operations will occur within the commercial estuary from the Drogheda Port inner town quays to the river entrance at Mornington (including all berths and swing basins) and the seaward approaches. The 7 electoral divisions located around the estuary and seaward approaches have a population of 49,629 (CSO 2011 data). Drogheda town is a typical urban centre with some industrial/commercial lands on the outskirts and rural agricultural lands dominated by one off housing further out. Dredging of the estuary will occur within 100m of residential homes in some locations. Dumping Site A2 is located *c.* 850m east of residential properties in the Clogherhead beach area and Dumping Site A1 is over 4km form the coast. Noise levels from the permitted activities will not cause a nuisance at any noise-sensitive location (NSL).

3.1.4. Risks associated with Activities

As all commercial shipping require a Drogheda Port Company licence pilot for entry to and exit from the port, with Standard Operating Procedures in place for these operations, the risk of a collision between cargo carrying commercial traffic and the operational dredger is eliminated. The navigation channel is well marked. Regular Drogheda Port Company Notices to Mariners are issued and posted on the Drogheda Port Company website. Prior to any Pilot assisted ship movements taking place a ships Master/Pilot Information Exchange must be completed. While a ship is on passage within the

Drogheda Port navigational jurisdiction, ship position reporting must be complied with at designated locations. Ship speed within the commercial channel and port approaches is *c*. 6kt. The dredger speed while dredging is *c.* 1-2kt. The A2 designated Dumpsite is located inshore of the normal shipping routes to/from Drogheda Port approaches. The A1 designated Dumpsite is seaward and north of the designated Drogheda Port anchorage and pilot boarding area. In addition, the risk of a collision while the dredger is en route to either disposal site is eliminated as the ports pilotage district extends to the disposal sites.

In addition, there is no risk of disposal occurring at Dumping Site A2 during its closed period between 1st June and 15th September or any other incorrect location. This risk is not possible as clear instructions are given to the dredging contractor management and dredger Master in advance of arrival at Drogheda and commencing operations. Additionally, Drogheda Port Company through the Harbourmaster monitor via AIS the dredger movements and any error in the dredgers course would be quickly identified and rectified.

The risks associated with Loading Operations are:

- Failure of dredger due to a collision. Unlikely that this would result in a loss of spoil material already dredged. The TSD Dredger is typically a double hulled vessel with the spoil compartment contained within the inner hull. The outer hull is used for ballast. Given the speed of a dredger while dredging at 1-2kt and the speeds of in/out bound vessels to Drogheda port is 6kt, the chance of a 'T' bone collision impacting or penetrating the inner hull is most unlikely. Even if it were to happen, the dredge spoil release would not be significant and dependant on the time of the collision within the dredge cycle. Further to that, the release of the spoil would be to almost the same site as it has previously been dredged unless underway to the dumpsite (most lightly river entrance dredging as this is the greatest dredging frequency). Given that the material is from the coastal sediment drift process and un-contaminated, no environmental risk exists. At the dredge site the actual depth of the column of water varies from 3 to 7m, less the actual draft of the dredger, therefore the fall impact of any material is minimal and dispersion greatly reduced.
- Failure of dredger due to mechanical failure. While a more likely occurrence the risk is again minimal. While dredging, the failure would occur at very slow speed. Most likely the vessel would take the ground gently in soft sand/mud within the defined navigational channel where the side slopes are typically of a 1:5 gradient, therefore the vessel is contained. The seamanship solution to a loss of power or steering that cannot be immediately returned is to

drop the anchor and all commercial vessels have two anchors. Generally a TSD Dredger may also be fitted with spud legs which can be deployed instantly and pin the vessel to a fixed position.

