

# **BURGHEAD HARBOUR: THE MORAY COUNCIL**

Maintenance Dredging of Entrance and Inner Basin

MARINE SCOTLAND ACT 2010

APPLICATION FOR DREDGING AND DEPOSIT OF SOLID WASTE IN THE  
TERRITORIAL SEA AND UK CONTROLLED WATERS ADJACENT TO SCOTLAND

## **BEST PRACTICABLE ENVIRONMENTAL OPTION ASSESSMENT**



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# 1. Introduction

## 1.1 Background

Moray Council is the Statutory Harbour Authority for 6 harbours extending from Burghead in the west to Cullen in the east. Of these, Buckie and Burghead are classed as the only commercial harbours, the others catering predominantly for the leisure market. Buckie handles cargo vessels and fish landings, and Burghead combines fish landings with leisure craft.

In order to maintain depth in the entrances and basins all these harbours, maintenance dredging is required. At the smaller leisure harbours, the rate of infill is such as to require dredging once every two or three years. At Buckie and Burghead however, dredging needs to be undertaken annually to maintain the depth in the entrance channels. 3 year licences for sea disposal were previously granted for both Buckie and Burghead by Marine Scotland in 2018.

The material removed from the Council's harbours has to be disposed of in accordance with guidance from Marine Scotland. This document assesses the options available for disposal and examines the Best Practical Environmental Option (BPEO) in accordance with the requirement of Part 4 of the Marine (Scotland) Act 2010.

## 1.2 Source of Materials

The sediments generally enter from seaward, mainly as a result of wave action during storm conditions. In each harbour, the coarse sandy material accumulates in the approach channels. The finer sand and silt placed in suspension by the waves is carried into the harbour basins by tidal currents. The relatively still conditions then allow settlement and deposition.

## 1.3 Description of Materials

The material is predominantly sand and silt. Apart from the discharge from local surface water drains and small watercourses, no other material enters the basins to contaminate the sediments. The material transported by wave action is composed predominantly of sand moved from areas of high wave energy, and from areas with no known sources of appreciable pollution. Consequently, it is considered that given the relatively small quantities to be removed from the harbours, the best disposal option is to return it to the marine environment.

## 1.4 Sediment Risk Assessment

A report of the Sediment Risk Analysis carried out by Envirocentre Limited in June is submitted as a separate document.

## 1.5 Method of Removal & Relocation

All of the maintenance dredging in Moray Council harbours is now undertaken with the Council vessel MV Selkie, which has been designed specifically to work in the smaller harbours around the coast. The vessel is equipped with a long reach excavator, enabling dredging down to a depth of 9 metres, and is based at Buckie Harbour as home port. Disposal takes place at sea with the excavator as the vessel is not equipped with bottom doors. Further details about the vessel can be found in Appendix 1 on page 8.

There are two options for disposal of the material removed by dredging:

- i) continued relocation of material at sea in a controlled manner
- ii) disposal on land

The dredging operation involves removal of the material from the sea bed, transportation to a disposal site and relocation in that location. The current dredging requirement in the Moray Council harbours necessitates the use of floating plant. Few of the dredging locations are accessible from the shore. Along with other factors such as the requirement to have a minimal impact on the normal harbour activity and the size and access constraints of the harbours, the most practical and economic method of dredging is to use the new vessel designed for the job.

For the vessel to transfer material ashore after completion of loading would require double handling into temporary shore based storage facilities or vehicles.

#### 1.6 Previous Maintenance Dredging at Burghead (10 years)

	Annual total m3
2010	11466
2011	10024
2012	9470
2013	10530
2014	8000
2015	7999
2016	7575
2017	8610
2018	8545
2019	2318

Material dredged from the harbour has previously been disposed of at sea. The location is licensed by Marine Scotland under the Marine (Scotland) Act 2010.. A diagram of the dump site at 57°43.50N 003°31.00W can be found in Appendix 2 on page 8.

#### 1.7 Designated Bathing Water Sites

The 2 designated bathing water sites nearest to the sea disposal site are as follows:

Nairn (East) is a relatively wide bay, about 1km long. There are 2 designated bathing waters at Nairn which are separated by the mouth of the River Nairn. This was designated in 1987. The distance from Nairn to the sea disposal site is approximately 30km.

