RAF Lossiemouth

Defence Infrastructure Organisation

MINISTRY OF DEFENCE

Draft Shadow Habitats Regulations Appraisal

March 2020

Town & Country Planning (Scotland) Act, 1997
as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

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13 August 2020

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The Moray Council

Contents

Figures

Appendices

Town & Country Planning
(Scotland) Act, 1997
as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

Glossary

ADCP	Acoustic Doppler Current Profiling
AST	Atlantic Salmon Trust
CAR	Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)
CEnv	Chartered Environmentalist
CIEEM	Chartered Institute of Ecology & Environmental Management
CJEU	Court of Justice of the European Union
DIO	Defence Infrastructure Organisation
GPP	Guidance for Pollution Prevention
GradCIEEM	Graduate Member of Chartered Institute of Ecology & Environmental Management
HLMP	Habitat and Landscape Management Plan
Habitats Regulations	Conservation of Habitats and Species Regulations 2017
HRA	Habitats Regulations Appraisal
IROPI	Imperative Reasons of Over-riding Public Interest
JNCC	Joint Nature Conservation Committee
LDP	Lossiemouth Development Plan
LSO	Long Sea Outfall
LSE	Likely Significant Effect
MBES	Multibeam echo-sounder
MCIEEM	Member of Chartered Institute of Ecology & Environmental Management
Natura 2000 site	A European site designated for its nature conservation value
PPG	Pollution Prevention Guidelines
PSD	Particle Sediment Distribution
pSPA	potential Special Protection Area
RAF	Royal Air Force
RAMSAR	Wetland of international importance
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SIAA	Statement to Inform Appropriate Assessment
SPA	Special Protection Area
SNH	Scottish Natural Heritage
SSSI	Site of Special Scientific Interest
WwTW	Wastewater Treatment Works

Executive Summary

Contents	Summary
Site location and description of scheme	The site is located at the western edge of Lossiemouth town in Moray, north-east Scotland, IV31 6SD, and is centred at approximate Ordnance Survey National Grid Reference NJ 21681 69843. Proposals include installation of a new wastewater treatment works and construction of a Long Sea Outfall (LSO) to discharge treated foul and surface water to the marine environment.
Scope of this Assessment	This is a submission to inform the Moray Council's Habitats Regulations Appraisal. The purpose of the planning proposal is to improve the surface water drainage at the RAF Lossiemouth site, as SEPA have raised concerns regarding de-icer entering Covesea Burn and have advised that the current drainage should be addressed. Therefore, installation of a LSO has been proposed. Although the purpose of this scheme is for the benefit of the local habitats, there is ecological connectivity between the designated Natura 2000 sites and the proposed drainage solution. Therefore, this report assesses potential pathways to likely significant effects during both construction and operation of the scheme, and subsequently assesses the significance of effects identified upon the integrity of these designated Natura 2000 sites (HRA Stage 4). **Note that, upon instruction of the contractor the design/construction method will be finalised. This assessment is based on avoidance/mitigation measures in principle, at the current time, as agreed in consultation with SNH (refer to Section 2.2).** **This assessment shall remain a Draft Shadow HRA until the above is achieved.**
Existing Site Information	WYG and select sub-contractors have completed extended Phase 1 habitat and additional ecology surveys at the site plus supporting assessments. The results are provided in the following reports: • Clydeside Surveys Ltd. (2019) *RAF Lossiemouth Outfall Hydrographic and Oceanographic Survey Report*. Report to WYG. • Pelagica (2019) *Lossiemouth Marine Ecology Desk Review*. • Pelagica (2019) *RAF Lossiemouth Marine Ecology Supplementary Assessment: Atlantic Salmon and Sea Trout*. • Pelagica (2020) *Marine Ecology Supplementary Assessment: Noise (draft report)*

	• Subacoustech Environmental (2019), *Underwater Noise Monitoring of Borehole Drilling near Lossiemouth, Moray Firth*. Defence Infrastructure Organisation. • WYG (2015) *RAF Lossiemouth: Extended Phase 1 Habitat Survey Report*. Defence Infrastructure Organisation. • WYG (2017) *RAF Lossiemouth Development Programme: Extended Phase 1 Habitat Survey*. Defence Infrastructure Organisation. • Wark Consulting (2019) *RAF Lossiemouth Proposed New Outfall Initial Dilution and Secondary Dispersion Modelling*. Report to WYG. • WYG (2018) *RAF Lossiemouth: Wintering Bird Survey Report*. • WYG (2019a) *RAF Lossiemouth Development Programme: Ecological Appraisal*. Defence Infrastructure Organisation. • WYG (2019b) *RAF Lossiemouth Development Programme: Marine Mammal Observer, Final Report*. Defence Infrastructure Organisation. • WYG (2019c) *RAF Lossiemouth Development Programme: Reptile Survey Report.* Defence Infrastructure Organisation.
Summary of Stage 1	Detail of the project is provided in Section 1.3 of this report.
Summary of Stage 2	The project is not directly connected with or necessary to site management for nature conservation.
Summary of Stage 3	This document identified that there were potential pathways to LSE for six Natura 2000 sites and two Ramsar sites within 20 km of the site: • Moray Firth SAC; • Moray Firth pSPA; • Loch Spynie SPA / Ramsar; • Lower River Spey – Spey Bay SAC; • Moray and Nairn Coast SPA / Ramsar; and • River Spey SAC. Pathways of effect were identified between the proposed scheme and the Moray Firth SAC, Moray Firth pSPA, Moray and Nairn Coast SPA / Ramsar and River Spey SAC. These included potential effects on water quality, visual disturbance of SPA birds, and noise/vibration disturbance of qualifying species.
Summary of Stage 4	The results from the Stage 4 Appropriate Assessment (AA) found that with further survey information together with mitigation, the pathways identified do not have the potential to affect the integrity of any European designated nature conservation site. In summary the survey information acquired and mitigation proposed comprises: • Particle Size Distribution and Mapping Interactions with Sandbank Assessment has demonstrated the likely absence of designated sand bank features within the footprint of the works, and surrounding Zone of Influence;

	• Atlantic salmon study identified that Spey Bay salmon will not be located within close proximity of the works; • A pre-construction survey will be undertaken to confirm there are no important features for otter (i.e. couches/ holts) within the onshore construction area that will be impacted; • A Marine Mammal Observer will be present to avoid any potential impact from construction noise on common bottlenose dolphin and eider ducks; • Strict adherence to standard SEPA GPPs/PPGs; • Hydrographic modelling demonstrated high dilution factors in the marine environment of the discharge; and • Timing of works to avoid seasonal sensitivity.
Summary of Stage 5	It can be ascertained, at the current time, that the project will not adversely affect the integrity of any European designated site, either alone or in-combination with other plans and/or projects. **Upon instruction of the contractor and finalising of the design/construction method it will be necessary to reassess the likely significant effects and potential for adversely affecting the integrity of any European designated site, either alone or in-combination with other plans and/or projects.**
Conclusion	It is concluded that the 'Competent Authority' will not require any further assessment under the Habitats Regulations, and the proposed development can proceed without progressing to Stages 6-9 (**subject to the conclusions of the assessment not being altered upon finalising design and construction methods**).

Town & Country Planning
(Scotland) Act, 1997
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The Moray Council

1.0 Introduction

1.1 Background

WYG was commissioned by the Defence Infrastructure Organisation (DIO) in late 2016 to prepare a report to inform Habitats Regulations Appraisal for a proposed development at the site known as RAF Lossiemouth, Moray, Scotland. The specific areas proposed for development are detailed within the Masterplan (Drawing No. A089116-69-1 LDP(SITE)00-2001 Rev G).

This report has been prepared by WYG Project Ecologist Lorna McRae Grad CIEEM and the conditions pertinent to it are provided in Appendix A.

1.2 Site Location

The site is located at the north western edge of Lossiemouth town in Moray, north-east Scotland, IV31 6SD, centred at Ordnance Survey National Grid Reference NJ 21421 70691. The site is located at the coast, with the pipeline to be constructed over onshore terrestrial habitats and offshore intertidal and marine habitats (see Figure 1 - Site Location Plan).

The Lossiemouth Development Plan (LDP) drainage site comprises a golf course with grasslands, dune heath, scrub and bare ground. The drainage site also includes a small section of grassland located within the north of Royal Air Force (RAF) Lossiemouth site boundary. The site extends beyond the golf course to the shoreline which transitions from dune habitat to pebble and sand substrate, into the marine habitat – the Moray Firth. The Long Sea Outfall (LSO) discharge point is located 820m off-shore from the last on-shore manhole.

The wider area surrounding the air base is a low lying, exposed coastal region on the edge of the Moray Firth consisting predominantly of a mosaic of farmland and small woodland compartments. Larger expanses of woodland lie to the east and south of the site and Lossiemouth town.

1.3 Development Proposals

The purpose of the scheme is to improve the surface water and foul sewerage drainage system at the RAF Lossiemouth site, as the Scottish Environment Protection Agency (SEPA) have raised concerns regarding de-icer entering Covesea Burn and have advised that the current drainage system must be addressed. At present effluent from three treatment plants and surface water discharge into the Covesea Burn which runs across the coastal golf course to the sea. The proposed scheme will result in two wastewater treatment plants closing and a new wastewater treatment plant being installed. All effluent and surface water from the airfield will then pass via a new Long Sea Outfall (LSO) to discharge into the marine environment approximately 800m from the shore. An attenuation tank will be installed to control surface water discharge to the pipe, and stormwater flows from this will pass into the Covesea Burn as at present. Detailed design drawings are provided in Figure 2.

1.3.1 Proposed Scheme

The proposal considered in this Shadow HRA is the installation of the following facilities within the RAF Lossiemouth boundary and across the adjacent Moray Golf Course and shoreline into the sea

(see Figure 2). The primary purpose of the scheme is to avoid drainage of foul water to Covesea Burn, and to treat wastewater in the first instance before discharging via a LSO into the Moray Firth.

Summary of Proposed Works:

- Flows upstream of the proposed Covesea Burn Weir (diversion) structure are to be directed to the proposed long sea outfall via the attenuation tank;
- Attenuation tank is sized to capture first flush flows (first 5 mm rainfall);
- Once the tank fills the flows shall be directed over the Covesea Burn Weir and flow down the Covesea Burn as it currently does;
- Any drainage outlets downstream of the weir shall remain discharging to the Covesea Burn, with the exception of the package treatment plant outlet at building 200 which is to be transferred to the proposed wastewater treatment works;
- Any new storm (road) drainage under the drainage project is being directed to the Covesea Burn is to discharge downstream of the weir.

The main areas of the works are broken down into six sections:

1. **Aircraft Lavatory and Water Truck Disposal & Fill Point** – this will be a dedicated area required to serve the aircraft water and wastewater trucks (specialist trucks for potable water supply and wastewater removal). This blue waste shall not enter the drainage system as this shall be held in a storage tank and then tankered off-site to a specialist waste disposal facility.
2. **Proposed Foul Drainage** – as there is limited foul drainage infrastructure to the north side of the runway, a new foul drainage system is proposed to pick up the new facilities and a number of existing buildings. This foul water system will involve new gravity and pumped systems discharging to the proposed Wastewater Treatment Works (WwTW). The final effluent is to be directed to the proposed site (onshore) drainage system (as detailed within Figure 2).
3. **Proposed Waste Water Treatment Works (WwTW)** – a new WwTW to be installed on the northern side of the Station to serve existing and new foul water facilities. A process and arrangement methodology has been developed which should not be altered as it has been agreed with DIO and SEPA.
4. **On-Shore Covesea Burn Diversion** – design for this portion has been significantly developed as it is integral to other parts of LDP and to allow the SEPA CAR licence[1] to be progressed. Therefore, the hydraulic design for this portion shall not be adjusted. This element has been designed both within and outwith the RAF boundary.
    - **Onshore within the RAF Boundary** - Detailed design has been developed for this element of the works, consisting of (from upstream to downstream):
        a. A diversion structure with an overflow arrangement which directs excess flows into the existing Covesea Burn;
        b. A silt trap manhole between the diversion structure and attenuation tank;

[1] Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).

c. The attenuation tank will be a Weholite piped system, which will be built up from 1200mm diameter parallel runs. The attenuation tank will be set at a level to mitigate impact on water level in Covesea Burn;
d. A HydroBrake flow control will be fitted downstream of the attenuation tank. Flow control is required to limit flows and potential headlosses (differences in pressure) generated on the downstream system;
e. A Klargester Full Retention Separator shall be installed on the storm drainage run downstream of the flow control. A layby shall be constructed to service the retention separator;
f. Final effluent connection from the WwTW shall connect to the storm drainage system prior to leaving the station (downstream of the retention separator).

- **Onshore beyond the RAF boundary** - detailed design has been developed for this element of the works (drainage pipeline is to continue to the shoreline from the Station), consisting of (from upstream to downstream):
  a. A drainage pipeline to continue to the shoreline from the station predominantly within the Moray Golf Club grounds;
  b. A section of pipeline is to cross the public roadway (B9040), before crossing back into golf club grounds.

5. **Offshore Long Sea Outfall** – As this is integral with the on-shore drainage and achieving SEPA requirements again the hydraulic design should not be altered. A 600 mm diameter LSO shall extend 820 m into the Moray Firth from the outfall manhole (the last manhole located within the 'onshore outwith the RAF boundary' section). Maximum allowable headloss generated between the LSO from manhole S1 to end of outfall pipe including diffusers arrangement is 1.8 m at 153 l/sec. This is on the basis of tide level of 3.18 m AoD.
6. **Proposed Maintenance Road** – there is a requirement to provide a new road system to allow maintenance of the proposed new infrastructure.

The design will be carried out in accordance with all relevant British Standards, Scottish Environment Protection Agency (SEPA), Moray Council, Aquatrine, Veolia and all other statutory Authority and public utility requirements and will achieve all necessary approvals and consents prior to commencement of construction.

1.3.2 Construction Phase

The detailed design and construction methodology can only be fully determined upon appointment of the contractor (e.g. pipe laying method). As such, **this assessment is based on the available design/construction methodology that can be determined at this stage** (with knowledge of the proposed location of the outfall pipe and the nature of the seabed etc).

The scheme will be constructed April to September 2021 (inclusive) with the offshore portion of the works to be undertaken between April and August 2021 (as the weather conditions are likely to be more favourable).

Construction Onshore

An open trench method will be used to excavate, install the pipeline, and backfill with suitable material. This will affect a corridor approximately 20 m wide across the sand dunes of the Moray Golf Course and out over the shoreline/intertidal area into the Moray Firth.

