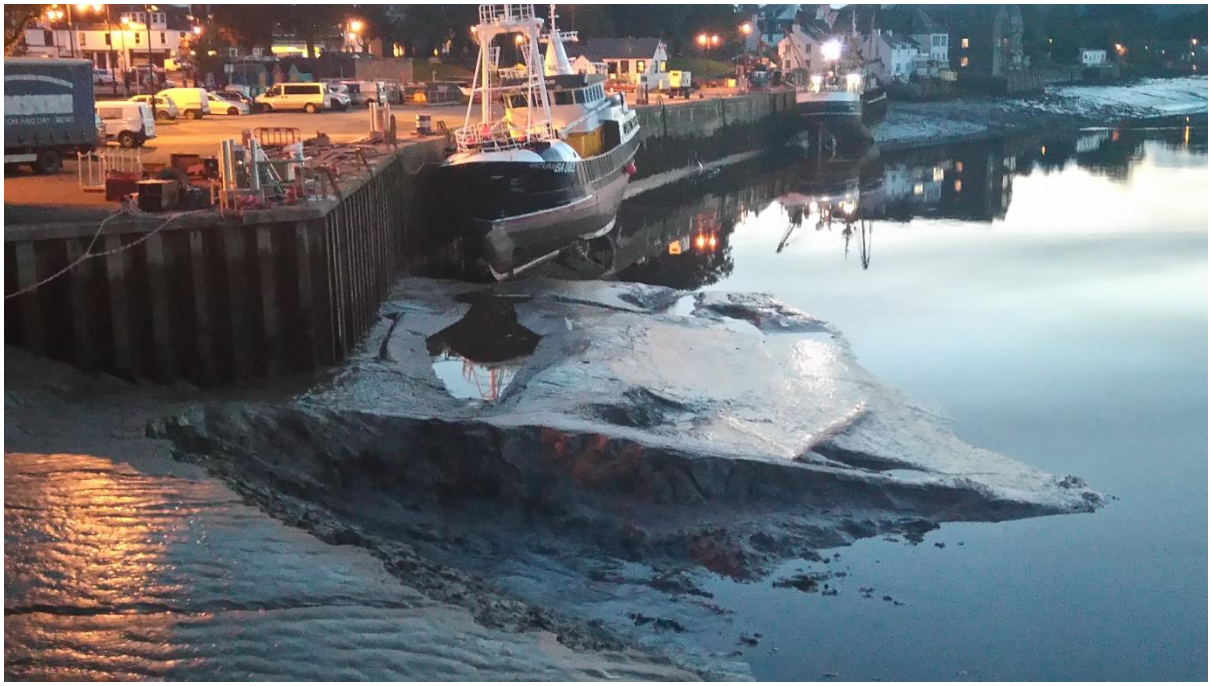
Kirkcudbright Harbour Main Basin Maintenance Dredging

Best Practical Environmental Option Assessment



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1 Introduction

1.1 Background

Dumfries & Galloway Council is the Statutory Harbour Authority for Kirkcudbright Harbour. The Council is seeking permission to renew its dredging license to undertake maintenance dredging in the main basin to remove excess material which builds up alongside the main quay wall. The work is necessary to maintain suitable depths along the quay to allow the scallop fishing fleet to berth alongside. Kirkcudbright harbour is the busiest port in the UK for scallop landings and the scallop industry is the backbone of the local economy with employment for hundreds of people in fishing, processing, equipment manufacturing and maintenance. Dredging work is therefore essential.

The material is the result of natural siltation in the River Dee. The dredging work has been undertaken by two 21 ton tracked land based excavators for the past 18 years. The work is undertaken either side of low water when the excavators venture out onto the exposed harbour bed and is normally completed within three tidal windows. Prior to this method, clearance work was undertaken by water jetting with fire hoses from a small vessel.

This assessment will consider the alternative options available for disposal of the dredged material.

In order to obtain a license for the deposit of materials 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 depositing the dredged material in the centre of the river for natural dispersal 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 the Marine Scotland Licensing Operations Team.

The location of Kirkcudbright harbour is shown in figure 1.

The dredge site is indicated in figure 2 by the area shown in pink alongside the quay. The proposed disposal area is indicated by the area in orange in figure 2.

