

Marine Scotland Licensing Operations Team (MS-LOT)
Marine Scotland
By email

Our ref 676030/ec/003rev1
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26 April 2022

Attn: Marine Scotland Licensing Operations Team (MS-LOT)

**Ardersier Port – Marine License MS-00009620 (Capital Dredging)
Request for a Screening Opinion**

We write on behalf of our clients, Ardersier Port (Scotland) Ltd, to formally request a screening opinion under The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 for the above-named project. The screening request relates to a temporal extension to the above noted marine license so capital dredging works can continue through to September 2023.

As required by Part 2, Paragraph 10 of the above Regulations we have provided information relevant to this proposal (attached) which includes:

- (2) A request for a screening opinion under paragraph (1) must include –
 - a) a description of the location of the proposed works, including a plan sufficient to identify the area in which the works are proposed to be sited;
 - b) a description of the proposed works, including in particular—
 - (i) a list of all of the regulated activities which are proposed;
 - (ii) a description of the physical characteristics of the proposed works and, where relevant, works to be decommissioned; and
 - (iii) a description of the location of the proposed works, with particular regard to the environmental sensitivity of geographical areas likely to be affected;
 - c) a description of the aspects of the environment likely to be significantly affected by the proposed works; and
 - d) a description of any likely significant effects, to the extent of the information available on such effects, of the proposed works on the environment resulting from either, or both, of the following:—
 - (i) the expected residues and emissions and the production of waste, where relevant;
 - (ii) the use of natural resources, in particular soil, land, water and biodiversity.
- (3) A request for a screening opinion may, in addition to the information required in accordance with paragraph (2), also be accompanied by a description of any features of the proposed works or proposed measures envisaged to avoid or prevent significant adverse effects on the environment.
- (4) The information referred to in paragraph (2) is to be compiled taking into account, where relevant—
 - a) the selection criteria set out in schedule 3; and
 - b) the available results of any relevant assessment.

The information provided is drawn from a desk-based appraisal of the site in relation to its environmental setting.

If you have any questions related to the information provided, please do not hesitate to contact the undersigned.

Yours sincerely
for EnviroCentre Ltd

(issued electronically)

Emma Cormack
Principal Consultant

Dr Ian Buchan
Principal Consultant

Enc: Ardersier Port (Marine License MS-00009620) – Request for a Screening Opinion

CC: Steve Regan, Ardersier Port (Scotland) Ltd

ARDERSIER PORT (MARINE LICENSE MS-00009620) – REQUEST FOR A SCREENING OPINION

Introduction

Ardersier Port Ltd seek a formal Screening Opinion from Marine Scotland as the Consenting Authority under Part 2, Regulation 10(1) of the Marine EIA Regulations in respect of the temporal variation of the Dredge License MS-00009620 for capital dredging activities at Ardersier Port. The approximate National Grid Reference (NGR) for the site is NH812576 with the site boundary shown in Drawing No 676030-GIS001, Appendix A.

Site Location

Ardersier Port is located 18 km to the northeast of Inverness on the southern shore of the Moray Firth and covers an area of approximately 820 hectares. A sand spit known as Whiteness Head forms the northern landward boundary of the port and a channel is located between the spit and a 1,000 m long quay. An area of sand dunes formed from excess dredge material during the initial construction phase is located along the western site boundary and low-lying coastal flats lie to the east. To the southwest of the site lies Fort George owned by the Ministry of Defence (MoD).

Access to the site is gained via a dedicated 2.5 km long access road, which links to the B9092 to the south. The B9092 subsequently links with the A96, which is the main transport link between Inverness and Aberdeen. For the site location see Drawing No. 675015-GIS001, Appendix A.

Local Sensitivities

The surrounding area contains several designations within a 5 km radius, as illustrated within Drawing No. 676030-GIS002, Appendix A. These include the following:

- Moray Firth Special Area of Protection (SPA). The site lies within this SPA and it extends north of the site. It is designated for Common Eider (*Somateria mollissima*), Common Goldeneye (*Bucephala clangula*), Common Scoter (*Melanitta nigra*), Great Northern Diver (*Gavia immer*), Greater Scaup (*Aythya marila*), Long-tailed Duck (*Clangula hyemalis*), Red-breasted Merganser (*Mergus serrator*), Red-throated Diver (*Gavia stellata*), Slavonian Grebe (*Podiceps auratus*), Velvet Scoter (*Melanitta fusca*) and European Shag (*Gulosus aristotelis*).

- Inner Moray Firth Special Area of Protection (SPA). The site lies within this SPA and it extends north of the site. It is designated for Common Tern (*Sterna hirundo*), Osprey (*Pandion haliaetus*), Bar-tailed Godwit (*Limosa lapponica*), Greylag Goose (*Anser anser*), Red-breasted Merganser, Redshank (*Tringa totanus*), Greater Scaup, Eurasian Curlew (*Numenius arquata*), Goosander (*Mergus merganser*), Common Goldeneye, Teal (*Anas crecca*), Wigeon (*Anas Penelope*), and Great Cormorant (*Phalacrocorax carbo*).
- Whiteness Head Site of Special Scientific Interest (SSSI). The site encompasses this SSSI, which is designated for coastal geomorphology, coastal features (saltmarsh, sand dunes and shingle), marine features (sandflats), Bar-tailed Godwit, and Knot (*Calidris canutus*).
- Moray Firth Special Area of Conservation (SAC). This SAC bounds the site to the north and is designated for subtidal sandbanks and bottlenose dolphins.
- Dornoch Firth and Morrich More SAC. This SAC lies 24 km north of the site and is designated for many habitat and vegetation interests, however due to the easterly direction of coastal process at Ardersier, and the distance between the two sites, there is not considered to be any habitat connectivity. With regard to winter dredging, the designated feature of note is the harbour seal.
- River Moriston SAC. This SAC lies 55 km southwest of the site and is designated for Atlantic salmon and freshwater pearl mussel, however there is no habitat connectivity between this SAC and Ardersier Port for Freshwater pearl mussel.

Other aspects of the environment within the harbour with the potential to be affected by dredging operations include:

- Salmonids;
- Marine mammals;
- Otter;
- Wildfowl;
- Terns;
- Waders;
- European Shag; and
- Whooper Swan (*Cygnus cygnus*).

2018 Environmental Impact Assessment

As Ardersier Port has lain dormant for over 20 years the existing infrastructure requires upgrading which includes the construction of a new quayside with associated capital dredging at the berth and navigation channel along with facilities to cater for vessels and normal port operations. An Environmental Impact Assessment Report (Report Ref: KMcG/2017/11/0234, dated September 2018 hereafter referred to as the EIAR) was prepared under the Marine EIA Regulations to accompany the marine licence applications for construction and dredging activities associated with port improvements.

