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The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)

Environmental Impact Assessment Consent Decision

Project Title: Aberdeen Harbour Expansion Project (“AHEP”)

Applicant: Aberdeen Harbour Board (“AHB”)

Location: Nigg Bay, Aberdeen, Aberdeenshire

1. Introduction

Council Directive 85/337/EEC (“the EIA Directive”) requires that development consent for public and private projects which are likely to have significant effects on the environment should be granted only after an assessment of the likely significant environmental effects of those projects has been carried out. An assessment is obligatory for projects listed in Annex I of the EIA Directive, which includes 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 (Annex I, point 8(b)). The AHEP therefore constitutes an Annex I project under the EIA Directive and is consequently subject to a mandatory EIA.

In regards to regulated marine activities, the EIA Directive has been transposed into UK law via The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) (“the 2007 Regulations”). Part 2, regulation 4 of the 2007 Regulations states that where an environmental impact assessment (“EIA”) is required in relation to a regulated activity (e.g. licensable marine activity), unless the appropriate authority has given EIA consent, the regulator must not grant regulatory approval in respect of the regulated activity.

Marine Scotland - Licensing Operations Team (“MS-LOT”) deliver the marine licensing function of The Marine (Scotland) Act 2010 (“the 2010 Act”) on behalf of the Scottish Ministers granting licences for licensable marine activities within the Scottish marine area. In regards to EIA projects, the Scottish Ministers are the appropriate authority under the 2007 Regulations and MS-LOT advises the Scottish Ministers in the discharge of those functions.

On 04 November 2015, AHB submitted an Environmental Statement (“ES”), under the 2007 Regulations, and construction, dredging and sea disposal marine licence applications, under Part 4 of the 2010 Act, to MS-LOT. Prior to determining to grant licences for the AHEP, the Scottish Ministers must first give (if appropriate) EIA consent for the project. This document constitutes the Scottish Minister’s EIA Consent Decision under Regulation 22 of the 2007 Regulations.

2. Project Description

AHB have stated that Aberdeen Harbour has been operating at or near capacity for several years. Located at the heart of Aberdeen City there is currently limited capacity to handle rising vessel numbers and the growing trend for new, larger, multi-purpose vessels in the oil and gas sector and other industries has created a demand for deep water berthing, which the existing facilities cannot fully support. The AHEP has the potential to attract new business streams such as larger cruise ships, provide support to the renewables sector, and accommodate the decommissioning of small to medium size oil and gas industry infrastructure.

In 2014, the Scottish Government published the National Planning Framework 3 (“NPF3”) which sets out the spatial strategy for Scotland’s development over the next 20 to 30 years. The AHEP is recognised by the Scottish Government as one of only 14 infrastructure projects considered as having national significance. NPF3 recognises the importance of Aberdeen Harbour to the oil and gas sector, as well as acknowledging the need to expand the harbour to address capacity constraints, and to secure new business streams in the region.

The principal marine activities associated with the AHEP are as follows:

- Dredging of proposed Harbour Basin location to achieve a seabed depth of approximately 9.0 metres below Chart Datum (“CD”);
- Dredging of proposed East Quay and Entrance Channel locations to achieve seabed depth of approximately 10.5 metres below CD;
- Dredging of proposed North Breakwater location to achieve seabed depth of approximately 15.0 metres below CD;
- Dredging of proposed South Breakwater location to achieve seabed depth of approximately 14.0 metres below CD;
- Deposit of dredge spoil (unsuitable for re-use) at Aberdeen authorised disposal site;
- Temporary stockpiling of dredged material (to be used as land reclamation infill during construction of the AHEP)
- Use of explosives to blast localised areas of bedrock;
- Construction of new north and south breakwaters (each approximately 600 metres long) to form the harbour;
- Construction of revetment south of the west quay; and
- Land reclamation (principally through using material recovered from capital dredging activities and local sources where possible) and construction of approximately 1400 metres of new quays and associated support infrastructure.

3. Environmental Concerns

The principal marine-related environmental concerns identified and discussed in the ES submitted in support of the AHEP are with regards to:

- The marine physical environment;
- Marine water and sediment quality;
- Flood risk and surface water;
- Nature conservation;
- Benthic ecology;
- Fish and shellfish ecology;
- Marine ornithology;
- Marine mammals;
- Socio-economics;
- Seascape, landscape and visual effects;
- Shipping and navigation;
- Commercial fishing;
- Other users; and
- Archaeology and cultural heritage.

The nature conservation designations relevant to the AHEP are as follows:

- River Dee Special Area of Conservation (“SAC”);
- Moray Firth SAC;
- Isle of May SAC;
- Firth of Tay and Eden Estuary SAC;
- Berwickshire and North Northumberland Coast SAC, Nigg Bay Site of Specific Scientific Interest (“SSSI”);
- Ythan Estuary, Sands of Forvie and Meikle Loch Special Protection Area (“SPA”);
- Fowlsheugh SPA;
- Buchan Ness to Collieston Coast SPA;
- Montrose Basin SPA;
- Firth of Tay and Eden Estuary SPA;
- Forth Islands SPA;
- Firth of Forth SPA;
- Ythan Estuary, Sands of Forvie and Meikle Loch proposed SPA (“pSPA”); and
- Outer Firth of Forth and St Andrew’s Bay Complex pSPA.

4. Consultation

In 2013 AHEP, under the 2007 Regulations, underwent an EIA scoping process during which wide ranging consultation with relevant expert bodies/advisors was conducted to inform the scoping opinion provided. Under The Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013 (“the PAC Regulations”) the AHEP also underwent a formal pre-application consultation process between July and September 2015, which provided members of the public and statutory consultees with the opportunity to comment on the proposals prior to the submission of the marine licence applications.

The following sections summarise the consultation processes undertaken in 2015/2016 in regards to the marine licence applications, ES and further information submitted by AHB.

4.1 Public consultation

In accordance with Regulation 16 of the 2007 Regulations and S. 26 of the 2010 Act, MS-LOT instructed AHB to publicise the marine licence applications, ES and further information submitted in respect of the AHEP.

In regards to the initial marine licence applications and ES submitted by AHB, public notices were placed in The Edinburgh Gazette and the Aberdeen Press & Journal on 06 November 2015 and 13 November 2015. Further information provided by AHB was subsequently publicised in The Edinburgh Gazette and the Aberdeen Press & Journal on 22 April 2016 and 29 April 2016. To reflect updated information, AHB withdrew their initial marine licence applications and submitted new applications to MS-LOT. The updated applications were publicised in the Aberdeen Press & Journal on 07 May 2016. Persons wishing to were given 42 days to make representations regarding the AHEP.

Throughout the public consultation periods electronic copies of the marine licence applications and ES, followed by the further information and updated applications, were made available on AHB's website and on the MS-LOT page of the Scottish Government website. Hard copies of the documentation were also made available at Torry Library and Aberdeen Maritime Museum.

During the initial consultation period 21 objections were received from local residents and 2 from local fishermen in regards to the marine licence applications.

The grounds of the objections received from the local residents are similar in many respects and in several cases are in identical terms. They relate to loss of amenity around Nigg Bay and concerns over increased traffic and pollution, impact on wildlife particularly dolphins and sea birds, noise, visual impacts and lack of communication. The local fishermen's objection related to the loss of fishing grounds and increased risk to fishing gear.

AHB responded in writing to all the objectors and offered to meet with them in order to address their concerns. AHB subsequently met with one of the fishermen (acting on behalf of himself and his father) and an agreement was reached between the two parties, which resulted in the fishermen's objection being withdrawn. None of the 21 local resident objectors opted to meet with AHB and their objections remain outstanding.

Whilst many of the points raised in the objections, are terrestrial in nature and therefore are not within the regulatory competence of the MS-LOT, acting on behalf of the Scottish Ministers under the Marine (Scotland) Act 2010, matters relevant to the licensable marine activities were:

- The Salmon and Pearl Mussels of the Dee SAC;
- Dolphin presence and as an asset for tourism;

- Bird use of the area;
- Potential effects of pollution from the Tullos Burn, including increased biological oxygen demand;
- Consultation - lack of leaflet drop and no provision of Non-English documentation;
- Financial case given oil and gas downturn;
- Generation of litter;
- Scale of development;
- Visual impact;
- Flood risk;
- Water Framework Directive requirements on consenting authorities;
- Amenity use of the area for recreation and wellbeing;
- Lack of local benefit; and
- Lighting during construction and operation.

The Salmon and Pearl Mussels of the Dee SAC, Bottlenose Dolphin presence and as an asset for tourism, sea bird use of the area

Due to the nature conservation concerns associated with the AHEP (as listed in section 3 above and reiterated by the public objections received), MS-LOT (acting on behalf of the Scottish Ministers) carried out an appropriate assessment ("AA") under Regulation 48 of the Conservation (Natural Habitats, &c.) Regulations 1994 ("the 1994 Regulations"). The Scottish Ministers, as a competent authority under the 1994 Regulations, has to be satisfied that the proposal will not cause an adverse effect to the integrity of any European site (SACs and SPAs) either alone or in combination with other plans or projects before the proposals can be licensed.

To inform the AA, MS-LOT sought advice from relevant experts namely Scottish Natural Heritage ("SNH"), the Royal Society for the Protection of Birds ("RSPB"), Whale and Dolphin Conservation ("WDC"), Dee District Salmon Fishery Board ("Dee DSFB") and Marine Scotland Science ("MSS"). The advice received from each of these bodies was reviewed and considered by MS-LOT and informed the conditions attached to the AA.

Based on the AA and advice received from relevant experts, MS-LOT is content that the AHEP will not adversely affect the integrity of any European site (either in isolation or in combination) subject to AHB's strict adherence to the conditions documented in the AA (which will also be attached to the EIA consent and any marine licence granted). MS-LOT is satisfied that the mitigation and monitoring required to be implemented by AHB (via marine licence conditions) will adequately minimise impacts to salmon, pearl mussel, bottlenose dolphin and sea birds in, and in the vicinity of, Nigg Bay.

Potential effects of pollution from the Tullos Burn, including increased biological oxygen demand

Whilst inputs into the Tullos Burn are not a matter within the regulatory competence of MS-LOT, acting on behalf of the Scottish Ministers under the Marine (Scotland) Act 2010, decreases in water quality in the Scottish marine area due to the licensable marine activities in the Scottish marine area must be considered. AHB responded to

the objector on the matter of increased biological oxygen demand (“BOD”) with reference to the modelling carried out as part of the ES. Concentrations of any contaminants or effluent discharging into Nigg Bay will increase due to the presence of the AHEP. However, BOD within Nigg Bay is likely to reduce, due to increased water depth in certain higher risk areas. To mitigate for any effects of any contamination entering and being held behind the proposed breakwaters, a condition is attached to the marine licence to ensure appropriate siting of the anthropogenic discharges is given full consideration as part of the Construction Environmental Management Document (“CEMD”). A condition to monitor water quality, including suspended sediment concentrations, is included in the dredging and disposal marine licence.

Consultation – lack of leaflet drop and no provision of non-English documentation

In accordance with Regulation 16 of the 2007 Regulations and S. 26 of the 2010 Act, MS-LOT instructed AHB to publicise the marine licence applications, ES and further information submitted in respect of the AHEP. AHB met the pre-application consultation requirements of the Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013. MS-LOT consider that AHB have met all the consultation requirements of the relevant legislation.

Financial case, given oil and gas downturn

AHB maintain the need for the AHEP despite the downturn in the oil and gas sector based on the restrictions in vessel sizes posed by the existing AHB facilities being a major disadvantage, an issue acknowledged in NPF3, which recognises the AHEP as having national significance due to the importance of Aberdeen Harbour to the oil and gas sector.

Generation of litter

A condition ensuring the licensee must ensure the site is maintained in good repair will be attached to the marine licence.

Scale of development and visual impact

The AHEP is recognised by the Scottish Government as one of only 14 infrastructure projects considered as having national significance. NPF3 recognises the importance of Aberdeen Harbour to the oil and gas sector, as well as acknowledging the need to expand the harbour to address capacity constraints, and to secure new business streams in the region. AHB will work with Historic Environment Scotland (“HES”), Aberdeen City Council (“ACC”) and other statutory authorities to agree a suitable approach to landscape mitigation to minimise the visual impact on historic assets and have attested to site construction materials and machinery carefully.

Flood risk

The ES includes a flood risk assessment based on a 1 in 200 year return period flood level and with a 100 year climate change allowance. The works are designed to withstand such predicted flooding.

Water Framework Directive (“WFD”) requirements on consenting authorities

MS-LOT has carried out the licensing function of Scottish Ministers under Part 4 of the Marine (Scotland) Act 2010 in accordance with the responsibility to exercise the function so as to secure compliance with the requirements of the WFD.

MS-LOT, in considering the applications, has consulted SEPA, as the relevant statutory consultee, and carried out assessments of the effects of the dredging, disposal of dredged substances and objects and construction associated with the AHEP on the Don Estuary to Souter Head waterbody and the Dee (Aberdeen) Estuary. MS-LOT is content with the conclusions of the ES, that the WFD status of the Don Estuary to Souter Head and the Dee (Aberdeen) Estuary waterbodies will not permanently deteriorate as a result of the AHEP.

Lack of local benefit and amenity use of the area for recreation and wellbeing

It is accepted that the amenity use of Nigg Bay itself will be lost as a result of the AHEP, however AHB have confirmed that all temporary terrestrial construction areas will be fully reinstated to their previous condition upon completion of the AHEP, thus ensuring that these aspects of greenspace are retained. It is MS-LOT's understanding that, in relation to AHB's planning application, ACC will seek compensatory habitat creation and management measures, including the adjoining areas of greenspace and coastline, and potentially in other parts of Aberdeen, particularly in relation to the loss of coastal habitats and fragmentation of a linear coastal nature conservation site.

Lighting during construction and operation

A condition has been included on the marine licence requiring AHB to submit a lighting plan, including a strategy for dimmed and directional lighting, as part of the CEMD, for the approval of MS-LOT prior to works commencing.

Local inquiry

MS-LOT is content that all material considerations relating to the Scottish marine area have been addressed in the ES, the clarification notes (further information) subsequently submitted by AHB to address concerns raised during the initial consultation, the AA and within the consultation responses received from relevant expert bodies/advisors. MS-LOT therefore does not consider it appropriate for a local inquiry to be instigated under the 2007 Regulations in regards to the outstanding public objections. Under the Harbours Act 1964, Transport Scotland have opted to handle the outstanding objections via a written representations process rather than causing an inquiry to be held. In regards to the terrestrial concerns raised by the local residents, it is MS-LOT's understanding that these will be addressed as appropriate by ACC during their consideration of AHB's planning application.

4.2 Advisory and regulatory body consultation

As part of the consideration of the applications and the ES, MS-LOT undertook wide-ranging consultation with advisory and regulatory bodies to gather expert advice on

the validity of the ES document and the conclusions of environmental effect drawn. An initial period of consultation opened on 06 November 2015 and closed on 18 December 2015, this was followed by a consultation on the Additional Environmental Information Report (further information) between 26 April 2016 and 07 June 2016, and consultation on the updated applications between 23 May 2016 and 19 June 2016.

