



# Aberdeen Harbour Expansion Project

## Construction Environmental Management Document

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**DRAGADOS**

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# Chapter 8

## Fish Species Protection Plan

## Revision Log

Minor updates to formatting have been made throughout the document. The main/significant changes are listed in the table below.

Revision Number	Date	Location of Revision	Revision Details
Rev 5	07/12/2018	Front of Document	Document updated to Revision 5 and date updated
		Section 8.2, Table 8.1	Table updated to remove individuals names
		Section 8.5.2	Minor text addition
		Section 8.5.3	Revised paragraphs
		Section 8.5.4	Rewritten section
		Section 8.5.5	Update to text. It has been agreed with Marine Scotland that only salmonids are to be delivered to the fish health inspectorate for autopsy. Dragados are currently using a pre-blast procedure. Text has been updated to reflect this.
		Section 8.5.6	Rewritten Section
		Section 8.1.1	Rewritten Section
		Section 8.5.8	Added a section for reporting commitments
		Appendix A	Addition of Appendix A with pre-blast procedure.
Rev 6	21/10/2019	Throughout the document	Aligned the document format

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Investigation of Soft Start Pre-Blast Procedure

## 8 Fish Species Protection Plan

### 8.1 Introduction

This Fish Species Protection Plan (FSPP) has been developed to monitor and mitigate impacts to fish during the construction phase of the Aberdeen Harbour Expansion Project (AHEP).

Atlantic salmon (*Salmo salar*) and sea trout are of environmental and economic value to the local area. Salmon, sea trout and other migratory species use the Nigg Bay area during their migrations, with salmon being one of the three species for which the River Dee Special Area of Conservation (SAC) is designated. The salmon fishery on the Dee alone provides 500 full time equivalent jobs and £15 million annually to the Deeside economy<sup>1</sup>. For these reasons, the FSPP has been produced.

The requirement to produce the FSPP is listed under the Marine Construction Licence Condition 3.2.4 and 3.2.7, the Marine Dredging and Deposit Licence Condition 3.2.4, as well as the Harbour Revision Order Schedule 2(d). This plan has been produced to fulfil these requirements.

### 8.2 Roles, Responsibilities and Cross- Referencing

The following individuals are responsible for ensuring that the requirements of this Fish Species Protection Plan are implemented at the AHEP site.

Table 8.1: Roles and Responsibilities

Job Title	Responsibilities
Environmental Clerk of Works (ECoW)	If dead fish are reported, the ECoW will initiate an investigation in lines with the requirements outlined in Section 8.5.5. The ECoW is responsible for notifying the Environmental Manager or the Construction Manager the findings of this investigation. The ECoW will liaise and notify MS-LOT as outlined in Section 8.5.5
Environmental Manager (EM)	The EM will work with the ECoW to ensure the mitigation and monitoring measures as outlined in the FSPP are undertaken. The EM will stop construction if fish mortality is found to be directly caused by construction activities (Section 8.5.5). The EM undertake the ECoW responsibilities if and when need be.

#### 8.2.1 Cross-Referencing

This FSPP should be read in conjunction with the following CEMDs:

- Marine Mammal Mitigation Plan;
- Dredging and Dredge Spoil Disposal Management and Monitoring Plan;

<sup>1</sup> Radcliffe et al (2004). The Economic Impact of Game and Coarse Angling in Scotland. Prepared for Scottish Executive Environment and Rural Affairs Department.



- Vessel Management Plan;
- Construction Lighting Management Plan; and
- Piling Management Plan.

### 8.3 Information Sources

The FSPP has been informed by information outlined in the following documents:

- Aberdeen Harbour Expansion Project Environmental Statement (ES)<sup>2</sup>; and
- ES Additional Environmental Information Report<sup>3</sup>.

### 8.4 Legislation and Guidance

This FSPP has been developed in line with the Offshore Marine Conservation (Natural Habitats, &c) Regulations 2007<sup>4</sup> and the Conservation of Habitats and Species Regulations 2010<sup>5</sup>.