- Uncontrolled or poorly controlled release during loading or grab dredging due to mechanical failure/human error. This would result in the release of dredge material which may have a temporary negative impact on water quality and/or on the immediate area of the marine environment. Again a very unlikely scenario given that the dredger bridge team comprises three persons in the control bridge and all employ Bridge Team Resource Management as part of their SOP's. If a release did occur the impact would only be to the immediate area, dependant on the quantity within the dredger hopper, tidal flow, tidal speed etc. Again the accidentally released material is from the site just dredged and un-contaminated. At the dredge site the actual depth of the column of water varies from 3 to 7m, less the actual draft of the dredger, therefore the fall impact of any material is minimal and dispersion greatly reduced.
- Fuel spillage from the dredger due to accidental release / storage tank fault / collision. This could result in a discharge to surface water which would have a short term negative impact on the marine environment. While a possible scenario, it is again unlikely. All TSD Dredger bunkering supply operations are carried out while moored at Drogheda port. Bunker transfers are only allowed by permission of the Harbourmaster and SOP's must be followed by the vessel and bunker supply contractor. In the unlikely event of a collision, the vessels bunker tanks are located in the engine room of the dredger within the integral hull, so similar to the spoil hopper given the relative speeds of the vessel, collision impact penetration to an internal bunker tank most unlikely. If a release did occur, given that the TSD Dredger engaged at Drogheda port all use light diesel (MGO), this fuel from a pollution perspective would be left to degrade naturally and this is consistent with the DPC Pollution Response Plan. Additionally, the tidal flows experienced at Drogheda make containment almost impossible.

The risks associated with Disposal Operation:

- Unloading carried out at incorrect location due to human error/fault with navigation system. This would result in the release of dredge material which would have a temporary, negative impact on the marine environment. This again is a very unlikely scenario given that the dredger bridge team comprises three persons in the control bridge and all employ Bridge Team Resource Management as part of their SOP's. If a release did occur the impact would only be to the immediate area, dependant on the quantity within the dredger hopper, tidal flow, tidal

speed etc. Again the accidentally released material is from the site just dredged and un-contaminated. At the dumpsites actual depth of the column of water varies from 4 to 14m, less the actual draft of the dredger, therefore the fall impact of any material is minimal and dispersion greatly reduced.

- Uncontrolled or poorly controlled release during unloading at the dumpsite due to mechanical failure/human error. This would result in the release of dredge material which would have a negative impact on the marine environment. This is a very unlikely scenario given that the dredger bridge team comprises three persons in the control bridge and all employ Bridge Team Resource Management as part of their SOP's. If a release did occur, the impact would only be to the immediate area, dependant on the quantity within the dredger hopper, tidal flow, tidal speed etc. Again the accidental release material is from the site just dredged and un-contaminated. At the dumpsites the actual depth of the column of water varies from 4 to 14m, less the actual draft of the dredger, therefore the fall impact of any material is minimal and dispersion greatly reduced.
- Fuel spillage from the dredger due to accidental release / storage tank fault / collision. If a release did occur, given that the TSD Dredger engaged at Drogheda port all use light diesel (MDO), this fuel from a pollution perspective would be left to degrade naturally and this is consistent with the DPC Pollution Response Plan. The release would only be a small quantity before being noticed and stopped. Additionally, the tidal flows experienced at Drogheda make containment almost impossible.

3.2. Risk Analysis

Risk analysis involves the establishment of the risk classification criteria followed by risk analysis based on these criteria. Risk analysis tables evaluate and rank the risks compared to each other. They form the basis for rating the likelihood (see Table 3.1) of an event occurring and the consequence of impact (see Table 3.2) if the event occurs. The likelihood and consequence ratings are combined to form a risk score for risk evaluation. Table 3.3 shows the Risk Score for the dredging and disposal activities in Drogheda Port.

Table 3.1: Risk Classification Table - Likelihood

Rating	Likelihood	
	Category	**Description**
1	Very Low	Very low chance of hazard occurring
2	Low	Low chance of hazard occurring
3	Medium	Medium chance of hazard occurring
4	High	High chance of hazard occurring
5	Very High	Very high chance of hazard occurring

Table 3.2: Risk Classification Table – Consequence

Rating	Likelihood	
	Category	**Description**
1	Trivial	No impact or negligible change to the environment
2	Minor	Minor impact/localised or nuisance
3	Moderate	Moderate impact to environment
4	Major	Severe impact to environment
5	Massive	Massive impact to a large area, irreversible in medium term