The construction activities for the onshore facilities have not been fully finalised to date; however, given the scope of the works and hydrological connectivity to the designated sites, the construction for sections within the tidal zone and below low tide are considered most significant and of higher priority for the purpose of this assessment. The full design and construction methodology will be provided by the contractor, and if necessary the HRA will be amended to take account of the revised proposals.

Construction Within the Tidal Zone

Construction within this area will be undertaken during low spring tide cycle using multiple excavators operating along the tidal zone simultaneously to excavate a trench to the required depth to allow for the 710mm OD PE MDPE SDR (Outer Diameter Poly Ethylene Medium Density Polyethylene Pipe Standard Dimension Ratio) pipe installation. The trench will be backfilled with suitably excavated materials.

Construction Below the Tidal Zone

Laying of the proposed pipeline below the surface of the water will be undertaken using a dredger ahead of bringing the pipe into position.

Where rock is present along the pipe route, this will be broken out using long reach equipment. It has been confirmed that the rock layer is a weak layer of weathered rock (Subacoustech Environmental, 2019) and it is anticipated that an excavator and dredger will be sufficient to remove the rock without the use of drilling.

The pipeline will consist of one singular piece or else pipe sections welded together at a suitable location. From the pipe assembly site onshore the pipe will then be floated into position. Floats will be removed in sections; collars will be fixed to the pipeline and long reach equipment used from a barge to allow positioning and backfill of the pipeline below the water level.

The temporary buoyancy pipe will then be recovered to shore.

1.3.3 Operational Phase

Foul Sewerage System

The new foul drainage system is proposed to pick up the new facilities and a number of existing buildings. It will involve new gravity and pumped systems discharging to the proposed WwTW. The final effluent is to be directed to the proposed onshore drainage system prior to discharging via the LSO.

Storm Drainage System

The proposed surface water drainage solution has been developed to allow run-off containing de-icer to be captured and discharged into the Moray Firth at a suitable location away from the shoreline via the proposed LSO pipeline. The onshore element of the drainage design has been substantially developed as other LDP elements are interlinked and required certainty for design of these elements.

The flows presently entering the Covesea Burn from Oil Interceptor 47 (upstream) are to be diverted into a storm water attention tank. Downstream of the tank is a flow control to limit flows being directed downstream to the LSO. Between the flow control and the shoreline, the gravity storm sewer will traverse the northern end of the station, Moray Golf Club grounds and cross under a public road.

Adequately developed design has been produced for portions of the drainage proposals to allow a CAR licence submission to SEPA, therefore the hydraulic design for these elements shall not be altered. During operation it is expected that surface water drainage from hard standing will also be diverted from Covesea Burn.

1.4 Requirements for the Habitats Regulations Appraisal (HRA)

The European Directive (92/43/EEC), termed 'the Habitats Directive' was introduced to protect and enhance species and habitats of nature conservation importance at the European level. As outlined in Article 6 (3) and 6 (4) of this directive, an Appropriate Assessment (AA) must be carried out on any plans or projects where it is considered that they are likely to have significant effects on Natura 2000 sites, either alone or in-combination with other plans or projects.

The 'screening of likely significant effects' stage is the initial identification of potential effects of a plan or project on the qualifying features of the Natura 2000 sites. It seeks to assess whether or not these effects will be significant either alone or in-combination with other plans or projects. The precautionary principle is used in assessing whether effects may be significant so that, where there is any uncertainty, the potential effect is examined in greater detail in the next AA stage. Detail of amended methodology following recent case law is detailed in Section 2.1.

An Appropriate Assessment should identify the effects of those plans or projects on qualifying features of the European sites in relation to the Conservation Objectives of Natura 2000 sites and determine whether these effects will result in an adverse effect on the integrity of the site. Only where the Competent Authority (in this case, Moray Council) is satisfied that there will be no adverse effect on integrity, or where there are Imperative Reasons of Overriding Public Interest (IROPI), may consent be granted.

Under Article 6(3) of the Habitats Directive, an Appropriate Assessment needs to be carried out in respect of any plan or project which:

i. Either alone or in combination with other plans or projects would be likely to have a significant effect on a site designated within the Natura 2000 network; and
ii. Is not directly connected with the management of the site for nature conservation.

This requirement is currently transposed into Scottish law through The Conservation (Natural Habitats, &c.) Regulations 1994 and The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2012.

1.5 Purpose and Structure of the Report

This report aims to inform the HRA process (Stages 1 to 5), identifying any likely significant effects (LSE) on European (Natura 2000) designated sites within a defined Zone of Influence (ZoI) of effects arising from the project, and then assessing whether or not the LSE identified during screening could result in an adverse effect on site integrity.

This assessment makes reference to avoidance/mitigation measures in principle (as advised during consultation with SNH; refer to Section 2.2).

2.0 Assessment Methodology

2.1 Assessment Guidance

The guidance provided under Scottish Natural Heritage's (SNHs) Natura Casework Guidance: How to consider plans and projects affecting Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) (SNH, 2014) has been used in this assessment. SNH's Guidance Note, The Handling of mitigation in Habitats Regulations Appraisal – the People Over Wind CJEU judgement has also been considered. SNH Guidance identifies the following assessment stages – for clarity these stages have been followed within this report:

- **Stage 1**: What is the plan or project?
- **Stage 2**: Is the plan or project directly connected with or necessary to management of European sites for nature conservation?
- **Stage 3**: Is the plan or project (either alone, or in combination with other plans or projects) likely to have a significant effect on European sites for nature conservation?
- **Stage 4**: Undertake an Appropriate Assessment of the implication for European sites for nature conservation in view of their conservation objectives;
- **Stage 5**: Can it be ascertained that the proposal will not adversely affect the integrity of European sites for nature conservation?
- **Stage 6**: Are there alternative solutions;
- **Stage 7**: Would a priority habitat or species be adversely affected?;
- **Stage 8**: Are there imperative reasons of overriding public interest (non-priority habitats and species)?;
- **Stage 9**: Are there imperative reasons of overriding public interest (priority habitats and species)?

This report aims to address Stages 1 – 5 (Screening and Appropriate Assessment stages) adopting the precautionary principle. Where there is any uncertainty the potential effect has been examined in greater detail at AA.

It is important to note that Stage 3 methodology has been called into question by a Court of Justice of the European Union ruling in April 2018. Prior to this ruling (in agreement with the Scottish Government Advice Notes), it was standard practice to incorporate mitigation into the assessment of whether a plan or project had the potential to result in Likely Significant Effect(s) on a European / International designated site at the Screening stage of the HRA process. In employing this method, the need to proceed to a full Appropriate Assessment was sometimes negated at the screening stage.

Case C323/17 (People Over Wind and Sweetman v Coillte Teoranta) judgment, with regards to the Habitats Directive, stated that '*a full and precise analysis of the measures capable of avoiding or reducing any significant effects on the site concerned must be carried out not at the screening stage, but specifically at the stage of the appropriate assessment*'. As such, it is currently not possible to have confidence in determining that avoidance and mitigation measures can be assessed at the screening stage for any potentially significant effects that would (with consideration of the measures) result in no significant adverse effects (i.e. Stage 1 to Stage 3).

This will have implications for whether other projects can be screened out of requiring a full AA. Compliance with this judgement is still under consideration with key statutory bodies and competent authorities. In the interim it is advised that this ruling be taken into account to avoid future legal challenge.

The Court Judgement relating to Case C-461/17 Holohan v. An Bord Pleanala ECLI:EU:C:2018:649 states 'Article 6(3) of Council Directive 92/43/EEC of 21st May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that 'an appropriate assessment' must, on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site.'

The purpose of this report is therefore to provide sufficient information to allow the Competent Authority (in this case Moray Council) to prepare a Statement to Inform Appropriate Assessment (SIAA), and ultimately to establish whether the project will or will not affect the integrity of any European site for nature conservation.

2.2 Consultation

2.2.1 Key Points

Consultations have been undertaken during the design of the project with numerous consultees. Two key correspondence email responses are provided in detail below.

A letter response from a representative of SNH dated 19th June 2019 with reference to HRA stated:

> *'The long sea outfall will extend from the land into the Moray Firth marine environment. It will include construction that will likely disrupt the seabed and the resulting discharge effluent may influence marine life.*
>
> *The sea immediately off RAF Lossiemouth is part of the Moray Firth Special Area of Conservation (SAC) and the Moray Firth proposed Special Protection Area (pSPA). The competent authority will therefore be responsible for carrying out a HRA to determine the effects on the 2 sites.*
>
> *The following advice is provided to help ensure that the applicant can provide sufficient information to inform the HRA process. Currently we don't have sufficient information to say whether or not the proposal will have a likely significant effect on these protected features.*
>
> *We would be happy to discuss these issues with the applicant and their consultants to ensure that the right level of detail is gathered at the right time to avoid any delay in the project.'*

Subsequent consultation between a representative of Pelagica Limited and a representative from SNH with reference to the HRA dated 19th November 2019 stated:

'Thankfully it looks like the LSO project will be relatively benign in terms of its impacts on the marine environments so should not pose significant risks for the Moray Forth SAC and pSPA. From what we've discussed and the information that you have available I feel this should be sufficient information to complete the HRA process and conclude no adverse effect on site integrity. I agree with you that I don't think further surveys (such as video/imagery) are necessary in this case.'

Other key points discussed with consultees and stakeholders of relevance to ecology on the LSO/drainage project are detailed in Appendix B. Full details of correspondence with the consultees is available upon request.

2.3 Information Used in this Assessment

2.3.1 Desk Study

In addition to those listed in Section 2.1, the following sources of information have been consulted during the preparation of this report:

- SNH's interactive, web-based database for statutory designations across Scotland from areas of local interest to sites of national and international interest was used to inform this report (SNH SiteLink).
- Joint Nature Conservation Committee (JNCC) website for statutory designations.
- Pelagica (2019a) *RAF Lossiemouth Development Programme: Marine Ecology Desk Review*. Defence Infrastructure Organisation
- Pelagica (2019b) *RAF Lossiemouth Marine Ecology Supplementary Assessment: Atlantic Salmon and Sea Trout*. Defence Infrastructure Organisation
- Pelagica (2020) *Marine Ecology Supplementary Assessment: Noise (draft report)*. Defence Infrastructure Organisation.

2.3.2 Field Surveys

WYG have completed field surveys at the site since 2013 and information from the surveys has been used to support the assessment (various different locations over time).

WYG Surveys

WYG have completed extended Phase 1 habitat and dedicated species surveys at the site plus supporting assessments. The results of the surveys/assessments are provided in the following reports:

- WYG (2015) RAF Lossiemouth: Extended Phase 1 Habitat Survey Report. Defence Infrastructure Organisation.
- WYG (2017) RAF Lossiemouth Development Programme: Extended Phase 1 Habitat Survey. Defence Infrastructure Organisation.
- WYG (2018) RAF Lossiemouth: Wintering Bird Survey Report.
- WYG (2019a) RAF Lossiemouth Development Programme: Ecological Appraisal. Defence Infrastructure Organisation.

- WYG (2019b) RAF Lossiemouth Development Programme: Marine Mammal Observer, Final Report. Defence Infrastructure Organisation.
- WYG (2019c) RAF Lossiemouth Development Programme: Reptile Survey Report. Defence Infrastructure Organisation.

Geotechnical Survey

Causeway Geotech were contracted by WYG to collect seven core samples along the proposed route of the LSO to determine the nature of the sediments. These were analysed further for Particle Sediment Distribution (PSD) analysis to help determine the nature of the seafloor in this area and the likelihood that the substrates form part of the designated sandbank feature (discussed in Pelagica (2020) RAF Lossiemouth Development Programme: Marine Ecology Supplementary Assessment: Sandbanks).

In addition SNH (2017) Commissioned Report No. 980 Predictive mapping of seabed features within selected Special Areas of Conservation and Nature Conservation MPAs in Scottish territorial waters using available datasets (Miller, F., McCallum, S., White, A., Azzarello, J. & Caryl, F.) was used to assess substrate characteristics within the ZoI of the pipeline route.

Geophysical Surveys

Clydeside Surveys Ltd were contracted by WYG to undertake a multibeam echo-sounder (MBES) survey of the site to characterise the seafloor and identify broadscale habitat changes (CSL, 2019; Pelagica, 2019).

Hydrological Surveys

Wark Consulting were commissioned by WYG to undertake a series of hydrology studies including dye tracing and Acoustic Doppler Current Profiling (ADCP) the results of which were combined to model the dilution and dispersion of de-icer in the Moray Firth (Wark Consulting, 2019).

Underwater Noise Monitoring

Subacoustech Environmental were contracted by WYG to undertake underwater noise monitoring during ground investigation works in the Moray Firth near Lossiemouth. The works utilised two different drilling techniques and noise monitoring was undertaken to assess the noise level and propagation characteristics to inform this HRA and future assessments (Subacoustech Environmental, 2019).

The Missing Salmon Project

The Atlantic Salmon Trust (AST) have been undertaking a large-scale study entitled 'The Missing Salmon Project' regarding the migration movements of salmon which included tagging fish (some 850 individuals), and the deployment of 358 receivers across the Inner Moray Firth. The study has not yet been published, but preliminary results have been supplied to Pelagica for use in this assessment (Pelagica Limited, 2020).

3.0 European Site Citations and Conservation Objectives

3.1 Zone of Influence

Projects may have spatial implications which can have further reaching effects than those predicted to fall within the development footprint itself. Specifically, it is recognised that distance between a proposed development and a designated site is not a definitive determinant as to the likelihood or severity of an impact occurring.

Additionally, the mobile nature of qualifying interest species must also be considered, since an adverse effect on the qualifying species of a site, even if they are not present within the site for which they are a qualifying feature, may still result in a significant adverse effect upon a site. Hence, a development some distance away from a European site could still have effects on the site and, therefore, needs to be considered as part of the screening process.

For this scheme Natura 2000 sites within a radius of minimum 20 km of the site were considered to fully assess potential impacts/connectivity (e.g. due to the hydrological component to the scheme and the potential capacity to have far reaching impacts, and due to the presence of SPA birds which may be found outwith the boundaries of designated sites). European designated sites within 20 km of the proposed development site are provided in Table 1 below along with a summary of their connectivity/potential connectivity to the proposed scheme. Although Ramsar sites are not subject to the same legal protection as Natura 2000 sites, they are of international importance and it is UK Government policy that Ramsar sites should have the same level of protection as SPAs and SACs. Ramsar sites are therefore included below.