Samples for analysis were taken by way of a core sample up at the location marked by the blue dot on figure 2; two grab samples were taken at the locations marked by red dots in the centre and towards the western extremity of the dredging area.

Figure 1 – Location Plan

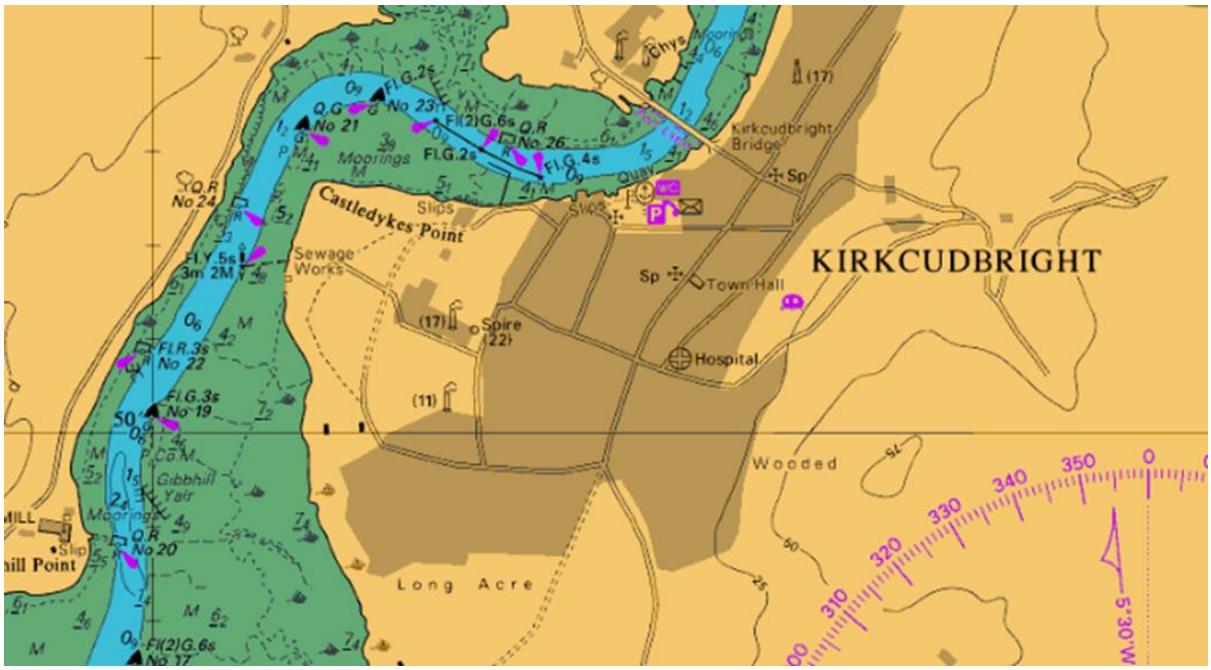
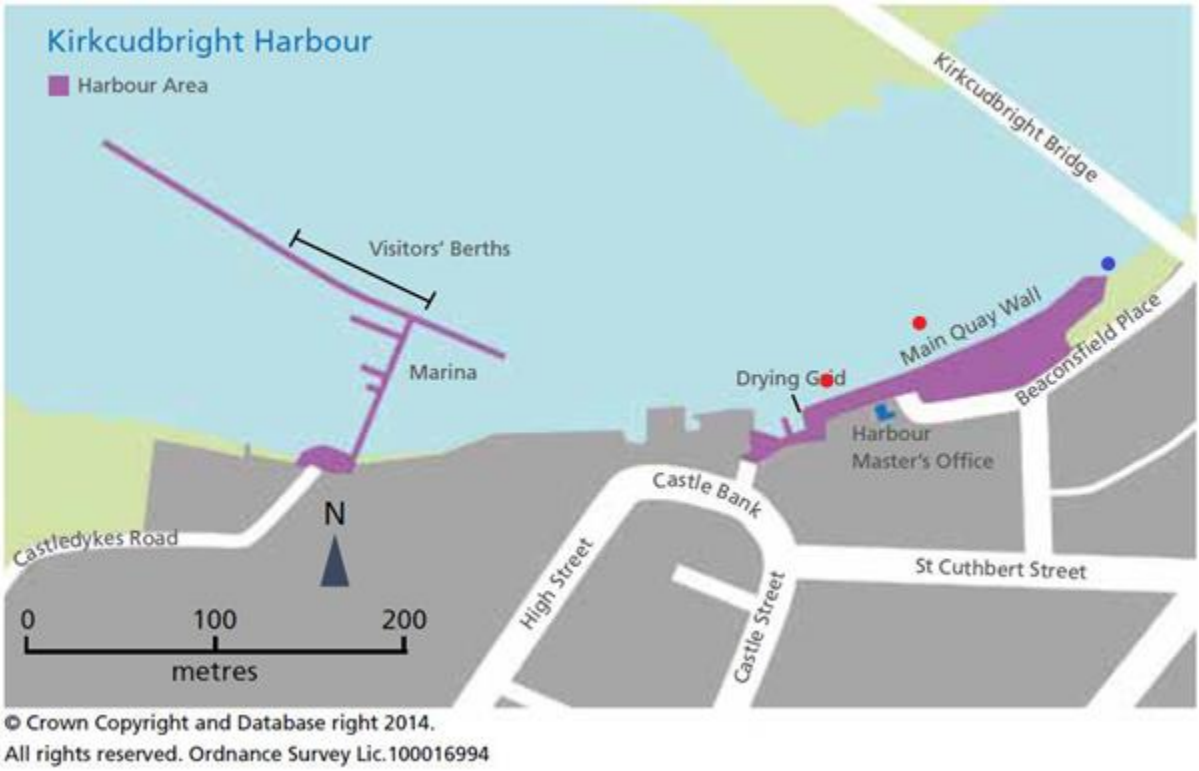


