

Stranraer Harbour Dredging Best Practical Environmental Option



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July 2012

Stranraer Harbour Maintenance Dredging
Best Practicable Environmental Option Assessment

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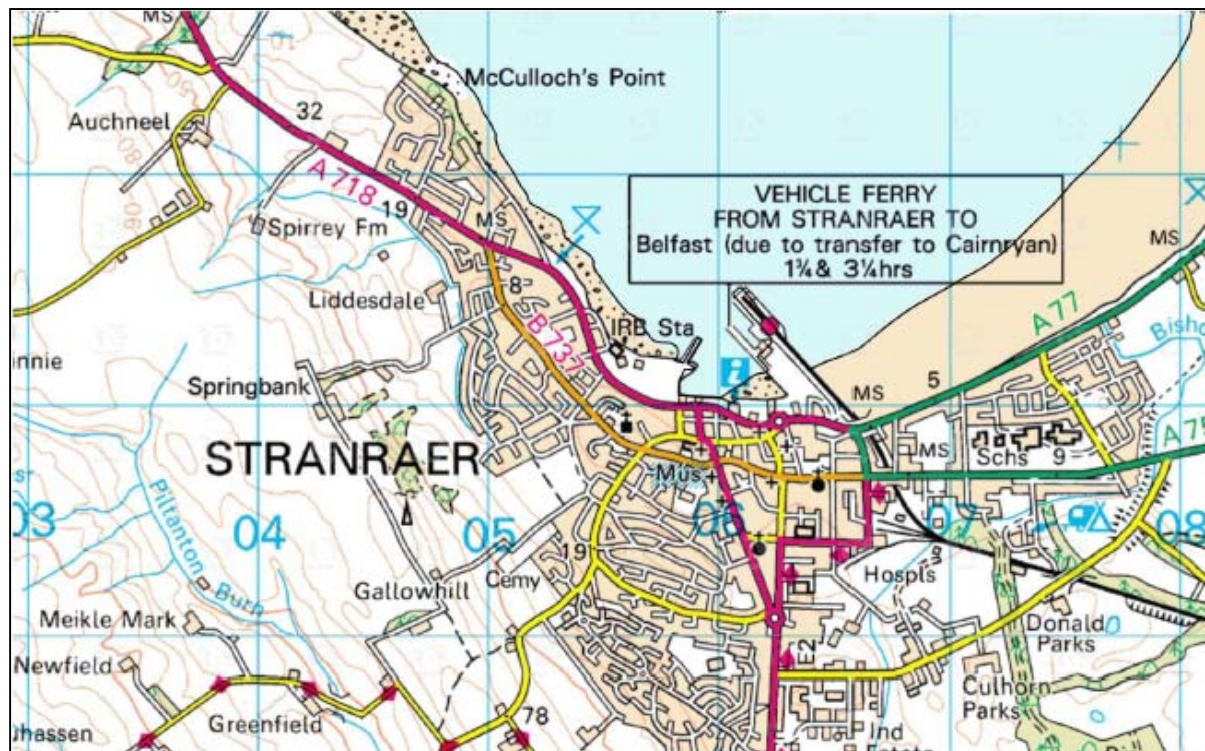
1 Introduction

1.1 Background to Application

Dumfries and Galloway Council is the Harbour Authority for Stranraer Harbour. The Authority plans to undertake a maintenance dredge of the harbour to restore accessibility at all states of tide. This assessment will consider the alternative options available for disposal of the dredgings. In order to obtain a licence for the deposit of materials at sea it is necessary to undertake a detailed assessment of the alternative options, together with a statement setting out the reasons which have led to the conclusion that deposition of the materials at sea is the Best Practicable Environmental Option (BPEO).

This BPEO is submitted together with the application for disposal at sea as required by the Marine (Scotland) Act 2010 to Marine Scotland Licensing Operations Team. Full details of the consultations undertaken are given in Appendix 1.

The location of Stranraer Harbour is shown in Figure 1 and the dredge site is shown in Figure 2. It should be noted that this does not cover the Eastern part of the harbour including the former ferry port for which Stena Line Ltd were the Harbour Authority.