The EIAR was based on the assumption that the capital dredging works would use a short duration – high volume dredge rate approach. Marine License MS-06859/19/1 (Dredging) was subsequently issued in September 2019 for capital dredging activities to be completed by September 2022. It took into account the outcomes of the EIAR which concluded that there was potential for the short duration – high volume dredge rate approach to have a significant

impact on the ecological sensitivities of the area and specified measures to protect these which included a requirement that no dredging activities would occur during the winter period (i.e. October to March).

Climate Change

Climate change has taken a prominent position within policy and legislation at a national level, with the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019¹ amending the Climate Change (Scotland) Act 2009². The 2019 Act sets a target date of 2045 for Scotland reaching net-zero emissions.

In addition, under Schedule 4(4), the Marine EIA Regulations require:

“A description of the factors specified in Regulation 5(3) likely to be significant affected by the works... (Including) climate (for example greenhouse gas emissions, impacts relevant to adaption)”

Note: Climate change was considered in the EIAR in Chapter 3 The Proposed Development specifically in relation to its vulnerability to climate change such as the impact on flooding.

2021 Marine License Variation Request

In 2021, the dredging method altered to using a smaller dredger with a long duration – low volume dredge rate approach. This revised method of dredging was deemed to have a reduced risk of impacting the ecological sensitivities of the area and thereby the risk of disturbing qualifying species was also reduced. Subsequently a request to Marine Scotland to vary the 2019 marine license to remove the condition relating to winter dredging was submitted. The submission included a Screening Request in accordance with the Marine Works EIA Regulations and was accompanied by a Screening Request Report (Ardersier Port Dredging Campaign Screening Request, Report Ref No: 9799, dated 5/11/2021).

Following a period of consultation Marine Scotland provided a Screening Opinion confirming the variation was considered to be non-substantial (i.e. no EIAR was required to support a variation request) and a revised marine dredging license was issued in February 2022 allowing dredging activities through the winter period. The new marine license is due to expire in September 2022 and includes the following additional condition:

Condition 3.3.7. - The Licensee must ensure that all dredging activities, between 01 October and 31 March inclusive each year, are undertaken in line with the methodology received on 05 November 2021 and mitigation received on 26 January 2022.

Note: Refer to Appendix B for the approved methodology and mitigation noted in the above condition.

¹ *Climate Change (Emission Reduction Targets) (Scotland) Act 2019 (asp 15)*. Available at: <https://www.legislation.gov.uk/asp/2019/15/enacted>

² *Climate Change (Scotland) Act 2009 (asp 12)*. Available at: <https://legislation.gov.uk/asp/2009/12/contents>

2022 Winter Dredge Avian Observations

Dredging operations commenced on the 21st February 2022 using the smaller dredger. An avian Environmental Clerk of Works (ECoW) was present on site for the majority of the first week the dredger was active. Thereafter an avian ECoW was present two days per week at the site until week ending 25th March 2022. For each of the site visits observations of birds including their activities and any sign of disturbance impacts were recorded through the day. The site observation records are provided in Appendix C and summarised below.

Generally, the records noted no human, vehicular or plant activity having caused any disturbance event to bird species present at the site. There was one isolated incident where vehicle movement on site flushed nine Goldeneye, however they were observed to resetttle quickly in their original position.

In relation to the dredger, it was noted that a low hum was barely audible to the human ear at 200 m and the outfall pipe was audible to approximately 100 m. These distances will likely reduce in windy conditions. Any birds present appear to have habituated to the constant low noise and they do not appear to have been spooked by the presence of the dredger, either active or inactive. In fact, it was noted that some birds (gulls and Little Grebe (*Tachybaptus ruficollis*)) occasionally swam/flew towards the dredger which may be a result of the dredging process providing food sources through release of nutrients / small prey items into the water column.

The outflow pipe / settlement area is observed to be attracting an increasing number of gulls possibly due to small prey items being suctioned through the dredge pipe. During the first week of dredging, it was observed on a couple of occasions that the dredge pipe and their rafts may have created a sheltered refuge for lesser coastal species (e.g. Little Grebe) in which to forage safely in.

Despite the vessel edging closer to the main high-tide roost present at the site, the distance to all known high tide roosts from the location of the dredger during this initial dredging phase suggests that disturbance of birds is highly unlikely. It is also noted that a new high tide roost has been utilised halfway between the quayside and the saltmarsh area during this initial dredging phase.

In conclusion initial observations show no discernible link between bird movements / disturbance and the current site activities.

Proposed Temporal Variation

Under the current Marine Scotland authorisation, capital dredging activities at the port are licensed until September 2022 with a total of 4,600,000 wet tonnes of sand being removed during the period.

The dredge rate of the smaller vessel is up to circa 800 m³ per hour. If it is assumed the dredger operates 20 hours per day for 6 days per week, it is estimated it will take 25 weeks to complete the work. This assumption means the dredging operations would not be completed until October / November 2022 which is beyond the date of the current license by circa 1 or 2 months.

This assumption is an idealised one which does not take into account other influences such as weather conditions, ecological constraints (such as sighting of marine mammals in the vicinity of the works), breakdowns etc which could have an impact on the dredge

programme. In addition, currently the dredger operates 12 hours per day, 5 days a week although the number of hours per day is anticipated to increase as we go into the summer period. As such it is proposed to extend the capital dredge license by 1 year to September 2023 which should allow sufficient time to complete the capital dredge works.

EIA Screening

Under the Marine EIA Regulations, proposals are screened to determine whether they fall within one of the types or scales of development which would require an EIA. In screening an application, consideration is given to whether the proposal would fall into any of the categories set out in Schedules 1 or 2 of the Regulations.

The EIA Regulations do not attempt to define 'significant effects' as each development must be dealt with in its own merits. Schedule 1 of the Regulations lists types and scales of development for which an EIA will always be required. Schedule 2 of the Regulations lists types and scales of development for which an EIA might be required, subject to assessment under Schedule 3.

Assessment in Relation to Schedule 1

The development was originally identified as being a Schedule 1 development as it fell under:

Paragraph 8 (2) - Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1,350 tonnes.

Assessment in Relation to Schedule 2

The table within Schedule 2, Paragraph 2 classes in which the proposed temporal extension to the works could fall under are:

Paragraph 14 - Any change to or extension of works of a description mentioned in Schedule 1 (other than a change or extension falling within paragraph 21 of Schedule 1) where those works are already authorised, executed or in the process of being executed.