Figure 2 – Dredging and disposal area plan showing sample locations



1.2 Dredging works

It is proposed to remove material down to a depth of 1.00m alongside the quay with dredging depths being increased up to 2.50m at eastern end of the quay wall. Silt build up requires regular maintenance dredging to be undertaken as frequently as every six months, however winters with heavy rainfall can lead to this period being extended to twelve months as the strong river current assists in keeping the harbour clear.

As fishing vessels take the bottom alongside the quay at low tide, the silt deposits are formed into mud berths. Mounds of silt up to 1.00m deep form which prevent vessels accessing the quay during the window of 2.5 hours either side of high water. At either end of the quay are banks of mud which form up to 2.50m deep and these require removal to allow vessels bows and sterns to project beyond the quay and allow utilisation of the full length of the quayside at what is a small and busy harbour.

It is proposed that the work be carried out by two 21 ton tracked land-based excavators operating two hours either side of low water over three tidal windows. Work is always scheduled for large sprig tides and in addition the Drax Hydro Electric station sited upriver at Tongland is requested to cease generating operations during the works thereby reducing water levels and providing the longest dredging window.

It is recognised that on occasions there can be a rapid accretion of sediment alongside the quayside and that it is not always practicable to delay the removal of material while waiting for suitable tides, a period of low rainfall and agreement from Drax that power generation can be suspended, and therefore it is considered that although the normal means of dredging should be by excavators moving material from the quayside to the central channel to be swept away by the river current, there should be an option of using a water injection dredger to move material alongside the quayside to the central channel for dispersal by the river current.

Timing of any dredging work is critical to avoid disturbance to the ‘smolt run’ of young juvenile salmon between April and June.

The total amount of material to be removed is estimated at 6,000 wet tonnes per dredge.

1.3 Source of Materials

The movement and accretion of fine mud sediment is prevalent along the course of the River Dee and within the area of harbour jurisdiction. In particular, silt builds up alongside the main quay wall where it is cleared under the authority granted by the plough dredging license number 06535/18/0. It is a natural process in the river for new deposits to build up and then wash away again.

The area involved in this application has required dredging for many years in order to maintain safe berthing operations at the harbour. It should be noted that water injection dredging has been carried out at Kirkcudbright Marina, a short distance down river, under the recently lapsed license 06071/17/1 to remove mud banks under the marina walkways.