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Figure 1 - Location Plan

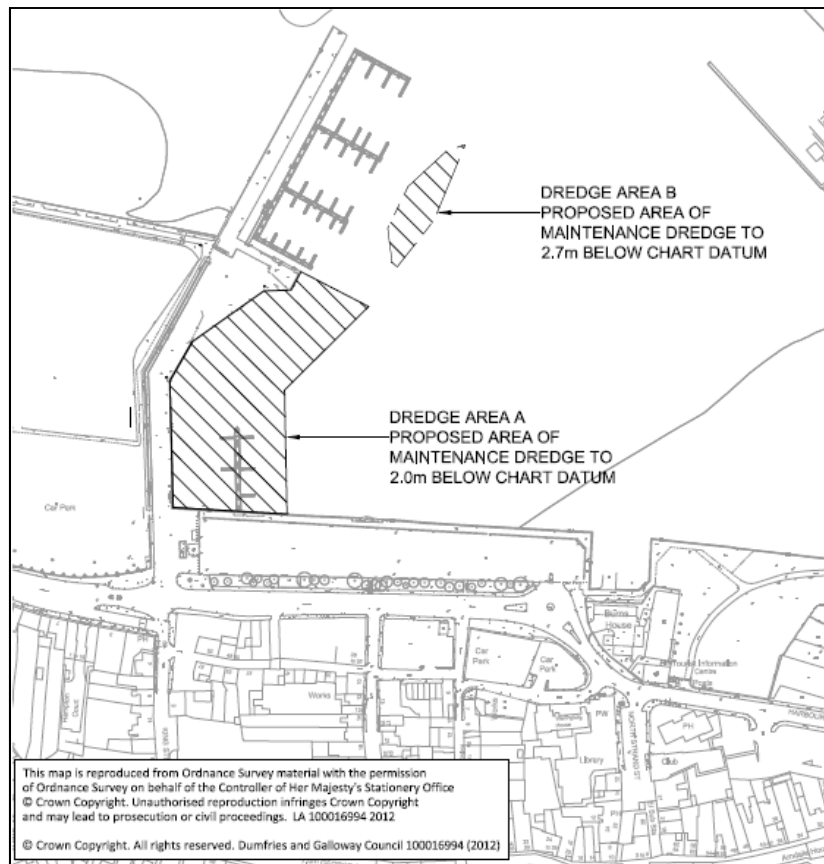


Figure 2 - Dredge Site Location

1.2 Source of Materials

The movement and accretion of shingle sands and finer sediments is prevalent throughout the Loch. There will be some deposition of silt and gravel from the town burn which discharges into the harbour area but this is judged to be minor. In the past there were reports of increased levels of sediment due to the fast ferries which operated using water jet propulsion and may have suspended fine materials as they manoeuvred at the mouth of the harbour. In November 2010 Stena Line Ltd moved their operations to Oldhouse Point near Cairnryan thus removing this potential source of siltation. The harbour has historically required dredging at periodic intervals of around 13 years when it becomes silted up to around Chart Datum. The area of the harbour involved was last dredged in 2004/05. During

the construction of Stranraer Marina in 2008 additional dredging was carried out in the area of the proposed marina.

1.3 Description of Materials

The deposits in the harbour consist mainly of clay with some sand, silt and gravel. The current programme of work involves the removal of 6,305 cubic metres of this material. Prior to the dredging operations carried out in 2004/05 the deposits to be dredged were tested for tri-butyl tin (TBT) and poly-aromatic hydrocarbons (PAH) as required by Marine Scotland.

The concentration of dibenzo anthracene was below the limits of detection of 0.01 mg/kg. The maximum individual PAH concentration found in a sample was 0.05mg/kg. The results for the TBT testing showed that the concentration is below the achieved detection limit of 0.1 mg/kg. These concentrations are below the recommended thresholds for action.

As the current proposals are for maintenance dredging pre-dredge testing is not required. Sampling and testing throughout the dredging will be required.

Stena Line Ltd have previously tested material in the dredge area and found that the material would not be suitable for anything other than car parking or landscaping.

1.4 Options for Relocating/Removal of Materials

Due to the location of the harbour any option involving the removal of the material by road would have an impact on the town centre of Stranraer. Many of the town's hotels and bed and breakfast businesses are located along the seafront. The location of the harbour is shown on Figure 1. The issues are discussed in detail in Section 3 of the report.

Sea disposal has historically been the method used for the dredgings from Stranraer Harbour and this has not in the past given rise to any major concerns or complaints when the spoil ground at Beaufort's Dyke has been used.