As such it is considered necessary to assess the proposals against the criteria contained in Schedule 3 in order to establish whether or not an EIA will be necessary.

Assessment in Relation to Schedule 3

Schedule 3 of the Regulations provides selection criteria for the screening of Schedule 2 developments. It must be noted that there are no rigid thresholds providing a universal test of whether or not an EIA is required. The proposal must be considered on a case-by case basis by virtue of factors such as its nature, size or location. The fundamental test to be applied in each case is whether that particular type of development proposed, and its specific impacts are likely, in that particular location, to result in significant effects on the environment.

The main concerns in relation to dredging activities identified in the 2018 EIAR were:

- Dredging of Whiteness Spit would result in habitat loss;

- Disturbance of birds through direct noise and visual disturbance;
- Increase in underwater noise and potential impacts on marine mammals;
- Increases in vessel movements and potential impacts on marine mammals;
- Increased turbidity within the waters of the Moray Firth via a disturbance of sediments; and
- Contamination of coastal water and sediments from accidental pollution incidents

The 2018 EIAR considered Whiteness Spit habitat loss, marine mammal disturbance from underwater noise and vessel movements, increase in turbidity within Moray Firth and contamination aspects and thereby defined appropriate mitigation measures to limit any impact as summarised in the Schedule of Mitigation and resulting Construction Environmental Management Document (CEMD). We are therefore of the opinion that the temporal extension to the dredging license to September 2023 will not have a significant impact on the outcomes of the 2018 assessments.

In relation to disturbance of birds through direct noise and visual disturbance, the 2018 EIAR assessment was based on using a larger vessel with a short duration, high volume dredging campaign and defined suitable mitigation measures in the Schedule of Mitigation and CEMD on this scenario to limit any environmental impact. The dredging method has, since the 2018 assessment, altered to a long duration, low volume dredge campaign which is considered to have a lower risk of impacting the birds present at site. This is supported by avian ECoW observations during the initial dredge campaign. However, although this new dredge methodology has an environmental benefit, it results in extending the dredge programme beyond that currently authorised.

As the risk of disturbance to birds present at the site and surrounding area have considerably reduced by the current dredging operations, we are of the opinion that there is no requirement to re-assess the impact as a result of the temporal extension to the dredge license.

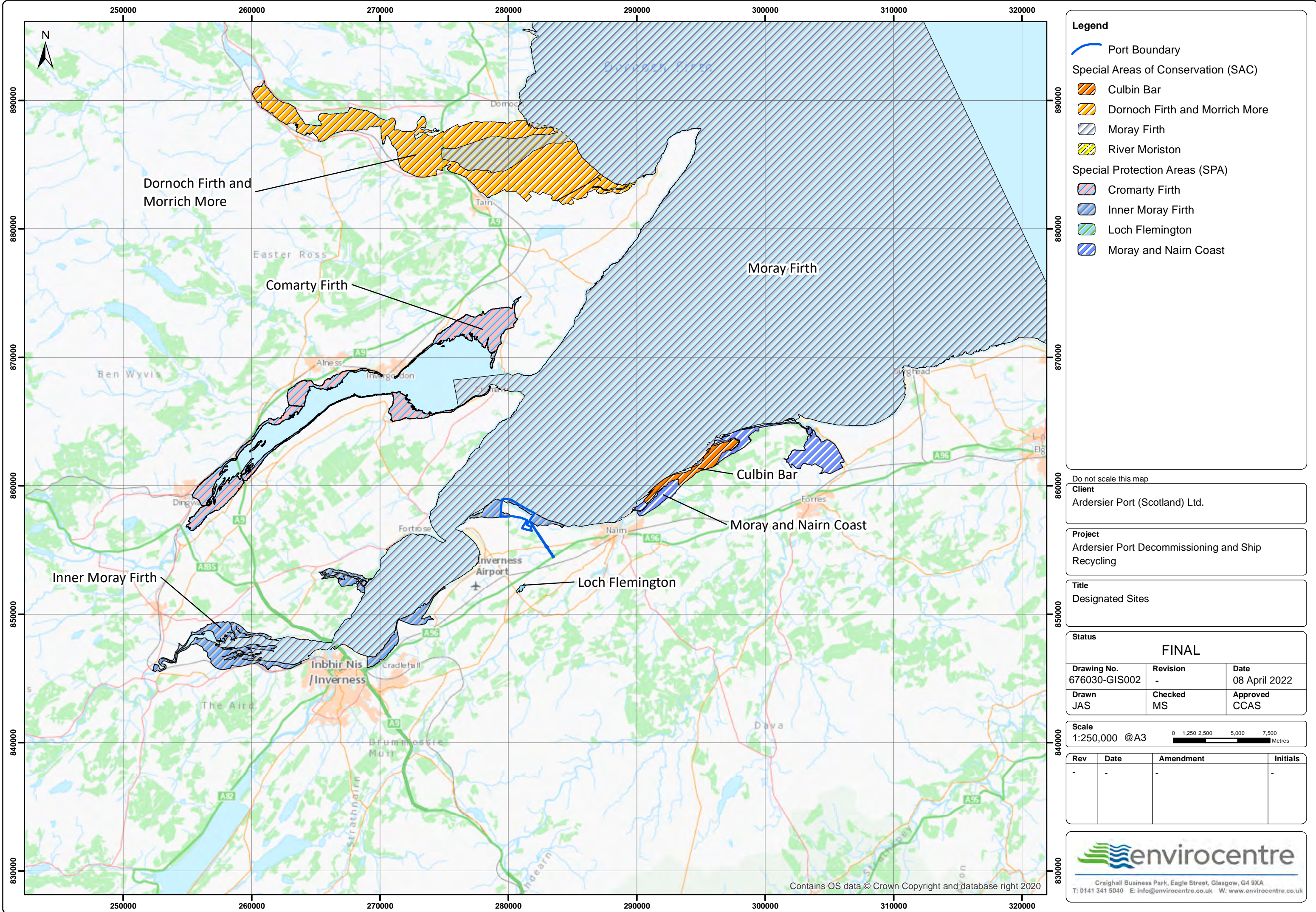
Assessment in Relation to Climate Change

As noted above, climate change was considered in the 2018 EIAR in Chapter 3 The Proposed Development specifically in relation to its impact on flooding. We are of the opinion that the temporal extension of the capital dredge license to September 2023 will not impact the outcomes of the EIAR assessment of climate change.