1.4 Material to be Disposed of

The current programme of work involves the removal of up to 12,000 wet tonnes per annum

1.5 Scope of the Report

The purpose of this document is to review the available options for the dredged material, to assess the viability and cost effectiveness of these options and to determine the Best Practicable Environmental Option (BPEO). Disposal options will be considered against their environmental suitability, strategic benefit, health and safety and cost. The report will be structured as below:

Section 2 – Available options

Section 3 – Options under consideration

Section 4 – Conclusions and rankings

Section 5 – BPEO

2 Available Options

This section outlines the disposal options that will be considered as part of the BPEO assessment. Where an option is deemed impracticable, justification for this will be provided and the option will not be progressed further.

Due to the location of the harbour quay in the very centre of Kirkcudbright town, an important tourist location within Dumfries & Galloway, any option involving the removal of the material by road to a suitable disposal site would have a serious detrimental effect. There is a weight limit of 17 tonnes MGW on Kirkcudbright bridge requiring all lorry movements to be along the A711 and past a large part of the towns residential area. in excess of 300 vehicle movement

would be required to move 6,000 wet tonnes which would mean severe disturbance to the local population and would be off putting to tourists.

Loading of the lorries from the harbour bed would also require long reach excavators with smaller buckets and it is estimated that work would require in excess of six tidal windows to complete the work, further impacting on the fishing fleet and creating more nuisance for residents. Long reach excavators operating on the quayside would also present a high safety risk to the general public and harbour users who would normally have free access to the quayside.

The risk to public health and safety including physical injury, noise and air pollution in conjunction with low levels of public acceptability preclude any options requiring the transportation of materials by road transport.

It is therefore recommended that any options of removing the material by road transport, including land incineration, landfill and soil conditioning are not progressed.

2.1 Do Nothing Approach

The current rate of build up of material necessitates clearance up to twice a year although after exceptionally wet years we have managed to last up to twelve months between dredges as the increased water flow have helped to keep the harbour clear.

Kirkcudbright is the busiest scallop port by value in the UK and the industry supports up to 600 jobs both directly and indirectly. Along with tourism it is the backbone of the local economy. If the fishing fleet was unable to operate due to silting at the quayside it would have a devastating effect on the local economy and would also impact heavily on tourism as tourists are attracted to the working harbour, situated as it is, within the heart of the town, adjacent to the main car park.

It is based on this assessment that a dredging license application is being made.

2.2 Coastal Protection

The material could be placed on various small river shore locations downriver of the dredging area or used further afield within the Solway Firth estuary. Assessment of coastal protection requirements have been made using the National Climate Change Assessment Tool from Mull of Galloway to Gretna (Cell 7) which identifies sites under threat of erosion up until 2050. There are seven residential properties under direct treat by 2050 at Southerness; whilst spoil from Kirkcudbright could possibly be used to enhance any flood defences, due to

the materials fine sedimentary nature it is unlikely that it would be of any benefit except in the very short term. Southerness is located in an area of the Solway Firth where there are expansive areas of shallow water and drying mudflats which would make it impossible to access with the grab dredgers vessel to deposit any material.

Use of the material for beach replenishment at locations outwith the River Dee estuary would increase the environmental risk of contamination.

There are Sites of Special Scientific Interest at:

Shoulder of Craig – Site Code 1430

Borgue Coast – Site Code 245

Torr's Point to Mason's Walk – Site Code 1553

The nature of the dredged material and the presence of the SSSI's and other environmental sites in the Solway Firth such as the Upper Solway Flats and Marshes Ramsar Site, Upper Solway Flats and Marshes Site of Special Scientific Interest and the Solway Firth Special Area of Conservation, all approximately 23 kilometres away in the inner Solway Firth and the recently expanded Solway Firth Special Protection Area, approximately 12 Kilometres away, make the material unsuitable for coastal protection.

There are areas of the inner Solway Firth where the fine material could potentially be used to protect habitats such as salt marshes but it would not be considered safe for vessels to navigate the very shallow and mobile depths further into the estuary.

This option for disposal has been discounted.

2.3 Sea Disposal

There is no licensed sea disposal site in close proximity available, there is however a registered sea disposal site at Beauforts Dyke in the North Channel of the Irish Sea. Operations involving Beauforts Dyke would be heavily weather dependent and involve a sea passage around the severe tidal gate at the Mull of Galloway where overfalls and adverse sea conditions are prevalent.