1.5 Details of Previous, Related Operations

The harbour was last dredged in 2008 prior to the construction of Stranraer Marina. Dredging was to a level of 2.0 m below Chart Datum in the main harbour area adjacent to the west wall. Licence Number 03535/07/0 – 2530 valid from 14 January 2008 to 13 January 2009 was issued to Dumfries and Galloway Regional Council. A volume of 20,035 m³ of dredged materials was taken to Beaufort's dyke shown on Figure 3. The previous year dredging was carried out prior to construction of a rock breakwater. Licence Number 03356/07/0 - 22370 valid from 23 April 2004 to 1 May 2008 was issued to Dumfries and Galloway Regional Council. A capital dredge of the harbour was carried out between

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December 2004 and May 2005 to a depth of 2.0m below Chart Datum. Licence Number 03130/04/0 - 2132 valid from 19 November 2004 to 18 November 2005 was issued to Dumfries and Galloway Regional Council. A volume of 20,810 m³ of dredged materials was taken to Beaufort's dyke shown on Figure 3. Prior to this the harbour was dredged to a depth of 2.0 m below Chart Datum in July 1992 and 1.6m below Chart Datum in 1979.

1.6 Structure of this Report

Section 3 describes each of the available disposal options and rejects those which are not practicable.

Section 4 discusses in detail each practicable disposal option

Section 5 presents a summary of the findings of this study and concludes by identifying the BPEO.

2 Discussion of Available Options

2.1 Introduction

In This section of the report discusses all available disposal options for the dredge spoil. Where an option is considered to be impracticable, the reason is given and the option discounted from further consideration. The remaining options are considered in detail in Section 3 of this report.

2.2 Disposal Options

2.2.1 Land Incineration

Due to the inert nature of the dredged material this option for disposal has been discounted.

2.2.2 Landfill

There is a landfill site at Galdenoch 7 miles west of Stranraer. If the dredged material was to be disposed of at Galdenoch it would be necessary to open a new cell which would be prohibitively expensive and in addition there are no plans to open any new cells. The other option would be to use the dredged material, after dewatering, as capping material for the landfill site. However, the operators of the site have an excess of composted material from the Eco Deco plant in Dumfries which will, with SEPA approval, be used to cap the landfill site. There is therefore no requirement at Galdenoch for capping material. This option is therefore discounted.

2.2.3 Soil Conditioning

Due to the high saline content of the dredged material it is not considered suitable for agricultural use. With some treatment it might be suitable for treatment of brown field sites. However, following discussion with Dumfries and Galloway Council Strategic Planning there are no suitable sites available within the locality at present. This option for disposal has been discounted.

2.2.4 Land Raising

Due to flooding issues during high tides it is proposed to raise the level of existing ground between Agnew Park and the harbour. This option is considered in more detail in Section 4.

2.2.5 Reclamation

There are plans to develop the east pier and Stranraer waterfront. An area between the west side of the east pier and the car park adjacent to Port Rodie is identified as a new civic space constructed on re-claimed land. Development plans are at an early stage and this option would require construction of a retaining wall prior to backfilling with dredged

materials. The quantity of dredged material is also likely to be considerably greater than that required for reclamation meaning that excess spoil would have to be disposed of by other methods. The costs associated with constructing a retaining wall are out with the remit of the dredging scheme. It is proposed to carry out the dredging works in 2012/13. Construction of a retaining wall as part of the Stranraer Waterfront wouldn't be completed before the dredging contract and there are no suitable storage facilities for spoil close to the proposed reclamation site. For these reasons this option is discounted.

2.2.6 Beach Nourishment

Due to the high clay content of the dredged material it is not considered suitable for beach nourishment.

2.2.7 Coastal Protection

The fine nature of the dredged material and the presence of significant oyster beds (which are sensitive to suspended solids) make the material unsuitable for coastal protection or inter-tidal recharge within the Loch. For information refer to Figure 3 which shows the Marine Biology features of the Loch including the extent of the native oyster beds.

There are areas on the Inner Solway where the fine material could be used to protect habitat such as salt marshes etc. However, this is too far away to be financially viable and there would be issues regarding the source of the material which is not contiguous with the Solway. This option for disposal has been discounted.

2.2.8 Sea Disposal

Historically this has been the method of disposal with Beaufort's Dyke the preferred spoil site. This option is considered in more detail in Section 4.