Conclusions

In conclusion, we are of the opinion that the temporal extension to the Marine License to September 2023 will have no significant impacts on the site or surrounding area and its notable environmental features.

A DRAWINGS



Legend

Port Boundary

Special Areas of Conservation (SAC)

- Culbin Bar
- Dornoch Firth and Morrich More
- Moray Firth
- River Moriston

Special Protection Areas (SPA)

- Cromarty Firth
- Inner Moray Firth
- Loch Flemington
- Moray and Nairn Coast

Do not scale this map

Client
Ardersier Port (Scotland) Ltd.

Project
Ardersier Port Decommissioning and Ship Recycling

Title
Designated Sites

Status		
FINAL		
Drawing No. 676030-GIS002	Revision -	Date 08 April 2022
Drawn JAS	Checked MS	Approved CCAS

Scale
1:250,000 @A3

0 1,250 2,500 5,000 7,500 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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B WINTER DREDGE METHODOLOGY AND MITIGATION

Winter Dredge Protocol

1. The winter dredge area is limited to the grid shown in Drawing 675015-GIS005.
2. During the more sensitive mid-winter period (December – January, as previously advised by Nature Scot), there would be no dredging activities in the following zones:
 - a. Within 500 m of Bird Roost Site 1
 - b. Within the green shaded area having direct line of sight to Bird Roost Site 1 (Drawing 675015-GIS005)
3. In terms of the dredging pattern, the grid system (shown in Drawing 675015-GIS005) provides a cell layout with unique identifiers in red font (e.g. A1, D5, etc.) where the letters A-P run along the quayside from east to west and the numbers -2 to +8 extend from the main quayside into the harbour. The initial anticipated pattern of dredging is set out as follows, but could be modified to suit sensitivities observed on site at the time (see point 5a below):
 - a. Dredging would commence out from the Dredger Berth (grid cell H1 as shown in Drawing 675015-GIS005).
 - b. It would initially work from the quayside out into the harbour (cell H1 then H2, H3 to H6).
 - c. Then move east and work in a similar direction from the quayside out into the harbour (cell G1 out to G6)
 - d. Continue on this basis up to the eastern extent of the harbour dredge (cells A1 to A6).
 - e. Then return to the berth area and work westwards (cell I1 out to I6).
 - f. The continued western progression would be in accordance with the zones highlighted in point 2 above.
4. The protocol to minimise bird disturbance will be monitored by the Environmental Clerk of Works (Schedule of Mitigation Ref 3) to ensure compliance by the Ardersier Port dredge team. It could also be included as an additional item with the schedule, which remains a live document.
5. The content of this protocol to minimise bird disturbance protocol would include the following, subject to any further comment from NatureScot:
 - a. Reviewing the dredge plan on a weekly basis with the ECoW, taking into account bird activity on site to confirm active dredge cells for the week to minimise bird disturbance.
 - b. Ensuring buffer zones to roost sites (including point 2 above) are maintained - through toolbox talks and shoreline markers
 - c. Avoiding any unnecessary vessel transit routes/journeys across the harbour that may cause disturbance



Legend

- Dredge Boundary
- Dredge Grid
- Dredge Pipeline Landfall
- Dredger Berth
- Dredger (For Scale)
- Screening Bund (3m High)
- Security Fence
- Sand Storage Area
- Mean Low Water Spring (MLWS)
- Roost Site
- Roost 250m Buffer
- Roost 500m Buffer
- Visibility From Roost Site 1
 - Not Visible
 - Visible

Do not scale this map

Client
Ardersier Port

Project
Ardersier Port Dredge

Title
Winter Dredge Strategy

Status
FINAL

Drawing No. 675015-GIS005	Revision -	Date 28 Sep 2021
Drawn MN	Checked KMD	Approved KMD

Scale
1:10,000 @A3

0 50 100 200 300 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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C AVIAN ECOW RECORDS DURING INITIAL DREDGE

Table 1. Bird Count Results

BIRD COUNTS					DREDGER LOCATION – c.50-100m off NH 80767 58129								
21 FEBRUARY 1000-1300 (LOW TIDE RISING)													
NORTH OF DREDGER													
<200m	Common Gull 1	Great Black-backed Gull 2	Shelduck 2	Red-breasted Merganser 1	Curlew 3	Eider 4	Cormorant 3						
SOUTH OF DREDGER													
<200m	Goldeneye 6	Long-tailed Duck 4	Red-breasted Merganser 16										
<500m	Goldeneye 17	Red-breasted Merganser 1	Wigeon 11	Little Grebe 1									
Saltmarsh / Harbour Channel	Dunlin c.140	Oystercatcher 48	Redshank 110	Curlew 20	Bar-tailed Godwit 45	Ringed Plover 6	Herring Gull 3	Carrion Crow	Hooded Crow				
NEAR DREDGER													
<100m	Eider 1	Goldeneye 2											
21 FEBRUARY 1300-1400 (RISING TIDE TO HIGH TIDE)													
NEAR DREDGER													
<20m	Little Grebe 2												
<50m	Goldeneye 2	Red-breasted Merganser 3	Little Grebe 1										
<100m	Long-tailed Duck 2	Herring Gull 2											
21 FEBRUARY 1400-1500 (HIGH TIDE)													
HIGH TIDE ROOST													
END OF SPIT	Curlew 48	Bar-tailed Godwit 7	Shag 2	Eider 2	Redshank 11								
NORTH OF DREDGER													
>200m	Great Black-backed Gull 1												
SOUTH OF DREDGER													
<100m	Red-breasted Merganser 2	Goldeneye 6	Little Grebe 1										
<200m	Goldeneye 3	Little Grebe 1											
<500m	Goldeneye 29	Red-breasted Merganser 2											
22 FEBRUARY 0830-1030 (LOW TIDE)													
NORTH OF DREDGER													
<200m	Curlew 4	Oystercatcher 2	Shelduck 18	Herring Gull 13	Great Black-backed Gull 2	Red-breasted Merganser 1							