Cullen Bay is a sandy beach about 1km long. It is located between the villages of Cullen and Portknockie and was designated in 1987. The distance from Cullen Bay to the sea disposal site is approximately 50km.

Due to the distances involved, it is considered that the option of sea disposal at the site licensed by Marine Scotland poses no risk to these designated bathing waters.

## **2. Disposal Options**

### 2.1 Temporary Storage

#### 2.1.1 At a land based site

The use of a quayside holding or storage area requires the identification of a suitable site of adequate capacity. This would in effect act as a settlement basin, with the resulting problems of containing the material and discharging surplus water at an acceptable solids concentration, the safety of the public and harbour users, and wind-blown particles causing interference across the wider area in dry conditions.

### 2.1.2 At a marine site

If material was dumped for subsequent re-dredging, a suitably sheltered location would have to be found. In practice this would mean dumping in the harbour itself. Dispersion of the material over the harbour bed during dumping would be a cause for concern, as would the loss of quayside and berthing space. There would also be risk of spillage into the harbour and onto the quayside.

### 2.1.3 Method of relocation/removal of stored material

Movement of material either from the dredger or a dump to the final site would require the provision of extra plant and equipment, substantially increasing the cost and duration of the operation. The risks of spillage and contamination would also increase due to double handling.

## 2.2 Permanent Disposal

### 2.2.1 Land Disposal

As the main component of the dredge spoil is sand, incineration of the material is not economically viable. This disposal option can therefore be discounted.

### 2.2.2 Sacrificial Landfill

There are no landfill sites within easy reach of any of the Moray Council harbours and the Council facilities are not able to accept the quantities involved, even when dried.

### 2.2.4 Spreading on Agricultural Land

Due to the high salt content, the dredged material is unsuitable for spreading on farmland. Removal of the salt from the material is not economically viable.

### 2.2.5 Land Reclamation

There is no local demand for the use of dredged material for land reclamation. To transport the material further afield would be not economically viable.

### 2.2.6 Beach Nourishment

There is a local beach just south of Burghead that has experienced erosion of 0.596 – 0.30 m loss from 1970 to Modern, according to DynamicCoast.com. There are other areas suffering similar losses east of Findhorn and between Findhorn and Nairn.

In order to disperse dredged material onto the local beach site, it would have to be transferred from the dredger to a holding basin or directly to road haulage units. This would involve a crane and a fleet of heavy road vehicles. The risk of spillage and contamination combined with the additional resources required and expense incurred mean this is not a viable option. The increase in the use of heavy haulage in the local villages would be socially unacceptable. Heavy machinery would be required to move the material on the beach, which may disturb the vegetated shingle and create an artificial profile. Regular recycling and re-nourishment at this site would be required causing disturbance to wild life. Transporting dredged material 10 – 20 miles by road to sites further afield would be very expensive.

### 2.2.7 Concrete Manufacture

The prohibitive cost of salt removal means this method of disposal is not viable. There is only 1 local supplier of ready mix concrete, which has its own quarries producing sand and gravel.

### 2.2.8 Licensed Disposal at Sea

The alternative to land disposal is to continue with the established method of placing the material in a licensed site at sea. This option allows the Council to utilise its own vessel, and returns material derived almost entirely from coastal waters to those same waters. This method avoids double handling of material, temporary storage on land, transport of material by road, the reduction of landfill capacity and minimises the possibility of contamination and spillage. Sea disposal has negligible impact on harbour users or the local community if managed correctly.

A comparison of the costs involved in these disposal options can be found in the table below.