Consultation requests were sent to:

Consultee	First Consultation Response Date	Second Consultation Response Date
Aberdeen City Council (ACC) *	16 December 2015	26 May 2016
Aberdeen Fisheries Office		
Association of Salmon Fishery Boards (ASFB)		
British Shipping		
Dee District Salmon Fishery Board (Dee DSFB)	18 December 2015	
Defence Infrastructure Organisation (DIO)	20 November 2015	28 April 2016
Don District Salmon Fishery Board		
Cove & Altens Community Council		
Health and Safety Executive (HSE)		
Historic Environment Scotland (HES)	11 December 2015	01 June 2016
Marine Safety Forum (MSF)		
Marine Scotland Science (MSS)	23 December 2015	08 June 2016
Maritime Coastguard Agency (MCA)	17 December 2015	18 May 2016
Nigg Community Council		
Northern Lighthouse Board (NLB)	01 December 2015	08 June 2016
Royal Society for the Protection of Birds Scotland (RSPB Scotland)	18 December 2015	03 June 2016
Royal Yachting Association (RYA)		24 May & 07 June 2016
Scottish Environment Protection Agency (SEPA)	16 December 2015	03 June 2016
Scottish Fishermen's Federation (SFF)		
Scottish Fishermen's Organisation (SFO)		
Scottish Natural Heritage (SNH)	18 December 2015	01 & 06 June 2016

Scottish Water	17 December 2015	23 May 2016
Scottish Wildlife Trust (SWT)		
The Crown Estate		
Torry Community Council**	14 December 2015	
Transport Scotland (TS) *	14 December 2015	08 June 2016
Visit Scotland		
Whale and Dolphin Conservation (WDC)	18 December 2015	07 June 2016
UK Chamber of Shipping		

*denotes other regulatory authorities carrying out their own consultation process

** denotes response through public consultation

Grey box denotes no response.

4.3 Consultation responses – nature conservation concerns

4.3.1 SNH Response

First Round of Consultation

A. Concerns

1. A separate marine licence application should be made in the future if the proposal for the construction of a jetty is taken forward.
2. The ES states that there would be investigation into further means to reduce noise. This is not sufficient to conclude no adverse effect on the SAC until effects and mitigation are sufficiently defined and robust that their practicality and effectiveness in Nigg Bay can be demonstrated.
3. If complete construction of the breakwaters is carried out before other aspects of the construction take place, this would provide sufficient reduction in noise to conclude no adverse effect on site integrity of the Moray Firth SAC for bottle nose dolphins. If only partial construction of the breakwaters or other means of noise reduction are proposed, then further assessment, including underwater noise modelling is required to demonstrate these means would be sufficient to avoid an adverse effect.
4. The information in the ES and Habitats Regulations Appraisal (“HRA”) provided with the application is not sufficient to conclude that there would not be an adverse effect to the integrity of SPAs for eider duck on the east coast of Scotland, in particular, the Ythan Estuary, Sands of Forvie and Meikle Loch SPA.
5. The proposed harbour will reduce the wave climate within Nigg Bay, thereby helping to protect the sediments within the SSSI (a finite resource) from erosion. However, the proposal also has the potential to adversely affect the interests of Nigg Bay SSSI by obscuring the sediments through vegetation growth and destabilising the cliffs by construction above them. These impacts are not identified or assessed in the ES.

6. This project will result in major and fundamental changes to the landscape and visual character of Aberdeen City, in particular its coastline. It will also result in changes to the popular adjacent green space at St Fitticks that has recently undergone major enhancements of its landscape and biodiversity for the benefit of the local and wider community.
7. Greater clarity is required on the relationship of the Design and Access Statement to any consents, the harbour order and the proposed Nigg Bay masterplan, particularly on how and when mitigation and compensation would be achieved and could be incorporated into a design and build contract.
8. The proposal has the potential to affect marine European Protected Species EPS, namely cetaceans, through impacts such as construction noise and disturbance from vessel movements.

B. Conditions

1. A Construction Environmental Management Document ("CEMD") or similar must be provided to Marine Scotland for agreement with relevant consultees. The CEMD should include detailed construction method statement(s) and construction environmental management plans. It must provide sufficient information to support conclusions of no adverse effect on the integrity of SACs and SPAs.

These documents should include details of commencement dates, duration and phasing information of key elements of construction e.g. drilling, blasting, dredging, piling and construction of the breakwaters. They should include measures to protect the marine environment and be cross-referenced to other relevant documents such as the Marine Mammal Mitigation Plan ("MMMP").

The documents should also detail how each and all contractors and sub-contractors will be made aware of environmental sensitivities, what requirements they are expected to adhere to, how chains of command will work including shore to vessel communications etc. In addition, there is a need for regular updates on construction activity, issues encountered and how these have been addressed.

These documents should be submitted prior to the commencement of any works within a timescale to be agreed with Marine Scotland.

2. An MMMP must be developed, to include full details of all mitigation measures and be cross referenced to the CEMD. The measures should include:
 - restriction of piling and blasting activities,
 - use of Marine Mammal Observers ("MMOs") and Passive Acoustic Monitoring ("PAMs") during piling/blasting/noise activities to ensure

- that start up does not occur while dolphins, seals (and other cetaceans) are within the mitigation zone,
- details of how this would be managed over the 1km area and any amendments that may be required,
 - use of soft start for piling operations and adherence to relevant JNCC guidelines (except where amendments have been agreed) and other best practice.
3. A Vessel Management Plan (“VMP”) providing details on vessel numbers, their speeds and frequency of trips and routes (creation of high and low disturbance areas), must be produced. The Plan should include details of how vessel management will be coordinated, particularly during construction, but also during operation, and should be cross-referenced with the CEMD.
 4. A code must be developed to guide the behaviour of boats in and in the vicinity of the harbour around marine mammals and rafts of birds.
 5. A management programme for the SSSI must be developed, to include regular visual inspections, clearing of sections of vegetation and access to the site.
 6. A lighting strategy must be developed, for dimmed and directional lighting.
 7. Full details of a landscape mitigation and compensation scheme must be provided and how it would effectively mitigate and compensate for the scale of significant local impacts. The scheme should consider enhancements and linkages to greenspace in the wider area to increase its benefits for the local community. One such measure to consider is protecting and maintaining a meaningful open space to St Fittick's to avoid significant fragmentation.
 8. Key design principles must be developed and incorporated into the design and build contract to ensure that impacts assessed within the EIA process are addressed.

C. Objection

SNH objected to the proposed development because of the potential effects of underwater noise on bottlenose dolphin and the lack of evidence to support conclusion of no adverse effect on the SPA integrity, in terms of eider ducks.

D. Action Taken

AHB produced two clarification notes on underwater noise and blasting on 23 February 2016 and 16 March 2016, respectively. The first clarification document proposed the requirement for partial construction of the breakwaters prior to marine impact piling, with the second one adding the requirement for deployment of bubble curtains where blasting will be carried out in ‘open water’ to reduce the propagation of underwater noise.

AHB produced a clarification note on 25 February 2016, which answered questions about the extent of suitable foraging habitat for eider ducks in the existing Nigg Bay, the suitability of the new structures and other areas within the new operational harbour to provide foraging habitat, and what mitigation measures could be implemented to enhance the quality of these habitats. The clarification note concluded that although some areas of eider foraging habitat will be lost as a result of the development, the artificial structures and remaining undeveloped areas of Nigg Bay will provide sufficient substitute habitat, so there will be no net loss of eider foraging habitat, and therefore no adverse effects on eider using Nigg Bay.

The use of seeded mussel ropes to provide further feeding resource for the eiders was presented through AHB's further clarifications of 14 and 24 March 2016. AHB's response of 30 March 2016 accepts the inclusion of conditions suggested by SNH in any marine licence. AHB, MSS and SNH attended a meeting on 16 May 2016 where the mussel rope proposal was rejected due to the practical limitations of installation and unknown level of success.

Second Round of Consultation (which included clarification notes detailed above)

A. Concerns

There have been no further concerns.

B. Conditions

SNH retained conditions from the first round of consultation and requested that the following are also included in any marine licences:

1. Impact piling must only be carried out in areas from which it is screened from the open water by the presence of a fully or partially constructed breakwater(s) so that there is no direct line of sight between the location of the piling and open water.
2. Blasting will either be carried out behind double bubble curtains or from areas from which it is screened from the open water by the presence of a fully or partially constructed breakwater(s) so that there is no direct line of sight between the location of the charges and open water.
3. The VMP must include a general presumption of avoidance of the area around Girdle Ness and Greyhope Bay during construction and operation of the harbour.
4. The code for vessels during operation of the harbour must include avoidance of the area around Girdle Ness and Greyhope Bay.
5. A monitoring strategy must be developed to record:
 - underwater noise, produced from piling and blasting and effectiveness of mitigation,

- use of Nigg Bay by marine mammals during construction,
- use of the new harbour and its surroundings by eider duck during construction and once it is operation,
- impacts to Nigg Bay SSSI during construction.

C. Objection

SNH submitted a conditional objection.

D. Action Taken

AHB have agreed to fulfil these conditions, as per SNH's request, and they will be included in any marine licence granted

4.3.2 SEPA Response

First Round of Consultation

A. Concerns

1. The use of water resistant materials and forms of construction should be used as appropriate.
2. It should be recognised that although this water body is at Poor Status for hydromorphology it should be ensured that no further deterioration in hydromorphological status to Bad Status occurs in this water body due to new coastal development in the future.

B. Conditions

The following conditions were requested:

1. For this scale of development a Construction Environmental Management Document (CEMD) is a key management tool to implement the Schedule of Mitigation. This document should form the basis of more detailed site specific CEMPs along with detailed method statements.
2. The CEMP must provide:
 - details of works relating to currently SEPA authorised discharges/abstractions from within the development area,
 - details of works relating to the discharge of the East Tullos Burn,
 - demonstrate that Scottish Water sewer infrastructure has been appropriately identified, and protected, within the development area,
 - details of measures to prevent the introduction of alien species. Further advice and guidance on this is available in our guidance note 'SEPA standing advice for The Department of Energy and Climate Change and Marine Scotland on marine consultations'.

C. Objection

SEPA submitted a conditional objection to the development.

D. Action Taken

AHB responded on 12 January 2016 accepting these conditions. Further clarification was provided on 17 February 2016 with regards to AHB's plans to retain the East Tullos Burn culvert in its existing location and at its existing diameter. The culvert will discharge into deeper water due to dredging activity and AHB will install a manual sluice gate so that water flow through the culvert can be controlled by ACC.

Second Round of Consultation

A. Concerns

SEPA did not express any concerns. See detail provided in D below (Action Taken).

B. Conditions

Conditions 1 and 2 from the first round of consultation still stand.

C. Objection

SEPA submitted a conditional objection, however AHB have agreed to SEPA's conditions and they will be included on any licence granted.

D. Action Taken

MS-LOT's Request (27 April 2016)

During the second round of consultation MS-LOT asked SEPA for specific advice on the Water Framework Directive Assessment (WFD) offered by AHB in light of the further information provided as part of the Additional Environmental Information Report. The query was mainly made with regards to the increased dredge disposal amount and elevated sediment contamination levels.

SEPA's First Response (03 June 2016)

The response concluded that it is unlikely that sea disposal of the dredged material will negatively impact the marine environment, due to the fact that none of the level 1 action limits had been exceeded in the sediment. There might be some impacts due to the increase in suspended solids during the month of dredging, but they are unlikely to affect the WFD classification.

However, there were revised Action Level 1 ("AL1") and revised Action Level 2 ("AL2") breaches in both 2015 and 2016 sediment sampling data and dredging is planned for approximately 19 months rather than one month, so MS-LOT queried SEPA's response on 06 June 2016.

SEPA's Second Response (05 July 2016)

The response stated that SEPA were aware of the duration of dredging activities with the reference to one month being an error. SEPA had not given consideration to the level 1 and 2 breaches in the 2015 data, as AHB had claimed they were erroneous.

However, MS-LOT were still considering the validity of discarding the 2015 results, so SEPA were contacted on 15 July 2016, requesting that both the 2015 and 2016 data are assessed and their advice is amended accordingly.

SEPA's Third Response (02 August 2016)

SEPA's third response was with regards to E. Coli concentrations and their effects on Aberdeen's bathing waters. MS-LOT responded to SEPA stating that the response was with regards to AHB's query rather than MS-LOT's.

SEPA's Fourth Response (03 August 2016)

SEPA stated that the Marine Chemist who provided specialist advice, had left SEPA and as such MS-LOT would have to defer to their in-house advisors. MS-LOT responded to SEPA asking that a final response is issued, as there are still outstanding comments from SEPA's previous replies.

SEPA's Fifth Response (17 August 2016)

SEPA issued a response that accepted AHB's WFD assessment on the grounds that the 2015 data were disregarded and the 2016 data were robust.

SEPA's Sixth Response (21 September 2016)

Further to AHB's provision of Interek clarification memo regarding the potential impact of the AHEP on the classification of the Aberdeen bathing water, SEPA confirmed that they accepted AHB's conclusions, namely that the proposed changes will not adversely impact on the 90 & 95 percentile bacterial concentrations at the beach. Therefore, SEPA's concerns regarding degradation of the bathing water classification have been addressed and they have no further issues regarding water quality.

Conditions advised by SEPA will be included in any marine licence if granted.

4.3.3 MSS Response

First Round of Consultation

A. Concerns

Marine Mammals

1. We advise that the C-POD (Continuous Porpoise Detection) data would have been more readily interpreted if they had been summarised over each month of deployment, rather than over each device deployment.
2. The technical appendix produced by Kongsberg is of good quality, although it is constrained due to the approach taken to use a design and build contract, which means that many of the details of the construction works are still unclear.

3. It is likely that marine mammals will be disturbed from the area. The consequences of this are likely to be most significant for the east coast of Scotland bottlenose dolphin population, which is protected in the Moray Firth SAC. Such effects have not been quantitatively assessed in the ES or accompanying HRA. This issue may need to be addressed for an Appropriate Assessment to be concluded.
4. It is likely that other cetacean species will also be disturbed (particularly harbour porpoise) by the piling works and so an EPS licence will be required for disturbance.
5. Noise levels from blasting may well be very much greater than those from piling. Source levels of 259 dB re 1 μ Pa at 1m are very much at the upper end of those assessed by MSS in other applications. The intention is to drill holes into which the explosives will be placed with the assumption that this will reduce the noise levels in open water. However, the applicant has not provided likely values to which the noise level will be reduced.
6. Consideration should be given as to whether the breakwaters' construction could be scheduled so that they are constructed first and then piling and blasting activities carried out behind them, to limit the noise levels at sea.
7. Dredging and dumping of dredge spoil, which is likely to include granite rocks is likely to require consideration in terms of mitigation to ensure that this activity does not injure marine mammals.
8. Any AA that is undertaken will need to take account of other activities which may affect the bottlenose dolphin population. This might include wind farm construction on the east coast of Scotland and other port developments within the dolphins' range. It may be possible that the AA can draw upon results of monitoring in the Cromarty Firth during port construction there.

Ornithology

9. Little information on the population level consequences of displacement of eider from this area is provided. The mitigation suggested in the application documents is the planned southern breakwater providing suitable refuge/foraging areas, but the evidence to support this assumption is lacking.
10. The area south of the planned southern breakwater has not been identified as a current key area, perhaps due to the greater water depth and its exposed nature. It is unclear whether the presence of the southern breakwater will change this.

Fish Ecology

11. There is a lack of information on the 'most likely' duration of piling activity and the extent of explosive activity to take place at the site.
12. Consideration of noise mitigation such as partial or complete construction of the North and South breakwaters prior to the onset of piling activity, soft start, bubble curtains, foam sheeting or mattresses, as mentioned within the ES, should be explored further to help minimise any potential localised impacts.