In order to reduce risk to vessels involved it would be preferable to make application for a new sea disposal site within the Solway Firth. To minimise travel distances this would preferably be south of Ross Island at the entrance to Kirkcudbright Bay beyond the 20m contour. The strong tides would be very effective at dispersing the spoil, however, this

disposal site would be approximately within 1nm of the recently expanded Solway Firth Special Protection Area.

The harbour at Kirkcudbright is 3.5nm up a narrow and winding channel. Operating restrictions for vessels as published in the Dumfries & Galloway Council Harbours Safety Management System are:

- Maximum LOA 67 metres
- Maximum beam proportional
- Maximum draught 4.5m
- Maximum deadweight 1,500 GRT

Any vessel would be required to work in a fast-flowing tidal environment and be able to take the ground, given the harbour dries outside of HW+/-2.5hours. UK Dredging grab hopper dredger 'Cherry Sand' is unable to operate within these constraints as she is unable to take the ground and would have to mobilise daily from another port such as Workington or Whitehaven. This would significantly reduce the operating window and significantly increase costs and the time taken to undertake the work. Any increase in the length of time taken to undertake the dredging work would be extremely disruptive to the operations of the fishing fleet.

Wyre Marine operate a smaller grab hopper vessel, the 'Admiral Day', which would be more suited as she is able to take the ground. Care would be required to ensure 'Admiral Day' was able to sit on a level dredged part of the harbour to avoid breaking her back. She would only be able to remove 250 cubic metres of spoil each day requiring 12 days to complete the work. This would cause severe disruption to the fishing fleet. The additional costs, as set out in the Cost Analysis at section 3.3, make it financially unviable.

2.4 Natural Dispersion by way of Water Injection

It would be feasible to undertake clearance by a small water injection dredger. Dredging work would be carried out on the ebb tide which would be very effective at dispersing the suspended sediment into the river flow so that it was carried downriver.

There would be some noise and air pollution from any vessel conducting the work. The operation would result in an increase in NO^2 and airborne particle matter from engine exhausts but this would be negligible when compared to the background pollution already present from existing vessels and vehicles operating in Kirkcudbright town centre.

Levels of contaminants within the dredged material will be equivalent to those within the rest of the river. This option will provide a low environmental impact, with the spoil being disposed of in its natural environment and by natural means; it is not anticipated that there will be any impacts on ecology within the river. Consideration should be given to the additional pollution during deployment and work on site.

Overall, this should be an environmentally acceptable option given the immediate proximity of the disposal location to the dredge site and the fact that natural dispersal in the river has been an accepted method from previous dredging operations ay Kirkcudbright harbour.

There are Sites of Special Scientific Interest in the River Dee estuary, however it is not anticipated that the dispersed material would impact on any of these sites given the small amount of material involved compared to the vast quantities of identical material that is moved by natural processes in the river. It should be noted that the nearest Site of Special Scientific Interest, the Shoulder o' Craig is over 3km away and is cited for its geological features rather than biological features.

The use of a small water injection dredger would require fishing vessels to be kept clear of sections of the harbour during operations but would not be overly disruptive and the dredging vessel would be able to moor a short distance downriver at Kirkcudbright marina and therefore there would be no requirement that it would need to take the ground or travel on a daily basis from another harbour.

Suitable notice would be given to both home vessels and visitors by way of Notice to Mariners.

2.5 Natural Dispersal by Land Based Excavators

This technique has been used successfully for 18 years. Two 22 tonne land based tracked excavators operate either side of low water over 3 tidal windows. Work is scheduled for large spring tides and in addition the Scottish Power Hydro Electric power station sited upriver at Tongland is requested to cease generating during the works; this provides the longest and safest dredging window. If water levels upriver are high, it is sometimes not possible for Scottish Power to hold the water back and therefore planned dredging works are postponed until water levels are acceptable.

Fishing vessels are inconvenienced as they must avoid berthing over low water during dredging works to allow the work to be undertaken as quickly and as safely as possible.

They are, however, able to land their catch as normal over high water +/-2.5hours. Suitable notice would be given to both home vessels and visitors by way of Notice to Mariners.

The excavators are able to visually target problem areas and can therefore achieve a high quality result – a very level harbour bed for the fishing vessels to operate over and to lie safely aground alongside the quay.