SOUTH OF DREDGER												
<200m	Oystercatcher 3	Curlew 2	Cormorant 1	Goldeneye 2	Herring Gull 4	Great Black-backed Gull 2						
<500m	Long-tailed Duck 5	Red-breasted Merganser 26	Goldeneye 46	Curlew 1	Herring Gull 2	Little Grebe 1	Wigeon 2					
Saltmarsh / Harbour Channel	Curlew 67	Oystercatcher 41	Redshank 107	Bar-tailed Godwit 53	Dunlin 1	Turnstone 1	Herring Gull 6	Common Gull 2	Carriion Crow	Hooded Crow		
NEAR DREDGER												
<100m	Curlew 3	Oystercatcher 4	Herring Gull 27	Red-breasted Merganser 1								
22 FEBRUARY 1030-1230 (LOW TIDE RISING)												
NORTH OF DREDGER												
<500m	Cormorant 1											
SOUTH OF DREDGER												
<200m	Red-breasted Merganser 2											
<500m	Red-breasted Merganser 12	Goldeneye 33	Little Grebe 2	Long-tailed Duck 4	Wigeon 2							
NEAR DREDGER												
<50m	Cormorant 1											
<100m	Cormorant 2	Shelduck 2	Little Grebe 1	Curlew 1								
24 FEBRUARY 1100-1400 (RISING TIDE)												
NORTH OF DREDGER												
<200m	Common Gull 1	Red-breasted Merganser 1										
<500m	Shelduck 5	Curlew 4	Herring Gull 6	Oystercatcher 1								
SOUTH OF DREDGER												
<200m	Black-headed Gull 1	Oystercatcher 1	Long-tailed Duck	3								
<500m	Red-breasted Merganser 13	Goldeneye 44	Wigeon 2	Little Grebe 1	Herring Gull 1							
Saltmarsh / Harbour Channel	Little Grebe 2	Goldeneye 1	Oystercatcher 47	Bar-tailed Godwit 69	Black-headed Gull 4	(Pale-bellied) Brent Goose 1	Dunlin 4	Redshank 86	Curlew 4	Herring Gull 3		
NEAR DREDGER												
<50m	Little Grebe 1											
24 FEBRUARY 1400-1600 (HIGH TIDE)												
NORTH OF DREDGER												

<200m	Long-tailed Duck 1	Red-breasted Merganser 2	Herring Gull 2										
<500m	Herring Gull 2												
SOUTH OF DREDGER													
<200m	Long-tailed Duck 1	Red-breasted Merganser 4											
<500m	Goldeneye 51	Red-breasted Merganser 19	Long-tailed Duck 2	Wigeon 4	Little Grebe 3								
NEAR THE DREDGER													
<100m	Little Grebe 2												
25 FEBRUARY 0845-1100 (MID-TIDE FALLING)													
NORTH OF DREDGER													
<200m	Shag 1	Goldeneye 1	Herring Gull 2	Little Grebe 1									
<500m	Great Black-backed Gull 2												
SOUTH OF DREDGER													
<200m	Redshank 1	Curlew 1	Red-breasted Merganser 4	Common Gull 1	Long-tailed Duck 1								
<500m	Goldeneye 42	Red-breasted Merganser 2	Long-tailed Duck 4	Curlew 2	Redshank 1	Oystercatcher 2							
Saltmarsh / Harbour Channel	Oystercatcher 9	Redshank 10	Curlew 7	Little Grebe 2	Goldeneye 3	Dunlin 1	Bar-tailed Godwit 2	Herring Gull 3					
NEAR THE DREDGER													
<50m	Little Grebe 2												
<100m	Oystercatcher 1	Herring Gull 1	Curlew 2	Redshank 1									
25 FEBRUARY 1100-1300 (LOW TIDE)													
NORTH OF DREDGER													
<200m	Red-breasted Merganser 7	Herring Gull 2	Oystercatcher 1										
<500m	Herring Gull 12	Shelduck 4	Great Black-backed Gull 2	Curlew 3	Oystercatcher 3	Shag 1							
SOUTH OF DREDGER													
<200m	Goldeneye 3	Red-breasted Merganser 7	Oystercatcher 4	Common Gull 3	Herring Gull 1	Redshank 1							
<500m	Goldeneye 38	Long-tailed Duck 6	Redshank 5	Oystercatcher 6	Red-breasted Merganser 5	Common Gull 3	Herring Gull 3	Wigeon 2	Curlew 2	Little Grebe 1			
Saltmarsh / Harbour Channel	Redshank 71	Curlew 39	Ringed Plover 7	Little Grebe 1	Oystercatcher 18	Bar-tailed Godwit 2	Black-headed Gull 2	Red-breasted Merganser 2	Herring Gull 58	Common Gull 1	Dunlin 1	Goldeneye 1	
NEAR THE DREDGER													

<100m	Little Grebe 4											
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Table 2. Disturbance Events, Notable Bird Movements, and On-site Groundwork and Dredging Activities

TIME OF EVENT	COMMENT
21 FEBRUARY	
1042	140 Dunlin, c.80 Redshank and 14 Curlew flying from mudflat and landing – tidal movements as no sign of apparent disturbance?
1044	1 Redshank flushed from quayside by me
1049	20 Redshank and 45 Bar-tailed Godwit flew from mudflat and re-alighted in same location – possible tidal movements or Herring Gull flight?
c.1153	Dredger start-up – no disturbance
1156	2 Goldeneye flew to within 100m of dredger
1248	2 Red-breasted Merganser flew within 200m of dredger
1258	2 Little Grebe within 10m of active dredger
1306	2 Goldeneye swam within 50m of active dredger
1412	4 Goldeneye flew to within 50m of active dredger
1418	2 Long-tailed Duck swam within 50m of active dredger
22 FEBRUARY	
0841	Excavator at water's edge by outfall pipe with personnel and shuttle boat – no disturbance
0914	c.26 Goldeneye swam into <500m zone
0922	c.50 Curlew flew into saltmarsh from mudflat – no discernible sign of disturbance
0933	c.20 Bar-tailed Godwit and 60 Redshank flew from mudflat and re-alighted in same location – tidal movement?
0936	6 Shelduck flew onto saltmarsh from harbour channel – tidal movement as no disturbance event noticeable
0945	1 Red-breasted Merganser alighted within 100m of dredger and another within 200m of dredger
0952 - 1009	Excavator on quayside movement, personnel movements, shuttle boat visit to dredger and associated noises – no disturbance
1020-1030	Rising tide pushed last birds off sandbanks and mudflats onto spit or saltmarsh
1043	2 Herring Gull alighted on outfall pipe
1116	Dredger start-up – no disturbance
1141	2 Red-breasted Merganser alighted within 200m of dredger
1153	Shuttle boat trip to dredger – no disturbance
24 FEBRUARY	
1139	3 Long-tailed Duck swam into <200m zone
1156	86 Redshank, 47 Oystercatcher, 69 Bar-tailed Godwit, 4 Curlew, 3 Herring Gull, 4 Black-headed Gull, 4 Dunlin on mudflat adjacent to saltmarsh all disturbed by Land Rover on neighbouring land – all settled in same location once vehicle had moved away
1228	Generator started – no disturbance
1233	2 Herring Gull moved from mudflat north of dredger to outflow pipe / settlement area – likely pushed by the tide
1236	2 Common Gull landed within 100m of dredger
1241	1 Long-tailed Duck landed <100m of dredger and 2 Great Black-backed Gulls flew to outflow pipe
1252	1 Long-tailed Duck swam to <50m of dredger