Benthic Ecology

13. No mitigation measures are suggested or discussed regarding the impacts from permanent loss of seabed and introduction of suspended solids.
14. Local ecosystem services will be greatly affected by the development which may have a knock-on effect at greater scales - this should be discussed in the document.
15. With regard to the increased levels of underwater noise/vibration, some limited information is now available on the impacts on invertebrates suggesting that many species are sensitive to vibration.
16. There is no information about the habitats, the thickness of deposits or any proposed mitigation, for the sediment deposition over a 71km area.

Physical Environment, Commercial Fisheries and Chemistry

No concerns were identified.

Diadromous Fish

17. Further consideration should be given to the fact that both the habitat change and the potential for disturbance could result in fish not using the area or using it less. This would pose the question of whether fish would be able to use alternative areas, without impact on the populations.
18. There is a need to consider further what monitoring and contribution to research would be appropriate in connection with diadromous fish. The plans by the Dee DSFB to carry out acoustic tracking work on smolts including in vicinity of the mouth of the Dee, may be relevant.

Socio-economics

19. There is a lack of explanation for how the future economic impact figures used were calculated in the technical appendix.
20. Can a breakdown on jobs in each year for construction and operations be provided rather than using job years.

Aquaculture

21. It is noted that an intake pipe that provides water to the Marine Laboratory Aquaria is situated in the area of the proposed development. The aquarium manager is fully aware of the proposals and is engaged in ongoing discussion with the applicant to agree a course of action to relocate the pipe.

- B. Conditions
No conditions were requested.
- C. Objection
MSS did not object to the development, however they advised MS-LOT to seek further clarification and input from AHB to address their concerns.
- D. Action Taken

Marine Mammals

AHB produced an Underwater Noise clarification document on 23 February 2016. AHB produced a Blasting Methodology and Mitigation clarification

document for SNH, which was sent to MSS on 16 March 2016. MSS responded on 01 April 2016 stating that they were content with the plan to construct the breakwaters prior to piling. However, MSS was concerned about the source level of the noise generated through blasting, which exceeds the thresholds for injury to all marine mammal species. The predicted range for permanent change in hearing ability is approximately 820m and MSS had concerns that MMOs and PAM would not effectively monitor such a large area. MSS advised that AHB should consider alternative mitigation strategies and methods of breaking the bedrock, but also that anticipated duration of the blasting activities can lead to disturbance. MSS mentioned that the cumulative effects of the Moray Firth and Forth and Tay wind farm developments should be quantitatively accounted for. However, these comments did not incorporate the information given in the Blasting clarification document. The complete response was issued on 11 April 2016 and requested further information regarding the integrity of a bubble curtain under differing weather conditions. MSS asked that AHB produce a comprehensive plan for mitigation of the effects of blasting noise to determine the effectiveness of the bubble curtain, as part of the CEMP. A reminder note was made on the requirement for AHB to consider the cumulative effects of the development with the Moray Firth and Forth and Tay wind farms.

To address the issues raised during consultation, AHB then provided further information via an Additional Environmental Information Report (incorporating clarification notes on underwater noise and on blasting methodology & mitigation), which prompted a further 42-day consultation process.

Ornithology

AHB, SNH, MSS and MS-LOT met on 17 February 2016 to discuss concerns about the development's impact on eider, kittiwake and terns. AHB were tasked with providing further clarification to support their argument. These parties also met on 16 May 2016 along with RSPB and discussed the potential of utilising mussel ropes to provide further food source for the eiders as compensation for loss of existing habitat. However, the decision was made by AHB, with agreement from SNH and RSPB not to proceed with the mussel ropes due to the practical limitations of installation and unknown level of success.

Fish Ecology, Benthic Ecology and Diadromous Fish

AHB responded to MSS concerns on 23 February providing further clarification.

Chemistry, Physical Environment, Commercial Fisheries and Aquaculture

No further actions.

Socio-economics

Following AHB's response of 23 February 2016, MSS responded on 17 March 2016 requesting clarification regarding the calculation methods employed in regards to the socio-economic assertions made by AHB in the ES. AHB requested that their consultant speak directly to the relevant MSS socio-economics specialist and a teleconference was subsequently arranged for 30 March 2016. Following the teleconference MSS confirmed that AHB had provided sufficient clarification during their discussion to reassure MSS that the calculation methodologies employed were robust. MSS' socio-economic

specialist noted that they were therefore content and had no further comments at present.

Second Round of Consultation

A. Concerns

Marine Mammals

1. Appendix 10 of the ES and the Blasting Methodology and Mitigation clarification note mention that there will be no spatial overlap of noise impact from Moray Firth and Forth & Tay wind farm projects. Whilst this may be true, the species of greatest concern (bottlenose dolphin) ranges widely between the inner Moray Firth and the Firths of Tay and Forth. It is known that animals from the Moray Firth SAC forage on the east Grampian coast during winter, and animals do move between the Moray Firth SAC and the Firth of Tay. Therefore, the AA should consider the cumulative effects of disturbance from the AHEP and all other licensed or consented developments within the range of the bottlenose dolphins. Cumulative pressures on a population may be additive despite not overlapping temporally.

Ornithology, Commercial Fisheries, Fish Ecology, Benthic Ecology, Socio-economics and Aquaculture

No concerns were raised.

Physical Environment

2. The increase in sediment to be dredged and disposed will have to be reflected in the modelling exercise of the sediment plumes as it exceeds the worst case example investigated.
3. It is stated that all rock will be used within the harbour works and will not be disposed of offshore. The amount of rock has more than doubled and this statement may not be realistic anymore.
4. There is uncertainty as to whether the timing of when the rock will be available and when it will be needed for the construction is synchronised.
5. The Additional Environmental Information Report states that the conclusions of the ES relating to the effects of disposal and plume dispersion remain valid, however there is a substantial increase in volume which has not been backed up by further modelling.
6. Clarification is required as to how the physical composition of substances from the 2016 chemistry data compare to the ones from 2015.
7. There might be discrepancies with the representation of different scenarios, as they were run for only one spring-neap cycle.
8. Using only one mean state will not represent any variability of the plume dispersal. It would be better to represent different scenarios under variable forcings.
9. There is no clarity as to when would operations stop, during stronger than average winds.
10. The suggested total increase in bed level at the disposal site of 6.471m will have to be adjusted to reflect the increased disposal volume.
11. The re-sampling of a few locations might be a way to rule out heavy metal contamination.

12. Further clarification is required to accept that the 2015 results are erroneous and should be discarded.

Diadromous Fish

13. There is a need for better information to be presented on the current use or realistic likely use of Nigg Bay by diadromous fish, including salmon.
14. There is a need to advance plans for appropriate monitoring/contribution to research both prior and during construction. AHB mentioned in a previous response that they would be developing a monitoring programme to track adult salmon entering the River Dee using salmon to be netted at Altens. MSS have not heard anything further on this, or indeed on any other plans.
15. MSS have not heard anything further on matters related to HRA with respect to salmon SACs.

Chemistry

16. There is no information about the laboratory's accreditation status (2013, 2015 and 2016 results).
17. The information provided for the 2013, 2015 and 2016 data does not state whether samples were sieved prior to analysis, nor whether partial digestion or a total digestion procedure was employed in the metals analyses.
18. There is no information on the precision or standard uncertainty for the 2015 results.
19. A greater risk of adverse biological effects than indicated by the Additional Environmental Information Report may be identified, should the Effects Range Low ("ERL") and Effects Range Median ("ERM") values for the individual polyaromatic hydrocarbons ("PAH") concentrations are taken into consideration, rather than their sum.
20. There are concerns about whether, post-deposition, the concentrations at the disposal site are likely to exceed ERL and/or ERM concentrations. If so, information on the length of time before they are predicted to decline to acceptable levels is required.
21. Whilst both the 2015 and 2016 data were analysed by the same laboratory, the information provided does not make clear whether the same particle size fractions of the sediment were analysed, nor whether the same methods were used, nor whether the quality of the analyses were adequate.
22. No explanation was provided to suggest how the contamination of the 2015 data had occurred, although AHB have rejected the data.
23. It is not clear whether the same contractor undertook the sampling in both 2015 and 2016, nor whether they did something different in 2016 to protect against contamination. If no additional procedures were put in place, then the 2015 sub-surface metals data are just as valid
24. AHB wish to exclude the full set of 2015 data, however no explanation has been given as to why the PAH data should be discarded.
25. AHB assert that the material is fit for sea disposal, although they have not adequately explained why that should be the case, considering that many of the sub-surface samples from 2016 had metals concentrations that were above AL1.

26. Core RC2016-16 had the highest number of AL1 breaches of any core and was collected from very close to core M2015-1, the concentrations of metals in which, were not too dissimilar. This leads into question the adequacy of the 2016 sampling/analyses, and/or the decision to reject the 2015 data.
27. The bioavailability of the sediments that are above AL1 should be investigated by AHB. However, criteria for judging 'safe' levels may not exist.
28. It is suggested that AHB calculate weighted average (and SD) concentrations for trace metals in the glacial till layer and for the overlying sandy material to demonstrate whether concentrations for the materials overall are significantly above/below Action Levels.
29. AHB have to demonstrate that there will not be an unacceptable environmental impact during the operations, in terms of the WFD assessment. Despite the breaches of AL1 for sub-surface sediments, the Additional Environmental Information Report stated that the 2016 sampling supported the original statement of no significant release and negligible impact. As concentrations of several elements were reported to be higher than was previously known, and as the volume of material that is being disposed is now much larger than was the case originally, AHB have not demonstrated a negligible impact.

- B. Conditions
No conditions were requested.
- C. Objection
MSS did not object to the proposal.
- D. Action Taken

Marine Mammals

MSS responded to the second round of consultation on 08 June 2016 with cumulative effects concerns as above. MS-LOT met with SNH and MSS to discuss the AA. During the meeting it was agreed that MSS (in collaboration with SNH) would conduct modelling to carry out a cumulative assessment of the potential effects to the east coast of Scotland bottlenose dolphin population from the AHEP and other developments within the dolphin population's range. A Population Viability Analysis (PVA) model was run by MSS to provide a baseline assessment of the population with no impact, and further scenarios were run with different developments added. The effect of the AHEP was small alone, and also when combined with other developments. All population size outcomes were statistically indistinguishable from each other and from the baseline population. When the worst case scenario (the AHEP plus Moray Firth and Forth and Tay wind farms) was run to 10 years following the end of construction activities, the population trend was stable, and potentially increasing slightly. This indicates that under this worst case scenario, the population is not predicted to be pushed into decline.

MSS noted that having now considered cumulative effects in a more quantitative manner, their conclusion concurred with SNH advice in that that they also do not consider that the AHEP in combination with other

developments would have an adverse effect on the integrity of bottlenose dolphin feature of the Moray Firth SAC, subject to the mitigations proposed.

MSS requested that the following conditions be attached to the AA and marine licences;

1. Blasting at night only occurs in exceptional circumstances, with MS-LOT being notified each time.
2. Blasting is only permitted for a maximum of 7 months in total.

Ornithology, Commercial Fisheries, Fish Ecology, Benthic Ecology and Aquaculture

No further actions.

Physical Environment

AHB produced a clarification note in response to MSS' comments on 29 June 2016 including confirmation of the following:

- the updated dredge volumes provided in the Additional Environmental Information Report are based on the maximum calculated volumes from any of the three contractors tendering for the project and it is unlikely that the preferred contractor will propose a greater volume than that stated in the revised application; however, if they do, they will be required to apply to Marine Scotland for a revision to the marine licence, with supporting evidence including revised modelling if necessary;
- 100% of the rock dredged will be reused in the construction of the harbour. No rock will be disposed offshore;
- a proportion of suitable material to be dredged (most likely sands and gravels, but potentially also glacial till) will be reused in the construction of the harbour. The volume to be reused cannot be confirmed at this stage as it will be dependent on the successful contractor's methodology; however, AHB can confirm that the volume of material to be disposed offshore will not exceed the volume that has been modelled in the Sediment Plume Modelling Report (Appendix 7-D of the Environmental Statement (ES)). The existing modelling report therefore remains valid for the revised disposal volume;
- as noted in Chapter 3 of the ES, the disposal of the total volume of dredged material (except for the rock) is a worst case scenario. AHB will work closely with the successful contractor to seek opportunities to reuse suitable dredged materials, as set out in the Best Practicable Environmental Option (BPEO) Report;
- there are similarities between the previously applied and revised PSDs, although the revised distribution shows that there is a reduction in the volume of fine material to be disposed, and an increase in the volume of sand. The original modelling results show that sand particles remain within the disposal site, so there is predicted to be a reduction in the dispersion of fine sediment;
- the original sediment plume modelling was based on the disposal of 2,190,000 m³. As stated above, the volume to be disposed offshore has not increased. The disposal rate per day therefore remains unchanged from the original modelling.

MSS responded on 07 July 2016 asking for the standard deviations/error bars around the calculations and for an indication of the order of magnitude of the error bars. MSS noted that even if the amount material to be disposed of stays the same, the amount of dredged material would increase which would require further modelling. The queries about timing of availability of rock and its use for construction, the cut-off for working in bad weather and the necessity to represent different scenarios under variable forcings were submitted again. MSS also requested further clarification regarding the depth that material will be released by the dredge hopper/barge and about the sensitivity testing that was run during the model setup.

MS-LOT received an email from AHB on 14 July 2016 which included confirmation of the following:

- the updated volumes provided in the Additional Environmental Information Report are based on the maximum calculated volumes from any of the three contractors tendering for the project. It is unlikely that the preferred contractor will propose a greater volume than that stated in the revised application; however, if they do, they will be required to apply to Marine Scotland for a revision to the Marine Licence, with supporting evidence including revised modelling if necessary;
- the plots provided in Intertek's memo (Appendix A of AHB response dated 29 June 2016) show that sediment spill released during the dredging operation will have limited effect outwith the harbour area due to low current velocities at this location;
- AHB have made a firm commitment that no rock will be disposed offshore. In the event that rock or other materials are dredged earlier than they are required for construction, they will be temporarily stored within the site boundary;
- In the hydrodynamic modelling ("HDM") report (ES Appendix 6-B) 'storm' conditions were modelled as mean spring conditions, with high fluvial discharge (10%ile flow) with no storm surge. Extreme conditions were modelled as high spring conditions with a 1:200 year river flow and 1:200 year storm surge conditions. Differences between 'average' and 'storm' conditions are presented in the HDM report and show that there is minimal effect to hydrodynamics and therefore will not noticeably affect the results when applied in the sediment plume modelling (ES Appendix 7-D);
- the approximate draft of the hopper/barge to be used for disposal operations is between 3.5m and 5.5m. The release of dredge spoil would occur through bottom-opening doors at this depth; and
- section 3.3 of the HDM report (ES Appendix 6-B) details the set up for the sediment plume models and Table 3-3 (Modelled wave conditions derived from ReMap model data) shows the wave conditions that were applied. Confusion may be due to wind not being applied directly as coupled module within the sediment plume model but being included as a wave field. There were minimal differences between these two applications of the data.