Stranraer Harbour Maintenance Dredging
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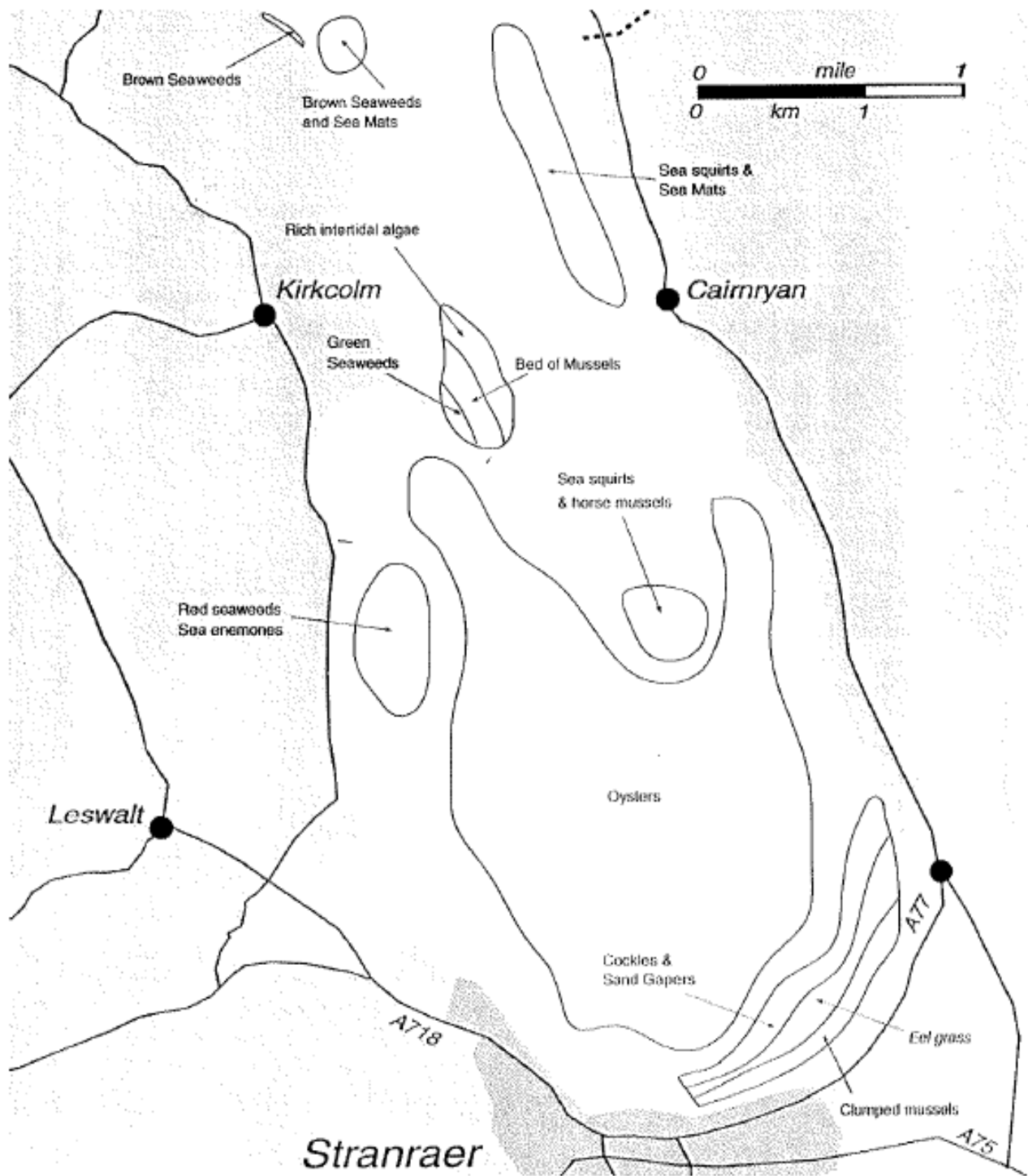


Figure 3 - Marine Biology Features of Loch Ryan

Taken from Loch Ryan Advisory Management Forum Strategy Document, January 2009

3 Aspects to be Taken into Consideration

3.1 Introduction

This section of the report considers the strategic, environmental and cost implications associated with each of the disposal options judged to be practicable in Section 2.

3.2 Land Raising

3.2.1 Strategic Considerations

3.2.1.1 Operational Aspects

Re-use of the dredge material in the proposed area would require dredging by backhoe or grab and transport of the material to the west or north walls of the harbour and unloading the material by grab into waterproof dump trucks and transporting the material the short distance to the site. An alternative would be dredging by cutter-suction and pumping the material from the west or north wall of the harbour to the site. However, cutter-suction dredging vessels are much larger than backhoe or grab dredgers and advice from dredging contractors is that cutter-suction dredgers wouldn't be able to access Stranraer Harbour. The dredge spoil would need to be de-watered in temporary lagoons prior to use for raising the level at the proposed site.

The high level of fines in the material mean that it would require protection (rock armour or similar) from wave action and it is not suitable as an engineering fill due to settlement characteristics. It is unlikely to be suitable for supporting buildings or other forms of construction without other treatment such as pre-consolidation or piling. Stena Line Ltd have previously tested material in the dredge area and found that the material would not be suitable for anything other than car parking or landscaping. In this case the proposed use would be for landscaping including a footpath. This option is only viable if the dredge material is not contaminated. However pre-dredge testing in 2004 showed that levels of contaminants were below the limit of detection.