Table 1: Natura 2000 Sites within 20 km of the Site

Site Name	Designation (s)	Distance and Direction
Moray Firth	SAC	Tidal and offshore construction and operational areas are within the boundaries of the designated sites
Moray Firth	pSPA	Tidal and offshore construction and operational areas are within the boundaries of the designated sites
Loch Spynie	SPA, Ramsar	2.5 km south-east
Lower River Spey – Spey Bay	SAC	5.5 km east
Moray and Nairn Coast	SPA, Ramsar	13 km west
River Spey	SAC	13 km east

The European designated sites listed within Table 1 are discussed further below. The site information has been taken from the Natura 2000 Standard Data Forms as presented on the JNCC website and the SNHi Sitelink website; these have been collated at Appendix C.

A map showing the location of all the Natura 2000 sites being considered is provided as Figure 1.

3.2 Moray Firth SAC

3.2.1 Background and Qualifying Features

The Moray Firth SAC is a large funnel-shaped area of marine waters which extends from the inner firths to Helmsdale on the Sutherland coast and Lossiemouth on the Moray coast. This SAC has been designated as it supports one of only two known resident populations of bottlenose dolphins *Tursiops truncatus* in UK waters, the last remaining resident population of bottlenose dolphins in the North Sea, and the most northerly resident population in the world. Bottlenose dolphins are European Protected Species listed under Annex II of the Habitats Directive. The other qualifying feature of the Moray Firth SAC is subtidal sandbanks, a habitat listed under Annex II of the Habitats Directive (European Commission, 1992 as amended).

Table 2: Moray Firth Site Data

SAC Name	Moray Firth
Geographical coordinates	Longitude -3.725555556 Latitude 57.81694444
Area (ha)	151273.99 ha Marine Area – 100%
General site character	NO1 – Marine areas, sea inlets
Qualifying species/populations (as identified at designation)	Annex II species that are a primary reason for selection of this site: • Bottlenose dolphin The Moray Firth in north-east Scotland supports the only known resident population of bottlenose dolphin in the North Sea. The population is estimated to be around 130 individuals. Dolphins are present all year round, and, while they range widely in the Moray Firth, they appear to favour particular areas. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • Sandbanks which are slightly covered by sea water all the time.

3.2.2 Site Condition

The conditions of the Moray Firth SAC are described for each qualifying feature (JNCC, 2005) and a copy of the citation is provided in Appendix C of this document:

Table 3: Summary of Site Condition

Feature	Feature Category	Latest Assessed Condition	Summary Condition	Last Visit Date
Bottlenose dolphin	Marine (including marine mammals)	Favourable maintained	Favourable	21/09/2016
Subtidal sandbanks	Marine (including marine mammals)	Favourable maintained	Favourable	12/08/2004

3.2.3 Threats, Pressures and Activities with Impacts on the Site

The Natura 2000 standard data form (JNCC, 2017) lists the following impacts and activities with potential effects on the Moray Firth SAC:

Table 4: Threats and Pressures on the Moray Firth SAC

Rank	Threats and Pressures
High	Shipping lanes, ports, marine constructions
Medium	Invasive non-native species
Medium	Marine and Freshwater Aquaculture
Medium	Fishing and Harvesting Aquatic Resource
Medium	Exploration and extraction of oil or gas
Low	Marine water pollution
Low	Mining and quarrying
Low	Pollution to surface waters (limnic & terrestrial, marine & brackish)
Low	Biocenotic evolution, succession
Low	Discharges
Low	Introduced genetic material, GMO
Low	Industrial or commercial areas
Low	Military use and civil unrest
Low	Interspecific faunal relations
Low	Abiotic (slow) natural processes
Low	Urbanised areas, human habitation
Low	Utility and service lines

3.2.4 Conservation Objectives

The conservation objectives for the Moray Firth SAC (JNCC, 2005; Appendix C) are listed as follows:

Qualifying Habitat

"*To avoid deterioration of the qualifying habitat* [subtidal sandbanks] *thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and*

To ensure for the qualifying habitat that the following are maintained in the long term:

- *Extent of the habitat on site;*
- *Distribution of the habitat within site;*
- *Structure and function of the habitat;*
- *Processes supporting the habitat;*
- *Distribution of typical species of the habitat;*
- *Viability of typical species as components of the habitat;*
- *No significant disturbance of typical species of the habitat."*

Qualifying Species

"To avoid deterioration of the habitats of the qualifying species [bottlenose dolphin] *or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and*

To ensure for the qualifying species that the following are established then maintained in the long term:

- *Population of the species as a viable component of the site;*
- *Distribution of the species within site;*
- *Distribution and extent of habitats supporting the species;*
- *Structure, function and supporting processes of habitats supporting the species;*
- *No significant disturbance of the species."*

3.2.5 Connection to the Proposed Scheme

The Moray Firth SAC is directly connected to the scheme as the LSO is to be constructed partially within the boundary.

3.3 Moray Firth pSPA

3.3.1 Background and Qualifying Features

The Moray Firth has been selected to provide protection to important wintering grounds used for feeding, moulting and roosting by waterfowl, many of which migrate to Scotland every year to overwinter or to stop off at as one of their staging posts while on migration. The inshore area to the north of the Moray Firth is also selected as an important foraging area for breeding European shag, *Phalacrocorax aristotelis*. All qualifying species of the pSPA are listed in Table 5.

Table 5: Moray Firth pSPA Site Data

pSPA Name	Moray Firth
Geographical coordinates	Longitude -3.72 Latitude 58.03595
Area (ha)	58º 03.595' N 003º 38.450' W
General site character	The Moray Firth proposed Special Protection Area (SPA) is a funnel-shaped body of sea on the north-east mainland coast of Scotland. Most of the Firth is shallow water (less than 20metres (m)) over a sandy substrate, apart from a 50m deep channel running east-west through muddy substrate. Tidal flows are relatively weak with a maximum tidal range of 3m and the Firth is relatively sheltered, at least in comparison to the exposure of the Atlantic west coasts The Moray Firth is an important spawning ground and nursery area for a number of fish species, which together with abundant bivalve molluscs, are important prey species for marine waterbirds.

Qualifying species/populations (as identified at designation)	The Moray Firth proposed Special Protection Area (pSPA) qualifies under Article 4.1 by regularly supporting a non-breeding population of European importance of the following Annex 1 species: • Great northern diver *Gavia immer* (a mean peak annual **non-breeding** population of 144 individuals (5.8% of the GB population) for the years 2001/02-2006/07); • Red-throated diver *Gavia stellata* (a mean peak annual **non-breeding** population of 324 individuals (1.9% of the GB population) for the years 2001/02-2006/07) • Slavonian grebe *Podiceps auritus* (a mean peak annual **non-breeding** population of 43 individuals (3.9% of the GB population) for the years 2001/02-2005/06). The site further qualifies under Article 4.2 by regularly supporting populations of European importance of the following migratory species: • Greater scaup *Aythya marila* (a mean peak annual **non-breeding** population of 930 individuals (17.9% of the GB population) for the years 2001/02 to 2005/06); • Common eider *Somateria mollissima* (a mean peak annual **non-breeding** population of 1,733 individuals (2.9% of the GB population) for the years of 2001/02 to 2006/07); • Long-tailed duck *Clangula hyemalis* (a mean peak **annual non-breeding** population of 5,001 individuals (45.5% of the GB population) for the years of 2001/02 to 2005/6); • Common scoter *Melanitta nigra* (a mean peak annual **non-breeding** population of 5,479 individuals (5.5% of the GB population) for the years 2001/02 to 2005/06); • Velvet scoter *Melanitta fusca* (a mean peak annual **non-breeding** population of 1,488 individuals (59.5% of the GB population) for the years 2001/02 to 2005/06); • Common goldeneye *Bucephala clangula* (a mean peak annual **non-breeding** population of 907 individuals (4.5% of the GB population) for the years 2001/02 to 2005/06); • Red-breasted merganser *Mergus serrator* (a mean peak annual **non-breeding** population of 151 individuals (1.8% of the GB population) for the years of 2001/02 to 2005/06) • European shag *Phalacrocorax aristotelis* (at least 6,462 individuals during the **non-breeding** season (3.2% of the biogeographic population and 5.9% of the GB population) and 5,494 individuals during the **breeding** season ((2.7% of the biogeographic population & 10.2% of the GB population) for the years 1980-2006).

3.3.2 Site Condition

Data not available at time of this assessment.

3.3.3 Threats, Pressures and Activities with Impacts on the Site

The Advice to Support Management document (SNH, 2016) provides initial advice regarding an overview of activities with potential to affect the qualifying features of the Moray Firth pSPA, these include:

- Fishing – benthic trawls and dredging, pelagic trawls and seines, drift nets and bottom set nets
- Maintenance dredging – existing maintenance dredging, dredge spoil disposal, capital dredging.
- Ports and harbours – new developments.
- Recreational users – jet skiing, wildfowling, angling, boating (wildlife tours) and kayaking
- Renewables – wave and wind.

The document also identifies activities not considered likely to affect the qualifying features (other than insignificantly):

- Anchorages and moorings;
- Fishing – static gear (creels), mobile gear (line fishing); and,
- Infrastructure – cables, pipelines and outfalls.

3.3.4 Conservation Objectives

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species. And this is to be achieved through the following objectives:

- Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term;
- To maintain the habitats and food resources of the qualifying features in favourable condition.

3.3.5 Connection to the Proposed Scheme

The Moray Firth pSPA is directly connected to the scheme as the LSO is to be constructed partially within the boundary, and also effects on-shore habitats which may be utilised by qualifying species of the designated site.

3.4 Loch Spynie SPA/Ramsar

3.4.1 Background and Qualifying Features

Loch Spynie is located approximately 2.5 km south-west of the site. It is one of only a few large and naturally eutrophic waterbodies in northern Scotland. The loch is of European importance as a roost

for Icelandic greylag goose which feed and roost away from the SPA on surrounding agricultural land during the day.

Table 6: Loch Spynie Site Data

SPA Name	Loch Spynie
Geographical coordinates	Longitude 03 16 42 W Latitude 57 41 00 N
Area (ha)	93.62
General site character	It supports a diverse aquatic flora with extensive reedbeds fringing the open water body and various stages of hydroseral succession including mesotrophic fen, willow *Salix* spp. scrub and swamp alder *Alnus glutinosa* woodland.
Qualifying species/populations (as identified at designation)	This site qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: Over winter: Greylag goose, 3,360 individuals representing up to 3.4% of the wintering Iceland/UK/Ireland population (5-year peak mean 1991/2 - 1995/6)

In the five-winter period 1985/86 to 1989/90 the average peak count was 8,830 birds (9% of the world population). (JNCC, 2011).

3.4.2 Site Condition

The underlying SSSI units for Loch Spynie describes the condition of the site features (JNCC, 2011) and a copy of the citation is provided in Appendix C of this document:

Table 7: Summary of Site Condition

Feature	Feature Category	Latest Assessed Condition	Summary Condition	Last Visit Date
Greylag goose, non-breeding	Birds	Unfavourable Declining	Unfavourable	01/03/2014

3.4.3 Threats, Pressures and Activities with Impacts on the Site

The SSSI site information form shows that there are currently no negative pressure affecting the breeding bird assemblage, or wet woodland. The eutrophic loch may suffer pressure from agricultural operations, invasive species or water management. The fen meadow may have pressure from grazing and under grazing, and greylag goose and open water transition fen may have pressure from natural events (JNCC, 2011).

3.4.4 Conservation Objectives

Qualifying Species

"To avoid deterioration of the habitats of the qualifying species [greylag goose] *or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and*

To ensure for the qualifying species that the following are established then maintained in the long term:

- *Population of the species as a viable component of the site;*
- *Distribution of the species within site;*
- *Distribution and extent of habitats supporting the species;*
- *Structure, function and supporting processes of habitats supporting the species;*
- *No significant disturbance of the species."*

3.4.5 Loch Spynie Ramsar

Loch Spynie was designated as a Ramsar in 1992 (JNCC, 1992). The Ramsar Information Sheet for the site states that:

"Loch Spynie is one of the few large and naturally eutrophic waterbodies in northern Scotland. It supports a diverse aquatic flora with extensive reedbeds fringing and adjacent to the open water body and various stages of hydroseral succession including mesotrophic fen, willow scrub and swamp alder woodland. The reedbeds and fen support several regionally scarce species of southern distribution. The abundance of yellow iris Iris pseudacorus in the fen and in the adjacent fen-meadow is an unusual feature in the Moray Firth and Grampian area. It is also one of the few Scottish localities for alder swamp woodland. The loch itself contains a nationally uncommon aquatic community and a nationally scarce pondweed species. Loch Spynie regularly supports internationally important numbers of roosting Icelandic greylag geese." (

Ramsar Criterion 1:

Loch Spynie is one of very few large and naturally eutrophic waterbodies in northern Scotland. It contains extensive areas of water-fringing vegetation and all stages of succession, through swamp and fen to willow and alder woodland.

Ramsar Criterion 2:

Loch Spynie supports three nationally scarce wetland vascular plants and several wetland species which are rare in northern Scotland.

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in winter: Greylag goose, Iceland/UK, Ireland 4700 individuals, representing an average of 5.2% of the population (5 year peak mean for 1996/7-2000/01) (JNCC, 1992)

3.4.6 Connection to the Proposed Scheme

Loch Spynie is not directly ecologically connected to the proposed scheme due to its geographic location, which is onshore and inland. In addition, the programming of the proposed works (i.e. likely to be April to August 2021) avoids the wintering populations of greylag geese. It is noted that the qualifying species of greylag geese do make use of agricultural land (in the wider landscape) for roosting in winter outside the designated site boundary; however, recent survey data concludes they are not present in close proximity to the proposed works (rather roosting at Findhorn Bay, located, approximately 14.5 km to the west of the site; WYG, 2018).

Following recent Case Law (Case C323/17 (People Over Wind and Sweetman v Coillte Teoranta) it is not possible to mitigate for potential significant effects prior to full Appropriate Assessment (Stage 4) and therefore Loch Spynie will need to be assessed further.

3.5 Lower River Spey - Spey Bay SAC

3.5.1 Background and Qualifying Features

The qualifying features of the Lower River Spey – Spey Bay are provided in Table 8 below.