Table 3.3: Risk Analysis

Risk ID	Activity	Potential Risks	Environmental Effect	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score (Consequence x Likelihood)
1	Loading Operations	Rupture/failure of dredger due to collision	Release sediment plume into the River Boyne and River Blackwater cSAC (Site Code: IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA– impact on water quality and natural habitats and species	2	Volumes relatively small (1,200-1300t maximum, 100-200t more realistic). Material is not contaminated and is suitable for disposal at sea. Material is comparable with the surrounding habitats. High velocities in the river will ensure rapid dispersal of sediments to the outer reaches.	1	DPC are presented with certification and inspection of sea worthiness.	2 (this consequence is scored at 2 based on worst-case (1,200-1,300t), in reality however, this scenario is most unlikely (100-200t more realistic)
2	Loading Operations	Rupture/failure of dredger due to mechanical fault	Release sediment plume into the River Boyne and River Blackwater cSAC (Site Code: IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA– impact on water quality and natural habitats and species	2	Volumes relatively small (1,200-1300t maximum, 100-200t more realistic). Material is not contaminated and is suitable for disposal at sea. Material is comparable with the surrounding habitats. High velocities in the river will ensure rapid dispersal of sediments to the outer reaches.	1	DPC are presented with certification and inspection of sea worthiness.	2 (this consequence is scored at 2 based on worst-case (1,200-1,300t), in reality however, this scenario is most unlikely (100-200t more realistic)
3	Loading Operations	Uncontrolled or poorly controlled release of dredge spoil during loading due to	Release sediment plume into the River Boyne and River Blackwater cSAC (Site Code:	1	Run-off from the dredger will only occur in the latter stages of the loading operation when the dredger's hold is almost at	1	DPC are presented with certification and inspection of sea worthiness. The Dumping at Sea	1

Risk ID	Activity	Potential Risks	Environmental Effect	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score (Consequence x Likelihood)
		mechanical failure / human error	IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA– impact on water quality and natural habitats and species		capacity and generally on the ebb tide Volumes would be very small. DPC has modelled this impact. Material is not contaminated and is suitable for disposal at sea. Material is comparable with the surrounding habitats. High velocities in the Estuary will ensure rapid dispersal of sediments.		permit conditions ensure that best practice measures and mitigation measures are implemented during loading to limit the release of suspended solids into the water column.	
4	Loading Operations	Fuel spillage from dredger during loading due to accidental leakage / storage tank fault / collision	Surface water pollution to the River Boyne and River Blackwater cSAC (Site Code: IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA – impact on water quality and natural habitats and species	3	Volumes of 1-2mt MGO maximum would be released Vigilant crew at all times during operations will ensure that any leak is detected immediately and valves closed (minimum of 2 on the bridge and 1 on the deck). Ship's Oil Pollution Plan will be implemented and on-board oil pollution control measures implemented.	1	DPC are presented with certification and inspection of sea worthiness.	3
5	Disposal Operation	Uncontrolled or poorly controlled release of dredge spoil during dumping at dumpsite	Uneven distribution of material throughout the dumpsite. This would have no implications on natural habitats or water quality beyond what is permitted under the	1	Maximum volume would be 1,200-1,300t. Material is not contaminated and is suitable for disposal at sea. Impacts of the disposal of 1,200-1,300t in wrong part of dumpsite out of a potential 2,816,000t is insignificant. The locations of subsequent	1	DPC are presented with certification and inspection of sea worthiness. The Dumping at Sea permit conditions ensure that best practice measures and mitigation measures are	1

Risk ID	Activity	Potential Risks	Environmental Effect	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score (Consequence x Likelihood)
			Dumping at Sea permit.		dumps will be revised to reflect initial error.		implemented to control release of sediments	
6	Disposal Operations	Fuel spillage from dredger during disposal due to accidental leakage / storage tank fault / collision	Surface water pollution to the River Boyne and River Blackwater cSAC (Site Code: IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA – impact on water quality and natural habitats and species	3	Volumes of 1-2mt MGO maximum would be released Vigilant crew at all times during operations will ensure that any leak is detected immediately and valves closed (minimum of 2 on the bridge and 1 on the deck). Ship's Oil Pollution Plan will be implemented and on-board oil pollution control measures implemented.	1	DPC are presented with certification and inspection of sea worthiness.	3

3.3. Risk Evaluation

The risk evaluation uses the outcome of the risk analysis carried out in the previous section to identify and prioritise the risks for risk treatment. Each of the risks are ranked to assist in the prioritisation of treatment. The risk matrix for the dredging and disposal activities in Drogheda Port can be seen in Table 3.4 below. The consequence and likelihood ratings (from Section 3.2 above) are used in the matrix with the level of consequence forming the x-axis and the likelihood forming the y-axis. The matrix is colour coded to provide a broad indication of the critical nature of each risk.

Table 3.4: Risk matrix for the dredging and disposal operations at Drogheda Port.