3.2.1.2 Availability of suitable sites / facilities

The only potential site for which the dredge spoil might be suitable is to raise the level of existing ground between Agnew Park and the harbour to alleviate flooding during high tides.

3.2.1.3 General Public Acceptability

It is likely that use of the dredgings for land raising would be acceptable. While the dredgings dry out there may be complaints regarding smell and the visual impact of the material.

3.2.1.4 Local Acceptability

The local acceptability of the project would be addressed by the formal planning process.

3.2.1.5 Legislative Implications

The spoil will be a controlled waste material for the purposes of transport, storage and disposal. As such Section 34(7) of the Environmental Protection Act 1990 and Section (1) of the Control of Pollution Act 1974 will apply. The works would require a licence under the Marine (Scotland) Act 2010. The agreement of the Crown Estate would also be required. The spoil will be a controlled waste material for the purposes of transport, storage and disposal. The Scottish Environment Protection Agency (SEPA) have indicated that as the harbour and surrounding land is under the ownership of Dumfries and Galloway Council, a Waste Management Licence or Exemption from Waste Management Licensing would not be required for the storage and dewatering process. Additionally they have stated that any run-off returned to the sea would not require Consent to Discharge under the Control of Pollution Act 1974.

3.2.1.6 Consultation

The Scottish Environmental Protection Agency and Scottish Natural Heritage have both been consulted on the subject and a copy of the relevant correspondence is appended to this report.

3.2.2 Environmental Considerations

3.2.2.1 Safety and Public Health

Whilst the material is drying out the area would require to be securely fenced to prevent public access. Provided security arrangements are properly managed there should be no impact on public health.

3.2.2.2 Pollution / Contamination Implications

During the drying process the containment for the material will be designed to minimise the amount of fine material re-entering the harbour and so the contamination or pollution implications would be comparable with the dredging operation itself.

Historically the dredged material has been classified as uncontaminated. There have been concerns about the level of tri-butyl tin (TBT) around Loch Ryan and SEPA produced a report in October 2003. Inter-tidal sampling of the sediment at Stranraer Harbour showed that the concentration was very low with results below the detection limit of 0.002 mg/kg.

Prior to the dredging operations carried out in 2004/05 the deposits to be dredged were tested for tri-butyl tin (TBT) and poly-aromatic hydrocarbons (PAH) as required by Marine

Scotland. The concentration of dibenzo anthracene was below the limits of detection of 0.01 mg/kg. The maximum individual PAH concentration found in a sample was 0.05mg/kg. The results for the TBT testing showed that the concentration is below the achieved detection limit of 0.1 mg/kg. These concentrations are below the recommended thresholds for action.

As the current proposals are for maintenance dredging pre-dredge testing is not required. Sampling and testing throughout the dredging will be required.

The contractor will be required to submit a method statement for the dredging operations detailing measures to be taken to prevent environmental pollution and in particular details on how the plume of suspended materials in the water column will be controlled.

3.2.2.3 General Ecological Implications

The major local natural heritage features including marine biology, ornithological habitats and landscape are unlikely to be significantly affected by the proposed land raising. However the ecological impact on the inter-tidal zone would require thorough examination as part of the planning process.

3.2.2.4 Interference with Other Legitimate Activities

The waterfront at Stranraer is currently the subject of a nationally important redevelopment study. A master plan has been prepared showing proposals for the Stranraer waterfront area. The proposed land raising would be compatible with the master plan proposals.

3.2.2.5 Amenity / Aesthetic Implications

The aesthetics and amenity impacts of the proposed land raising would be examined in detail as part of the formal planning process.

The transshipment and hauling of the wet dredgings would cause noise, smell, dust and water nuisances during the contract period. There would be no impact on public roads as the material would only require moving a short distance by waterproof dump trucks within the harbour area. Hours of working for the contract would be agreed with local Environmental Health Officers. The area affected is confined mainly to the site itself but there would be some impact on nearby residential properties and to the public who have access along the seafront walkway and cycle track.

3.2.3 Cost Considerations

Historically sea disposal has been the method of disposal adopted when Stranraer Harbour has been dredged. The disadvantage of sea disposal is the long passage to the licensed spoil site at Beaufort's Dyke approximately 37.5 km from Stranraer Harbour in the North Channel. The passage to the dumping ground typically takes approximately 2 ½ hours

meaning that only two return trips per day are possible. Using the spoil for land raising at the proposed site would obviate the need for the long passages to and from the dumping ground but discussions with dredging contractors indicates that due to the time taken in offloading by grab would mean that only two loads per day would be achievable. The time taken for this option would therefore be the same as for disposal at sea but with the additional costs associated with haulage and rock armour provision.