Table 8: Lower River Spey – Spey Bay Site Data

SAC Name	Lower River Spey – Spey Bay
Geographical coordinates	Longitude -3.116666667 Latitude 57.67
Area (ha)	654.26
General site character	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins) (8%), Salt marshes, Salt pastures, Salt steppes (5%) Coastal sand dunes, Sand beaches, Machair (1%) Shingle, Sea cliffs, Islets (16%) Inland water bodies (Standing water, Running water) (7%) Bogs, Marshes, Water fringed vegetation, Fens (2%) Heath, Scrub, Maquis and Garrigue, Phygrana (26%) Humid grassland, Mesophile grassland (7%) Broad-leaved deciduous woodland (14%) Coniferous woodland (8%) Inland rocks, Screes, Sands, Permanent Snow and ice (4%). Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites) (2%)
Qualifying species/populations (as identified at designation)	**Annex I habitats that are a primary reason for selection of this site:** **Perennial vegetation of stony banks** Historically, Lower River Spey – Spey Bay in north-east Scotland formed part of the same shingle aggregation as Culbin Bar to the west. Although sea-level rise has separated the sites, they are still linked, being maintained by the same coastal processes. Lower River Spey – Spey Bay and Culbin Bar are, individually, the two largest shingle sites in Scotland and together form a shingle complex unique

	in Scotland. They represent this habitat type in the northern part of its range in the UK. Lower River Spey – Spey Bay contains significant areas of both bare and naturally vegetated parallel shingle ridges, although some of these have been planted with trees. The most significant feature of the site is the complex of wet and dry vegetation types, depending on the physical relief of the shingle ridges and hollows. Species-rich dry heath and grassland occurs on the ridges, while in the wetter hollows there is species-rich wet heath and transitions to a vegetation type comparable to that of dune slacks. Large areas of scrub, mainly of gorse *Ulex europaeus*, also occur. **Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*** The Lower River Spey in north-east Scotland is unique within Britain in comprising an extensively braided channel along the whole length of the river. The active river channel provides a mosaic of substrates, and in more stable, damper situations large stands of valley alder *Alnus glutinosa* woods occur, along with willows *Salix spp.*, ash *Fraxinus excelsior* and bird cherry *Prunus padus*. The ground flora includes both southern and northern elements such as wood speedwell *Veronica montana* and wood stichwort *Stellaria nemorum*.

3.5.2 Site Condition

The conditions of the Lower River Spey SAC are described for each qualifying feature (JNCC, 2005) and a copy of the citation is provided in Appendix C of this document:

Table 9: Summary of Site Condition

Feature	Feature Category	Latest Assessed Condition	Summary Condition	Last Visit Date
Alder woodland on floodplains	Woodland	Unfavourable no change	Unfavourable	20/06/2013
Coastal shingle vegetation outside the reach of waves	Coast	Favourable declining	Favourable	27/09/2013

3.5.3 Threats, Pressures and Activities with Impacts on the Site

The Natura 2000 standard data form lists the following impacts and activities with potential effects on the Lower River Spey – Spey Bay SAC (JNCC, 2005; Appendix C):

Table 10: Threats and Pressures on the Lower River Spey – Spey Bay SAC

Rank	Threats and Pressures
High	Human induced changes in hydraulic conditions
High	Interspecific floral relations
High	Mining and quarrying
High	Invasive non-native species
High	Grazing in forests/ woodland

Moderate	Changes in abiotic conditions
Moderate	Other human intrusions and disturbances
Moderate	Grazing
Moderate	Roads, paths and railroads
Moderate	Outdoor sports and leisure activities, recreational activities
Moderate	Abiotic (slow) natural processes
Low	Biocenotic evolution, succession
Low	Airports, flightpaths
Low	Military use and civil unrest
Low	Discharges

3.5.4 Conservation Objectives

The conservation objectives for the Lower River Spey – Spey Bay are as follows (JNCC, 2005, Appendix C):

"*To avoid deterioration of the qualifying habitats (alder woodland on floodplains and coastal shingle vegetation outside the reach of waves) thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and,*

To ensure for the qualifying habitats that the following are maintained in the long term:

- *Extent of the habitat on site;*
- *Distribution of the habitat within site;*
- *Structure and function of the habitat;*
- *Processes supporting the habitat;*
- *Distribution of typical species of the habitat;*
- *Viability of typical species as components of the habitat; and,*
- *No significant disturbance of typical species of the habitat."*

3.5.5 Connection to the Proposed Scheme

The Lower River Spey – Spey Bay SAC has no ecological connectivity to the proposed scheme. The site is located 5.5 km east of the site and comprises of woodland habitat and coastal shingle vegetation outside of the reach of waves.

3.6 Moray and Nairn Coast SPA/RAMSAR

3.6.1 Background and Qualifying Features

The Moray and Nairn Coast SPA is located on the south coast of the Moray Firth. The site comprises the intertidal flats, saltmarsh and sand dunes of Findhorn Bay and Culbin Bar, and the alluvial deposits and associated woodland of the Lower River Spey and Spey Bay. It is of outstanding nature conservation and scientific importance for coastal and riverine habitats and supports a range of wetland birds throughout the year. In summer it supports nesting osprey *Pandion haliaetus,* whilst in winter it supports large numbers of Iceland/Greenland pink-footed goose *Anser brachyrhynchus*,

Icelandic greylag goose and other water birds, especially ducks, sea-ducks and waders. The geese feed away from the SPA on surrounding agricultural land during the day. The sea-ducks feed, loaf and roost over inundated intertidal areas within the site, but also away from the SPA in the open waters of the Moray Firth.

Table 11: Moray and Nairn Coast Site Data

SPA Name	Moray and Nairn Coast
Geographical coordinates	Latitude: 57 38 54 N Longitude: 03 43 48 W
Area (ha)	2410.25
General site character	The site comprises the intertidal flats, saltmarsh and sand dunes of Findhorn Bay and Culbin Bar, and the alluvial deposits and associated woodland of the Lower River Spey and Spey Bay.
Qualifying species/populations (as identified at designation)	This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: During the breeding season; Osprey *Pandion haliaetus*, 7 pairs representing at least 7.0% of the breeding population in Great Britain (Count, as at early 1990s); Over winter; Bar-tailed godwit *Limosa lapponica*, 1,156 individuals representing at least 2.2% of the wintering population in Great Britain (5-year peak mean 1991/2 - 1995/6); This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: Over winter; Greylag goose, 2,679 individuals representing at least 2.7% of the wintering Iceland/UK/Ireland population (5-year peak mean 1991/2 - 1995/6) Pink-footed goose, 139 individuals representing <0.1% of the wintering Eastern Greenland/Iceland/UK population (5-year peak mean 1991/2 - 1995/6); Redshank *Tringa totanus*, 1,690 individuals representing at least 1.1% of the wintering Eastern Atlantic - wintering population (WeBS 1989-1993 and additional surveys). Assemblage qualification: A wetland of international importance. The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl. Over winter, the area regularly supports 20,250 individual waterfowl including: pink-footed goose, dunlin *Calidris alpina alpina*, oystercatcher *Haematopus ostralegus*, red-breasted merganser, Velvet scoter, common scoter *Melanitta nigra*, long-tailed duck *Clangula hyemalgs*, wigeon *Anas penelope*, redshank, greylag goose, bar-tailed godwit.

3.6.2 Site Condition

The Ramsar citation does not list any factors (past, present or potential) adversely affecting the sites ecological character.

The site condition details for the Moray and Nairn Coast are shown in Table 12 (JNCC, 1997) and a copy of the citation is provided in Appendix C of this document:

Table 12: Summary of Site Condition

Feature	Feature Category	Latest Assessed Condition	Summary Condition	Last Visit Date
Bar-tailed godwit, non-breeding	Birds	Unfavourable Declining	Unfavourable	01/03/2014
Dunlin, non-breeding	Birds	Favourable Maintained	Favourable	30/11/2008
Greylag goose, nonbreeding	Birds	Unfavourable declining	Unfavourable	01/03/2014
Long-tailed duck, non-breeding	Birds	Favourable maintained	Favourable	30/11/2008
Osprey, breeding	Birds	Favourable maintained	Favourable	30/04/2001
Osprey, foraging	Birds	Not assessed	-	-
Oystercatcher, non-breeding	Birds	Favourable maintained	Favourable	30/11/2008
Pink-footed goose, non-breeding	Birds	Unfavourable declining	Unfavourable	01/03/2014
Red breasted merganser, non-breeding	Birds	Favourable maintained	Favourable	30/11/2008
Redshank, non-breeding	Birds	Unfavourable declining	Unfavourable	01/03/2014
Waterfowl assemblage, non-breeding	Birds	Favourable declining	Favourable	01/03/2014
Wigeon, non-breeding	Birds	Favourable Maintained	Favourable	30/11/2008

3.6.3 Threats, Pressures and Activities with Impacts on the Site

The Natura 2000 standard data form lists the following impacts and activities with potential effects on the Moray and Nairn Coast SPA (JNCC, 1996, Appendix C).

Table 13: Threats and pressures on the Moray and Nairn Coast SPA

Rank	Threats and Pressures
Medium	Changes in biotic conditions
Medium	Changes in abiotic conditions

Medium	Other forms of pollution
Low	Utility and service lines
Low	Renewable abiotic energy use
Low	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)

3.6.4 Conservation Objectives

The conservation objectives for the Moray and Nairn Coast SPA are as follows (JNCC, 1996; Appendix C):

"*To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and,*

- *To ensure for the qualifying species that the following are maintained in the long term:*
- *Population of the species as a viable component of the site;*
- *Distribution of the species within site;*
- *Distribution and extent of habitats supporting the species;*
- *Structure, function and supporting processes of habitats supporting the species;*
- *No significant disturbance of the species".*

3.6.5 Moray and Nairn Coast Ramsar Site

The Moray and Nairn Coast Ramsar is comprised of two areas: the intertidal flats, saltmarsh and sand dunes of Findhorn Bay and Culbin Bar, and the alluvial deposits and associated woodland of the lower River Spey and Spey Bay. It is of outstanding nature conservation and scientific importance for coastal and riverine habitats, and for migrating geese and over-wintering waders (JNCC, 1997; Appendix C).

The Ramsar meets the following site criterion:

Ramsar criterion 1:

- The site supports a variety of important wetland features, including particularly good examples of intertidal flats, saltmarsh and floodplain alder *Alnus glutinosa* woodland.

Ramsar criterion 2:

- At least six nationally scarce aquatic and coastal plants are present, sea centaury *Centaurium littorale,* Baltic rush *Juncus balticus*, oysterplant *Mertensia maritima* and the eelgrasses *Zostera noltei, Z. angustifolia* and *Z. marina*. The British Red Data Book invertebrates, *Ochthebius lenensis* (a small water beetle) and *Tetanocera freyi* (a snail-killing fly) are also found.

Ramsar criterion 5

- Assemblages of international importance: Species with peak counts in winter: 22609 waterfowl (5-year peak mean 1998/99-2002/2003).

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in winter:

- Pink-footed goose, Greenland, Iceland/UK 1855 individuals, representing an average of 0.7% of the population (5-year peak mean 1996- 2000)
- Greylag goose, Iceland/UK, Ireland 3023 individuals, representing an average of 3.3% of the population (Source period not collated)
- Common redshank, 757 individuals, representing an average of 0.6% of the GB population (5-year peak mean 1998/9- 2002/3)

Species/populations identified subsequent to designation for possible future consideration under criterion 6.

- Species with peak counts in winter: Long-tailed duck, W Siberia/N Europe 1366 individuals, representing an average of 1% of the population (5-year peak mean 1998/9- 2002/3).

Noteworthy Fauna

Birds Species currently occurring at levels of national importance:

Species regularly supported during the breeding season:

- Osprey, *Pandion haliaetus*, Europe 14 individuals, representing an average of 11% of the GB population (Count as at early 1990s)

Species with peak counts in spring/autumn:

- Red-breasted merganser, NW & C Europe 104 individuals, representing an average of 1% of the GB population (5-year peak mean 1998/9- 2002/3)

Species with peak counts in winter:

- Greater scaup, W Europe 81 individuals, representing an average of 1% of the GB population (5-year peak mean 1998/9- 2002/3)
- Black (common) scoter, 3246 individuals, representing an average of 6.4% of the GB population (5-year peak mean 1998/9- 2002/3)
- Velvet scoter, Baltic/W Europe 1146 individuals, representing an average of 38.2% of the GB population (5-year peak mean 1998/9-2002/3).

3.6.6 Connection to the Proposed Scheme

The Moray and Nairn Coast SPA/Ramsar is connected to the scheme via water pathways (albeit any impacts from events such as a pollution event would be highly diluted) as its location is along the same coastline. There are rare plants and invertebrates associated with the Ramsar designation supported along the shoreline. These species may also be present along the shoreline across which the pipeline will pass.

3.7 River Spey SAC

3.7.1 Background and Qualifying Features

The River Spey SAC is located across a large area of North East Scotland encompassing the River Spey watercourse. The River support a number of high priority species including freshwater pearl mussel *Margaritifera margaritifera* , sea lamprey *Petromyzon marinus*, Atlantic salmon *Salmo salar,* and otter *Lutra lutra*.

Table 14: River Spey Site Data

SPA Name	River Spey SAC
Geographical coordinates	Latitude: 57.37 Longitude: -3.5
Area (ha)	5759.72
General site character	The site comprises of primarily inland water bodies (standing and running water) (60%), with humid grassland, mesophile grassland (15%) and bogs, marshes, water fringed vegetation, fens (11%).
Qualifying species/populations (as identified at designation)	Annex II species that are a primary reason for selection of this site: • Freshwater pearl mussel • Sea lamprey • Atlantic salmon • Otter

3.7.2 Site Condition

The conditions of the Lower River Spey SAC are described for each qualifying feature (JNCC, 2005) and a copy of the citation is provided in Appendix C of this document:

Table 15: Summary of Site Condition

Feature	Feature Category	Summary Condition	Last Visit Date
Atlantic salmon	Fish	Unfavourable recovering	04/09/2011
Sea lamprey	Fish	Favourable maintained	07/09/2011
Otter	Mammal (except marine)	Favourable maintained	18/09/2011
Freshwater pearl mussel	Invertebrates	Unfavourable declining	30/09/2019

3.7.3 Threats, Pressures and Activities with Impacts on the Site

The Natura 2000 standard data form lists the following impacts and activities with potential effects on the River Spey SAC:

Table 16: Threats and Pressures on the River Spey SAC

Rank	Threats and Pressures
High	Human induced changes in hydraulic conditions
High	Changes in abiotic conditions
High	Other ecosystem modifications
High	Marine and Freshwater Aquaculture
High	Pollution to surface waters (limnic & terrestrial, marine & brackish)
Medium	Annual and perennial non-timber crops
Medium	Invasive non-native species
Medium	Interspecific faunal relations
Medium	Use of biocides, hormones and chemicals
Medium	Changes in biotic conditions
Medium	Air pollution, air-borne pollutants
Medium	Forest and Plantation management & use
Medium	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)
Medium	Abiotic (slow) natural processes
Medium	Marine water pollution
Medium	Mining and quarrying
Medium	Introduced genetic material, GMO
Medium	Utility and service lines
Medium	Roads, paths and railroads
Medium	Discharges
Medium	Fishing and harvesting aquatic resources
Medium	Renewable abiotic energy use
Medium	Hunting, fishing or collecting activities not referred to above
Low	Urbanised areas, human habitation
Low	Grazing

3.7.4 Conservation Objectives

The conservation objectives for the River Spey are as follows (JNCC, 2005; Appendix C):

"*To avoid deterioration of the qualifying habitats (alder woodland on floodplans and coastal shingle vegetation outside the reach of waves) thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and,*

To ensure for the qualifying habitats that the following are maintained in the long term:

- *Populations of species, including range of genetic types for salmon, as a viable component of the site;*
- *Distribution of the species within site;*
- *Distribution and extent of habitats support the species;*

- *Structure, function and supporting processes of habitats supporting the species;*
- *No significant disturbance of the species;*
- *Distribution and viability of freshwater pearl mussel host species*
- *Structure, function and supporting processes of habitats supporting freshwater pearl mussel host species."*

3.7.5 Connection to the Proposed Scheme

The mouth of the River Spey is located approximately 13 km to the east of the proposed works area. The mouth of river is the only potential area of interaction between the works and the designated site, as the majority of the site is located upriver. Due to the differing ecology of each qualifying species, these have been considered on an individual basis for their potential connectivity to the site.