During a meeting between AHB and MSS on 18 July 2016, MSS stated that further clarification was still required in regards to Particle Size Distributions (“PSD”) and dredging spill depth implications. AHB submitted an Intertek clarification memorandum titled ‘Redeposited Sediment Depths From Dredging Spill’ on 22 July 2016 providing the requested clarification, which MSS accepted on 25 July 2016.

Diadromous Fish

MSS submitted further comments on 22 June 2016 expressing concerns about lack of information, the likelihood of the unavailability of an area currently used by salmon and the extent to which other areas will likely be substitutes without impact on populations. AHB responded to MSS on 23 June 2016 stating that it was their understanding there were no outstanding issues which would have to be resolved pre-consent. MSS responded on 01 July 2016 stating that although there is not enough information on the topic of diadromous fish in Nigg Bay, it is up to MS-LOT to make a determination and for outstanding issues to be dealt with through the CEMP. MSS sent a further request, on 02 August 2016, for a condition to be included in the marine licences that relates to salmon tracking and monitoring as part of the development. On 19 September 2016 MSS asked that the monitoring condition is amended so that it incorporates monitoring before initiating any works, however upon receiving advice from MS-LOT about timescales and that such a condition had not been requested before, MSS were satisfied with post-licence monitoring. The following condition was requested:

3. AHB must develop a monitoring programme to track adult salmon in the vicinity of the development site and entering the River Dee.

Chemistry

AHB produced a clarification note combining their chemistry and physical environment comments on 29 June 2016. MSS reviewed the supplied data and requested information on inter-laboratory competitions marking, quality control and particle size distribution. MSS notified MS-LOT on 15 July 2016 that they had accepted AHB’s comments. Quality control and standard operating procedures were supplied to MSS later. Refer to 6.1.1 later.

Socio-economics* see above

Following the receipt of a public representation expressing concerns about the economic need for the project, MS-LOT contacted MSS to ask for updated comments. MSS advised that the BIGGAR report survey used to justify AHB’s case for development in the ES was conducted in 2013, when oil prices were high, compared to the latest downturn. MSS pointed out that the decommissioning option was presented as a worst case scenario, but has since been marketed as one of the realistic scenarios. Hence, MSS advised MS-LOT to challenge the ES’ findings and ask AHB for an updated estimation.

AHB responded to MS-LOT on 24 August 2016 asserting that the motivations for the AHEP remain valid despite the downturn in the oil and gas industry and confirming that the BIGGAR report does not contain an assumption that the oil price will be \$100 a barrel but rather takes a long term (20 year) view, taking into account the cyclical nature of the price of oil & gas. At a consistent price of

\$45 a barrel, over the 20 year period the key difference is in the type of economic activity within the harbour (i.e. maintenance and exploration versus decommissioning activities): a high oil price results in more maintenance and exploration activity, whereas a lower oil price will expedite and increase decommissioning activities during that period.

AHB further stated that the reasons for the AHEP are not as simple as overall capacity; AHB must provide the correct sort of capacity. The existing harbour operates very well for the Platform Support Vessels ("PSV") that are the workhorses for the day to day requirements of the North Sea energy industry. The type of vessel required for small/medium piece decommissioning activity is classed under the broad category of Dive Support Vessel ("DSV"). An average PSV is circa 85-90m in length with a Gross Tonnage of 3,000-3,500 tonnes and draft of 4.5-5.5m. A DSV is approximately 120-150m in length with a Gross Tonnage up to 18,500 tonnes and a draft of 6.5-7.5m. The AHEP would deliver the necessary capacity for the level of berthing that the DSVs require. The capacity for berthing DSVs is limited throughout the North East of Scotland with far greater capacity in Norway. The deeper and longer berths provided by the AHEP would also allow the harbour to attract larger cruise vessels and larger cargo vessels, whereas the existing harbour is restricted to vessels approximately 165-170m in length due to the turning circle.

The predictions stated in the BIGGAR report therefore remain valid due to the long term view taken. Whilst the oil price has remained low since the report was produced, the long term view taken by the report has accounted for the fluctuations in the oil price that have occurred throughout the life of the North Sea market.

4.3.4 WDC Response

First Round of Consultation

A. Concerns

1. Nigg Bay is a common wildlife watching area for birds and marine mammals, especially bottlenose dolphins from Torry Battery. RSPB's 'Date with Nature Dolphinwatch' and WDC's 'Shorewatch' attract a considerable number of visitors and as such WDC do not consider that the impact on wildlife watching would be negligible.
2. Whilst there is agreement that the surveys can be conducted in conjunction with monitoring, the sea bird and marine mammal surveys should have their own dedicated observers.
3. MMOs should be from a JNCC accredited source and there should be enough of them to work continuously without tiring.
4. The MMMP, Noise and Vibration Management Plan ("NVMP"), Piling Management Protocol ("PMP"), Marine Mammal Observation Protocol ("MMOP") and VMP should be developed in consultation with scientists with expertise in the Natura species to ensure that monitoring contributes to existing monitoring studies.

5. The construction of the breakwaters prior to further construction in order to retain as much of the noise generated during pile driving, drilling and blasting within the harbour, is supported.
6. Dredging is expected to last for 19 months which is very likely to cause a significant long-term displacement of marine mammals from a known foraging area.
7. All vessels should adhere to the existing Aberdeen Harbour Dolphin Code.
8. WDC does not agree that because dolphins use the harbour, they are habituated to loud noise, and therefore it is acceptable.
9. WDC has concerns that the development will have an impact on the salmon, one of the prey species of bottlenose dolphins whilst using the area.
10. An EPS licence for disturbance to cetaceans must be obtained.
11. Cumulative impacts must be sufficiently accounted for in the HRA.

B. Conditions

1. Sufficient mitigation must be in place for underwater noise generated during construction due to pile driving, drilling and blasting.
2. Drilling and blasting are only permitted during daylight hours.
3. MMOs and PAM must be conducted in parallel at all times during construction.

C. Objection

WDC objected to the development.

D. Action Taken

AHB attached the Underwater Noise and Blasting Methodology and Mitigation clarification notes to WDC for their review, to their letter of 17 March 2016. WDC's condition to restrict piling during daylight hours was accepted, whereas the restriction of drilling was rejected as it was considered to have a minor adverse impact. AHB agreed to having dedicated MMOs who will be employed from a JNCC accredited source, conducting PAM in parallel to visual observations at all times and obtaining an EPS licence. The construction timeframes for the majority of the wind farm projects are highly unlikely to overlap with the construction of the AHEP, and as such they were not considered further.

Second Round of Consultation

A. Concerns

1. An EPS licence for disturbance to cetaceans must be obtained.

B. Conditions

Condition 3 from the first consultation round still stand. Additionally,

1. Bubble curtains must be utilised to reduce noise.
2. Blasting is only permitted during daylight hours.

C. Objection

WDC removed their previous objection, but asked for conditions to be attached to any licences.

D. Action Taken

On 07 June 2016 WDC confirmed they had no further comments, but would like to be involved in the design of the CEMP process. The conditions suggested by WDC will be included in any marine licence if granted.

4.3.5 RSPB Scotland Response

First Round of Consultation

A. Concerns

1. No information is provided on the relative extent habitat loss caused by the alteration to Nigg bay in the context of other suitable habitats in the region. Specifically, there is no description of other areas that the eider ducks are likely to use nor whether they will be able to access them given their limited ability to travel during the period of moulting. Further information and analysis on the extent of alternative suitable habitat that is available to eider to better establish along with the contextualisation of the significance of the loss of habitat expected at Nigg Bay, are required.
2. More detail is required on the proposed mitigation in relation to the proven effectiveness of the measures described on any eider which continue to use the Nigg Bay area. How will flocks of sea duck be monitored and this avoidance subsequently enforced?
3. Consideration should be given to the reasons behind eiders' use of Nigg Bay environments, in order to inform any other mitigation measures.
4. The provision of artificial mollusc habitat should be explored as a potential mitigation measure.
5. Further information must be provided to support the decision that there are no potential in-combination effects with the planned European Offshore Wind Deployment Centre ("EOWDC").
6. The inclusion of mitigation such as roosting structures targeted at terns should be explored, particularly as the long-term impact of the development on the tern and wader roost in Greyhope Bay is not considered after the construction phase.
7. The inclusion of areas which are safeguarded for nesting common and arctic terns and/or gulls should be feasible within the design for the new harbour.
8. Within the development there may be opportunity to provide mitigation in the form of nesting areas for kittiwakes and such measures should be integrated into the project proposal where feasible.
9. The extent and scale of the impacts to birds, particularly in terms of duration of construction activities and potential for them to be

simultaneous or concurrent across all or some offshore wind farm projects, have not been assessed fully.

10. The production of the ES was funded on data collected from one year's worth of survey effort, which may not be sufficient nor does it provide an indication of the temporal variability in use of the site by ornithological interests.

B. Conditions

No conditions were requested.

C. Objection

The RSPB Scotland objected to the development due to insufficient information to enable a conclusion of no adverse effect on site integrity to relevant SPAs in the region.

D. Action Taken

A clarification note with regards to eider ducks was issued in February to SNH and RSPB Scotland. This was updated twice in April and submitted to the RSPB.

Second Round of Consultation

A. Concerns

1. The distribution of eider within Nigg Bay itself is likely to be due to physical characteristics of the site including predominant wind direction, wave action and tidal flow. As such, the new harbour is likely to provide similar shelter for eider once construction is complete. During construction, however, there is likely to be some displacement due to disturbance and loss of foraging habitat.
2. The Ythan Estuary, Sands of Forvie and Meikle Loch SPA and SSSI eider population is already currently under pressure.
3. The inclusion of mitigation such as roosting structures targeted at terns is recommended.
4. A full monitoring exercise of the use of the area by cetaceans, during and post construction, is recommended.

B. Conditions

1. Construction of the breakwaters must not commence between 01 June and 31 August without the prior consent of SNH and the RSPB Scotland.
2. A buffer/vessel exclusion zone around Greyhope Bay must be implemented during construction, to provide undisturbed areas for eider to loaf and feed. A minimum distance of 100m is anticipated. This will also prevent disturbance to terns and waders which use this area.
3. A Vessel Management Plan (VMP) must be implemented post construction, to avoid disturbance to moulting flocks which are likely to

utilise the harbour and in particular the area of water in front of the SSSI in the south of the new harbour.

C. Objection

RSPB withdrew their objection on 03 June 2016 subject to the above conditions.

D. Action Taken

AHB have agreed to honour these conditions, and they will be included in any marine licence if granted.

4.3.6 Dee DSFB Response

First Round of Consultation

A. Concerns

1. It is recommended that AHB listen for the presence of tagged smolts in the development zone so that appropriate adaptive mitigation steps can be implemented.
2. It is requested that continuous monitoring of suspended solids be undertaken during the construction of the harbour so that adaptive mitigation can be undertaken to reduce either the suspended solids or the presence of predators.
3. It is requested that sufficient Acoustic Deterrent Devices (ADDs) are installed at the construction site at Nigg Bay and the mouth of the Dee to discourage predators when the sediment plume is detected.
4. It is requested that the environmental monitoring associated with this scheme is regularly published on a specific website, along with accompanying commentary. This is to avoid a lack of information which may adversely impact the financial viability of the fishery.
5. Dee DSFB provided information on the fish run timing and stressed the importance of allowing for appropriate mitigation measures to be targeted to specific times of the year.
6. Dee DSFB raised concerns with regards to marine percussion/impact piling activities associated with the construction phase of the AHEP, and the potential for impacts on migratory adult salmon.

B. Conditions

1. A monitoring programme to look at fish entry into the River Dee, must be developed in partnership with MSS and Dee DSFB.
2. AHB must track adult salmon and develop an effective mitigation strategy to minimise the impacts on salmon.
3. Light levels at the breakwaters must be 1 lux or less.

C. Objection

Dee DSFB did not raise an objection to the proposed development, but requested that the above conditions are included in any licences issued.

D. Action Taken

AHB responded to Dee DSFB on 23 February 2016 stating that there will be night-time and weekend timing restrictions on marine impact piling throughout the year and that they are supportive of developing a monitoring programme to track adult salmon entering the Dee. AHB forwarded the Underwater Noise clarification note sent to SNH, stating that the partial construction of breakwaters before piling will significantly reduce noise. AHB did not consider that continuous monitoring of suspended sediment concentrations during the construction of the harbour was justified, but committed to carrying out further investigation of the spatial extent and concentration of the sediment plume around the mouth of the River Dee. The investigation will include an assessment of the natural variability of suspended sediment concentrations/turbidity, which can be highly variable depending on meteorological conditions. Any mitigation measures to reduce effects on smolts will be incorporated into the CEMP. AHB, SNH and MSS did not support the use of ADDs during construction due to the increase in noise, but accepted the request for regular updates on environmental monitoring being published online.

Dee DSFB confirmed that they were content with AHB's response and have no further comments, on 01 April 2016.

A condition to monitor water quality, including suspended sediment, will be included in the dredging and disposal marine licence if granted.

Second Round of Consultation

Dee DSFB did not respond to the second round of consultation.

4.4 Consultation responses – other concerns

4.4.1 ACC Response

First Round of Consultation

A. Concerns

1. Consideration should be given to the potential import of construction material via sea as part of the Construction Environmental Management Plan.
2. Compensatory measures, including the adjoining areas of greenspace and coastline, and potentially in other parts of Aberdeen particularly in relation to the loss of coastal habitats and fragmentation of a linear

coastal nature conservation site as part of Habitat Creation & Management Measures should be developed.

3. A Pollution Protection Plan for East Tullos Burn should be developed, to address potential release of pollutants into the marine environment, and to measure, monitor and mitigate against water pollution and manage up-stream sources.
4. A Noise Management Plan(s) should be developed to agree noise assessment and mitigation details, including noise limits during construction and operation, timing management and vessel movement and output levels.
5. Design details should be provided to include the southern part of the beach, south of the outlet of East Tullos Burn, and to clarify the design of the breakwaters and how these will act as a substitute for existing on-shore feeding and roosting areas.
6. Further ecological surveys should be conducted to fill in the ES' information gaps, including an otter survey to clarify the otter population in and around the site and opportunities to mitigate impacts and enhance habitat and prey.
7. Fish population monitoring will be undertaken by River Dee Fisheries Trust, during and post construction, to measure any construction impacts and monitor population health.

B. Conditions

No conditions were requested.

C. Objection

ACC formally objected to the development.

D. Action Taken

Between January and March 2016, AHB held weekly meetings with the relevant technical departments within ACC to discuss and resolve their concerns. On 24 March 2016 AHB submitted further clarification to ACC, confirming the delivery mechanism and timescale for all mitigation measures proposed. An Outline Mitigation and Compensation Plan was produced setting out AHB's proposals to provide social amenity and environmental mitigation and enhancements in the vicinity of the development.

ACC withdrew their objection on 31 March 2016 subject to agreed mitigation measures. A Legal Agreement was drawn up between AHB and ACC to formalise the agreed mitigation measures. These measures are not required to be included on any marine licence granted.

Second Round of Consultation

A. Concerns

No concerns were expressed during the second round of consultation.

B. Conditions

No conditions were requested.

C. Objection

The objection from the first round of consultation was withdrawn.

D. Action Taken

ACC had no comments to make and stated that they were satisfied that MS-LOT should progress to determine the applications without further input from ACC.

4.4.2 MCA Response

First Round of Consultation

A. Concerns

No concerns.