3.3 Disposal at sea

3.3.1 Strategic Considerations

The amount of dredge material from this project is small in relation to the capacity of the licensed dumping ground at Beaufort's Dyke. The disposal of the material in this manner does not have any strategic implication for disposal capacity in the area.

3.3.1.1 Operational Aspects

Material arising from the dredging will be transported from the dredge site by barge (or dredger with integral hopper) and released by bottom dumping at the spoil site. Details of the vessel will be confirmed when a dredging contractor is appointed.

3.3.1.2 Availability of suitable sites / facilities

There is a licensed spoil site at Beaufort's Dyke approximately 37.5 km from Stranraer Harbour in the North Channel, shown on Figure 4.

3.3.1.3 General Public Acceptability

The disposal site has been in use for some time for dredgings arising from Stranraer (both the local authority and the ferry company sites) and it is unlikely that the general public will raise any objections.

3.3.1.4 Local Acceptability

Dumping at the licensed site over the years has been the accepted method for disposing of the dredgings and it is unlikely to raise objections from the local community or fishermen.

3.3.1.5 Consultation

SEPA and SNH have both been consulted on the subject and a copy of the relevant correspondence is appended to this report.

3.3.2 Environmental Considerations

3.3.2.1 Safety and Public Health

Disposal at sea would have negligible implications on safety, provided that normal navigational and maritime procedures were observed.

3.3.2.2 Pollution / Contamination Implications

The implications regarding possible contamination of the dredged material are the same as outlined in Section 3.2.2 above for the option to dispose to landfill.

It is anticipated that 6,305 cubic metres of sandy silt and clay will be deposited at the spoil site. During dumping silt in suspension may contaminate the water column around the site for a limited period. However, it is expected that wave motion and tidal flows will minimise the effect on local fauna.

3.3.2.3 General Ecological Implications

A degree of mortality on local faunal communities may result due to burial, but the impact is likely to be small.

Post deposition sampling of material dredged from Stranraer by Stena Line Ltd. has shown no adverse effects on the ecology of the deposition area.

3.3.2.4 Interference with Other Legitimate Activities

It is anticipated that the disruption to other legitimate activities will be kept to a minimum.

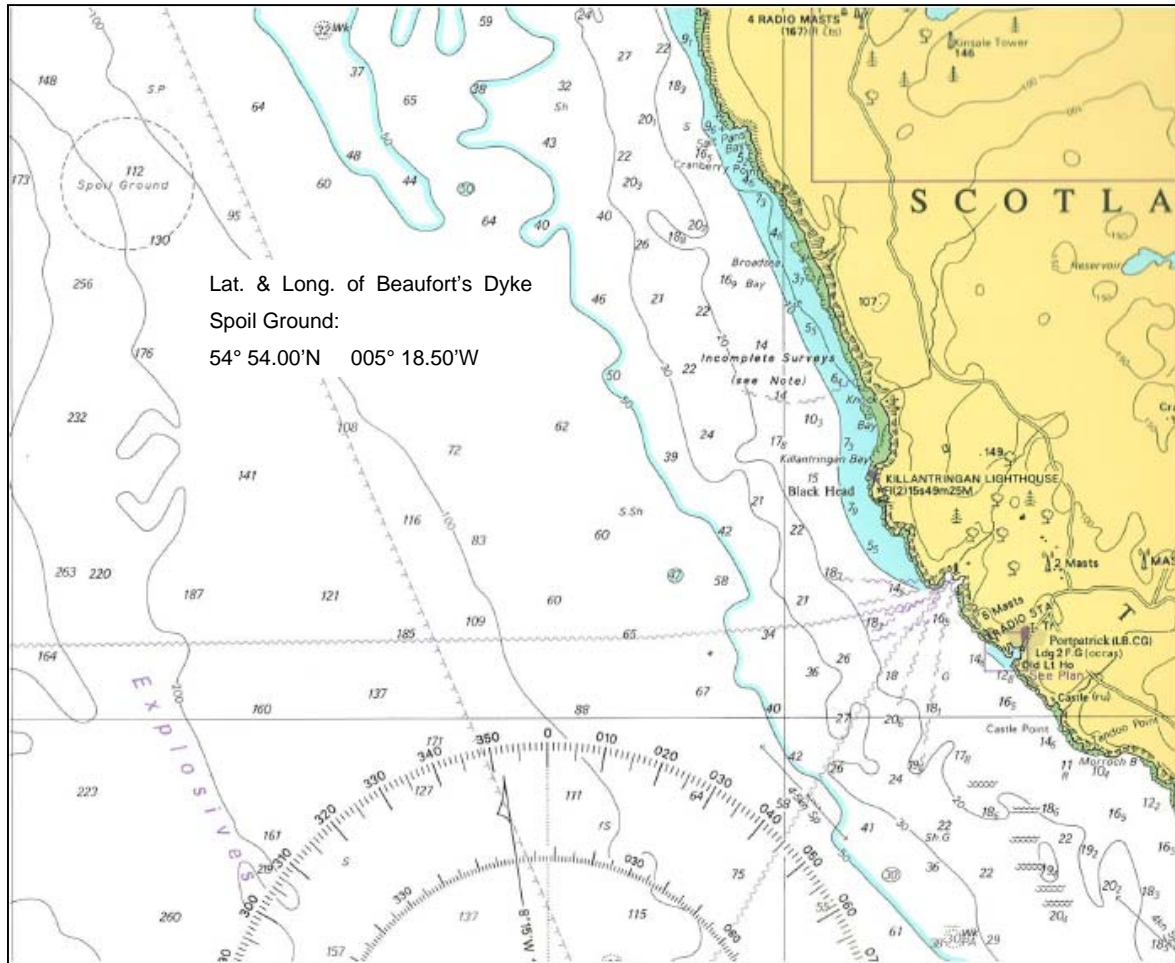
3.3.2.5 Amenity / Aesthetic Implications