- Atlantic salmon – are known to occur within the Moray Firth, therefore this qualifying feature of the SAC is connected.
- Sea lamprey – has the potential to occur within the Moray Firth, therefore this qualifying feature of the SAC is connected.
- Otter – the EA (WYG, 2019) identified the shore habitat adjacent to the site as having potential to support otter, therefore they may be present within the Moray Firth and the works area and are potentially linked to the River Spey otter population due to the wide ranging nature of this species.
- Freshwater pearl mussel – no direct impact pathway as this species is found in upstream reaches of the freshwater river and is not found in marine environments. However, this species is wholly reliant on Atlantic salmon and/or sea trout for part of its life cycle, living in their gills for the first year of life. There is therefore potential for an indirect pathway of effect on freshwater pearl mussels as a result of migratory fish from the River Spey passing through the zone of influence of the construction phase of the project.

Qualifying features of the River Spey SAC (Atlantic salmon, sea lamprey and otter) have potential to be present within the vicinity of the works. There is a potential indirect pathway of effect to freshwater pearl mussels given their dependence on migratory Atlantic salmon and sea trout.

4.0 Stages 1 to 3 of HRA (SNH Guidelines)

4.1 Stage 1: What is the Project?

The scheme involves the provision of improved surface water drainage facilities at RAF Lossiemouth, to reduce effects of de-icer entering Covesea Burn by installing a long-sea outfall. Please refer to Section 1.3 for details regarding the proposed works, including construction and operation phases.

4.2 Stage 2: Is the Project Directly Connected with or Necessary to Site Management for Nature Conservation?

The project is not necessary to site management of any of the designated sites considered herein. That said, it is expected that this project shall result in positive impacts within the freshwater and marine environment (i.e. improved wastewater treatment processes and amendments to the outfall location as described in Section 1.3).

4.3 Stage 3: Is the Project (Either Alone, or In-combination with other Projects) Likely to have a Significant Effect(s) on the Natura 2000 Sites / Identification of Likely Significant Effects

Upon instruction of the contractor and finalising of the design/construction method it will be necessary to reassess the likely significant effects and potential for adversely affecting the integrity of any European designated site, either alone or in-combination with other plans and/or projects.

Stage 3 involves a screening process whereby the potential effects of the scheme are identified and considered for all receptors within the Natura 2000 sites within the Zone of Influence of the scheme. This stage focusses on the qualifying features of the designated sites plus any supporting features, species or habitats, which may be present both within and outside the designated sites. The screening test is to identify any LSE on features of each designated site.

The SNH Guidance provides the following definitions for LSE:

A 'likely' effect is one that cannot be ruled out on the basis of objective information. European Commission Guidance 17 advises that the test is whether there is a 'likelihood' of effects rather than a 'certainty'. Paragraph 45 of the Waddenzee judgement further states that:

'…any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects.'

In the light of the precautionary principle therefore, 'likely', in this context, should not simply be interpreted as 'probable' or 'more likely than not', but rather whether a significant effect can objectively be ruled out.

Paragraph 49 of the Waddenzee judgement states:

'*…where a plan or project not directly connected with or necessary to the management of a site is likely to undermine the site's conservation objectives, it must be considered likely to have a significant effect on that site. The assessment of that risk must be made in the light inter alia of the characteristics and specific environmental conditions of the site concerned by such a plan or project.*'

The test of significance is therefore considering whether a plan or project could undermine the site's conservation objectives. The assessment of that risk (of 'significance') must be made in the light, amongst other things, of the characteristics and specific environmental conditions of the site concerned. Each proposal should be considered on a case-by-case basis.

Regulation 48 of the HR Directive makes it clear that effects should be considered 'in combination with other plans or projects' Whether the proposal in question is likely to cause a threshold of significant impact to be crossed, in combination with plans or projects already completed, underway, or actually proposed (for example, in a local development plan), needs to be addressed so that combined effects on the site, over time or space, can be considered. Thus, approval given to a plan or project considered not likely to have a significant effect alone, should not set a precedent that further plans or projects of a similar type could be approved on the same basis.

Potential effects on the qualifying features of Natura 2000 sites which may arise from construction work and future operation of the proposed scheme include:

- Direct and indirect loss of habitat which forms or supports qualifying features of the designated site or suitable functional habitat (located beyond the boundary of the designated site) for qualifying species associated with Natura 2000 designated sites.
- Direct and indirect degradation of habitat which forms or supports qualifying features of the designated site or of suitable functional habitat (located beyond the boundary of the designated site) for qualifying species associated with Natura 2000 designated sites.
- Impact on chemical water quality / pollution to watercourses/marine environment (i.e. via accidental chemical spillages, fuel storage leaks and spills, disturbance of sediments, runoff from construction, release of de-icer to marine environment).
- Impact on physical water quality (i.e. through mobilisation of sediment in run-off resulting in high suspended solids and potential for increased sedimentation at outfall).
- Potential hydrological changes as a result of drainage alterations and excavation for pipe installation.
- Noise and vibration disturbance to qualifying bird, fish and cetacean species within the designated sites and or qualifying bird species taking temporary refuge on site.
- Visual disturbance/human activity to qualifying bird and cetacean species.
- Disturbance of qualifying features of the designated sites during operation of the proposed project.
- Introduction or spread of non-native invasive species.

During the **construction** phase of the development, the following activities could result in the above impacts:

- Habitat degradation due to movement and operation of plant;
- Visual disturbance /human activity/vehicle movements during construction;
- Noise and vibration generated from construction plant/ machinery;

- Impacts on surface water quality from construction;
    - Sediment disturbance;
    - Fuel spillages/storage of oils/chemicals; and
    - Chemical storage leakages/spillages.
- Impacts on marine water quality from removal and backfilling of trenching.
- Introduction or spread of non-native invasive plant and animal species.

During the **operational** phase of the development;

- Degradation of marine habitats due to localised discharge, and potential redistribution of marine sediments around outfall location.
- Localised impacts on water quality at the outfall into the Moray Firth which may be caused by;
    - Reduction in salinity and water quality (primarily due to the release of de-icer);
- Noise and vibration generated from operating pumps.

Table 17 provides a summary of LSEs identified during the construction and operational phases of this drainage scheme. This table indicates which designated sites will be carried forward into more detailed Appropriate Assessment with reference to Stage 5 of SNH Guidance.

Table 17: ALSE

Phase of Project Assessed	Qualifying Features	Pathway of Effect	Potential for Likely Significant Effect	Requirement for AA
Moray Firth SAC				
Construction	Common bottlenose dolphin. Sandbanks which are slightly covered by sea water all the time.	Direct or indirect loss of habitat which forms or supports qualifying features.	Loss of sandbank habitats due to pipe installation.	YES
		Direct or indirect loss of functionally linked habitat.	Potential impacts on similar sandbanks due to sediment redistribution as result of trenching works in marine environment.	YES
		Degradation of habitat which forms or supports qualifying features.		
		Pollution to freshwater/marine environment (chemical).	Construction pollution sources to surface run-off into SAC; mobilisation of sediment resulting in increased suspended solids and sedimentation within SAC habitats.	YES
		Pollution to freshwater/marine environment (physical).		YES
		Hydrological change.	Flows in freshwater burn affected; limited scope for affecting SAC itself.	NO
		Noise/vibration disturbance.	Disturbance of bottlenose dolphin.	YES
		Visual disturbance.	Disturbance of bottlenose dolphin.	YES
		Introduction or spread of non-native invasive species.	Introduction on machinery /plant used for dredging/trenching etc and any introduced materials to site.	YES

Operation	Common bottlenose dolphin. Sandbanks which are slightly covered by sea water all the time.	Discharge to sea resulting in reduction in marine water quality including release of de-icer.	Bottlenose dolphin habitat.	YES
		Noise disturbance from pumping/discharge.	Outfall Operation. The outfall itself is driven solely by gravity and there are no pumps being used anywhere in the system, therefore the only source of operational noise will be from the water leaving the outfall and any future inspection and maintenance work should that be required. No LSE.	NO
Moray Firth pSPA				
Construction	SPA Bird populations Non-breeding species: • Red-throated diver • Great northern divers • Slavonian grebe Migratory species: • Greater scaup • Common eider • Long-tailed duck • Common scoter • Velvet scoter • Goldeneye	Direct or indirect loss of habitat which supports qualifying features.	Temporary loss of coastal habitat and marine habitat used by SPA birds.	YES
		Direct or indirect loss of functionally linked habitat.	Both directly and functionally linked land, along shore/coastal are along pipeline route.	YES
		Degradation of habitat which forms or supports qualifying features.	Along pipeline route.	YES
		Pollution to freshwater/marine environment (chemical).	Potential for construction phase spills, leakages etc reaching marine environment.	YES
		Pollution to freshwater/marine environment (physical).	Mobilisation of sediment during construction dredging/trenching reaching marine environment.	YES

	• Red-breasted merganser • European shag Breeding species: • European shag	Hydrological change.	Diversion of the Covesea Burn with localised hydrological changes; no LSE.	NO
		Noise/vibration disturbance.	SPA birds.	YES
		Visual disturbance.	SPA birds.	YES
		Introduction or spread of non-native invasive species.	Potential for introduction on plant machinery during construction affecting linked habitats.	YES
Operation	Non-breeding species: • Red-throated diver • Great northern divers • Slavonian grebe Migratory species: • Greater scaup • Common eider • Long-tailed duck • Common scoter • Velvet scoter • Goldeneye scoter • Red-breasted merganser • European shag Breeding species: • European shag	Discharge to sea resulting in reduction in marine water quality including release of de-icer.	Indirect effects on feeding areas.	YES
		Noise disturbance from pumping/discharges.	Outfall Operation The outfall itself is driven solely by gravity and there are no pumps being used anywhere in the system, therefore the only source of operational noise will be from the water leaving the outfall and any future inspection and maintenance work should that be required.	NO

The Moray Firth and Nairn Coast SPA/Ramsar				
Construction	SPA Non-breeding species: • Bar-tailed godwit • Greylag goose • Pink-footed goose • Redshank • Dunlin • Oystercatcher • Red-breasted merganser • Velvet scoter • Common scoter • Long-tailed duck • Wigeon Breeding species: • Osprey	Direct or indirect loss of habitat which forms or supports qualifying features. Direct or indirect loss of functionally linked habitat. Degradation of habitat which forms or supports qualifying features. Pollution to freshwater/marine environment (chemical). Pollution to freshwater/marine environment (physical). Hydrological change. Noise/vibration disturbance. Visual disturbance. Introduction or spread of non-native invasive species.	These sites are located 15 km from the proposed scheme and along a coastal stretch around 22 km away from the proposed pipeline route to the west and approximately 12 km to the east. No LSE. Records for osprey on NBN Gateway (cannot be shared due to licence issues) indicate that osprey may be active in close proximity to the site (with to the east / Findhorn Bay area 14.5 km away being the most likely location (noting that some records are given for the 10 km square in which the site is located). WYG consider that there are no suitable **breeding habitats** for osprey within close proximity of the working areas that could be impacted during construction. SPA birds may make occasional use of land further along the coast overwinter for foraging/roosting but the populations will not be significantly affected by temporary displacement during the proposed works. There are numerous alternative sites available much closer to the designated sites; the qualifying SPA populations for these designated sites are located a distance away from Lossiemouth itself.	NO
Construction	**Ramsar** Criterion 1 – wetland features, intertidal flats,	Direct or indirect loss of habitat which forms or supports qualifying features.	This site is located 15 km from the proposed scheme and along a coastal stretch around 22 km away from the proposed pipeline route to the west and approximately 12 km to the east.	YES

	saltmarsh, floodplain alder woodland Criterion 2 – nationally scarce aquatic and coastal plants; British RDB invertebrates Criterion 5 – waterfowl assemblages	Direct or indirect loss of functionally linked habitat.	No specific survey was undertaken to record nationally scarce aquatic and coastal plants along the coast adjacent to the proposed works on the Moray Firth. Therefore, there is potential for scarce species to be present and a functional link between the drainage scheme and the Ramsar site.	
		Degradation of habitat which forms or supports qualifying features.		
		Pollution to freshwater/marine environment (chemical).		
		Pollution to freshwater/marine environment (physical).		
		Hydrological change.		
		Noise/vibration disturbance.		
		Visual disturbance.		
		Introduction or spread of non-native invasive species.		
Operation	Non-breeding species: • Bar-tailed godwit • Greylag goose • Pink-footed goose • Redshank • Dunlin • Oystercatcher • Red-breasted merganser • Velvet scoter • Common scoter	Discharge to sea resulting in reduction in marine water quality including release of de-icer.	This site is located 15 km from the proposed scheme and along a coastal stretch around 22 km away from the proposed pipeline route to the west and approximately 12 km to the east. No LSE due to lack of connectivity or distance away from the source of any pathways of effect.	NO

	• Long-tailed duck • Wigeon Breeding species: • Osprey	Noise disturbance from pumping/discharges.	Outfall Operation The outfall itself is driven solely by gravity and there are no pumps being used anywhere in the system, therefore the only source of operational noise will be from the water leaving the outfall and any future inspection and maintenance work should that be required. No LSE.	NO
Operation	**Ramsar** Criterion 1 – wetland features, intertidal flats, saltmarsh, floodplain alder woodland Criterion 2 – nationally scarce aquatic and coastal plants; British RDB invertebrates Criterion 5 – waterfowl assemblages	Discharge to sea resulting in reduction in marine water quality including release of de-icer.	No specific survey was undertaken to record nationally scarce aquatic and coastal plants along the coast adjacent to the proposed works on the Moray Firth. Therefore, there is potential for scarce species to be present and a functional link between the drainage scheme and the Ramsar site.	YES