1254	Rising tide pushed 2 Shelduck, 2 Curlew, 10 Oystercatcher and 1 Herring Gull off mudflat north of dredger
1300	Dredger sounded horn – no disturbance
1309	Activity recommences on quayside (moxy, bulldozer, 4x4 and personnel) – no disturbance
1331	1 Great Black-backed Gull landed <100m from dredger
1352	1 Little Grebe dived under outflow pipe and swam <5m of active dredger
1359	1 Red-breasted Merganser landed <200m of dredger
1422	1 Herring Gull landed <200m of dredger
1441	Shuttle boat movement – no disturbance
1500	Shuttle boat movement – no disturbance
1509	2 Common Gull and 2 Herring Gull flew to outflow pipe
1514	Shuttle boat movement – no disturbance
1516	Shuttle boat movement – no disturbance
1523	Shuttle boat movement – no disturbance
1524	Shuttle boat movement – no disturbance
1526	1 Shag swam into <100m zone
25 FEBRUARY	
0845 - 1300	Constant gull activity over outflow pipe and settlement area
0927	1 Curlew landed in <100m zone
0943	3 Herring Gull landed in <100m zone
0946 – 0953	14 Herring Gull, 3 Common Gull, 3 Curlew and 2 Oystercatcher landed on mudflat north of dredger
0952	Shuttle boat movement – no disturbance
1004	Shuttle boat movement – no disturbance
1006	3 Red-breasted Merganser landed in <200m zone
1013	2 Herring Gull took off from spit and landed in same place <100m of dredger – no obvious sign of disturbance event
1019	Shuttle boat movement – no disturbance
1020	Shuttle boat movement – no disturbance
1023	Dredger start-up after short maintenance break – no disturbance
1024	2 Herring Gull flew from <100m from dredger to outflow pipe
1035	1 Oystercatcher landed in <100m zone
1040	Shuttle boat movement – no disturbance
1042	Shuttle boat movement – no disturbance
1045	1 Curlew, 3 Red-breasted Merganser, 2 Goldeneye and 1 Herring Gull all took off from water as shuttle boat passed and immediately landed in same area; 1 Oystercatcher landed on spit <10m from shuttle boat
1052 – 1100	Increased gull activity over mudflat north of dredger and outflow pipe / settlement area (c. 30 individuals)
1104	2 Little Grebe <10m of dredger
1106	18 Herring Gull over outflow pipe / settlement area
1109	Dredger start-up following short maintenance stop – no disturbance
1123	2 Herring Gull took off <100m of dredger – no obvious disturbance event recorded
1125	1 Little Grebe flew 10m within 50m of dredger and landed – no obvious disturbance event recorded

Table 1. Bird Count Results

BIRD COUNTS				DREDGER LOCATION – c.30m off NH 80673 58183							
9 MARCH 1015-1115 (LOW TIDE RISING)											
NORTH OF DREDGER											
<500m	Eider 1	Oystercatcher 2	Curlew 4	Herring Gull 8	Great Black-backed Gull 3	Common Gull 2					
SOUTH OF DREDGER											
<500m	Goldeneye 36	Long-tailed Duck 2	Red-breasted Merganser 4	Eider 2	Shelduck 2						
Saltmarsh / Harbour Channel	Shelduck 2	Oystercatcher 16	Redshank 34	Curlew 4	Turnstone 1	Bar-tailed Godwit 104	Dunlin 17				
9 MARCH 1215-1315 (LOW TIDE RISING)											
NORTH OF DREDGER											
<200m	Great Black-backed Gull 3	Herring Gull 3	Common Gull 2	Shelduck 1	Oystercatcher 2	Curlew 4					
SOUTH OF DREDGER											
<500m	Goldeneye 31	Red-breasted Merganser 12	Eider 1	Herring Gull 3							
Saltmarsh / Harbour Channel	Shelduck 16	Goldeneye 2	Oystercatcher 26	Redshank 23	Dunlin 19	Curlew 17	Bar-tailed Godwit 3	Herring Gull 6			
9 MARCH 1315-1415 (LOW TIDE RISING)											
NORTH OF DREDGER											
<500m	Herring Gull 1										
SOUTH OF DREDGER											
<500m	Goldeneye 40	Long-tailed Duck 1	Red-breasted Merganser 4	Herring Gull 4							
Saltmarsh / Harbour Channel	Goldeneye 4	Red-breasted Merganser 1	Shelduck 16	Oystercatcher 24	Curlew 23	Redshank 15	Turnstone 4				
9 MARCH 1415 - 1515 (RISING TIDE TO HIGH TIDE)											
NORTH OF DREDGER											
<500m	Little Grebe 2										
SOUTH OF DREDGER											
<500m	Goldeneye 37	Long-tailed Duck 2	Red-breasted Merganser 19	Oystercatcher 2	Herring Gull 3						
Saltmarsh / Harbour Channel	Curlew 19	Bar-tailed Godwit 3	Redshank 3	Grey Plover 1							

9 MARCH 1620 (HIGH TIDE)										
HIGH TIDE ROOST										
End of spit	Cormorant 5	Great Black-backed Gull 2								
West Shore of sand storage area	Light-bellied Brent Goose 44	Curlew 59	Dunlin 148	Sanderling 2	Ringed Plover 6	Redshank 18	Oystercatcher 9	Shelduck 4		

Table 2. Disturbance Events, Notable Bird Movements, and On-site Groundwork and Dredging Activities

TIME OF EVENT	COMMENT
9 MARCH	
1116	1 Oystercatcher flew towards spit from south of dredger – no disturbance noted
1200	Dredger start-up – no disturbance
1222	Shuttle boat movement – no disturbance
1223	7 Herring Gull attracted to outfall pipe
1239	Shuttle boat movement – no disturbance
1239 - 1241	Dredger stopped then restarted – no disturbance
1300	Goldeneye and Red-breasted Merganser flew south towards existing flock south of dredger – no disturbance noted
1311	Cormorant flew towards end of spit – no disturbance from dredging noted.
1324	Shuttle boat movement – no disturbance
1333	Dredger stopped – no disturbance
1342	Vehicle along quayside flushed 9 Goldeneye which quickly resettled into original location
1420	Dredger start-up and shuttle boat movements – no disturbance
1450	2 Little Grebe move within 50m of dredger
1451	Dredger stops and shuttle boat movements – no disturbance
1510	Shuttle boat movements and pipe repairs ongoing – no disturbance