This disposal method results in a low environmental impact to Kirkcudbright and its residents given the limited amount of equipment in use, the short deployment distances involved and the short period of active dredging; 12 hours over 2 days. The use of tracked excavators does create some noise disturbance to local residents in the adjacent cottages and apartments but there are no instances of complaints being made about previous operations.

This is an environmentally acceptable option. The impact on the natural environment from this option is equivalent to natural dispersion by water injection (option 2.4).

3 Options under Consideration

3.1 Introduction

This section of the report considers the options judged to be practicable in Section 2 –

- Natural Dispersion by way of Water Injection
- Natural Dispersion by Land Based Excavators

3.2 Overview

Natural Dispersal into the river on an ebb tide could be carried out by either two tracked excavators working on the riverbed either side of low tide depositing the material into the river channel where it is swept downriver by the current and the following ebb tide or by a small water injection dredger working at high tide so that sediment in suspension is carried away on the ebb tide and river current.

The disposal option would follow the natural flow of the River Dee with waterborne sediment being dispersed by the strong tidal flow of the river; a historically tried and tested method.

3.2.2 Environmental Considerations

3.2.2.1 Pollution/Contamination Implications

All sample results were generally found to be below AL1 thresholds. Disposal downriver by the current and tide has been the historical method of removing dredged material from Kirkcudbright harbour and is in harmony with the natural environment of the river. It is not

considered that there is any appreciable difference in risk of pollution between a dredger using water injection technology to disperse the sediment and tracked excavators dispersing the sediment in the river channel.

3.2.2.2 Public Health and Safety Implications

Whichever method was used to dredge the sediment, the equipment used would need to be delivered by road transport to the harbour.

If the water injection method was utilised, the dredging vessel would need to be transport by low loader and offloaded into the water using a mobile crane. Craning boats in and out of the water at Kirkcudbright is a not uncommon occurrence and involves closing the harbour to all members of the public while craning is carried out. Once in the water it is not considered that the vessel would present any danger to public health or safety. Removal of the vessel would follow the same procedure as launching, with members of the public excluded from the harbour while craning is carried out.

If the tracked excavators were used to dispose of the material, they would need to be delivered by road low loader. Offloading of the excavators from the low loader would be supervised by a banksman to ensure members of the public were not endangered. As the slipway that the excavators would use to gain access to the riverbed is outwith the area that members of the public can be excluded from, a banksman would be present when the excavators were accessing or exiting the riverbed. Apart from engine noise and air pollution from the two excavators it is considered that there is no risk to the public as the area they would be working in is inaccessible to the public.

Either operation would result in a miniscule increase in NO^2 and airborne particle matter from exhausts, but this would be negligible when compared to the background pollution already present from traffic operating in the town centre of Kirkcudbright.

There would be no impact on the local road network except for the delivery and uplift of the chosen dredging equipment by low loader.

3.2.2.3 General Ecological Implications

The excavated material is being dispersed into the natural environment and by natural means. It is not anticipated that there will be any impacts on the flora and fauna of the River Dee or estuary.

There are Sites of Special Scientific Interest in the River Dee estuary however it is not anticipated, and there is no historical evidence, that the material would impact upon these given the small amount of material involved compared to the vast quantities of identical material that is moved naturally by the River Dee, it should be noted that the nearest Site of Special Scientific Interest, the Shoulder o' Craig is over 3km away and cited as a geological site.

Natural dispersal into the river current, either by tracked excavator or by water injection dredger is the preferred option given the immediate vicinity of the disposal location and is a tried and tested method from previous dredging operations at Kirkcudbright harbour. If the method used is the two excavators, the material placed towards the centre of the river at low tide is quickly dispersed as once the excavators are clear of the riverbed, Scottish Power will release water at the Hydro Electric station at Tongland which will move the material downriver. If the water injection dredger is used after high tide the outgoing tide and current will wash away the sediment in suspension with the flow being up to 5 knots on the ebb tide.

3.2.2.4 Interference with Existing Activities

There is little direct interference with members of the public except when the dredging equipment is being delivered and uplifted where access is restricted around the low loader.

The work does impact on the fishing fleet as berths have to be left unoccupied, either at low tide if excavators are being used, or at high tide if the water injection dredger is used where the dredging is to be carried out. Suitable notice would be given to both home vessels and visiting vessels by way of notice to mariners.