		Noise disturbance from pumping/discharges	Outfall Operation. The outfall itself is driven solely by gravity and there are no pumps being used anywhere in the system, therefore the only source of operational noise will be from the water leaving the outfall and any future inspection and maintenance work should that be required.	NO
River Spey SAC				
Construction	• Atlantic salmon • Sea lamprey • Otter • Freshwater pearl mussel	Direct or indirect loss of habitat which forms or supports qualifying features.	River Spey itself located 15 km from scheme and discharges to Moray Firth some 12 km from Lossiemouth.	NO
		Direct or indirect loss of functionally linked habitat.	Migratory fish and otter passing along the coast could be disturbed or alter course due to noise and vibration, or pollution as a result of the construction phase, particularly during installation of the LSO.	YES
		Degradation of habitat which forms or supports qualifying features.	Migratory fish and otter passing along the coast.	YES
		Pollution to freshwater/marine environment (chemical).	Migratory fish and otter passing along the coast.	YES
		Pollution to freshwater/marine environment (physical).	Migratory fish and otter passing along the coast.	YES
		Hydrological change.	Limited change; no LSE.	NO
		Noise/vibration disturbance.	Migratory fish and otter moving along the coast.	YES
		Visual disturbance.	Migratory fish and otter moving along coast.	NO

		Introduction or spread of non-native invasive species.	No pathway of effect so no LSE.	NO
Operation	• Atlantic salmon • Sea lamprey • Otter • Freshwater pearl mussel	Discharge to sea resulting in reduction in marine water quality including release of de-icer.	No LSE with regards migratory fish and otter due to the limited spatial effect and potential for avoidance.	NO
		Noise disturbance from discharge.	Outfall Operation. The outfall itself is driven solely by gravity and there are no pumps being used anywhere in the system, therefore the only source of operational noise will be from the water leaving the outfall and any future inspection and maintenance work should that be required. No LSE, low level noise and potential for avoidance.	NO
Loch Spyrnie SPA/Ramsar				
Construction	**SPA/Ramsar** • Greylag goose	Direct or indirect loss of habitat which forms or supports qualifying features.	Potential for greylag goose to use land along pipeline route.	YES
		Direct or indirect loss of functionally linked habitat.	Potential for greylag goose to use land along pipeline route.	YES
		Degradation of habitat which forms or supports qualifying features.	Potential for greylag goose to use land along pipeline route.	YES
		Pollution to freshwater/marine environment (chemical).	Potential for greylag goose to use land along pipeline route.	YES
		Pollution to freshwater/marine environment (physical).	Potential for greylag goose to use land along pipeline route.	YES

		Hydrological change.	No LSE.	NO
		Noise/vibration disturbance.	Potential for greylag goose to use land along pipeline route.	YES
		Visual disturbance.	Potential for greylag goose to use land along pipeline route.	YES
		Introduction or spread of non-native invasive species.	No LSE as no pathway of effect to habitats.	NO
	Ramsar Criterion 1 – large eutrophic waterbody, with extensive water fringing vegetation, through swamp and fen to willow carr and alder woodland	Direct or indirect loss of habitat which forms or supports qualifying features.	**Ramsar habitats:** No LSE due to lack of connectivity between the proposed scheme and pipeline route.	NO
	Criterion 2 – 3 nationally scarce wetland vascular plants and several rare Scottish species	Direct or indirect loss of functionally linked habitat Degradation of habitat which forms or supports qualifying features.	**Ramsar habitats**: No LSE due to lack of connectivity with the proposed scheme and pipeline route.	NO
	Criterion 6 – greylag goose peak overwintering counts	See above for SPA.	Greylag goose – effects as above for SPA.	YES
Operation	**SPA** • Greylag goose	Discharge to sea resulting in reduction in marine water quality including release of de-icer.	No LSE.	NO
		Noise disturbance from pumping/discharge.	Outfall Operation The outfall itself is driven solely by gravity and there are no pumps being used anywhere in the	NO

			system, therefore the only source of operational noise will be from the water leaving the outfall and any future inspection and maintenance work should that be required. No LSE.	
	Ramsar Criterion 1 – large eutrophic waterbody, with extensive water fringing vegetation, through swamp and fen to willow carr and alder woodland	Discharge to sea resulting in reduction in marine water quality including release of de-icer.	No LSE due to lack of connectivity.	NO
		Noise disturbance from pumping/discharges.	No LSE as receptors are habitats.	NO
	Criterion 2 – 3 nationally scarce wetland vascular plants and several rare Scottish species	Discharge to sea resulting in reduction in marine water quality including release of de-icer.	No LSE due to lack of connectivity.	NO
		Noise disturbance from pumping/discharges.	No LSE as receptors are habitats.	NO
	Criterion 6 – greylag goose peak overwintering counts	Discharge to sea resulting in reduction in marine water quality including release of de-icer.	No direct LSE. Greylag geese roosting and foraging on terrestrial sites along coast.	NO
		Noise disturbance from pumping/discharges.	Outfall Operation. The outfall itself is driven solely by gravity and there are no pumps being used anywhere in the system, therefore the only source of operational noise will be from the water leaving the outfall and any future inspection and maintenance work should that be required. No LSE.	NO

Lower River Spey – Spey Bay SAC				
Construction	Annex 1 habitat – Perennial vegetation of stony banks Annex 1 habitat – Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*	Direct or indirect loss of habitat which forms or supports qualifying features.	No potential for LSE; no pathway of effect to SAC habitats.	NO
		Direct or indirect loss of functionally linked habitat.	No potential for LSE; no pathway of effect to SAC habitats.	NO
		Degradation of habitat which forms or supports qualifying features.	No potential for LSE; no pathway of effect to SAC habitats.	NO
		Pollution to freshwater/marine environment (chemical).	No potential for LSE; no pathway of effect to SAC habitats.	NO
		Pollution to freshwater/marine environment (physical).	No potential for LSE; no pathway of effect to SAC habitats.	NO
		Hydrological change.	No potential for LSE; no pathway of effect to SAC habitats.	NO
		Noise/vibration disturbance.	No potential LSE.	NO
		Visual disturbance.	No potential LSE.	NO
		Introduction or spread of non-native invasive species.	No potential for LSE; no pathway of effect to SAC habitats.	NO
Operation		Discharge to sea resulting in reduction in marine water	No potential for LSE; no pathway of effect to SAC habitats.	NO

Town & Country Planning (Scotland) Act, 1997 as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

	Annex 1 habitat – Perennial vegetation of stony banks Annex 1 habitat – Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*	quality including release of de-icer.		
		Noise disturbance from pumping/discharges.	No LSE as receptors are habitats.	NO

Town & Country Planning
(Scotland) Act, 1997
as amended

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4.4 Summary of LSEs Taken Forward to AA

Moray Firth SAC

Due to the nature of the scheme and proximity of qualifying features, there is potential for likely significant effects at both construction and operational phases. Potential LSEs identified include direct or indirect loss of habitat which forms or supports qualifying features, direct or indirect loss of functionally linked habitat, degradation of habitat which forms or supports qualifying features, pollution of freshwater/marine environment (chemical), pollution to freshwater/marine environment (physical), noise/vibration disturbance, visual disturbance, and introduction or spread of non-native invasive species

Therefore, a full **Appropriate Assessment has been undertaken for Moray Firth SAC** to consider how these potential significant effects might be mitigated, and if there is any risk to the integrity of the designated site as a result of these effects.

Moray Firth pSPA

Due to the nature of the scheme and proximity of qualifying features there is potential for likely significant effects on qualifying features at both construction and operational phases. Potential LSEs identified include direct or indirect loss of habitat which forms or supports qualifying features, direct or indirect loss of functionally linked habitat, degradation of habitat which forms or supports qualifying features, pollution to freshwater/marine environment (chemical), pollution to freshwater/marine environment (physical), noise/vibration disturbance, visual disturbance, and introduction or spread of non-native invasive species

Therefore, a full **Appropriate Assessment has been undertaken for Moray Firth pSPA** to consider how these potential significant effects might be mitigated, and if there is any risk to the integrity of the designated site as a result of these effects.

Moray and Nairn Coast Ramsar/SPA

These designated sites are located approximately 22 km from the proposed pipeline route along the coast to the west, and approximately 12 km along the coast to the south-east. There are no pathways of effect for any habitats associated with the Moray and Nairn Coast Ramsar designation. The sites are considered to be located too distant from the scheme for non-breeding and breeding qualifying SPA species to be significantly affected, even if the SPA make use of coastal land outside the designation boundary. **No Appropriate Assessment is considered necessary for Moray and Nairn Coast SPA** and this site is not considered further in this assessment.

There is potential for nationally scarce botanical species to be present within the footprint of the scheme that may be represent a functional link to the Moray and Nairn Coast Ramsar. Therefore an **Appropriate Assessment has been undertaken for Moray and Nairn Coast Ramsar Criterion 2.**

River Spey SAC

Due to the nature of the scheme and mobility of the qualifying species along the coast, which include migratory fish and otter, there is potential for LSE at both construction and operational phases. Potential LSEs identified include direct or indirect loss of functionally linked habitat, degradation of habitat which forms or supports qualifying features, pollution to freshwater/marine environment (chemical), pollution to freshwater/marine environment (physical), and noise/vibration disturbance. Therefore, a **full Appropriate Assessment has been undertaken for the River Spey SAC** to consider how these potential significant effects might be mitigated, and if there is any risk to the integrity of the designated site as a result of these effects.

Loch Spynie SPA / Ramsar

Due to the location of this SPA, approximately 2.5 km from the proposed pipeline scheme, there is potential for the qualifying species (greylag goose) to be affected should they be using functionally linked roosting/foraging coastal land along the adjacent coast. Potential LSEs identified include temporary loss of functionally linked habitat and noise/human disturbance during construction whilst greylag geese are making use of these coastal habitats.

There are no pathways off effect for qualifying wetland habitats of the Loch Spynie Ramsar site.

Therefore, a **full Appropriate Assessment has been carried out for Loch Spynie SPA** in respect of greylag geese for the construction phase only.

During the operational phase there is no ecological connectivity, and no potential for any likely significant effects. Therefore, **the operational phase does not require an Appropriate Assessment.**

Lower River Spey – Spey Bay SAC

This European site is designated for its range of qualifying habitats. Annex 1 habitats are perennial vegetation of stony banks, and alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*. There are no pathways of effect from the proposed scheme which could impact upon these habitats.

There is **no potential for a LSE** at construction and/or operational phases. Therefore, the **Lower River Spey – Spey Bay SAC has been screened out and does not require an Appropriate Assessment**. Lower River Spey – Spey Bay SAC is not considered any further in this assessment.

4.5 Likely Significant Effects (In-combination)

Following consultation with SNH, no relevant plans or projects were presented which might need to be considered in-combination with the proposed construction area.

Construction works as part of a 5-year maintenance project by Transport Scotland are ongoing at the Kessock Bridge in the Moray Firth. This is approximately 65 km away and is therefore considered highly unlikely that such projects would act in-combination with the proposed construction site to exert likely significant effects.

Moray Councils planning portal was used to identify planning proposals which may result in in-combination effects, along the Moray Firth coastline where there are various small planning

applications. Almost all of these are associated with home improvements/ extensions and are not considered to have any pathways of effect to the designated sites.

One application (Ref: 18/00384/EIA) was submitted for the '*Proposed extraction area to be used in conjunction with (and the retention of) the existing processing area at Caysbriggs Quarry Elgin Lossiemouth Moray*'. This is located approximately 4.7 km south east of the proposed LSO. The principal components of the development are:

- The extraction of cobbles, pebbles and sand from the extraction area (at the rate of approximately 30,000 to 40,000 tonnes per annum), which are transported to an existing nearby processing area for processing, stockpiling and dispatch to market.
- Planning consent is sought for 26 years, the total estimated reserve is 800,000 tonnes giving an estimated life of 20 to 26 years.
- Construction of an access track within the extraction area and widening/ up-grading of an existing access track onto public road to accommodate HGVs.
- Extraction would be to a depth of approximately 7m.
- The extraction area comprises of 11 phases, each covering approximately 1 hectare and with each phase, on average, equating to two years of production.
- Progressive restoration of the ground profile earthworks and woodland re-planting would be undertaken upon completion of each phase.
- Incorporation of a protective margin around the extraction perimeter, where vegetation will be retained, with additional trees to be planted along the north and northeast boundaries of the site.
- Construction of a 2 m high bund along the north and west (part) boundaries of the extraction area with additional planting and screening vegetation.

The application has been approved following a number of planning conditions, which include provisions to:

- To prevent pollution of the water environment.
- To ensure the Scottish Water assets and infrastructure within the extraction area are adequately protected during the lifetime of the development.
- To ensure that an acceptable plan with monitoring is in place from the start of the development in accordance with the submitted EIA Report, to address / mitigate dust impacts upon neighbouring property.
- To minimise hours of quarry extraction to control / restrict the impact of noise emissions resulting from such operations upon the amenities of the locality and neighbouring property.
- To ensure an acceptable form of development in accordance with the submitted EIA Report and to limit / mitigate the impact of noise associated with on-site extraction upon the amenities of the locality and neighbouring property; with further mitigation measures to be agreed and implemented where such impacts are identified as a result of the compliance noise monitoring.

These conditions are to ensure that an acceptable plan with monitoring is in place from the start of the development in accordance with the submitted EIA Report, to address and mitigate dust impacts upon neighbouring property. It is considered that, provided the proposed development be undertaken in accordance with these conditions, the development will not have any interaction with the marine

environment via run off, and no in-combination effects are expected associated with water pollution. Noise limitations have been imposed so as not to adversely affect the residential properties, however there is no assessment provided for potential effects of noise and visual disturbance on SPA/Ramsar bird populations which are located close to this quarry. Noise impacts will be temporary in nature, potentially resulting in birds taking flight but unlikely to have any significant effect even in-combination.

Based on the above information it is concluded that there will be no in-combination effects as a result of the proposed works.

5.0 Stage 4 (SNH Guidelines): Undertake an Appropriate Assessment of the Implication for the Site in View of its Conservation Objectives

5.1 Assessment of Potential Impacts on Natura 2000 Site(s)

Upon instruction of the contractor and finalising of the design/construction method it will be necessary to reassess the likely significant effects and potential for adversely affecting the integrity of any European designated site, either alone or in-combination with other plans and/or projects.