B. Conditions

MCA confirmed that they had no objections to the Marine Licence Applications, subject to the following conditions:

1. The Licensee must ensure that local mariners and fishermen's organisations are made fully aware of the activity through local notices to mariners.
2. The Licensee must ensure that HM Coastguard, in this case nmoccontroller@hmcg.gov.uk, The National Maritime Operations Centre is made aware of the works prior to commencement.
3. The Licensee must notify the UK Hydrographic Office to permit the promulgation of maritime safety information and updating of nautical charts and publications through the national Notice to Mariners system.
4. The Consent Holder should ensure suitable bunding, storage facilities are employed to prevent the release of fuel oils, lubricating fluids associated with the plant and equipment into the marine environment.
5. Any jack up barges/vessels utilised during the works/laying of the cable, when jacked up, should exhibit signals in accordance with the UK Standard Marking Schedule for Offshore Installations (SMS).
6. The site (when the Harbour Revision Order is enforced) be within port limits and the applicant should gain the approval/agreement of the responsible local navigation authority or the Harbour Authority/Commissioners/Council. They may wish to issue local warnings to alert those navigating in the vicinity to the presence of the works, as deemed necessary.
7. If in the opinion of the Secretary of State the assistance of a Government Department, including the broadcast of navigational warnings, is required in failure to mark and light the works as required by the consent or to

maintain the works in good order or from the drifting or wreck of the works, the owner of the works shall be liable for any expense incurred in securing such assistance.

C. Objection

MCA did not object to the development.

D. Action Taken

AHB responded to MCA on 11 February 2016 to confirm they have no objections to conditions 1 to 7 and are content for them to be included in the Marine Licences. MCA responded on 15 March 2016 confirming that AHB had addressed each of their comments and these matters have been resolved.

Second Round of Consultation

A. Concerns

No concerns.

B. Conditions

MCA requested that conditions 2 & 3 from the first round of consultation are included in the Marine Licences and noted that conditions 4 to 7 are advisories.

C. Objection

MCA did not object to the development.

D. Action Taken

No further action taken. The conditions will be in any marine licence granted.

4.4.3 NLB Response

First Round of Consultation

A. Concerns

No concerns.

B. Conditions

NLB confirmed that they had no objections to the Marine Licence Applications, subject to the following conditions:

1. Develop a lighting and marking plan covering all stages of the construction programme for NLB's approval, as per the Shipping and Navigation Hazard Workshop, prior to the commencement of any construction works.

2. The establishment of a sector light to mark the approach channel centreline, and four navigation markers indicating the southern navigable limits within Nigg Bay.
3. The establishment of appropriate navigation lighting on the seaward extensions of both breakwaters; the westerly extremity of the South East Pier, and the southerly extremity of the West Quay, and will liaise directly with AHB to this effect.
4. The Statutory Sanction of the Commissioners of Northern Lighthouses will be required prior to establishment of all permanent and long term temporary navigation marks, prior to deployment.
5. It is advised that marine safety information be issued or broadcast as considered appropriate by Aberdeen Harbour, prior to and on completion of these works, clearly stating the nature and duration of the proposed operations.
6. It is advised that AHB liaise directly with the UK Hydrographic Office.

C. Objection

NLB did not object to the development.

D. Action Taken

AHB responded to NLB on 22 January 2016 to confirm that they have no objections to these conditions being included in the Marine Licences. NLB's response of 12 February 2016 questioned the range of the leading and sector lights, to which AHB responded on 01 March 2016. NLB replied on 04 March 2016 confirming that AHB had addressed each of their comments and that they consider these matters to be resolved.

Second Round of Consultation

A. Concerns

No concerns.

B. Conditions

NLB requested conditions 1, 4, 5 & 6 from the first round of consultation, along with the following:

1. The establishment of a Construction Marine Co-ordinator, and use of traditional and innovative means in the dissemination of relevant information to mariners.
2. A starboard hand buoy marking the Northerly edge of the approach channel.
3. A 10M light marking the outermost extremity of the South breakwater.
4. Leading lights and narrow sector lights marking the approach channel.
5. Four spar buoys making the southern navigable limits within the harbour.
6. Three starboard hand lights marking the southerly limits if the North breakwater.
7. A sector light to define the inner leg of the approach channel.

C. Objection

NLB did not object to the development.

D. Action Taken

AHB have no objection to including the conditions requested by NLB in any marine licence granted.

4.4.4 HES Response

First Round of Consultation

A. Concerns

1. A protocol for archaeological discovery should be adopted during capital dredging and construction works, to ensure that any unexpected archaeological discoveries are reported and investigated.

B. Conditions

No conditions were requested.

C. Objection

HES did not object to the development.

D. Action Taken

Although, HES did not request any conditions, AHB have committed to developing a protocol for archaeological discovery as per concern 1, in their response of 17 February 2016. The following condition was also agreed:

A CEMP must be produced and agreed with HES prior to construction works commencing.

Second Round of Consultation

A. Concerns

No concerns.

B. Conditions

No conditions were requested.

C. Objection

HES did not object to the development.

D. Action Taken

No further action was taken. The requirement for a protocol for archaeological discovery will be included in the conditions attached to the marine licence if granted.

4.4.5 Scottish Water Response

First Round of Consultation

A. Concerns

1. Should any foul connection associated with shipping or off-shore wastes be required, a separate Pre-Development Enquiry shall be submitted to Scottish Water.
2. Once all water and wastewater requirements for the development are understood, connections will need to be applied for to Scottish Water via an appointed License Provider.
3. AHB will be responsible for checking where potential asset conflicts exist and contacting Scottish Water's Asset Impact Team (AIT) (service.relocation@scottishwater.co.uk) as soon as possible to discuss any potential issues identified. All detailed design proposals relating to the protection or diversion of Scottish Water's assets should be submitted to AIT for review and written acceptance before any works take place.

B. Conditions

No conditions requested.

C. Objection

Scottish Water did not object to the development.

D. Action Taken

Although SW did not request any conditions, AHB have committed to complying with conditions to address concerns 1 to 3, in their response of 23 February 2016, on the construction marine licence. SW responded on 24 February 2016 stating there were no outstanding issues and no further information was required.

Second Round of Consultation

A. Concerns

No concerns.

B. Conditions

No conditions requested.

C. Objection

Scottish Water did not object to the development.

D. Action Taken

No further action was taken.

4.4.6 TS Response

First Round of Consultation

TS did not have any concerns or comments.

Second Round of Consultation

TS did not have any concerns or comments.

4.4.7 DIO Response

First Round of Consultation

DIO did not have any concerns or comments.

Second Round of Consultation

DIO did not have any concerns or comments.

4.4.8 RYA Response

First Round of Consultation

RYA did not respond to the first round of consultation.

Second Round of Consultation

RYA did not have any concerns or comments.

5. Construction licence conditions

Following consideration of all relevant information, including the ES, further information, supporting documents, consultation responses and AA, MS-LOT consider that the following conditions must be included in any marine licence granted to construct, alter or improve works or to deposit or use explosive substances or articles within the Scottish marine area:

5.1 Prior to the licensed works commencing

- 5.1.1** The licensee must, no later than 7 days prior to commencement of the works, notify the licensing authority of the proposed start date of the works.

- 5.1.2** The licensee must ensure that a Notice to Mariners is issued prior to commencement of the works, clearly stating the nature and duration of the works.
- 5.1.3** The licensee must complete and submit a Proposed Activity Form in the online Marine Noise Registry for all licensable marine activities that will produce loud, low to medium frequency (10Hz-10kHz) impulsive noise no later than 7 days prior to commencement of the licensable marine activities. If any aspects of the licensable marine activities differ from the Proposed Activity Form in the online Marine Noise Registry, the licensee must complete and submit a new Proposed Activity Form no later than 7 days prior to commencement of the licensable marine activities.
- 5.1.4** The licensee must submit a detailed Construction Environmental Management Document (“CEMD”) to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the works. It is not permissible for the works to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such other advisors, organisations or stakeholders as may be required at their discretion. The CEMD must be consistent with the marine licence application, ES and supporting information.

The CEMD must include, but shall not be limited to, the following:

- a) detailed Construction Method Statements (“CMS”) and Construction Environmental Management Plans (“CEMP”) including the following specific management plans:
- I. marine mammal protection plan (“MMPP”);
 - II. vessel management plan (“VMP”);
 - III. noise and vibration mitigation plan (including hours of operation)
 - IV. lighting plan (including strategy for dimmed and directional lighting)
 - V. traffic management plan;
 - VI. pollution prevention plan;
 - VII. otter protection plan;
 - VIII. piling management plan;
 - IX. fish species protection plan;
 - X. habitat management plan;
 - XI. waste management plan;
 - XII. Nigg Bay Site of Special Scientific Interest management plan;
 - XIII. dredging and dredge spoil disposal management and monitoring plan;
 - XIV. marine non-native species and biosecurity management plan; and
 - XV. a plan to protect and appropriately locate existing abstractions and discharges in the vicinity of the works.
- b) commencement dates, duration and phasing information of key elements of construction;
- c) a schedule of mitigation and monitoring measures to protect the environment, including cross-referencing between relevant management plans or other documents;
- d) processes to control and action changes from the agreed schedule of mitigation;

- e) processes to detail how each and all contractors and sub-contractors will be made aware of environmental sensitivities, what requirements they are expected to adhere to, how chains of command will work including shore to vessel communications; and
- f) a process and schedule for providing the licensing authority with regular updates on construction activity, issues encountered and how these have been addressed.

In the event that the licensee wishes to request staged approval of the CEMD, the licensee must submit, in writing, a detailed schedule of the proposed CEMD submission stages and associated documents relative thereto, to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the works.

In the event that the licensee wishes to update or amend the CEMD, the licensee must submit, in writing, details of the proposed updates or amendments to the licensing authority for their written approval, no later than one month or at such a time as agreed with the licensing authority, prior to the planned implementation of the proposed updates or amendments. It is not permissible for any works associated with the proposed updates or amendments to proceed prior to the granting of such approval.

Unless otherwise agreed, in writing by the licensing authority, all works must proceed in accordance with the approved CEMD.

- 5.1.5** The licensee must submit a detailed MMPP to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the works. It is not permissible for the works to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such other advisors, organisations or stakeholders as may be required at their discretion. The MMPP must be consistent with the marine licence application, ES, the CEMD (including CMS and CEMP) and supporting information.

The MMPP must set out measures to prevent injury and disturbance to marine mammals and must include, but shall not be limited to the following:

- a) restriction of piling activity to 7am to 7pm Monday to Friday, 9am to 4pm on Saturdays and no percussive piling on Sundays;
- b) restriction of blasting to daylight hours unless during exceptional circumstances;
- c) a process to record and report, in writing to the licensing authority, within 48 hours, instances where blasting has occurred, outwith daylight hours, due to exceptional circumstances;
- d) measures to ensure piling commences with soft start over forty minutes;
- e) use of MMOs and PAMs during piling, blasting, drilling and other noisy activities to ensure that start up does not occur while dolphins and seals are within relevant mitigation zones;
- f) details to show how this would be managed over the 1 km area and any amendments that may be required;

- g) measures to ensure that the minimum amount of blasting is undertaken using the smallest practicable charges;
- h) measures to ensure blasting works are undertaken for a maximum period of seven consecutive months, with no more than two blasts per day;
- i) measures to ensure impact piling will only be carried out in areas in which it is screened from the open water by the presence of a partially or fully constructed breakwater(s), so that there is no 'direct line of sight' between the impact piling and open water;
- j) measures to ensure blasting will only be carried out in areas in which it is screened from the open water by the presence of a partially or fully constructed breakwater(s), so that there is no 'direct line of sight' between the blasting and open water, or will be carried out behind bubble curtains; and
- k) adherence to relevant JNCC guidelines (except where amendments have been approved by the licensing authority) and other best practice.

In the event that the licensee wishes to update or amend the MMPP, the licensee must submit, in writing, details of the proposed updates or amendments to the licensing authority for their written approval, no later than one month or at such a time as agreed with the licensing authority, prior to the planned implementation of the proposed updates or amendments. It is not permissible for any works associated with the proposed updates or amendments to proceed prior to the granting of such approval.

Unless otherwise agreed, in writing by the licensing authority, all works must proceed in accordance with the approved MMPP.

- 5.1.6** The licensee must submit a detailed VMP to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the works. It is not permissible for the works to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such other advisors, organisations or stakeholders as may be required at their discretion.

Relative to the duration of the works, the VMP must include details on vessels, their speeds, routes and frequency of trips during the works, creation of high and low disturbance areas, a vessel free buffer zone around Girdle Ness and Greyhope Bay, and details of how vessel management will be coordinated.

Relative to the operation of the harbour, the VMP must include a code of practice to guide the behaviour of vessels in and in the vicinity of the harbour around marine mammals and rafts of birds and avoidance of the area around Girdle Ness and Greyhope Bay.

In the event that the licensee wishes to update or amend the VMP, the licensee must submit, in writing, details of the proposed updates or amendments to the licensing authority for their written approval, no later than one month or at such a time as agreed with the licensing authority, prior to the planned implementation of the proposed updates or amendments. It is not permissible for any works associated with the proposed updates or amendments to proceed prior to the granting of such approval.

Unless otherwise agreed in writing by the licensing authority, works must proceed in accordance with the approved VMP.

- 5.1.7** The licensee must submit a detailed monitoring strategy to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the works. It is not permissible for the works to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such other advisors, organisations or stakeholders as may be required at their discretion. The monitoring strategy must be consistent with the marine licence application, ES, the CEMD (including CMS and CEMP) and supporting information.

The monitoring strategy must include, but shall not be limited to the following:

- a) monitoring of underwater noise produced from piling and blasting and effectiveness of mitigation;
- b) monitoring of use of Nigg Bay by marine mammals during construction;
- c) monitoring of use of the new harbour and its surroundings by eider duck during construction and once it is operational;
- d) development of monitoring programme to track adult salmon in the vicinity of the development site and entering the River Dee; and
- e) a binding timetable for reporting the findings of the monitoring.

In the event that the licensee wishes to update or amend the monitoring strategy, the licensee must submit, in writing, details of the proposed updates or amendments to the licensing authority for their written approval, no later than one month or at such a time as agreed with the licensing authority, prior to the planned implementation of the proposed updates or amendments. It is not permissible for any works associated with the proposed updates or amendments to proceed prior to the granting of such approval.

Unless otherwise agreed in writing by the licensing authority, works must proceed in accordance with the approved monitoring strategy.

- 5.1.8** The licensee must submit a lighting and marking plan covering all stages of the construction programme, to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the works. It is not permissible for the works to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such other advisors, organisations or stakeholders as may be required at their discretion.
- 5.1.9** The licensee must submit a protocol for archaeological discovery to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the works. It is not permissible for the works to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such advisors, organisations or stakeholders as may be required at their discretion.