Disposal at sea has no amenity or aesthetic implications and avoids any potential hazard associated with leakage during transportation by road.

3.3.3 Cost Considerations

Due prevailing weather conditions at Stranraer and the consequent demurrage contractors have indicated that the preferred pricing method would be on day rates. Pricing on a cubic metre dredged basis would incorporate a significant sum to cover demurrage costs. The dredge carried out in 2005 removed 14,715 m³ of spoil at a cost of approximately £92,000 equating to £6.25/m³ and was carried out on day rates.

Stranraer Harbour Maintenance Dredging Best Practicable Environmental Option Assessment



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Figure 4 – Location of the Beaufort's Dyke Spoil Ground

4 CONCLUSIONS

4.1 Summary of available options

Seven options were initially considered for the disposal of the dredged material from Stranraer Harbour. However due to the inert nature of the material, the high proportion of fine material, operational and environmental considerations agricultural use, incineration and beach nourishment were considered impractical. As there are no landfill sites with a requirement for capping material disposal to landfill was discounted. Reclamation of an area of land between the East Pier and Port Rodie was considered but due to the requirement for a retaining wall to be constructed by others and timescales this option was discounted.

The two remaining options; land raising and disposal at sea are reviewed in summary form in the table below.

Aspect (Acceptability rating)	Land Raising	Sea Disposal
Strategic Acceptability		
Operational acceptability	Moderate	High
Availability of suitable sites	High	High
Public & Local acceptability	Moderate	High
Environmental Acceptability		
Health and Safety	Moderate	High
Pollution	Moderate	High
Ecological acceptability	High	Medium
Interference	Low	High
Amenity	High	High

4.2 Summary of Primary Objections to Each Option

4.2.1 Land Raising

Strategically and environmentally this option scores moderately. Although mainly fine silty material it would be useable at the proposed land raising site. The dewatering on the waterfront and the transport from the harbour to the site may lead to complaints regarding smells, dust and water leakage and the visual impact of the lagoons required. The development of Stranraer Seafront is a nationally important scheme and the impact of the temporary storage is difficult to assess at this stage in the project. It may have a negative impact on its economic viability but the ecological acceptability is high.

Although the dredging cost for this option will be the same as for disposal at sea as explained earlier the overall costs of this option would be significantly greater due to the need for transport the short distance from the quay wall to the site, construction of temporary lagoons for de-watering and rock armour or similar protection against wave action.

4.2.2 Disposal at Sea

Disposal at sea is the preferred option in overall strategic terms and presents no greater environmental disbenefits than the other option. On cost grounds this option provides a significant advantage.

4.3 Identification of the Best Practicable Environmental Option

It is concluded that the assessment of the BPEO for disposing of the dredged material from Stranraer Harbour is the controlled placement in an approved sea disposal site (Beaufort's Dyke), and that such a disposal operation is considered an acceptable option under the terms of the Marine (Scotland) Act 2010.