Occurrence	**V. High**	**5**					
	High	**4**					
	Medium	**3**					
	Low	**2**					
	V. Low	**1**	3, 5	1, 2	4, 6		
			1	**2**	**3**	**4**	**5**
			Trivial	**Minor**	**Moderate**	**Major**	**Massive**
			Consequence				

3.4. Risk Treatment

The risk treatment process involves the identification and prioritisation of management and mitigation measures to mitigate against the risks identified in the risk evaluation process. This results in a Statement of Measures which can be seen in Table 3.5 below.

Table 3.5: Statement of Measures

Risk ID	Potential Risks	Risk Score	Mitigation Measures to be Taken	Outcome	Action	Completion Date	Contact Person
1	Failure of dredger due to collision	2	• Vessels do not come on charter until all certification is in order • Vessel speeds ≤ 6kt	• Mitigates against vessel failure • Minimises damage if collision occurred	None required	Completed	Harbourmaster
2	Failure of dredger due to mechanical fault	2	• Vessels do not come on charter until all certification is in order • Twin anchors and spud legs	• Mitigates against vessel failure • Stabilise vessel if it grounds	None required	Completed	Harbourmaster
3	Uncontrolled or poorly controlled release of dredge spoil during loading due to mechanical failure / human error	1	• Vessels do not come on charter until all certification is in order • Slow speeds during dredging • Overflow from the vessel will be minimised using best practice	• Mitigates against vessel failure and sediment loss	None required	Completed	Harbourmaster
4, 6	Fuel spillage from dredger during loading/disposal due to accidental leakage / storage tank fault / collision	3	• Vessels do not come on charter until all certification is in order • Vigilant crew at all times during operations will ensure that any leak is detected immediately and valves closed (minimum of 2 on the bridge and 1 on the deck). • Ship's Oil Pollution Plan will be implemented and on-board oil pollution control measures implemented. • Emergency oil spill kit and oil spill containment equipment will be held on board by the dredging operator	• Mitigates against vessel failure • Ensures any leaks are detected immediately and source of leak closed/repaired • Ensures any leaks are contained and controlled	None required	Completed	Harbourmaster

Risk ID	Potential Risks	Risk Score	Mitigation Measures to be Taken	Outcome	Action	Completion Date	Contact Person
5	Uncontrolled or poorly controlled release of dredge spoil during dumping at dumpsite	1	• Vessels do not come on charter until all certification is in order • Slow speed within disposal site • Divide the disposal site into sections to ensure even disposal throughout the site	• Mitigates against vessel failure • Mitigate against loss of control • Mitigate against poorly controlled dumping	None required	Completed	Harbourmaster

3.5. Costing

The worst case scenario concerns the release of fuel, albeit in small quantities (Risks 4 and 6). The risks to the environment and water quality associated with the incorrect release of sediments are of a lower consequence than the risk posed by the release of fuel, as the sediment released was taken from the area initially.

The risk involves the release of small quantities (1-2mt) of MGO into the marine environment. Mechanical containment and recovery often net little gain since MGO tends to evaporate and dissolve very quickly after hitting the water surface. In addition, the tidal flows experienced at Drogheda make containment almost impossible. As a result and in accordance with the DPC Pollution Response Plan, a small spill like this would be left to degrade naturally and therefore no clean up costing is required.

4. Summary

This Environmental Liabilities Risk Assessment (ELRA) which is required as a condition of their Dumping at Sea permit (S0015-02) has identified the release of small quantities of fuel (MGO) from the dredger due to accidental leakage, storage tank fault or collision as the plausible worst-case-scenario. In accordance with the DPC Pollution Response Plan, a small spill like this would be left to degrade naturally and therefore no clean up contingency is required.

5. References

EPA. 2014a. *Guidance on Assessing and Costing Environmental Liabilities.* Published by the Environmental Agency, Ireland. ISBN 978-1-84095-535-4.

EPA. 2014b. *Guidance on Assessing and Costing Environmental Liabilities – Unit Cost Rates for Verification.* Published by the Environmental Agency, Ireland. ISBN 978-1-84095-535-4.

EPA. 2014c. *Draft Guidance on Financial Provision.* Published by the Environmental Agency, Ireland. ISBN 978-1-84095-557-6.

EPA. 2011. *Environmental Liability Regulations Guidance Document.* Published by the Environmental Agency, Ireland. ISBN 978-1-84095-416-6.