Table 17 has assessed aspects of the proposed scheme which have been identified in SNH Guidelines Stage 3 (ALSE) as potentially giving rise to LSE on the qualifying features of the designated sites. These effects are evaluated in more detail at Stage 4 AA in Table 18 below to identify whether or not the resulting impacts could have an adverse effect on the integrity of the designated sites. This detailed assessment is known as Appropriate Assessment (AA) and will conclude whether or not the overall integrity of designated sites might be compromised by allowing the scheme to proceed.

Assessment of effects follows a precautionary approach as recommended by the SNH guidance. The following text taken form this guidance provides definitions for adverse effect on integrity.

'A decision of the Court of Justice of the European Union in Peter Sweetman v An Bord Pleanala (Case C-258/11) discussed what is meant by an **adverse effect** on site integrity in relation to a priority habitat (although there was no firm ruling in relation to non-priority habitat). It states in paragraph 46 "*Consequently, if, after an appropriate assessment of a plan or project's implications for a site, carried out on the basis of the first sentence of Article 6(3) of the Habitats Directive, the competent national authority concludes that that plan or project will lead to the lasting and irreparable loss of the whole or part of a priority natural habitat type whose conservation was the objective that justified the designation of the site concerned as an SCI, the view should be taken that such a plan or project will adversely affect the integrity of that site*".

Paragraph 48 further states that a plan or project "*will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective*

justifying the designation of the site in the list of SCIs, in accordance with the directive. The precautionary principle should be applied for the purposes of that appraisal".'

Table 18: Appropriate Assessment

Aspect of Project Assessed	Qualifying Feature	Pathway of Effect and Type of Operation	Avoidance / Mitigation	Appropriate Assessment	Effect on Integrity of Designated Site
Moray Firth SAC					
Construction	Sandbanks which are slightly covered by sea water all the time	Direct or indirect loss of habitat which forms or supports qualifying features Degradation or destruction of habitats during removal of substrate. Temporary habitat loss of sandbank features.	A detailed assessment of the nature of the substrate and proximity of proposed works to the designated sandbank features has been undertaken. This identified that sandbank features are not present within the footprint of the site.	The loss of habitat within the Moray Firth SAC is not expected to be significant, in part due to the small size of the affected area relative to the entire Moray Firth site and to the extent of the designated sandbank features. The habitat affected does not consist of any specific qualifying feature listed. Detailed spatial analysis has revealed that the pipeline will sit over 100m from the modelled boundary of the designated sandbank feature at its nearest point (as defined by SNH commissioned model, Miller 2017). Geophysical and sediment analysis by Pelagica (2019) have confirmed that the area to be worked lies in soft rock with a veneer of boulders, cobbles and rock along the chosen pipeline route, providing further evidence that the development site does not form part of the sandbank feature. These samples also demonstrated that the rocky ground extends into the modelled area of the sandbank feature so indicating the actual extent of the sandbank itself is less than the modelled boundary shows.	It has been demonstrated that there are no qualifying sandbank habitats within or directly adjacent to the footprint of the site. It is therefore considered that there will be **no adverse effect on the integrity of the SAC** during pipeline installation through degradation or destruction of qualifying habitat features.

				Pipeline installation will be a temporary phase and whilst there may be increased turbidity and localised increases in suspended solids, this will not be of a magnitude which could possibly have an adverse effect on site integrity.	
	Common bottlenose dolphin *Tursiops truncatus*	Noise and/or vibration disturbance from plant / machinery on common bottlenose dolphin. Visual Disturbance	A Marine Mammal Observer (MMO) will be present for the construction and installation of the coastal and offshore sections of pipeline. The MMO Method Statement followed for the geotechnical investigations shall be updated and sent to SNH for comment/approval, and appropriate disturbance licence obtained. A generous mitigation zone of	Pelagica Limited (2019) undertook a Marine Ecology Desk Review which considered the impact (permanent damage and avoidance behaviour) range for cetaceans from noise sources. For bottlenose dolphin, the most extreme source given is pile driving which identifies an avoidance range of 503 m (although a frequency for this activity was not given). The Marine Ecology Desk Review also identifies March to September (inclusive) as the time of highest sensitivity for cetaceans (including bottlenose dolphins). Underwater noise monitoring during ground investigation works was undertaken (Subacoustech Environmental, 2019) which identified the background noise levels[2] when all machinery (including generators) were off at an average of 105 10s SPL RMS dB re 1 µPa[3]. This is considered the baseline above	It is considered that with the presence of an MMO that disturbance (under licence) (avoidance behaviour) will be reduced as far as reasonably practicable. It is therefore considered that with mitigation, there will be **no adverse effect on the integrity of**

[2] Baseline noise levels here include fishing boats in the area, which are considered as part of the baseline as a near continuous source of noise throughout the Moray Firth.
[3] Average Sound Pressure Level (SPL) over 10 seconds as form of acoustic pressure in decibels (dB) for underwater sources (where the standard unit of acoustic pressure is micro Pascals µPa).

			500m from the works will be adopted and should any qualifying species approach or be noted within this zone, all works will be halted. The MMO search will be carried out for a minimum of 30 minutes before work commences; no works will start until the mitigation zone is clear of species. In addition, if necessary soft start methods will be adopted as works commence which will alert species of any activity and allow them to move away before any risk of damaging noise or vibration.	which noise levels for various construction methodologies can be compared. Methodology for the construction of the pipeline will involve excavation of material by either bucket/dredging from a barge, laying the outfall and then backfilling over the outfall with the excavated material. This will have a temporary localised low noise effect with no requirement to make use of noisy methods such as piling. A Marine Mammal Observer (MMO) was deployed for the ground investigation works (WYG, 2019b) during which the closest a bottlenose dolphin was recorded was 50m from the site. It is therefore assumed that the dolphin population do use the area around the proposed LSO. The MMOs were equipped with reticle binoculars, enabling accurate assessment of object distance. At any one time, a distance of approximately 700m - 1.3 km could typically be seen, allowing for early warning for works, in case of dolphins coming within close proximity of the 500 m buffer zone. The maximum number of individuals seen at any one time was over 20; at a distance of between 50 m and 1 km from the platform, prior to any drilling works being undertaken. At no point were dolphins observed within 500 m of the platform whilst drilling was being	**the SAC**; there will be no significant effect on the size, structure or health of the qualifying bottle nosed dolphin population as a result of noise, vibration or visual disturbance.

				undertaken; however, they were seen at distances of approximately 1 km during drilling; indicating that whilst a localised deterrent, the drilling did not cause abandonment of the entire bay area. The expected noise generated from the construction of the LSO could not be obtained for this assessment. However, it has been confirmed that the weak layer of weathered rock can be broken out with an excavator and dredger only. This will generate a relatively minimal noise level in comparison to alternative (piling, rock hammer). Therefore, an MMO is required on site to undertake MMO duties and minimise disturbance as far as reasonably practicable, using the typical 500m buffer for a mitigation zone.	
	Sandbanks which are slightly covered by sea water all the time. Common bottlenose dolphin.	Reduction in water quality impacting the integrity of the habitat: Pollution of the freshwater/marine environment (chemical) i.e. Pollution event. Pollution to freshwater/marine	Standard SEPA GPP/PPGs will be employed	All underwater pipe laying techniques will generate a level of turbidity from the disturbance of sediment. This is unavoidable but given the temporary and short-lived nature of this impact it is not considered to have a significant effect that would threaten the conservation objectives and the integrity of the qualifying features of the Moray Firth SAC. Dredging and excavation works will be small-scale and temporary. The major sedimentation pathway from this area is in a westerly direction with fine sediment being deposited in the inner firths. As the sandbank feature is	It is considered that with the implementation of SEPA GPPs/ PPGs that impacts on water quality from construction have been mitigated for as reasonably practicable. It is

Town & Country Planning
(Scotland) Act, 1997
as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

		environment (physical) i.e. sediment disturbance, suspended solids and sedimentation (when removing and backfilling from pipeline trench)		located greater than 100m north north-east from the end of the pipeline the likelihood of any sediment affecting the sandbank is very low. It can be assumed that during the operational phase the marine habitat will be stable, apart from localised disturbance around the discharge pipe outfall. Standard SEPA GPP and PPGs will be employed to reduce the risk of a significant pollution events from land-based construction activities, including; • PPG 1: Understanding your environmental responsibilities - good environmental practices; • GPP 5: Works and maintenance in or near water; • PPG 6: Working at construction and demolition sites; • PPG 7: Safe storage – The safe operation of refuelling facilities; • GPP 21: Pollution incident response planning; and • GPP 22: Dealing with spills.	therefore considered that with mitigation, there will be **no adverse effect on the integrity of the SAC** through a deterioration in water quality or increase in sedimentation.
	Sandbanks which are slightly covered by sea water all the time.	Introduction of non-native invasive plant and/or animal species during construction and	Standard SEPA GPP/PPGs will be employed	Standard SEPA GPP and PPGs will be employed to reduce the risk of spread or introduction of non-native species. Tyres of plant and vehicles accessing the site will be cleaned to prevent introduction of invasive species from outside the site. The source of imported materials	It is considered that with the implementation of SEPA GPPs/ PPGs that potential

Town & Country Planning (Scotland) Act, 1997 as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

		movements of plant/ machinery		must be from recognised suppliers with no risk of importing invasive species to the terrestrial or marine /freshwater environments.	impacts due to spread of non-native species have been mitigated for as reasonably practicable. It is therefore considered that with mitigation, there will be **no adverse effect on the integrity of the SAC** through introduction or spread of invasive plant species**.**
Operation	Sandbanks which are slightly covered by sea water all the time. Common bottlenose dolphin.	Reduction in water quality impacting the integrity of the habitat/ supporting habitats (release of de-icer)	Hydrographic modelling was adopted to identify dilution factor, tide/ flow rate etc. Wark Consulting (2019) RAF Lossiemouth Proposed New Outfall Initial Dilution and Secondary Dispersion	Dispersion modelling has been completed which reports that the level of de-icer discharged into the marine environment will be negligible. <0.24 mg/l, 95% of the time is a considerably lower value than the 'no biological effect level' of 859 mg/l. The compounds contained in the de-icer do not bio-accumulate and rapidly breakdown in water. Considering the size of the Moray Firth there is no	It is considered that the operational phase of the work will have **no adverse effect on the integrity of the SAC**.

Town & Country Planning (Scotland) Act, 1997 as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

			Modelling (p.154, Wark Consulting, Stewarton.	identified impact on the Moray Firth SAC from the release of de-icer. Hydrographic modelling results support conclusion of no LSE.	
Moray Firth pSPA					
Construction	Non-breeding species: • Red-throated diver • Great northern divers • Slavonian grebe • Greater scaup • Common eider • Long-tailed duck • Common scoter • Velvet scoter • Goldeneye scoter • Red-breasted merganser • European shag Breeding species: European shag	Temporary direct habitat loss of designated land /coastal habitats during construction phase (plant / machinery within the designated site footprint rendering it unusable by qualifying species).	The timing of the works will be April – September and will therefore avoid any impact for temporary loss of habitats and disturbance for non-breeding over wintering SPA birds.	Most qualifying features identified as non-breeding (wintering) populations are not expected to be significantly disturbed as the works are will be undertaken during the summer months, most of the wintering bird populations are not expected to be present and therefore will not be impacted by noise disturbance.	It is considered that the construction phase of the work will have **no adverse effect on the integrity of the pSPA** through temporary loss of designated and supporting coastal habitats**.**

Town & Country Planning
(Scotland) Act, 1997
as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

		Noise from plant / machinery resulting in avoidance behaviour (disturbance).	Eider duck will be protected from significant disturbance by being within the remit of the MMO. The timing of the works will be April – September and will therefore avoid any impact for temporary loss of habitats and disturbance for non-breeding over wintering SPA birds.	An MMO will be present on site who will implement a buffer within which works will cease if an eider is present or enters as they will not be able to move away from the disturbance easily. The mitigation Section 6 of Moray Firth pSPA Site Selection Document (SNH, 2016), includes distribution of SPA bird species throughout the Moray Firth area. This has been reviewed in relation to the qualifying species that use the marine habitat around Lossiemouth. European shag (breeding) are not expected to occur within the vicinity of Lossiemouth as their breeding sites are limited to the northern coast of the Moray Firth >30km away from the site and therefore are not considered to be impacted by the works, and are hereby scoped out of any further consideration.	It is considered that the construction phase of the work will have **no adverse effect on the integrity** of the pSPA through noise disturbance.
		Reduction in water quality (physical and chemical) during underwater and shoreline construction impacting the supporting habitats of qualifying birds both within and outside the SPA boundary	Standard SEPA GPP/PPGs will be employed.	All pipe laying techniques will generate a level of turbidity from the disturbance of sediment. This is unavoidable but given the temporary and short-lived nature of this impact it is not considered to have a significant effect that would threaten the conservation objectives and the integrity of the qualifying features of the Moray Firth pSPA (for example smothering foraging habitats, or an increase in suspended solids) . It can be assumed that during operation the marine habitat will be unchanged from the	It is considered that the construction phase of the work will have **no adverse effect on the integrity** of the pSPA through reduction in water quality.