Disturbance Events, Notable Bird Movements, and On-site Groundwork and Dredging Activities

TIME OF EVENT	COMMENT
10 MARCH	
1251	Shuttle boat movement to clear cutter head– no disturbance
1313	Dredger start-up – no disturbance
1320	Shuttle boat movement – no disturbance
1352	Shuttle boat movement – no disturbance
1404-1406	Pause in dredging, cutter head raised
1407-1417	Little Grebe swam into <100m zone before moving back south
1449	Goldeneye flew into <200 zone south of dredger
1505	Increased gull activity over outflow pipe and settlement area (c20 Herring Gulls)
1512	Little Grebe swam into <100m zone
1533-1608	Frequent shuttle boat movements and clearance of cutter head – no disturbance
1543-1545	c18 Redshank and 1 Turnstone flew south upriver within 100m of dredger – presumed tidal movement
1608	Dredger start-up – no disturbance
1608	Further increased gull activity over outflow pipe and settlement area (c50 Herring Gulls and 3 Great Black-backed Gulls) but many soon dispersed to shed roof

Table 1. Bird Count Results

BIRD COUNTS					DREDGER LOCATION – c.20-50m off NH 80651 58207	
17 MARCH 0930-1130 (MID TIDE TO HIGH TIDE)						
NORTH OF DREDGER						
<200m	Herring Gull 2	Great Black-backed Gull 1	Oystercatcher 3	Goldeneye 2		
<500m	Cormorant 6	Red-breasted Merganser 26	Common Gull 3	Great Black-backed Gull 2	Long-tailed Duck 1	
SOUTH OF DREDGER						
<200m	Shelduck 2					
<500m	Goldeneye 3	Oystercatcher 13	Redshank 11	Turnstone 6	Little Grebe 1	
Saltmarsh / Harbour Channel	Redshank 71	Oystercatcher 18	Shelduck 6	Goldeneye 3		
NEAR DREDGER						
<50m	Long-tailed Duck 2					
17 MARCH 1130-1200 (HIGH TIDE)						
HIGH TIDE ROOST						
END OF SPIT	Knot 31					
LAGOON	No birds present					
SALTMARSH	Curlew 8	Shelduck 6	Herring Gull 3			
18 MARCH 1000-1200 (MID TIDE TO HIGH TIDE)						
NORTH OF DREDGER						
<200m	Cormorant 8	Oystercatcher 4	Eider 9	Herring Gull 3	Great Black-backed Gull 6	Red-breasted Merganser 2
<500m	Red-breasted Merganser 24	Goldeneye 2	Eider 1			
SOUTH OF DREDGER						
<200m	Long-tailed Duck 1					
<500m	Long-tailed Duck 2	Eider 3	Goldeneye 7	Herring Gull 3		
Saltmarsh / Harbour Channel	Redshank 16	Shelduck 8	Turnstone 5	Eider 1	Herring Gull 1	
NEAR DREDGER						
<100m	Herring Gull 1	Red-breasted Merganser 6				
18 MARCH 1200-1300 (HIGH TIDE)						
HIGH TIDE ROOST						
END OF SPIT	Curlew 87	Bar-tailed Godwit 1	Eider 9	Red-breasted Merganser 12		
LAGOON	No birds present					
SALTMARSH	Oystercatcher 35	Curlew 22	Shelduck 5			

QUAY ROOST @ NH 81157 57909	Redshank 53	Oystercatcher 28	Turnstone 5			
18 MARCH 1300-1430 (FALLING TIDE)						
NORTH OF DREDGER						
<200m	Oystercatcher 3	Herring Gull 2				
<500m	Cormorant 5	Great Black-backed Gull 4	Herring Gull 3	Common Gull 1	Oystercatcher 2	Eider 1
SOUTH OF DREDGER						
<200m	Red-breasted Merganser 2	Long-tailed Duck 3	Herring Gull 1			
<500m	Goldeneye 8	Eider 4	Herring Gull 2			
NEAR DREDGER						
<50m	Long-tailed Duck 1					

Table 2. Disturbance Events, Notable Bird Movements, and On-site Groundwork and Dredging Activities

TIME OF EVENT	COMMENT
17 MARCH	
0930-1230	No dredging, but on-site activity consisted of maintenance, tidying of quayside, excavation of outfall pits. MOD firing range active.
18 MARCH	
1000-1430	Dredging continuing, with maintenance on site, construction of the yard, excavation and increased moxy movements, and quayside works. MOD firing range active in morning.
1041	Shuttle boat trip to dredger – no disturbance
1041	Horn sounds – no disturbance
1042	Shuttle boat trip to dredger – no disturbance
1107	Gull activity at outflow pipe
1114	Personnel and 4x4 activity on quayside – no disturbance
1122	Shuttle boat trip to dredger – no disturbance
1123	Dredger temporarily shut down
1123	Increased gull activity at outflow pipe
1124	Maintenance on blocked pipe – no disturbance
1132	Shuttle boat trip to dredger – no disturbance
1132	Dredger start-up – no disturbance

1132	Increased gull activity at outflow pipe
1134	Shuttle boat trip to dredger – no disturbance
1136	6 Red-breasted Merganser land <100m of dredger
1138	1 Herring Gull lands <100m of dredger
1320	Increased gull activity at outflow pipe
1323	1 Long-tailed Duck lands <50m of dredger
1324	Horn sounds – no disturbance
1328	c.50 Herring Gulls present at outflow pipe
1329	Increased noise from volume of shingle/gravel through dredge pipe – no disturbance
1331	Shuttle boat trip to dredger – no disturbance
1336	Dredging paused – gulls vacated outflow pipe area
1338	Dredging recommenced – gulls returned to outflow pipe area
1343	Increased noise from volume of shingle/gravel through dredge pipe – no disturbance
1351	Increase of gulls to outflow pipe – c.60 individuals (predominantly Herring Gulls, with some Great Black-backed Gulls present) foraging immediately adjacent to excavation of material and moxy activity