	<b>Disposal Option</b>	<b>Operations</b>	<b>Costs £/T</b>	<b>Comments</b>
1	Incineration	Loading	500	Crane hire per day
		Transport	25	Depending on distance travelled
		Treatment	120	Not acceptable at most plants
2	Landfill	Loading	500	Crane hire per day
		Transport	25	Depending on distance travelled
		Delivery	175.25	No contamination or special waste
3	Spreading on agricultural land	Loading	500	Crane hire per day
		Transport	25	Depending on distance travelled
		Treatment	N/A	Contaminants not acceptable.
		Spreading	N/A	Carried out by landowner
4	Land reclamation	Loading	500	Crane hire per day
		Transport	25	Depending on distance travelled
		Distribution	500	Hire of Plant per day
5	Beach nourishment	Loading	500	Crane hire per day
		Transport	25	Depending on distance travelled
		Distribution	500	Hire of Plant per day
6	Concrete manufacture	Loading	500	Crane hire per day
		Transport	25	Depending on distance travelled
		Treatment	N/A	Contaminants not acceptable
7	Disposal at sea	Loading	N/A	Council owned vessel
		Transport	N/A	
		Distribution	N/A	

### 3. Environmental Considerations

#### 3.1 Moray Firth Special Area of Conservation

A large part of the inner Moray Firth, west of a line from Helmsdale to Lossiemouth, has been designated a Special Area of Conservation (SAC). The Moray Firth SAC was initially proposed for designation in 1996 to help protect the resident population of bottlenose dolphins (*Tursiops truncatus*), which is considered to be rare in a European context. The dolphins live a long time and reproduce slowly, and because the Moray Firth population is relatively small and isolated, it is extremely vulnerable. It is considered that the limited passages carried out by the dredger to the sea disposal sites, compared to all the other shipping activity in the Firth and current Offshore Wind construction works taking place on the Smith Bank, will have a negligible effect on the dolphin population. As a matter of course, a mammal watch is kept on board and work ceases should any mammal activity be spotted at any time.

According to a commissioned report by SNH in 2008, dredging can be a source of continuous noise in near shore regions. Unlike other shipping activity, dredging often continues in a localised area for several days or weeks at a time. Dredgers usually produce broadband sounds that are detectable up to 20-25 km from the source, and impacts on marine mammals are thought to be similar to those of other ships. Dredging and disposal operations are common in the Moray Firth, with some disposal operations occurring relatively frequently in at least two of the core areas used by dolphins i.e. in

between the Sutors and in the Kessock channel. The sea disposal area, designated by Marine Scotland for dredging at Burghead, is much further to the east.

In 2001 'Sandbanks which are slightly covered by sea water at all times' (subsequently referred to as 'sandbanks') were added to the designation. These subtidal sandbanks encompass a range of fine grained sediment types typically, but not exclusively, down to the 20m depth contour. Submerged sandbanks are ecologically and economically important, for example, they often support important nursery areas for fish. In addition, the animals associated with them provide a vital food source for birds and the sandbanks can provide protection from coastal erosion. No spoil from Burghead harbour will be deposited near any subtidal sandbanks, but in the sea disposal site as designated by Marine Scotland.

### 3.2 Geology

The coastal section between Burghead and Cummington provide continuous exposures in the Burghead Sandstone Formation, and was been designated a Site of Special Scientific Interest (SSSI). This is a set of predominately fluvial-deposits, which although unfossiliferous contain reptilian footprints, and appear to lie conformably on the Hopeman Sandstone Formation below. A Triassic age for them is therefore indicated. A unique feature of the sandstone is the abundance of fluorite and barite within the sediment binding together the sand grains. Masonshaugh Quarry has yielded an excellent range of fossil footprints (small, medium and large), probably made by mammal-like reptiles. The large ones appear to be unique in the world, whilst the small ones compare with widespread finds from the Upper Permian in England and Germany. The tracks are the only fossils in the extensive Hopeman Sandstone Formation, and are thus the only hope for dating it at present. This is one of the best Permian footprint localities in Britain. This site would not form part of the disposal plan for Burghead, either by land or sea. In the case of land disposal, this site lies to the east of Burghead harbour and any material deposited there would eventually be transported west and back into the harbour. The sea disposal site lies to the north west of Burghead, well away from this geologically important area.

## **4. Conclusion**

It has been demonstrated in this discussion paper that disposal of dredged material to land presents a significant set of risks, including spillage and contamination, safety concerns, reduction of valuable landfill capacity, nuisance, noise and impact on local communities and wildlife. In addition, this method involves considerable practical difficulties and the resource implications of additional equipment and vehicles, all of which increase overall operational costs significantly.