The Offshore Marine Conservation (Natural Habitats, & c.) Regulations 2007 (as amended) transpose Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and Council Directive 79/409/EEC on the conservation of wild birds (Wild Birds Directive) into national law. These regulations apply to the UK's offshore marine area which covers waters beyond 12 nautical miles, within British Fishery Limits and the seabed within the UK Continental Shelf Designated Area.

The Conservation (Natural Habitats etc.) Regulations 1994 (as amended in Scotland in 2007 and 2008) are the British response to the Habitats & Species Directive 1992 issued by the European Community (EC). They offer protection to a number of plant and animal species throughout the EC via the designation of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in terrestrial areas of the UK and territorial waters out to 12 nautical miles. In the United Kingdom these regulations are implemented through the Wildlife and Countryside Act 1981 (as amended).

In relation to this report, the River Dee is designated as an SAC with Atlantic salmon as a qualifying interest. This ensures that any plan or project that may impact the integrity of the River Dee SAC is subject to a Habitats Regulations

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<sup>2</sup> Waterman and Fugro (2015), Environmental Statement

<sup>3</sup> Aberdeen Harbour Expansion Project (April 2016), Additional Environmental Information Report.

<sup>4</sup> The Offshore Marine Conservation (Natural Habitats, &c.) Regulations (2007).  
<http://www.legislation.gov.uk/ukxi/2007/1842/contents>. Accessed 10/01/2017.

<sup>5</sup> The Conservation of Habitats and Species Regulations (2010).  
<http://www.legislation.gov.uk/ukxi/2010/490/contents/made>. Accessed 10/01/2017

Appraisal (HRA)<sup>6</sup>. In the event that a plan or project is likely to have a significant effect (LSE) an Appropriate Assessment (AA)<sup>7</sup> must be undertaken.

An AA was completed by Marine Scotland on 11<sup>th</sup> October 2016, which concluded that the AHEP proposed works, alone or in-combination with other plans or projects, will not adversely affect the River Dee SAC with respect to Atlantic salmon, provided it is undertaken in strict accordance with the conditions in the marine licence.

## 8.5 Mitigation/Monitoring Measures

### 8.5.1 Marine Impact Piling

Marine impact piling is no longer proposed during the construction of the AHEP, so the potential for adverse effects on fish is reduced.

### 8.5.2 Blasting

Explosives will be used below the seabed to fracture rock to allow the dredgers to remove it for reuse. When blasting occurs the following conditions relevant to fish species will be adhered to:

- a) Blasting is restricted to daylight hours unless during exceptional circumstances;
- b) A process to record and report, in writing to the licensing authority, within 48 hours, instances where blasting has occurred, out with daylight hours, due to exceptional circumstances;
- c) The minimum amount of blasting will be undertaken using the smallest practicable charges; and
- d) All blasting will be shielded from open water by a breakwater structure or a bubble curtain (See section 8.5.3).
- e) A proposed mitigation strategy for the use of soft-start pre-blasts is provided in Appendix A

### 8.5.3 Bubble Curtain

In order to further reduce the sound exposure to marine mammals and fish during blasting, a bubble curtain (BBC), will be deployed. A double BBC will be deployed during blasting operations of this project, with plans to move to one bubble curtain if it can be shown this reduces noise sufficiently.

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<sup>6</sup> HRA is a rigorous assessment process undertaken by a competent authority intended to insure the qualifying interests of a Natura site (SAC/ SPA) are protected. More information can be found at: <http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/international-designations/natura-sites/habitats-regulations-and-hra/>

<sup>7</sup> An AA is a detailed analysis of evidence focused on the qualifying interests of a Natura site. It is undertaken by a competent authority, with input from SNH to determine whether there will be an adverse effect on site integrity related to a proposed plan or development. More information can be found at: <http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/international-designations/natura-sites/hra-appropriate-assessment/>



A BBC consists of walls of bubbles rising from a nozzle or porous pipe that is secured to the seabed and connected to an air compressor. The compressors will be installed on shore or on a pontoon. The BBC will be installed so that there is no 'direct line of site' between the blasting area and open water.

During the initial blasting activities, Dragados is implementing underwater noise monitoring to demonstrate the effectiveness of mitigation measures. This incorporates measuring the noise at certain distances from the source. Reports of the effectiveness of the bubble curtain following blasting events in 2018 have been provided to MS-LOT.