River mud from the excavator tracks can be deposited onto a public footpath when they leave the harbour bed between tides, but this is removed immediately to ensure there is no danger to members of the public.

3.2.2.5 Amenity/Aesthetic Implications

Using either of the methods of natural dispersal using the river current means that the dredged material is transported downriver and spread over a very large area so there are no piles of dredged material.

3.2.2.6 Environmental Summary

Levels of contaminants within the dredged material are below that which would result in ecological impacts and are equivalent to those found within the natural environment of the River Dee.

Suspended sediment in the water column can be problematic to fish and therefore no dredging would take place in April, May or June when the smolt run of juvenile salmon occurs (the smolt run is when the juvenile salmon in the river, change to silvery smolts and are modifying internally to adjust to living in saltwater. They travel downriver towards the sea to start the next stage of the salmon life cycle).

3.2.3 Strategic Considerations

3.2.3.1 Availability of suitable disposal sites

Both of the potential dredging methods will direct material to or place material in the channel of the river where it will be swept downriver by the river current and ebb tide.

3.2.3.2 Public Acceptability

Using tracked excavators to dredge the harbour basin would create noise during the operating window. Although the immediate area is not densely populated there are residential properties adjacent to the harbour. Dredging work using the tracked excavators has been carried out for many years and we have had no complaints from local residents about any noise.

Using a water injection dredger would also create noise but recent operations at Stranraer with a water injection dredger has shown that there would be less noise than if the tracked excavators were used. As there have been no complaints about the noise of the tracked excavators, it is not anticipated that there would be any complaints about the noise from the water injection dredger.

As the dredged material would be transported down river by the river current and ebb tide there would be no impact on the local roads network except for the delivery and uplift of the tracked excavators or the dredging vessel.

Historically, deposit of the dredged material into the river has been the accepted disposal method and therefore it is not expected that there would be any objections to this tried and tested method.

3.2.3.3 Legislative Implications

The spoil will be a controlled waste material. The works will require a license from Marine Scotland and there is existing consent from Crown Estate Scotland.

3.2.3.4 Strategic Summary

Disposal of the dredged material into the river is likely to result in minimal disruption to the public and be perceived positively as it is the historically preferred and accepted option at Kirkcudbright. The amount of dredge material from this project is relatively small and does not support the use of disposal options more suitable for larger scale projects. Alternative disposal methods are restricted due to the operating constraints of this drying harbour and the vessels available. There would also be significantly higher costs involved if any method other than dispersal into the river was used.

The disposal of the dredged material into the river where it is dispersed by the current and tide is viewed as the most appropriate method of disposal.

4 Conclusions – Best Practicable Environmental; Option

4.1 Summary of Available Options

The ‘do nothing’ approach does not solve the immediate operational issues and does not support the future use of this very busy harbour.

Due to the high public safety and environmental impacts any options that involved removing the waste materials by road were discounted.

Use of the material for coastal protection was discounted as there are no suitable sites where the material could be utilised within close proximity.

Disposal at sea at a remote location was discounted as the distance required to deliver the material to a disposal site would be excessive and would place the vessel being used in danger.

Disposal by natural dispersion into the river current by either a water injection dredger or tracked excavators was considered to be the most viable and environmentally sustainable option. Dredging is currently carried out by tracked excavators, however, the ability to carry out this work can be compromised by weather conditions and river levels, when a water injection dredger would be able to operate.

The preferred options are reviewed in summary form in the table below.

Scoring: 1(least acceptable) to 5 (most acceptable)

Aspect (Acceptability Rating)	Natural Dispersal by Water Injection Dredger	Natural Dispersal by Tracked Excavators
Environmental Acceptability		
Pollution contamination	5	5
Public health and safety	5	5
General ecological implications	4	4
Interference with existing activities	5	4
Amenity/aesthetic	5	5
Strategic Acceptability		
Availability of suitable sites	5	5
Public acceptability	5	5
Legislative implications	4	4
Cost	4	5
SCORED RATING	42	42

4.2 Rankings

- Pollution contamination – As both the water injection dredger and the tracked excavators would be depositing natural sediment into the river channel for dispersal by the current and tide, there is no quantifiable difference between the two methods.