Table 1. Bird Count Results

BIRD COUNTS					DREDGER LOCATION – c.30m off NH 80673 58183							
23 MARCH 1200-1300 (LOW TIDE RISING)												
NORTH OF DREDGER												
<500m	Red-breasted Merganser 6	Oystercatcher 2										
SOUTH OF DREDGER												
<500m	Goldeneye 13	Red-breasted Merganser 9	Eider 2	Turnstone 4	Redshank 43	Oystercatcher 7	Herring Gull 2					
Saltmarsh / Harbour Channel	Shelduck 2	Oystercatcher 18	Redshank 13									
23 MARCH 1300-1400 (LOW TIDE RISING)												
NORTH OF DREDGER												
<200m	Great Black-backed Gull 1	Herring Gull 1	Cormorant 4									
SOUTH OF DREDGER												
<500m	Goldeneye 13	Red-breasted Merganser 9	Eider 1									
Saltmarsh / Harbour Channel	Shelduck 2	Oystercatcher 16	Redshank 10									
23 MARCH 1400-1500 (RISING TO HIGH TIDE)												
NORTH OF DREDGER												
<500m	Great Black-backed Gull 1	Herring Gull 1	Common Gull 1	Cormorant 4								
SOUTH OF DREDGER												
<500m	Goldeneye 12	Long-tailed Duck 2	Red-breasted Merganser 4	Eider 5	Redshank 27	Dunlin 4	Turnstone 6					
Saltmarsh / Harbour Channel	Shelduck 2	Oystercatcher 2										
23 MARCH 1500-1600 (HIGH TIDE)												
NORTH OF DREDGER												
<500m	Goldeneye 3	Eider 1										
SOUTH OF DREDGER												
<500m	Pink-footed Goose 1	Long-tailed Duck 2	Goldeneye 11	Redshank ~25								
Saltmarsh / Harbour Channel	Oystercatcher 32	Curlew 17	Shelduck 9									
End of spit	Curlew 81	Oystercatcher 16	Cormorant 4	Great Black-backed Gull 3	Shelduck 2							

West Shore of sand storage area	Light-bellied Brent Goose 1	Shelduck 4	Redshank 1	Ringed Plover 8							

Table 2. Disturbance Events, Notable Bird Movements, and On-site Groundwork and Dredging Activities

TIME OF EVENT	COMMENT
23 MARCH	
1203	Shuttle boat movement – no disturbance. Red-breasted Merganser within 50m of dredger
1236	4 Red-breasted Merganser within 50m of dredger
1251	Shuttle boat movement – no disturbance
1302	Shuttle boat movement – no disturbance
1315	Shuttle boat movement – no disturbance
1334	5 Herring Gull attracted to dredger outfall pipe
1340	Shuttle boat movement – no disturbance
1402	Dredger stopped
1414	~40 Dunlin flew to roost areas. Not as a result of disturbance as dredger inactive at time
1417	Dredger restarted – no disturbance
1458 -1500	Dredger stopped, repositioned and restarted – no disturbance
1546 - 1553	Dredger stopped, repositioned and restarted – no disturbance

Table 1. Bird Count Results

BIRD COUNTS				DREDGER LOCATION – c.30m off NH 80636 58205							
24 MARCH 1300-1400 (LOW TIDE RISING)											
NORTH OF DREDGER											
<500m	Eider 1										
SOUTH OF DREDGER											
Saltmarsh / Harbour Channel	Goldeneye 18	Long-tailed Duck 1	Eider 4	Curlew 8	Oystercatcher c35	Shelduck 4	Herring Gull 2				
24 MARCH 1400-1500 (LOW TIDE RISING)											
NORTH OF DREDGER											
<500m	Eider 1	Shelduck 1	Herring Gull 1								
SOUTH OF DREDGER											
Saltmarsh / Harbour Channel	Goldeneye 10	Long-tailed Duck 1	Eider 3	Curlew 2	Oystercatcher 2	Shelduck 2	Herring Gull 1				
24 MARCH 1500-1600 (LOW TIDE RISING)											
NORTH OF DREDGER											
<500m	Herring Gull 17										
SOUTH OF DREDGER											
<200m	Pied Wagtail 1										
Saltmarsh / Harbour Channel	Goldeneye 16	Long-tailed Duck 1	Eider 4	Shelduck 2	Redshank 2	Ringed Plover 4 (on yard)					
24 MARCH 1600-1640 (RISING TIDE TO HIGH TIDE)											
NORTH OF DREDGER											
<500m	Eider 1										
SOUTH OF DREDGER											
<500m	Long-tailed Duck 1	Redshank 3									
Saltmarsh / Harbour Channel	Goldeneye 12	Shelduck 4 (roosting on quayside)	Redshank 8	Eider 4	Turnstone 7						
24 MARCH 1650-1720 (HIGH TIDE)											
HIGH TIDE ROOST											
ROOST SITE 1	Curlew c55	Bar-tailed Godwit c15	Oystercatcher c170	Shelduck 2							
ROOST SITE 2	Curlew c65	Redshank 16	Light-bellied Brent Goose 1								

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Table 2. Disturbance Events, Notable Bird Movements, and On-site Groundwork and Dredging Activities

TIME OF EVENT	COMMENT
24 MARCH	
1310	c30 Redshank flew north downriver within 100m of dredger – presumed tidal movement
1329	Shelduck flew north downriver within 100m of dredger
1339	Roosting Oystercatcher (20) and Redshank (12) disturbed from quayside c600m south of dredger by Port vehicle. Flew south upriver.
1346	Long-tailed duck flew into <200 zone south of dredger
1351	c20 Oystercatcher flew north downriver within 200m of dredger
1440-1446	Pause in dredging. Shuttle boat out. No disturbance.
1459	Red Kite flew south-east low over settlement area within 200m of dredger
1459	Increased gull activity over outflow pipe and settlement area as excavator moved close to outflow pipe (c20 Herring Gulls)
1536	2 Ringed Plover flew south across from spit after being flushed by dogwalker
1537	Shelduck flew south upriver within 200m of dredger
1540	Goldeneye flew south upriver within 100m of dredger
1540	2 Shelduck flew south upriver within 200m of dredger
1610	7 Jackdaw flew to quayside within 100m of dredger
1618	2 Shelduck flew south upriver within 100m of dredger
1626	3 Oystercatcher flew north downriver within 200m of dredger
1629	2 Oystercatcher flew south upriver within 100m of dredger
1637	2 Oystercatcher flew north downriver within 200m of dredger
1637	Eider swam south upriver to within 200m of dredger
1638	5 Oystercatcher flew south upriver within 100m of dredger before flying back north downriver