Further details on methodology and deployment procedure please refer to the Marine Mammal Mitigation Plan, Chapter 11 of the CEMD.

### 8.5.4 Sedimentation Plume

As part of the Harbour Revision Order (HRO), Schedule Mitigation Measures 2d, the FSPP must outline methods for the investigation of the special extent and concentration of the sediment plume around the mouth of the River Dee, and, if necessary implement appropriate mitigation measures to reduce the potential for impacts on salmon smolts from increased predation.

The ES presented background Suspended Sediment Concentrations (SSCs) in Nigg Bay ranging from 24 mg/l in the outer bay area to 144 mg/l in the inner bay area, with maximum SSCs of up to 529 mg/l recorded in the outer bay and 899 mg/l in the inner bay during high energy wave events.

In the ES, the plume model showed turbidity generated by the dredging works reaching the entrance of Aberdeen Harbour and the outer coastal area. The peak SSC north of Girdle Ness was predicted to be no higher than 200 mg/l above background levels, and generally around 10-50 mg/l in front of the mouth of the River Dee, which is well within natural background variation. Therefore, the ES states that the expected increases in SSC as a result of dredging in the areas surrounding Nigg Bay will be within natural range.

In 2017, SSC measurements were collected from eight locations before dredging and SSC data was acquired during dredging operations. All measurements recorded in 2017, were below the agreed 50mg/l threshold.

In May 2018, Dragados installed two continuous suspended sediment monitors 750m apart in Nigg Bay. One was located within the plume from the sediment deposit site, the other was outside the plume to monitor background concentrations unrelated to dredging and sediment deposit. The highest recorded difference between the two buoys was 65.81 mg/l and was well below the 200 mg/l predicted in the ES. Further details of this monitoring can be found in the Chapter 7: Dredging and Dredge Spoil Disposal Management and Monitoring Plan.

### 8.5.5 Reporting and Management of Dead Fish

All on-site Dragados staff will be required to report any observations of dead or injured salmonids or other fish during marine construction activities. They will be instructed on how to do this in toolbox talks.

All fish carcasses which can be collected safely will be stored in an air tight container and the species will be identified. The fish health inspectorate will be contacted immediately on collection of any salmonid carcasses to arrange uplift to the MS-Fish Pathology Unit in Aberdeen (Table 8.2). The carcass will be analysed following the wild fish sampling procedure to determine, where possible, the cause of death<sup>8</sup>.

Table 8.2: Contact information for reporting dead fish

Contact	Contact Number
During Working Hours: Fish Health Inspectorate	01224 295525
Evenings or Weekends: On-call Inspector	01224 876544

In the event that five or more fish carcasses (or injured, or moribund fish) are reported during one 24 hour period within 50m of a construction zone, the ECoW will notify MS-LOT, Dee District Salmon Fishery Board and the Environmental Manager via email. Within 24 hours of the fifth reported carcass, consultation will be sought with the Dragados Environmental Manager and MS-LOT to determine any temporary mitigation requirements. If deemed necessary, temporary mitigation will be implemented as soon as it is safe to do so.

The ECoW will review all results from salmonid post mortem assessments. In the event that a post mortem report identifies construction activity as the primary cause of death, or that construction activity was likely to have been a contributing factor in the death, the ECoW will notify the Environmental Manager or Construction Manager. MS-LOT will also be notified by email (ms.marinelicensing@gov.scot) within one working day of the information being received by the ECoW.

Prior to each blasting event, Dragados will detonate a small charge before the main charge to deter fish from the immediate area. The proposed startle procedure is outlined in Appendix A. If dead, injured or moribund fish continue to be found, following discussions with MS-LOT and others if necessary, the ECoW and Environmental Manager will propose any additional management or mitigation measures that must be put in place to reduce the risk of fish mortality.

Electronic copies of any post mortem reports that are carried out will be retained for the duration of works. These will be reviewed on a monthly basis by the ECoW in combination with reports of injured or moribund fish to determine whether there

<sup>8</sup> This was the best course of action agreed/ with the MS-Laboratory in Aberdeen. During office hours the fish health inspectorate can be contacted on 01224 295525. During evenings or weekends the on call inspector should be contacted on 01224 876544

are any patterns indicative of indirect impacts. A summary of any salmonid fish carcass assessment will be included in the ECoW's monthly report to SNH and MS-LOT.