Disposal to Sea is therefore considered to be the Best Practical Environmental Option for removal and relocation of material dredged from this harbour. The risks and costs are minimal in comparison to disposal on land. Having taken delivery of a dredging vessel in 2016, Moray Council has a responsibility to use the disposal method which gives best value for the inhabitants of Moray.

## Appendix 1



### **MV SELKIE (Moray Council)**

**Designers:** MacDuff Ship Design Ltd.

**Builders:** MacDuff Shipyard Ltd. (Buckie)

**Classification:** Workboat Cat 3

**Crew:** Master, Engineer & Deckhand

**Home port:** Buckie, Moray Firth

**LOA:** 25.7 metres

**Registered Length:** 24.2 metres

**Breadth:** 8.2 metres

**Draught:** Hopper empty 2.3metres/ full 3.2metres

**Max Speed:** 9 knots

**Range:** 1,400 NM

**Dredging Equipment:** Long reach excavator with buckets

**Max. Dredging Depth:** 9 metres

**Hopper Capacity:** 147 cubic metres

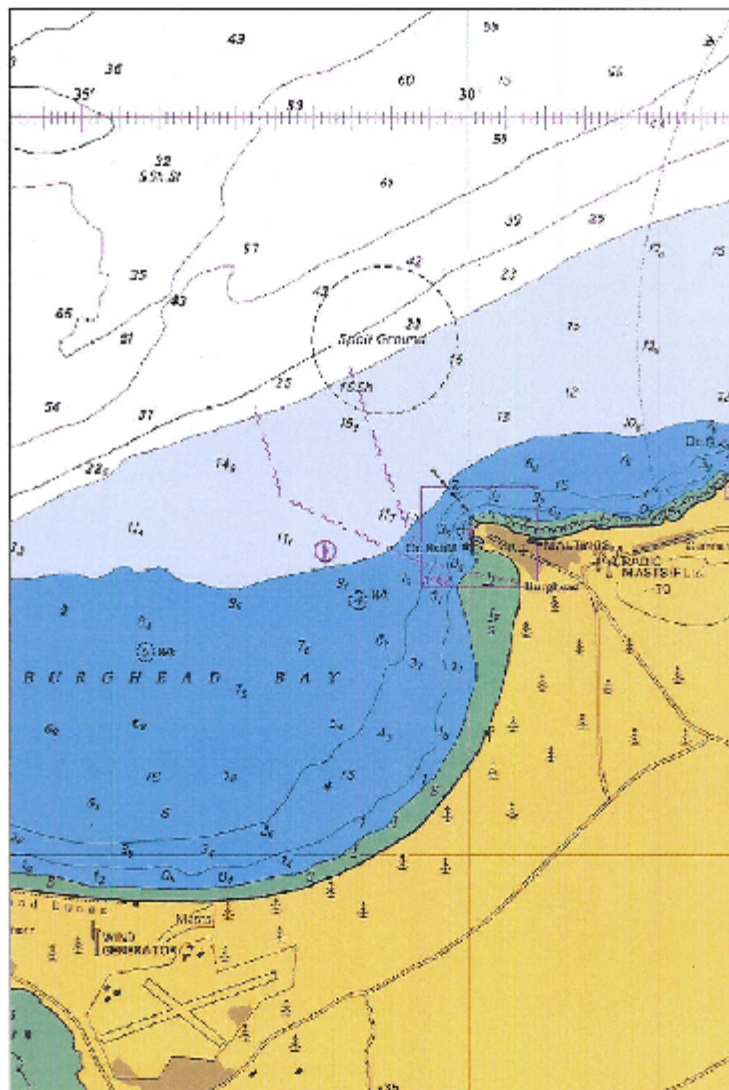
**Positioning:** 2 spud legs & bow thruster



## Appendix 2

### MORAY COUNCIL: DISPOSAL OF DREDGINGS FROM BURGHEAD – Burghead Spoil Ground

<b>Disposal site:</b>	Within 0.5 nautical mile radius of centre coordinates: 67° 43.50'N 003° 31.00'W
<b>Disposal Restrictions:</b>	Dumping to be confined to areas of water depth greater than 25 metres.



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