- 5.1.10** The licensee must submit a landscape mitigation and compensation scheme, demonstrating effective mitigation and compensation for the scale of significant local impacts, to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the works. It is not permissible for the works to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such advisors, organisations or stakeholders as may be required at their discretion. The scheme must consider enhancements and linkages to greenspace in the wider area to increase its benefits for the local community.
- 5.1.11** The licensee must ensure that construction of the breakwaters does not commence between 01 June and 31 August.
- 5.1.12** Prior to commencement of the works, the licensee must appoint an Environmental Clerk of Works (“ECoW”) who will be responsible for ensuring delivery of the CEMD. The ECoW must be on site during licensed activities, as determined by the CEMD, and shall have authority to halt activities if necessary.
- 5.1.13** The licensee must ensure that HM Coastguard, in this case nmoccontroller@hmcg.gov.uk, The National Maritime Operations Centre, is made aware of the works prior to commencement.
- 5.1.14** Should any foul connection associated with shipping or off-shore wastes be required, the licensee must submit a separate Pre-Development Enquiry to Scottish Water, prior to commencement of the works.
- 5.1.15** The licensee must, once all water and wastewater requirements for the development are understood, apply to Scottish Water via an appointed Licence Provider for the required connections, prior to commencement of the works.
- 5.1.16** The licensee must review where potential asset conflicts exist and contact Scottish Water’s Asset Impact Team (“AIT”) (service.relocation@scottishwater.co.uk) as soon as practicable to discuss any potential issues identified. All detailed design proposals relating to the protection or diversion of Scottish Water’s assets must be submitted to AIT for review and written acceptance before any works take place.
- 5.1.17** The licensee must ensure that existing abstractions and discharges in the vicinity of the works are protected, diverted or relocated to ensure functionality is maintained during the construction and operation of the AHEP, with particular reference to the outfalls (United Fish Industries, Scottish Water and East Tullos Burn) and intake (Marine Scotland Science aquarium) currently located in Nigg Bay.
- 5.1.18** Prior to commencement of the works the licensee must submit proposals for communication with the local community to the licensing authority for their written approval. It is not permissible for the works to commence prior to the granting of such approval. Such proposals must include local liaison meetings with representatives of Aberdeen Harbour Board, Contractors, and Community Councils and can include regulators where appropriate. For the avoidance of

doubt the remit of the liaison meetings shall be to promote effective communication and to discuss and resolve local issues.

5.2 During the works

- 5.2.1** The licensee must ensure that the works take place in accordance with the approved indicative plan (Annex 1).
- 5.2.2** The licensee must ensure that the works are carried out in accordance with the approved CEMD.
- 5.2.3** The licensee must ensure that, during the execution of the works, the risk of transferring marine non-native species to and from the location of the works is minimised by implementing the approved marine non-native species and biosecurity management plan.
- 5.2.4** The licensee must ensure that the works are marked and lighted as required by the Northern Lighthouse Board, in accordance with the agreed lighting and marking plan, and the marking and lighting is continued unless and until the licensing authority rescind this direction.
- 5.2.5** If it is desired by the licensee to display any marks or lights not required by this licence then details of such marks or lights must be submitted to the Northern Lighthouse Board and their ruling must be complied with. The display of unauthorised marks or lights is prohibited.
- 5.2.6** The licensee must ensure that the works are maintained at all times in good repair.
- 5.2.7** The licensee must ensure that any debris or waste materials arising during the course of the works are removed from below Mean High Water Springs.
- 5.2.8** In the event of the works being discontinued prior to their completion, the licensee must remove the works and clear the site to the satisfaction of the licensing authority.
- 5.2.9** The licensee must remove all temporary structures constructed as part of the works before the expiry date of this licence.
- 5.2.10** The licensee must remove all temporary stockpiles of dredged substances or objects before the expiry date of this licence.
- 5.2.11** The licensee must complete and submit a Close-out Report for the licensable marine activities that produced loud, low to medium frequency (10Hz-10kHz) impulsive noise in the online Marine Noise Registry at 6 month intervals during the validity of the licence and no later than 12 weeks from the completion of the licensable marine activity.
- 5.2.12** If, in the opinion of the licensing authority, the assistance of a Government Department, including the broadcast of navigational warnings, is required to deal with any emergency arising from:

- a) The failure to mark and light the works as required by licence;
- b) The maintenance of the works; or
- c) The drifting or wreck of the works.

The licensee is liable for any expenses incurred in securing such assistance.

5.3 On completion of the works

- 5.3.1** The licensee must, within 7 days of completion of the works, notify the licensing authority of the date of completion of the works.
- 5.3.2** The licensee must, within 28 days of completion of the works or within 28 days of the date of expiry of the licence, whichever is the sooner, submit a written report to the licensing authority stating the nature and quantity of all materials placed and removed under authority of the licence. Where appropriate, nil returns must be provided.
- 5.3.3** The licensee must, within 28 days of completion of the works, supply Source Data Receipt, The Hydrographic Office, Admiralty Way, Taunton, Somerset, TA1 2DN (email: sdr@ukho.gov.uk ; tel.: 01823 337900) with a copy of the 'as built plans', in order that all necessary amendments to nautical publications are made. The licensee must notify the licensing authority of the notification at the time it is made.

6. Dredging licence conditions

Following consideration of all relevant information, including the ES, further information, supporting documents, consultation responses and AA, MS-LOT consider that the following conditions must be included in any marine licence granted to carry out dredging and to deposit dredged spoil substances or objects within the Scottish marine area:

6.1 Prior to the licensed activities commencing

- 6.1.1** The licensee must, no later than 7 days prior to commencement of the activities, notify the licensing authority of the proposed start date.
- 6.1.2** The licensee must, no later than 1 month or at such a time as agreed with the licensing authority, prior to the commencement of the dredging activity and deposit of substances and objects, notify the licensing authority of the names of addresses of the sea disposal contractors and the names of the vessels to be employed to undertake the activities.
- 6.1.3** The licensee must ensure that a Notice to Mariners is issued prior to commencement of the licensed activities, clearly stating the nature and duration of the activities.
- 6.1.4** The licensee must submit a detailed Construction Environmental Management Document ("CEMD") to the licensing authority for their written approval, no later

than two months or at such a time as agreed with the licensing authority, prior to the commencement of the licensed activities. It is not permissible for the licensed activities to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such other advisors, organisations or stakeholders as may be required at their discretion. The CEMD must be consistent with the marine licence application, ES and supporting information.

The CEMD must include, but shall not be limited to, the following:

- a) detailed Construction Method Statements (“CMS”) and Construction Environmental Management Plans (“CEMP”) including the following specific management plans:
 - I. marine mammal protection plan (“MMPP”);
 - II. vessel management plan (“VMP”);
 - III. noise and vibration mitigation plan (including hours of operation)
 - IV. lighting plan (including strategy for dimmed and directional lighting)
 - V. traffic management plan;
 - VI. pollution prevention plan;
 - VII. otter protection plan;
 - VIII. piling management plan;
 - IX. fish species protection plan;
 - X. habitat management plan;
 - XI. waste management plan;
 - XII. Nigg Bay Site of Special Scientific Interest management plan;
 - XIII. dredging and dredge spoil disposal management and monitoring plan;
 - XIV. marine non-native species and biosecurity management plan; and
 - XV. a plan to protect and appropriately locate existing abstractions and discharges in the vicinity of the licensed activities.
- b) commencement dates, duration and phasing information of key elements of construction;
- c) a schedule of mitigation and monitoring measures to protect the environment, including cross-referencing between relevant management plans or other documents;
- d) processes to control changes from the agreed schedule of mitigation;
- e) processes to detail how each and all contractors and sub-contractors will be made aware of environmental sensitivities, what requirements they are expected to adhere to, how chains of command will work including shore to vessel communications; and
- f) a process and schedule for providing the licensing authority with regular updates on construction activity, issues encountered and how these have been addressed.

In the event that the licensee wishes to request staged approval of the CEMD, the licensee must submit, in writing, a detailed schedule of the proposed CEMD submission stages and associated documents relative thereto, to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the licensed activities.

In the event that the licensee wishes to update or amend the CEMD, the licensee must submit, in writing, details of the proposed updates or amendments to the licensing authority for their written approval, no later than one month or at such a time as agreed with the licensing authority, prior to the planned implementation of the proposed updates or amendments. It is not permissible for any activities associated with the proposed updates or amendments to proceed prior to the granting of such approval.

Unless otherwise agreed, in writing by the licensing authority, all licensed activities must proceed in accordance with the approved CEMD.

- 6.1.5** The licensee must submit a detailed Dredging and Dredge Spoil Disposal Management and Monitoring Plan to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the licensed activities. It is not permissible for the activities to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such other advisors, organisations or stakeholders as may be required at their discretion. The plan must be consistent with the marine licence application, ES, the CEMD (including CMS and CEMP) and supporting information.

The Plan must include, but shall not be limited to, the following:

- a) a detailed Dredging Management Plan which must set out the measures to be taken to minimise, as far as is practically possible, the environment effects of dredging and disposal activity.
- b) a detailed Disposal Site Monitoring Plan including:
 - i. the undertaking of sampling and analysis of the disposal site, in accordance with Marine Scotland Guidance, to demonstrate that the dispersal of the substances or objects deposited under this licence and levels of contamination at the disposal site are in line with predictions made during the EIA. The Plan must document the actions to be taken by the licensee should levels of contamination be shown to be above acceptable limits; and
 - ii. the undertaking of bathymetric surveys of the disposal site prior to, at intervals during, and upon completion of the licensed activities. The Plan must document the actions to be taken by the licensee should unacceptable bathymetric conditions resulting from the deposit activities be established.
- c) a detailed Dredging Monitoring Plan including:
 - i. the undertaking of collection and analysis of samples of the substances or objects described in Part 2 of the Schedule, in line with Marine Scotland Guidance, during dredging activities. Duplicate samples must be submitted to the licensing authority. The Plan must commit the licensee to minimum agreed timescales, from the time the samples are taken, to provide results and samples to the licensing authority and must document the actions to be taken by the licensee should levels of contamination be shown to be above acceptable limits.

- d) a detailed Water Quality Monitoring Plan including:
- i. as a minimum, the monitoring of water quality, including levels of suspended sediments in the water column and sediment levels near the seabed, at locations and frequency to be agreed with the licensing authority, to demonstrate among other things that suspended sediment dispersal is in line with that predicated in the ES. Baseline data must be established and the Plan must document the actions to be taken by the licensee, including adaptive management, should suspended sediments be shown to be above acceptable limits.

In the event that the licensee wishes to update or amend the approved Dredging and Dredge Spoil Disposal Management and Monitoring Plan, the licensee must submit, in writing, details of the proposed updates or amendments to the licensing authority for their written approval, no later than one month or at such a time as agreed with the licensing authority, prior to the planned implementation of the proposed updates or amendments. It is not permissible for any licensed activities associated with the proposed updates or amendments to proceed prior to the granting of such approval.

Unless otherwise agreed, in writing by the licensing authority, all licensed activities must proceed in accordance with the approved Dredging and Dredge Spoil Disposal Management and Monitoring Plan.

- 6.1.6** The licensee must submit a detailed VMP to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the licensed activities. It is not permissible for the activities to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such other advisors, organisations or stakeholders as may be required at their discretion.

Relative to the duration of the licensed activities, the VMP must include details on vessels, their speeds, routes and frequency of trips during the licensed activities, creation of high and low disturbance areas, a vessel free buffer zone around Girdle Ness and Greyhope Bay, and details of how vessel management will be coordinated.

Relative to the operation of the harbour, the VMP must include a code of practice to guide the behaviour of vessels in and in the vicinity of the harbour around marine mammals and rafts of birds and avoidance of the area around Girdle Ness and Greyhope Bay.

In the event that the licensee wishes to update or amend the VMP, the licensee must submit, in writing, details of the proposed updates or amendments to the licensing authority for their written approval, no later than one month or at such a time as agreed with the licensing authority, prior to the planned implementation of the proposed updates or amendments. It is not permissible for any activities associated with the proposed updates or amendments to proceed prior to the granting of such approval.

Unless otherwise agreed in writing by the licensing authority, all licensed activities must proceed in accordance with the approved VMP.

- 6.1.7** The licensee must submit a protocol for archaeological discovery to the licensing authority for their written approval, no later than two months or at such a time as agreed with the licensing authority, prior to the commencement of the licensed activities. It is not permissible for the licensed activities to commence prior to the granting of such approval. In granting such approval, the licensing authority may consult any such advisors, organisations or stakeholders as may be required at their discretion.
- 6.1.8** Prior to the commencement of the licensed activities, the licensee must appoint an Environmental Clerk of Works (“ECoW”) who will be responsible for ensuring delivery of the CEMD. The ECoW must be on site during licensed activities, as determined by the CEMD, and shall have authority to halt activities if necessary.
- 6.1.9** The licensee must ensure that HM Coastguard, in this case nmoccontroller@hmcg.gov.uk, The National Maritime Operations Centre, is made aware of the works prior to commencement.
- 6.1.10** The licensee must review where potential asset conflicts exist and contact Scottish Water’s Asset Impact Team (“AIT”) (service.relocation@scottishwater.co.uk) as soon as practicable to discuss any potential issues identified. All detailed design proposals relating to the protection or diversion of Scottish Water’s assets must be submitted to AIT for review and written acceptance before any licensed activities take place.
- 6.1.11** Prior to commencement of the works, the licensee must ensure that existing abstractions and discharges in the vicinity of the licensed activities are protected, diverted or relocated to ensure functionality is maintained during the construction and operation of the AHEP, with particular reference to the outfalls (United Fish Industries, Scottish Water and East Tullos Burn) and intake (Marine Scotland Science aquarium) currently located in Nigg Bay.

6.2 During the licensed activities

- 6.2.1** The licensee must ensure that the licensed activities take place in accordance with the approved indicative plan (Annex 1).
- 6.2.2** The licensee must ensure that the licensed activities are carried out in accordance with the approved CEMD.
- 6.2.3** The licensee must deposit the substances or objects, identified for disposal as described in Part 2(8) of the Schedule, in the following disposal area(s):

Deposit Area Name and Code: ABERDEEN, CR110

Up to a maximum quantity of **4,702,737 wet tonnes / 2,190,000 m³** may be deposited during the period of validity of this licence, within the circle area centred at:

57° 07.00' N 002° 00.00' W with a radius of 0.25 nautical miles.

- 6.2.4** The licensee must ensure that, during the execution of the licensed activities, the risk of transferring marine non-native species to and from the location of the activities is minimised by implementing the approved marine non-native species and biosecurity management plan.
- 6.2.5** The licensee must remove all temporary stockpiles of dredged substances or objects before the expiry date of this licence.
- 6.2.6** At the authorised disposal site, the licensee must ensure that a dedicated watch is kept by a trained Marine Mammal Observer (“MMO”) or someone else following the general guidance for, and acting in the role of, a MMO. A 30 minute watch must be undertaken prior to disposal commencing to ensure that no marine mammals are within 500 metres of the authorised disposal site. If marine mammals are observed within this distance then disposal operations must be ceased until the area has been clear of marine mammals for at least 20 minutes.
- 6.2.7** The licensee must ensure that a formal log is maintained, whether or not marine mammals are sighted, and the completed log(s) must be returned to the licensing authority. The log(s) should contain the name of observer, time of disposal, start and finish times of observation, observations of marine mammals and any action taken as a result.

To ensure consistent recording of marine mammal observations, the licensee must also ensure that the MMO’s formal log(s) are submitted to the following:

Offshore Industries Advisor
Joint Nature Conservation Committee
Inverdee House
Baxter Steet
Aberdeen
AB11 9QA

- 6.2.8** The licensee must ensure that all vessels associated with the dredging and disposal activities adhere to the approved VMP. The route to and from the disposal site is at the Master and Harbour Master’s discretion, subject to Port operations and environmental conditions.
- 6.2.9** The licensee must ensure that a log of operations is maintained on each vessel employed to undertake the disposal operations. The log(s) must be kept onboard the vessel(s) throughout the disposal operations, and be available for inspection by any authorised Enforcement Officer. The log(s) must be retained for a period of six calendar months following expiry of the licence, and copies of the log(s) may be requested during that period for inspection by the licensing authority.