### 8.5.6 Salmon Monitoring

Chapter 13 of the Environmental Statement for the AHEP predicted minor adverse effects on fish during the construction and operation of the project. Condition 3.2.7 of the Construction Marine Licence for the AHEP requires that 'a monitoring programme [is] developed to track adult salmon in the vicinity of the AHEP site and entering the River Dee.'

An adult salmon and sea trout monitoring study was undertaken in 2017 by the Scottish Centre for Ecology and Natural Environment of the University of Glasgow, and the results are presented in Newton *et al.* (2018)<sup>9</sup>.

### 8.5.7 Underwater Noise Measurements

Underwater noise measurements are undertaken following the 'Good Practice Guide for Underwater Noise Measurement'<sup>11</sup> including following best practice for in-situ measurement of underwater sound, for processing the data, and for reporting the measurements using appropriate metrics.

Hydrophones will be deployed in/around Nigg Bay to record underwater sound levels as described in the Marine Mammal Mitigation Plan, Chapter 11 of the CEMD.

The underwater noise measurements were undertaken at AHEP to establish the noise baseline without construction activities and to characterise noise from a range of activities including:

- Dredging
- Drilling
- Use of mechanical 'ripper' deployed from vessel
- Blasting

The underwater noise mitigation strategy is reviewed and updated regularly to ensure that the measured underwater noise levels are consistent with those assessed in the ES as not having significant adverse effects on fish.

### 8.5.8 Reporting commitments

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<sup>9</sup> Newton, M., Honkanen, H. & Adams, C. (2018) . Aberdeen Harbour Expansion Project: Salmon Monitoring Report, June 2018

<sup>11</sup> National Measurement Office, Marine Scotland, The Crown Estate, Robinson, S.P., Lepper, P. A. and Hazelwood, R.A., NPL Good Practice Guide No. 133, ISSN: 1368-6550, 2014.

TYPE OF REPORT	REPORT DESCRIPTION	CEMD CHAPTER	FREQUENCY	REPORTING CHANNEL
<b>Fish carcasses (Notification)</b>	In the event that <b>five or more fish carcasses</b> (or injured, or moribund fish) are reported during one 24 hour period within 50m of a construction zone, the ECoW will notify MS-LOT and the Environmental Manager via phone and email. Within 24 hours of the fifth reported carcass, consultation will be sought with the Environmental Manager and MS-LOT to determine any temporary mitigation requirements	8.5.5	As & When	ECoW to MS-LOT and EM
<b>Fish carcasses (post mortem results report)</b>	The ECoW will review all results from post mortem assessments. In the event that a post mortem report identifies construction activity as the primary cause of death, or that construction activity was likely to have been a contributing factor in the death, the ECoW will notify the Environmental Manager or Construction Manager.	8.5.5	As & When	ECoW to MS-LOT and EM

## Appendix A

Proposed Soft Start Pre-Blast  
Procedure

## A1 Proposed Startle Pre-Blast Procedure

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The blasting contractor has proposed the following startle procedure to be used at Nigg Bay. This procedure will be employed as a routine mitigation measure prior to each blasting event.

Prior to the full blast charge, a pre-blast charge will be detonated to scare fish away from the blasting area.

This will comprise of a small explosive device (for instance the ‘Shockstar MS’ containing 720mg of explosives) being detonated one minute prior to the start-up of the double bubble curtain. The full blasting procedure will then commence as outlined in the CEMD Chapter 7: Dredge and Dredge Spoil Disposal Management Plan.

Following the blasting, a nominated individual will check the blasting area for dead or injured fish. These fish will be recorded and managed as outlined in Section 8.5.5.

If dead fish are found to be present following the full blast, an adaptive management procedure will be put into place. This may consist of varying the small timing of the detonation prior to the start-up of the double bubble curtain.

The number of dead or injured fish noted pre-blasting and post-blasting recorded, along with any pictures, will be provided to MS-LOT in the blasting report.