- Public health and safety – Dredging by either method would see the operational equipment working in the river and so there would be no danger to members of the public. The water injection dredger would need to be craned in and out of the river but the harbour area would be closed to members of the public while this was happening so they would not be endangered. The tracked excavators would need to enter and exit the river between tides and would bring a limited amount of river mud onshore on their tracks but this would be cleared immediately and would present no danger to members of the public. With the necessary precautions in place, both methods are considered to be equally safe.

- General ecological implications – the most ecological action would be to do nothing but unfortunately this would see the harbour at Kirkcudbright silting up and becoming unusable with the loss of many jobs within the local community. Removal of the material from the side of the quay to the centre of the river is considered to be the most environmentally friendly method of ensuring that the harbour at Kirkcudbright can continue to operate and benefit the local area. The method that the material is moved into the centre of the river would have little consequence to the ecological implications. It is recognised that the proposed works would release suspended sediment into the water column and that this can be harmful to fish, however it is noted that the naturally occurring suspended sediment in the water column in the river can be high and the additional sediment would have a minimal effect on the normal levels, nevertheless dredging would not be carried out between April and June to avoid any interference with the ‘smolt run’ when juvenile salmon migrate to the sea.

- Interference with existing activities – Whichever method of dredging was used, the fishing boats in the harbour would need to be moved to allow access to the berths by either the tracked excavators, if the work was carried out at low tide, or the water injection dredger, if the work was carried out at high tide. If the works were carried out at low tide by tracked excavators, Scottish Power would be required to curtail energy generation at Tongland hydroelectric power station and hold back water to allow the operation to be carried out safely; if water levels are too high it is

sometimes not possible to hold the water back and planned dredging has had to be postponed. The water injection dredging is not dependent on Scottish Power controlling the water flow.

- Amenity/aesthetic – Whichever dredging method is used to initially move the sediment towards the centre of the river, the onward movement of that material will be by natural processes. This will see the suspended sediment washed downriver with other natural suspended sediment and deposited over the lower estuary. There will be no indication that the sediment in suspension is anything but natural. If other methods of disposal were used, such as coastal protection, there would be unsightly piles of fine river mud at the shore.

- Availability of suitable sites – Depositing the sediment into the river channel allows the natural processes of current and tide to disperse the material into the lower estuary. Using methods other than natural dispersal would entail the moving of quantities of material over large distances by either road or boat.

- Public acceptability – Movement of sediment within the River Dee is a natural part of the river processes. Dredging using tracked excavators to place material in the river channel which is then removed by the current is an established and accepted way to dredge the harbour. Dredging by water injection dredger would utilise the same process and it is not anticipated that there would be any objections. If alternative methods were considered, such as removing the material by road, it is expected that there would be numerous complaints due to the need for numerous lorry movements through the centre of Kirkcudbright.

- Legislative implications – Both dredging by means of tracked excavators or by water injection dredger will require the same permissions.

- Cost – Dredging is currently carried out by using two tracked excavators operating in the river at low tide to move material from alongside the quayside to the centre of the river where it is transported downriver by the natural river flow and the ebb tide; this is recognised as a cost-effective solution to clearing the harbour using excavators sourced locally. A water injection dredger is a specialised vessel and would need to be transported a considerable distance by road to carry out operations at the harbour and it is envisaged that the cost of using this method would be higher.

5 Best Practicable and Environmental Option

It is considered that the disposal of the material removed from alongside the quay is best done by depositing the material into the river channel where it can be transported away from the site by the river current and ebb tide.

Using tracked excavators to move the material from the side of the quay to the centre of the river channel is a tried and tested method of clearing the harbour and is accepted by the local population as an environmentally friendly method of dredging. This method is very effective but is dependent on Scottish Power being able to restrict the flow of water down the river to ensure the operation can be carried out safely.

It is thought that carrying out the dredging operation using a water injection dredger would be a more expensive option due to the use of specialised equipment and the vessel having to travel a greater distance from its base, however, it would not be constrained by Scottish Power managing the flow of water down the river as operations would be carried out at high tide.

It is therefore considered that the best option for dredging at Kirkcudbright would be to have the option of using either tracked excavators or water injection dredger to move the material alongside the quayside into the central channel where it will be swept away by the current and ebb tide.