Appendix 1 - Consultation

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25 June 2012

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Dear Sirs

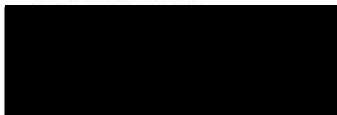
STRANRAER HARBOUR DREDGING


Dumfries and Galloway Council propose to carry out maintenance dredging at Stranraer Harbour. An application for a licence in accordance with the Marine (Scotland) Act 2010 is currently being prepared together with a Best Practical Environmental Option (BPEO) for disposal of the dredgings. The dredging operation will involve the removal of approximately 750m³ of sandy clay and silt. Sea disposal at Beauforts Dyke has always been the preferred option when dredging Stranraer Harbour. The only other practical option considered was to use the dredged material to raise the level of an area of ground between Agnew Park and the harbour which is subject to tidal flooding. This option was more expensive and also required construction of temporary lagoons close to the seafront to allow dewatering of the dredged material. The dredged material has limited use as an engineering material and would require protection with rock armour or similar if it was used for the proposed land raising.

After considering both cost and environmental issues, sea disposal is the preferred option.

Prior to submitting the application for a licence to Marine Scotland, I would welcome any comments you may have with regard to our proposals.

Yours faithfully



 Andrew Herd
Engineering Manager



Our Ref: Water/
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02 July 2012

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05 JUN 2012

Dear Mr Herd

STRANRAER HARBOUR DREDGING

I refer to your letter dated 25 June 2012 regarding the proposed dredging of Stranraer Harbour and disposal of dredged material.

SEPA has no comments to offer at this stage regarding the option to remove and dispose of the material to Beauforts Dyke via appropriate disposal licence as statutory consultation will form part of the Marine (Scotland) Act 2010 application process. This established outlet has been used not only for historical Stranraer Harbour arisings but also for dredged materials from within the main body of Loch Ryan itself.

With regards to the alternative land based disposal for land reclamation, further information will be required to demonstrate why this option is preferred. Such information will be required to support any application for an appropriate waste licence exemption. You will also be required to clearly demonstrate compliance with relevant objectives to ensure that waste is managed without endangering human health and without using processes or methods which could harm the environment and in particular without :

- Risk to water, air, soil, plants or animals; or
- Causing nuisance through noise or odours; or
- Adversely affecting the Countryside or places of special interest

If you fail to comply with the relevant objectives, you may be committing an offence under section 33(1)(c) of the Environmental Protection Act 1990 by treating keeping or managing controlled waste in a manner likely to cause pollution of the environment or harm to human health. It is also an offence to carry on an exempt activity in breach of the Registration Obligations.

Cont'd / ...



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25 June 2012

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Dear Sirs

STRANRAER HARBOUR DREDGING


Dumfries and Galloway Council propose to carry out maintenance dredging at Stranraer Harbour. An application for a licence in accordance with the Marine (Scotland) Act 2010 is currently being prepared together with a Best Practical Environmental Option (BPEO) for disposal of the dredgings. The dredging operation will involve the removal of approximately 750m³ of sandy clay and silt. Sea disposal at Beauforts Dyke has always been the preferred option when dredging Stranraer Harbour. The only other practical option considered was to use the dredged material to raise the level of an area of ground between Agnew Park and the harbour which is subject to tidal flooding. This option was more expensive and also required construction of temporary lagoons close to the seafront to allow dewatering of the dredged material. The dredged material has limited use as an engineering material and would require protection with rock armour or similar if it was used for the proposed land raising.

After considering both cost and environmental issues, sea disposal is the preferred option.

Prior to submitting the application for a licence to Marine Scotland, I would welcome any comments you may have with regard to our proposals.

Yours faithfully



 Andrew Herd
Engineering Manager



Scottish Natural Heritage
All of nature for all of Scotland

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18 JUL 2012

17 July 2012
Our ref: CNS/FEPA/W/CLC115313
Your ref: C/Harb/B/10

Dear Mr Herd

Stranraer Harbour Dredging proposal

Thank you for your letter dated 25th June 2012 regarding proposals for maintenance dredging at Stranraer Harbour.

You present two options for the disposal of some 750m² of sandy clay and silt. Scottish Natural Heritage is of the view that the existing method of disposing these inert materials in the Beaufort's Dyke is tried and tested. However, we always urge caution in terms of the actual works by restricting the plume in the water column to an absolute minimum in line with best practice, thereby ensuring no impacts on the native oyster fishery in Loch Ryan.

The second option you present, involving the land raising of ground between Agnew Park and the Harbour, does not impact on any designated sites nor any known species of interest, although the precise location is not provided in your letter.

Please do not hesitate to contact me if I can be of any further assistance.

Yours sincerely

[Redacted signature]

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