The log(s) shall record in English the following information:

- a) the name of the vessel;

- b) the nature and quantity of each substance or object loaded for disposal;
- c) the date and time of departure from port, and the date and time of arrival at the disposal area(s), on each occasion that the vessel proceeds to the disposal area(s);
- d) the date, time and position of commencement, and the date, time and position of completion, of each disposal operation;
- e) the course(s) and speed(s) throughout each disposal operation. (Multiple changes may be recorded as "various");
- f) the weather, including wind strength and direction, sea-state and tidal set throughout each disposal operation;
- g) the rate of discharge during each disposal operation, if appropriate, and the duration of each disposal operation. (If the rate of discharge is not constant, the maximum and mean rates of discharge should be indicated);
- h) comments on the disposal operations, including any explanations for delays in the disposal operations; and
- i) the signature of the Master at the foot of each page of the record.

The above information can be entered on form FEP6.

- 6.2.10** Only those substances or objects described in Part 2 of the Schedule must be deposited under authority of the licence.
- 6.2.11** Any unauthorised materials associated with the substances or objects scheduled for disposal, including debris such as demolition waste, wood, scrap metal, tyres and synthetic materials, must be disposed of on land at an approved location above the tidal level of Mean High Water Springs.
- 6.2.12** The appointed dredger and any other floating plant in attendance during these operations must exhibit the required lights/shapes at all times, in accordance with the International Regulations for the Prevention of Collisions at Sea.
- 6.2.13** All tank/hopper washings must be deposited in the authorised disposal area(s).
- 6.2.14** The method of disposal shall be:

BOTTOM DUMPING

6.3 On completion of the licensed activities

- 6.3.1** The licensee must, within 7 days of completion of the licensed activities, notify the licensing authority of the date of completion of the licensed activities.
- 6.3.2** The licensee must, within 28 days of completion of the licensed activities or within 28 days of the date of expiry of the licence, whichever is the sooner, submit a written report to the licensing authority stating the nature and quantity of all materials placed and removed under authority of the licence. Where appropriate, nil returns must be provided.
- 6.3.3** The licensee must, within 28 days of completion of the licensed activities, supply Source Data Receipt, The Hydrographic Office, Admiralty Way, Taunton, Somerset, TA1 2DN (e-mail: sdr@ukho.gov.uk ; tel.: 01823 337900)

with a copy of the 'as built plans', in order that all necessary amendments to nautical publications are made. The licensee must notify the licensing authority of the notification at the time it is made.

- 6.3.4** The licensee shall submit written reports, to the licensing authority stating the nature and total quantity, in both cubic metres and wet tonnes, of all substances or objects disposed of under authority of the licence. The written reports shall be submitted to the licensing authority:
- a) by 31 January and 31 July each year, covering the amount deposited each calendar month. Where no deposit is made in a given period a NIL return is required.
 - b) if the licence expires during the course of the calendar year a certified return of quantities of substances or objects deposited shall be submitted not later than 28 working days after the date of expiry of the licence.

The written reports should be submitted on form FEP4. Where appropriate, nil returns shall be provided.

7. Regulatory Evaluation

7.1 Evaluation Process

7.1.1 Chemical analysis data

AHB submitted their original applications and ES on 04 November 2016, and a 42-day consultation process was initiated on 06 November 2016. Upon initial review of the submission, MS-LOT noted that the chemical analysis undertaken by AHB in regards to their dredging and sea disposal application was inadequate as it did not follow MS-LOT's sampling guidelines in terms of type and number of sediment samples required. MS-LOT instructed AHB to take core samples rather than grab samples and it was agreed that although the quantity of cores (scheduled to be taken during the site investigation works ongoing at the time) was fewer than that specified in MS-LOT's guidance (14 versus 30+), should the core analysis results concur with the existing grab sample results (which indicated no elevated levels of contaminants), analysis of the 14 cores would be accepted in this instance.

The applicant undertook a core sampling exercise in December 2015, the results of which showed elevated levels of heavy metals, in some cases above AL2, and PAHs above AL1. Samples below AL1 are generally considered acceptable for disposal at sea, whereas those above AL2 are generally considered unacceptable. Samples between AL1 and AL2 require further case-specific consideration. However, these guideline Action Levels are not statutory contaminant concentrations for dredged material but are used as part of a weight of evidence approach to decision-making. Therefore they are not 'pass/fail' criteria but triggers for further assessment.

The applicant advised that the samples could not be re-tested as they had been disposed of in error by AHB's contracted laboratory. Consequently, MS-LOT advised AHB that further sampling was required to inform MS-LOT's determination. AHB commissioned a further set of site investigation works in 2016, which followed MS-

LOT's sampling guidance. Out of the 34 samples collected during the 2016 sampling activities, no metals were elevated above AL2, except for Copper in the 8.7m depth of one sample, however PAHs were elevated above AL1 in all samples but 7.

AHB noted that the 2015 sample analysis data was inconsistent with the 2016 data and attributed the AL2 exceedances of heavy metals in the 2015 data to contamination of the samples either whilst being collected in the field or analysed in the laboratory. AHB asserted that the 2015 data was therefore erroneous and should be discarded. MS-LOT requested that both the 2015 and 2016 results along with AHB's justification for disregarding the potentially erroneous data be included in the further information document to be provided by AHB for a second round of consultation.

AHB's Additional Environmental Information Report (further information document) dated 22 April 2016 summarised the sediment sample analysis carried out to date in regards to AHEP. As reported in Section 7.5.3.2 within Chapter 7 of the ES and Appendix 12-B: Subtidal Benthic Ecological Characterisation Survey, surface sediment samples were collected from ten stations in Nigg Bay. In addition, the Chemical Analysis Summary submitted with the marine licence application for dredging and disposal in November 2015 presented the results of a marine site investigation carried out in 2013, in which 26 surface sediment samples were collected and analysed for chemical quality.

All samples were tested for the full suite of contaminants listed in Appendix II of Marine Scotland's 'Guidance for the sampling and analysis of sediment and dredged material to be submitted in support of applications for sea disposal of dredged material'.

Results were compared against the thresholds set in the Marine Scotland guidance document for sea disposal of dredged material (AL1 and AL2). All samples returned contaminant concentrations below AL1 for all contaminants tested, as detailed in ES Appendix 12-B.

All contaminants were found to be below AL1, with the exception of one sample in which the concentration of lead was found to be 74 mg/kg, which is above the revised AL1 (50 mg/kg), but well below the revised AL2 (400 mg/kg).

In accordance with Marine Scotland's Pre-Dredge Sampling Guidance (April 2011), core samples are required when the depth of dredging exceeds 1 m below the existing seabed level. AHB have carried out two separate core sampling surveys since the ES was submitted:

- 14 core samples in December 2015
- 34 core samples in February – March 2016

Subsamples were collected at regular intervals from the seabed surface to the depth to be dredged. Approximately 300 samples were collected.

In summary, the results of the December 2015 survey revealed:

- Levels of nickel elevated above Marine Scotland AL2 at 10 locations, in samples both near surface and at depth.
- Levels of lead several times higher than AL2 at one location in the two deeper samples.
- Levels of arsenic above AL2 at two locations near surface.
- Levels of a broad spectrum of heavy metals between AL1 and AL2, both near surface and at depth, in 12 locations.
- Levels of PAHs in excess of AL1 at four locations (there is no AL2 for PAHs).

A high proportion (almost 50%) of the 2015 survey dataset revealed levels of nickel that are an order of magnitude above those that would be expected for the natural marine and glacial sediments. It is highly unlikely that these levels would be found within the glacial till layer, due to the glacial nature of this deposit. A range of other heavy metals were also found to be significantly above AL1, again higher than expected background levels for glacial deposits.

No heavy metals above AL2 were found in any of the 34 surface samples collected in 2013 or 2015, or in any of the core samples collected in 2016, including at locations that are in close proximity to 2015 sampling locations.

The survey contractor that undertook the 2015 sampling campaign has confirmed (via letter dated 21 April 2016) that the 2015 samples could have been contaminated after being brought to the surface.

In regards to the 2016 survey, none of the samples were found to contain heavy metals that are above AL2. 21 of the 34 sample locations contain levels of heavy metals that are between AL1 and AL2 in at least one sub-sample, at surface or at depth. The most prevalent elevated heavy metals are copper and nickel, which occur in at least one subsample in 20 and 14 of the sample locations (respectively). In the majority of cases, the levels recorded are well below AL2.

AHB has been carrying out maintenance dredging within the existing Aberdeen Harbour and disposing of material to authorised disposal site CR110 – Aberdeen for many years and, as described in Chapter 3 of the ES, is the proposed disposal site for the capital dredged spoil arising from the AHEP. Marine Scotland has undertaken regular analysis of the material from the dredge hopper as far back as 1988. The levels of heavy metals range between below the detection limit to above AL2. For example, a set of samples collected in 1998 and 1999 show elevated levels of copper, zinc, nickel and cadmium above AL1 and AL2, and there are notable samples that are far in excess of AL2. It should be noted that the licensing regime for dredging and sea disposal activities has changed substantially since 1988 and that all dredging and disposal was carried out in accordance with the appropriate regulations of the time.

A report by the Marine Laboratory (Hayes et al., 2005¹) examined the concentration of heavy metals from the Aberdeen offshore disposal site CR110, along with a number of other disposal sites off the east coast of Scotland. The majority of samples were collected from surveys undertaken in 2002 and 2003; however, historical data collected and analysed in a similar manner was also included.

The results of additional sampling undertaken by Marine Scotland at disposal site CR110 between 1995 and 2011 and the study by Hayes et al. (2005) show that levels of heavy metals at the disposal site are consistently below AL1, even during times when material above AL1 (and in some cases above AL2) was disposed at the site. As the average levels are considerably lower in the sediments at the disposal site than at the source of dredging, there is no evidence of an accumulation of heavy metals at the site at levels that could cause biological harm.

In considering the further sediment chemistry data provided and the disposal assertions made by AHB, MS-LOT sought specific advice from MSS chemistry department and SEPA. MSS expressed concerns regarding the validity of AHB's argument for disregarding the 2015 data and asked for further clarification on the methods employed and the quality control methods put in place for collection of samples. AHB's claim was accepted by MSS once all requested clarification was supplied. SEPA confirmed that they were not concerned about the two sets of results and did not consider it likely that water quality deterioration would occur for the waterbody. Both MSS and SEPA noted that it is ultimately MS-LOT's responsibility to determine whether or not the dredge spoil is suitable for sea disposal and to assess the potential waterbody impact of the disposal activities.

To further investigate the apparent disparity between the 2015 and 2016 chemistry data, MS-LOT conducted a statistical analysis of the two sets of chemistry data for the first three sub-sample depths of each sediment core sample taken. The results of the analysis showed a statistically significant difference between the 2015 and 2016 metals data. MS-LOT therefore accept the applicant's view that the 2015 results should be disregarded and determination be based on the 2016 results.

Given that AHB propose to use trailer-suction and backhoe dredging, with dredge spoil placed in an open barge before being transported 3.5 km and deposited at authorised disposal site CR110 – Aberdeen, MS-LOT sought advice from MSS in regards to whether the physical disturbance and exposure of what are likely to be anoxic (i.e. no oxygen present) sediments to oxygen during the transportation process would potentially lead to any changes in the contaminants in the sediment.

MSS responded confirming that the exposure of anoxic sediments to increased dissolved oxygen levels could change the valence state of certain metals resulting in changes to their physical state. For example under anoxic conditions reduced iron (FeII) and manganese (MnII) can exist in solution in sediment pore waters. Exposure to dissolved oxygen would result in their rapid oxidation and precipitation as Fe(III) or

¹ Hayes, P., Russell, M. & Packer, G. (2005) Surveys of dredged material and wastewater sludge sea disposal sites for the east coast of Scotland. Fisheries Research Services Internal Report No. 08/05.

Mn(VI) oxyhydroxides. Other authigenic species such as iron sulphides precipitated under anoxic conditions may also be oxidised to oxyhydroxides when exposed to dissolved oxygen. This may result in the release of metals associated with iron sulphides which could then be re-adsorbed by iron or manganese iron oxyhydroxides. It is through this process that iron and manganese and other metals can show subsurface peaks in their sediment concentration profiles. However, only a small percentage of the total iron and manganese is available for such biogeochemical processes.

The volume of sediment in a dredger will have the buffering capacity to reduce the levels of oxygenated water brought into contact with the sediments during dredging. This is because oxygen levels in oxygenated water are quite low (approximately ~8 mg/l). The dredged anoxic sediments will have a number of reduced species in the pore water and sediment. The reduced species will exist in concentrations greater than dissolved oxygen and could strip out the dissolved oxygen. Mixing of anoxic sediment with oxygenated water during dredging would be influenced by the physical nature of the sediment. Loose sediment will mix more thoroughly than stiffer sediments increasing the rate of oxidation for reduced species.

Anoxic sediments from within the inner harbour, caused by the high supply flux of reactive organic carbon relative to the downward diffusion rate of dissolved oxygen into the surface sediments, have historically been transported to the Aberdeen disposal site. Subsequent survey work collecting surface sediment samples from the Aberdeen disposal site has shown little evidence for the accumulation of anoxic sediments at the site. This would suggest that conditions encountered at the site have the capacity to withstand the rate of anoxic sediment disposal resulting in their oxidation and dispersion.

The impact on the bioavailability and toxicity is difficult to predict since a total concentration for a sediment sample is not indicative of the concentration that could be available for biological uptake e.g total tin and TBT in a sediment. Changes in metal speciation resulting from changes in the redox conditions can influence the toxicity e.g. hexavalent chromium (Cr(VI)) is more toxic than trivalent chromium (Cr(III)). In the absence of a known chromium anthropogenic source, it is likely that most chromium in the environment will be held in chemically inert oxide or silicate forms that will not be influenced by sediment redox conditions.

The mean value for each contaminant across all samples is considerably below revised AL1 and therefore it is unlikely that any long-term detrimental impact on the marine environment or other legitimate users or uses will occur. Hence, MS-LOT is content to license the disposal of the capital dredge spoil arising from AHEP at the authorised disposal site CR110 – Aberdeen subject to AHB's strict adherence to a dredging and dredge spoil management and monitoring plan, to be submitted by AHB, as a condition of the marine licence, to MS-LOT for their written approval, prior to works commencing.

7.1.2 Water Framework Directive ("WFD") Assessment

AHB submitted a WFD assessment as part of the ES. During the initial consultation process SEPA, as the statutory WFD consultee, did not express any concerns

regarding AHB's WFD assessment. During the second round of consultation, MS-LOT specifically asked SEPA to comment on the conclusions of AHB's assessment, in light of the increased dredging quantity now proposed and the further sediment analysis data provided by AHB. SEPA confirmed that they were content with AHB's WFD assessment on the basis that the 2015 chemistry data was erroneous and the 2016 data was robust. SEPA raised concerns regarding the impact of the development on the bathing waters status of Aberdeen Beach. AHB addressed SEPA's concerns by providing an Intertek clarification memo regarding the potential impact of the AHEP on the classification of the Aberdeen Beach bathing water. SEPA confirmed that they accepted AHB's conclusions, namely that the proposed changes will not adversely impact on the 90 & 95 percentile bacterial concentrations at the beach. Therefore, SEPA's concerns regarding the degradation of the bathing water classification have been addressed and they have no outstanding concerns regarding water quality.

In order to further ascertain the validity of AHB's assessment, and in the absence of SEPA WFD assessment guidance in terms of the different triggers and methodology, MS-LOT followed Stage Two of the Environmental Agency's Clearing the Waters WFD guidance. At this stage most triggers were screened out in relation to the AHEP, however the following aspects required further assessment:

- Aquatic flora
- Benthic invertebrate fauna
- Fish fauna
- Inter-tidal zone structure
- Dominant currents
- Wave exposure
- Transparency
- Nutrient conditions
- Specific pollutants (including Arsenic, Chromium, Copper, Zinc, Cadmium, Lead, Mercury and Nickel)
- PAHs (including Anthracene, Fluoranthene, Napthalene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Indeno(1,2,3-cd)pyrene and Tributyltin compounds)
- Bodies of water designated as recreational waters and
- Nutrient-sensitive areas including Nitrate Vulnerable Zones, polluted waters and sensitive areas.

The assessment of these aspects is summarised as follows:

Aquatic flora

SNH and MSS were consulted with regards to the impacts of dredging on the aquatic flora in the area. There have been no comments received in relation to this, therefore MS-LOT deem that there is no requirement to undertake a Stage 3 Assessment under the Clearing the Water guidance.

Benthic invertebrate fauna

The ES (Chapter 12, table 12.10) assessed the effects of temporary release of sediment contaminants due to dredging, the temporary increases in sediment deposition due to dredging and the temporary increases in suspended sediment concentrations (SSCs) as negligible, whereas temporary physical seabed disturbance has been classed as negligible to minor adverse and permanent loss of seabed habitat as minor to major adverse. MSS marine benthic expert was consulted on these estimations and did not express any concerns. Therefore, MS-LOT deem that there is no requirement to undertake a Stage 3 Assessment under the Clearing the Waters guidance.

Fish fauna

The ES (Chapter 13, table 13.25) assessed the effects of seabed habitat disturbances, increased SSCs and deposition of sediment plumes as minor adverse, with temporary release of sediment contaminants due to dredging being negligible. The Dee DSFB and MSS asked that monitoring of salmon in the area is included as a condition of the marine licence, but their concerns with regards to SSCs were resolved during a meeting with AHB and SNH. Therefore, MS-LOT deem that there is no requirement to undertake a Stage 3 Assessment under the Clearing the Waters guidance.

Inter-tidal zone structure

The assessment conducted in Chapter 6 of the ES was consulted upon for both the original and increased dredging quantities. MSS questioned some of the analysis, but on receipt of further clarification from AHB, they were able to agree to the findings. Hence, MS-LOT deem that there is no requirement to undertake a Stage 3 Assessment under the Clearing the Waters guidance.

Dominant Currents (relevant to coastal water bodies only).

As per inter-tidal zone structure paragraph.

Wave exposure

As per inter-tidal zone structure paragraph.

Transparency

As per inter-tidal zone structure paragraph.

Nutrient conditions

The ES assessed (Chapter 7, Paragraph 7.6.3.3) that no significant release of such pollutants into the water column is anticipated to occur as a result of capital dredging and disposal operations, based on the 2013 grab sample results that had low levels of contaminants in the sediment. However, considering the results from the 2015 and 2016 sampling activities, these statements were no longer accurate. Therefore, the chemistry department in MSS, and SEPA, were consulted to provide expertise insight into the matter for both consultation rounds. Quality control and sampling methods were provided as part of MSS' request. Both MSS and SEPA were content with the

additional clarification and did not consider there may be issues regarding nutrients. Therefore, MS-LOT deem that there is no requirement to undertake a Stage 3 Assessment under the Clearing the Waters guidance.

Specific pollutants

Arsenic was present above AL1 in 2 samples, Cadmium in 5, Chromium in 7, Copper in 18, Lead in 6, Mercury in 3, Nickel in 12 and Zinc in 1 out of a total of 33 samples from the 2016 chemical analysis. AL2 was exceeded for Cadmium, Copper and Zinc at 8.7 m below chart datum depth in one sample.

MS-LOT consulted with SEPA and the chemistry department within MSS, neither of which were concerned about these concentrations. However, MSS specified that it is MS-LOT's decision whether this material should be disposed or not. Therefore, MS-LOT, taking MSS' expert advice into consideration, deem that there is no requirement to undertake a Stage 3 Assessment under the Clearing the Waters guidance.

Selected priority substances

The PAH analysis results were passed onto the chemistry department in MSS, who were content with the analysis, but specified that it is up to MS-LOT to make a final determination.

Designated recreational waters

AHB undertook modelling to investigate whether the development could have an impact on the Aberdeen Ballroom Bathing Waters classification, which was queried by SEPA. The clarification produced by AHB removed SEPA's concerns. Therefore, MS-LOT deem that there is no requirement to undertake a Stage 3 Assessment under the Clearing the Waters guidance, if taking SEPA's advice into consideration.

Nutrient-sensitive areas

As per nutrient conditions paragraph.

WFD assessment conclusion

The assessment of these WFD parameters was conducted by combining the modelling, fieldwork and chemical analysis results submitted by AHB, along with the advice received from consultees. This allowed MS-LOT to conclude that none of the triggers required assessment through Stage 3 of Clearing the Waters. Consequently, MS-LOT is content that the WFD status of the Don to Souter Head waterbody will not be permanently deteriorated as a result of the AHEP.

7.1.3 AA and obligations under the Habitats and Birds Directives

MS-LOT on behalf of the Scottish Ministers undertook an AA under Regulation 48 of the Conservation (Natural Habitats, &c.) Regulations 1994 (the "Habitats Regulations"), and in accordance with Council Directive 92/43/EEC (the "Habitats Directive") on the conservation of natural habitats under wild fauna and flora. Having considered the information provided by the applicant, the potential risks from the

different impact pathways, the mitigation and the advice provided by SNH and other consultees, and the details of other development works taking place in the region, MS-LOT concluded in the AA that the AHEP, alone or in-combination with other plans or projects, will not adversely affect the integrity of the Ythan Estuary, Sands of Forvie and Meikle Loch SPA, Fowlsheugh SPA, Buchan Ness to Collieston Coast SPA, Montrose Basin SPA, Firth of Tay and Eden Estuary SPA, Forth Islands SPA or Firth of Forth SPA, provided it is undertaken in strict accordance with conditions which are to be attached to the marine licences if granted.

In Scotland the Scottish Ministers are currently in the process of identifying a suite of new marine SPAs. In 2014 advice was received from the statutory nature conservation bodies ("SNCBs") on the sites most suitable for designation and at this stage they became draft SPAs ("dSPAs"). Once the Scottish Ministers have agreed the case for a dSPA to be the subject of a public consultation, the proposal is given the status of proposed SPA ("pSPA") and receives policy protection, which effectively puts such sites in the same position as designated sites, from that point forward until a decision on classification of the site is made. This policy protection for pSPAs is provided by Scottish Planning Policy (paragraph 210), the UK Marine Policy Statement (paragraph 3.1.3) and the National Marine Plan for Scotland (paragraph 4.45). The AHEP was identified as having a likely significant effect on The Ythan Estuary, Sands of Forvie and Meikle Loch pSPA (extension to current SPA) and the Outer Firth of Forth and St. Andrew's Bay Complex pSPA, which are currently at consultation and, therefore these sites were included in the AA.

It is not a legal requirement under the Habitats Directive or relevant domestic regulations for the AA to assess the implications of the proposal on the pSPAs. The AA includes an assessment of implications upon those sites in accordance with domestic policy. The Scottish Ministers are also required to consider article 4(4) of Council Directive 2009/147/EC on the conservation of wild birds ("the Birds Directive") in respect of the pSPAs. The considerations under article 4(4) of the Birds Directive are separate and distinct to the considerations which must be assessed under this Habitats Directive assessment but they are, nevertheless, set out within the AA.

In accordance with regulation 50 of the Habitats Regulations the Scottish Ministers will, as soon as reasonably practicable following the formal designation of the pSPAs, review their decisions authorising the AHEP. This will include a supplementary AA being undertaken concerning the implications of the proposal on the sites as designated (as they are currently pSPAs their conservation objectives are currently in draft form, their conservation objectives are finalised at the point the sites are designated).

The AA concluded that the AHEP, alone or in-combination with other plans or projects, will not adversely affect the integrity of the Ythan Estuary, Sands of Forvie and Meikle Loch pSPA and the Outer Firth of Forth and St. Andrews Bay Complex pSPA, provided it is undertaken in strict accordance with conditions which are to be attached to the marine licences if granted.

As described above the Ythan Estuary, Sands of Forvie and Meikle Loch pSPA and the Outer Firth of Forth and St. Andrews Bay Complex pSPA are not yet designated

they also fall within the regime governed by the first sentence of Article 4(4) of the Birds Directive as follows:

“In respect of the protection areas referred to in paragraphs 1 and 2, Member States shall take appropriate steps to avoid pollution or deterioration of habitats or any disturbances affecting the birds, in so far as these would be significant having regard to the objectives of this Article. Outside these protection areas, Member States shall also strive to avoid pollution or deterioration of habitats.”

MS-LOT has considered the information presented in the ES, in particular Volume 4 Habitats Regulations Appraisal, Volume 2 Chp. 7: Marine Water and Sediment Quality, Volume 3 ES Appendix 6-B: Hydrodynamic Modelling and Coastal Processes Assessment, Volume 3 ES Appendix 7-D: Sediment Plume Modelling, along with an Intertek clarification memorandum – “Redeposited Sediment Depths From Dredging Spill” dated 21 July 2016.

This information predicts that there will be increased suspended sediment concentration levels from the dredge overspill, although this is not expected to overlap with the boundaries of the pSPA. Increased mud deposition from the trailer suction hopper dredging spill is thought to come close to the pSPA boundary, although deposition depths close to the boundary is predicted to be minimal (Figure 1 Intertek clarification memorandum – “Redeposited Sediment Depths From Dredging Spill” dated 21 July 2016). Modelling shows that increased suspended sediment concentration and sediment deposition at the disposal site will not come close to the pSPA boundary.

In conclusion, proposed dredging and dredge spoil disposal activities (during construction and operation) will result in some increase in suspended sediment concentration and sediment deposition, however these increases will be localised and temporary in nature and therefore will not significantly affect the ability of the terns to forage for prey within the pSPA or in the immediate vicinity of the boundaries of the pSPA. MS-LOT do not consider that the dredging and disposal activities will lead to any significant pollution or habitat deterioration within the pSPA.

Furthermore, to ensure that any impacts to the pSPA associated with the dredging and dredge spoil disposal activities are effectively minimised and monitored, AHB will be required to submit a Dredging and Dredge Spoil Disposal Management and Monitoring Plan for MS-LOT’s approval prior to commencement of the works.

MS-LOT consider that the Outer Firth of Forth and St. Andrews Bay Complex pSPA is sufficiently far from the area of proposed works that there will be no risk of pollution, deterioration of habitats or disturbance of the qualifying interests from the AHEP.

7.1.4 Marine Mammals

During the first round of consultation objections with regards to marine mammals were received from SNH and WDC, with MSS having concerns about the methodology employed. Noise issues associated with piling and blasting were discussed by AHB, SNH, WDC and MSS, and agreement was reached when AHB committed to partially constructing breakwaters and using bubble curtains to mitigate

the noise propagated by piling and blasting works. The use of PAM and MMOs was then deemed suitable in conjunction with the other mitigation proposed. SNH and WDC subsequently removed their objections.

MSS raised concerns regarding cumulative impacts, stating that they were not content with the assessments carried out to date. Towards the end of the application process, to address their concerns, MSS, in collaboration with SNH, ran a PVA model that concluded there will be no significant cumulative impacts. Additionally, AHB have committed to undertaking blasting work for no more than 7 consecutive months with no more than two blasts per day, which MSS have requested as a marine licence condition.

7.1.5 Marine Ornithology

During the first round of consultation, objections were received from SNH and RSPB, along with concerns by MSS, with regards to the loss of roosting habitat for eider ducks. AHB investigated the idea of installing mussel ropes as a substitute to current feeding grounds being lost and proposed the potential use of the breakwaters as roosting habitat. Clarification notes addressing concerns relating to eiders and terns were produced in the meantime, and the objections were removed after the second round of consultation. The installation of mussel ropes was removed from the plan due to concerns from MSS and SNH, however timing restrictions of construction work will be included in conditions of any marine licence granted to mitigate impacts to eiders and terns. RSPB removed their objection.

7.1.6 Sediment plume & hydrographic modelling

During the second round of consultation, MS-LOT requested specific comments from the MSS Oceanography department, with regards to the applicability of AHB's original oceanographic modelling in light of the increase in dredging. MSS challenged some of the modelling but following the provision of further clarification by AHB, MSS confirmed that the modelling remained valid.

7.1.7 Socio-economics

A public representation was received as part of the second round of consultation, which expressed concerns about the applicability of AHB's socio-economic assessment as a result of the recent downturn in the North Sea oil and gas industry. MS-LOT consulted MSS marine analytical unit, who after consideration of the latest socio-economic indicators and review of the initial assessment stated that there may be grounds for challenging AHB's ES findings. AHB confirmed that the motivations for the AHEP remain valid despite the downturn in the oil and gas industry as they consider the development of the harbour to be a necessity in order to meet vessel berthing demands. The deeper and longer berths provided by the AHEP would allow the harbour to attract larger cruise vessels and larger cargo vessels, whereas the current harbour is restricted to vessels approximately 165-170m in length. Therefore, the downturn has not affected their plans for the development.

7.2 Conclusions

In considering the application, ES (including further information) and the relevant provisions of the 2007 Regulations and the 2010 Act, a full and detailed assessment has been made of the potential direct and indirect effects of the proposal on human beings, fauna and flora, soils, water, air climate, the landscape, material assets, the cultural heritage and the interaction between any two or more of these factors.

MS-LOT do not consider that the clarification notes which were provided by AHB following the consultation on the Additional Environmental Information Report constituted "further information" under regulation 14 of the 2007 Regulations as they were for clarification purposes only in relation to specific consultee queries.

MS-LOT, as the regulator, is satisfied with the findings of the ES and, subject to the inclusion of the conditions referred to above in any marine licence granted in due course, is of the opinion that for the marine elements of the project there are no outstanding concerns with regards to the effects on the environment which would require a marine licence to be withheld.

7.3 Recommendations

Having carried out assessments of the potential environmental impacts of the proposed project, MS-LOT make the following recommendations:

MS-LOT is satisfied that the marine licence applications, ES, Additional Environmental Information Report and all other supporting documentation submitted by AHB, adequately address all environmental issues in relation to Aberdeen Harbour Expansion Project.

The MS-LOT reviewer recommends that a favourable EIA consent decision is given in respect of the project, subject to the inclusion of the above conditions being attached to any marine licences granted.

7.4 Environmental Impact Assessment Consent Decision

Having considered the analysis and recommendations of the environmental impact assessment process above, an environmental impact assessment consent decision is given in favour of the AHEP in accordance with Regulation 22 of the 2007 Regulations.

Reviewed by:	Victoria Bell
Date:	10 October 2016
Approved by:	Gayle Holland
Date:	13 October 2016
The Licensing Authority:	MS-LOT on behalf of the Scottish Ministers