Town & Country Planning (Scotland) Act, 1997 as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

				baseline, apart from localised sediment redistribution at the outfall itself.	
		Introduction of non-native invasive plant and/or animal species during construction and movements of plant/ machinery.	Standard SEPA GPP and PPGs will be employed to reduce the risk of spread or introduction of non-native species.	Standard SEPA GPP and PPGs will be employed to reduce the risk of a significant pollution event, including; • PPG 1: Understanding your environmental responsibilities - good environmental practices; • GPP 5: Works and maintenance in or near water; • PPG 6: Working at construction and demolition sites; • PPG 7: Safe storage – The safe operation of refuelling facilities; • GPP 21: Pollution incident response planning; and • GPP 22: Dealing with spills	It is considered that with the implementation of SEPA GPPs/ PPGs that potential impacts due to spread of non-native species have been mitigated for as reasonably practicable. It is therefore considered that with mitigation, **there will be no adverse effect on the integrity of the SAC.**
Operation	Non-breeding species: • Red-throated diver	Reduction in water quality impacting the integrity of the supporting habitats (release of de-icer)	Hydrographic modelling was adopted to identify dilution factor, tide/ flow rate etc. Wark	Hydrographic modelling has been completed which reports that the level of de-icer will be negligible. <0.24 mg/l, 95% of the time is a considerably lower value than the 'no effect level' of 859 mg/l. This level is considered to	It is considered that the operational phase of the work will have

	• Great northern divers • Slavonian grebe • Greater scaup • Common eider • Long-tailed duck • Common scoter • Velvet scoter • Goldeneye scoter • Red-breasted merganser • European shag Breeding species: • European shag		Consulting (2019) RAF Lossiemouth Proposed New Outfall Initial Dilution and Secondary Dispersion Modelling (p.154, Wark Consulting, Stewarton).	be far below any level for biological effect (including bacteria) and therefore will not impact any prey species of the qualifying species of the Moray Firth pSPA. Furthermore, the compounds contained in the de-icer do not bio-accumulate and rapidly breakdown in water. It can therefore be assumed that during operation the marine habitat will be unchanged.	**no adverse effect on the integrity of the pSPA** as a result of deterioration in water quality
Moray and Nairn Coast Ramsar					
Construction	Criterion 2 – nationally scarce aquatic and coastal plants.	Direct or indirect loss of functionally linked habitat.	A pre-commencement survey will be undertaken to identity and relevant species within the footprint of the site. A Habitat and Landscape Management Plan (HLMP) will include details for the translocation of relevant species (if required).	Should any nationally scarce aquatic and coastal plants identified under Criterion 2 be identified during the pre-commencement survey, translocation of relevant plants will be undertaken in accordance with the HLMP.	It is considered with the implementation of a HLMP following the identification of relevant species that there will be **no adverse effect on the integrity of qualifying botanical species** under Criterion 2 of

					the Moray and Nairn Coast Ramsar.
Operation	Criterion 2 – nationally scarce aquatic and coastal plants;	Direct or indirect loss of functionally linked habitat	A Habitat and Landscape Management Plan will include details for reinstatement and monitoring.	The HLMP includes details for the reinstatement of coastal habitats at completion of the works. Town & Country Planning (Scotland) Act, 1997 as amended ***APPROVED*** 13 August 2020 Development Management Environmental Services The Moray Council	It is considered with the implementation of a HLMP and habitat reinstatement that there will be **no adverse effect on the integrity of qualifying botanical species** under Criterion 2 of the Moray and Nairn Coast Ramsar.
Loch Spynie SPA/Ramsar					
Construction	• Greylag goose (overwintering) **Ramsar Criterion 1** – large eutrophic water body, with extensive water	Temporary direct habitat loss of functionally linked land /coastal habitats during construction phase (plant / machinery within the	The timing of the works is currently anticipated to be April – September and will therefore avoid any impact for temporary loss of habitats and	Greylag geese are non-breeding (wintering) populations so are not expected to be significantly disturbed as the works will be undertaken during the summer months. Wintering bird populations are not expected to be present and therefore will not be impacted by noise or visual disturbance.	It is considered that the construction phase of the work will **have no adverse effect on the integrity** of

	fringing vegetation, through swamp and fen to willow carr and alder woodland **Ramsar Criterion 2-3** – nationally scarce wetland vascular plants and several rare Scottish species **Ramsar Criterion 6** – greylag goose peak overwintering	construction site footprint rendering it unusable by qualifying species from adjacent SPA).	disturbance for over-wintering greylag geese making use of functionally linked land.		Loch Spynie SPA/Ramsar site as there will be no significant effect on the population status of qualifying greylag geese.
		Noise from plant / machinery resulting in avoidance behaviour (disturbance) to SPA birds outside the designated site boundary.	The timing of the works will be April – September and will therefore avoid any impact for temporary loss of habitats and disturbance for non-breeding over wintering SPA birds.	Wintering bird surveys (WYG, 2018) were focussed on line of sight between Loch Spynie, and the end of the main runway to assess linkage between the site and the SPA; however, incidental records in the location of the LSO area of works were also included in this report. Greylag geese were generally found to be foraging in fields to the south and east of RAF Lossiemouth during daylight hours. At no point were any greylags recorded roosting either on/around Loch Spynie, or within any fields being surveyed. It was found that the geese were generally recorded roosting at Findhorn Bay, approximately 14.5 km to the west of the site, and were	

Town & Country Planning (Scotland) Act, 1997 as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

				arriving at the site and leaving from the site each day from/to this location. It is possible that greylags may be roosting in areas along the LSO which have not been recorded; however, it is considered, with reference to noted flight lines and flight heights, that this is less likely and that the majority of geese in the wider area are likely to be roosting at Findhorn Bay. The construction site does not provide suitable foraging for greylag geese as it comprises hardstanding and close-cropped amenity grassland.	
		Reduction in water quality (physical and chemical) during underwater and shoreline construction impacting the supporting habitats of qualifying birds outside the SPA boundary.	Standard SEPA GPP/PPGs will be employed	All pipe laying techniques will generate a level of turbidity from the disturbance of sediment. This is unavoidable but given the temporary and short-lived nature of this impact it is not considered to have a significant effect that would threaten the conservation objectives and the integrity of the qualifying features of the Moray Firth pSPA. Dredging and excavation works will be small-scale and temporary. The major sedimentation pathway from this area is in a westerly direction with fine sediment being deposited in the inner firths. As the sandbank feature is located greater than 100m north north-east from the end of the pipeline the likelihood of any sedimentation affecting the sandbank is very low	

Operation	• Greylag goose (overwintering) **Ramsar Criterion 1** – large eutrophic water body, with extensive water fringing vegetation, through swamp and fen to willow carr and alder woodland **Ramsar Criterion 2-3** – nationally scarce wetland vascular plants and several rare Scottish species **Ramsar Criterion 6** – greylag goose peak overwintering	No LSE during operational phase. **Screened out in ALSE stage.** Included in table for completeness.	**No potential pathway of effect – screened out at ALSE stage.**	**Appropriate Assessment not necessary for operational phase.** Town & Country Planning (Scotland) Act, 1997 as amended ***APPROVED*** 13 August 2020 Development Management Environmental Services The Moray Council	**No adverse effect on integrity of Loch Spynie SPA/Ramsar site** possible during operational phase.
River Spey SAC					
Construction	• Atlantic salmon • Sea lamprey • Otter • Freshwater pearl mussel	Noise / disturbance from construction plant / machinery resulting in avoidance behaviour (disturbance).	Further desk study has been made of the qualifying species potentially present within the ZoI of the works (Pelagica, 2020). In addition information from the Marine Ecology Desk	**Atlantic salmon** It has been demonstrated within preliminary results supplied by the AST that salmon migrating down the River Spey (spring migration) typically travel north / north east in the Moray Firth. As the mouth of the River Spey is circa 12.7 km east of the proposed scheme it is considered that Atlantic Salmon will not be within the vicinity of the	It is considered that the construction phase of the work will have **no adverse effect on the overall**

			Review (Pelagica, 2019) which assesses the impact of noise on these qualifying species has been reviewed in detail, as well as additional input from the AST surveys during 2019 migration. Avoidance of any type of piling operations during pipeline installation. Should harder rock be present then only vibration piling will be allowed with soft start. Seasonal avoidance of work within the marine environment to avoid the most sensitive period for Atlantic salmon from June to July when smolt are migrating offshore, and then in the autumn when	construction works and will therefore not be impacted by noise / vibration during spring migration (Pelagica, 2020). Return of the salmon to spawn when mature is generally from November through to February, well outside any work proposed at Lossiemouth. **Sea trout** Sea trout are not qualifying features of the SAC but provide a vital support in the life cycle of the freshwater pearl mussel. It has been demonstrated within preliminary results supplied by the AST that sea trout migrating down the River Spey (April to June) typically do not travel far offshore and tend not to travel as large shoals unlike the Atlantic salmon. Within the Moray Firth individuals travel in very different directions, with frequent changes. They are therefore considered likely to pass through the marine environment close to and within the zone of influence of the effects of the proposed pipeline installation works (Pelagica, 2020). As sea trout from the Spey River SAC travel in many different pathways it is not considered that a significant population would be affected by the temporary works involved. There will be no significant effect on the sea trout populations during the temporary construction works; and therefore no likely significant effect on the life cycle of freshwater pearl mussel.	**integrity of the SAC**. There will be no direct impacts, and any potential disturbance within the work zone will be to individuals of much larger qualifying populations of migratory fish. No potential for impact on population size or viability. Works only temporary.

Town & Country Planning (Scotland) Act, 1997 as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

			mature salmon return to natal rivers to spawn.	**Sea lamprey** Sea lamprey are sensitive to noise and vibration, but they only occur sporadically in the vicinity of the proposed outfall (Laughton R (2011) River Lossie Juvenile Fish Survey 2010 . Spey Foundation Report No 02/11 Laughton R (2017) River Lossie Juvenile Fish Survey 2016. FNL Fisheries Trust Report No. 2017-03). As they are highly mobile they can avoid any noise disturbance. Therefore, ecologically significant effects are considered highly unlikely (Pelagica, 2019b). Furthermore, it is anticipated that the weak rock layer can be broken out with an excavator / dredger which will generate minimal noise relative to the piling / rock hammer etc. **Otter** The area experiences a high level of noise from aircraft that far exceeds anything else above the waterline, therefore any otter within the area could be considered habituated to a high level of disturbance/ background noise on land. `*There have been very few studies into the sensitivity of otters to noise but Voigt et al. (2019) calculated their hearing range (in air) at 80 dB to be 200 Hz to 32 kHz, indicating that this species can hear a narrower spectra of sounds than pinnipeds. Historically, there has been a general assumption that anthropogenic noise is detrimental to otter populations arising*	

				primarily because of their widespread decline in heavily populated parts of England. However, the persistence of a breeding otter population under Shetland's ferry terminal and the recovery of otters in noisy cities like Glasgow, provides strong evidence that anthropogenic noise in not adversely impacting this species (Chanin 2003). Like pinnipeds and cetaceans there will be a level of noise that will damage the hearing of otters and hence their presence during noisy construction works should be monitored" (Pelagica Limited, 2019)).	
			A pre-construction survey is to be undertaken to identify any otter features (i.e. holts or couches) within the onshore section, and an MMO to identify any using the marine habitat.	A riparian mammal survey was conducted in 2018 that did not identify the presence of any otter. The survey has not been updated due to support this Shadow HRA (due to COVID-19 restrictions). However, a pre-construction survey will be undertaken to confirm there are no important features for otter (i.e. couches/ holts) within the onshore construction area that will be impacted. If there are holts which will be disturbed by the temporary installation works, a licence to allow temporary disturbance will be obtained before works commence.	

				The MMO will monitor any otter within the marine habitat, and stop works should otter move into the 500m buffer zone. **Freshwater pearl mussel** Freshwater pearl mussel are restricted to freshwater habitats within the River Spey SAC and are therefore not located anywhere near the proposed scheme. They do depend on Atlantic salmon and /or sea trout for part of their life cycle. Atlantic salmon are sensitive to anthropogenic noise and vibration in water. It has been demonstrated within preliminary results supplied by the AST that salmon migrating down the River Spey (spring migration) typically travel north / north east in the Moray Firth. As the mouth of the River Spey is circa 12.7 km east of the proposed scheme it is considered that Atlantic Salmon will not be within the vicinity of the construction works and will therefore not be impacted by noise / vibration during spring migration (Pelagica, 2019b). Return of the salmon to spawn when mature is generally from November through to February, well outside any work proposed at Lossiemouth. Therefore, as salmon populations will not be impacted, there is no potential impact on freshwater pearl mussel.	

		Reduction in water quality (potential pollution event)	Standard SEPA GPP/PPGs will be employed.	The River Spey SAC is located 12.7 km east of the proposed site. Any reduction in water quality from construction is expected to be temporary and highly localised within the marine environment therefore there is no potential threat to the conservation objectives and the integrity of the qualifying features of the River Spey SAC (Pelagica, 2019a).	
Operation	• Atlantic salmon • Sea lamprey • Otter	Reduction in water quality impacting the integrity of the supporting habitats (release of de-icer).	Hydrographic modelling was adopted to identify dilution factor, tide/ flow rate etc. Wark Consulting (2019) RAF Lossiemouth Proposed New Outfall Initial Dilution and Secondary Dispersion Modelling (p.154, Wark Consulting, Stewarton).	Hydrographic modelling has been completed which reports that the level of de-icer will be negligible. <0.24 mg/l, 95% of the time is a considerably lower value than the 'no effect level' of 859 mg/l. Furthermore, the compounds contained in the de-icer do not bio-accumulate and rapidly breakdown in water. Considering the distance between the site and Spey Bay SAC the release of de-icer is negligible. It can therefore be assumed that during operation the marine habitat will be like-for-like (Pelagica, 2019b).	It is considered that the operation phase of the work will have **no adverse effect on the integrity of the SAC**.

6.0 Stage 5: Can it be Ascertained that the Proposal will not Adversely Affect the Integrity of the Site?

Upon instruction of the contractor and finalising of the design/construction method it will be necessary to reassess the likely significant effects and potential for adversely affecting the integrity of any European designated site, either alone or in-combination with other plans and/or projects.

6.1 Moray Firth SAC

Table 18 identifies the potential pathways of effect from the proposed construction and operational works and the designated Moray Firth SAC (with consideration of the qualifying features and conservation objectives). Considering the further assessments undertaken (e.g. mapping interactions with sandbank habitats) and proposed mitigation (e.g. MMO) there is not considered to be any residual risk of adverse effects on the integrity of the SAC.

AA for Moray Firth SAC has identified no residual effects likely to have an adverse effect on the integrity of the site.

6.2 Moray Firth pSPA

Table 18 identifies the potential impact pathways from the proposed construction and operational works and the designated Moray Firth pSPA (with consideration of the qualifying features and conservation objectives). Timing of construction will avoid impacts to most wintering bird species, and breeding European shags will not be present in the Zone of Influence of the works, as they are known to breed >30 km further north. Eider duck remaining in the summer months will be protected against any disturbance by being within the remit of an MMO. Other qualifying species will not be present during construction and therefore no direct impact is anticipated. During operation, hydrographic modelling has demonstrated a negligible impact on marine water quality as a result of the proposed discharge from the LSO, and the habitats supporting the qualifying features are expected to be unchanged.

AA for Moray Firth pSPA has identified no residual impacts likely to have an adverse effect on the integrity of the site.

6.3 Moray and Nairn Coast Ramsar

Table 18 identifies a potential impact pathway from the proposed construction and operation and the Moray and Nairn Coast Ramsar (Criterion 2). A HLMP will include requirements for the translocation of relevant species should they be identified during a pre-commencement survey.

AA for Moray and Nairn Coast Ramsar has identified no residual impacts likely to have an adverse effect on the integrity of the site.

6.4 Loch Spynie SPA/ Ramsar

Table 18 identifies the potential impact pathways from the proposed construction and operational works and the designated Loch Spynie SPA/Ramsar site (with consideration of the qualifying features

and conservation objectives). The qualifying greylag geese are an overwintering population and will not be present during the proposed construction period. During operation, hydrographic modelling has demonstrated a negligible impact on water quality as a result of the new discharge from the LSO, and the habitat supporting the qualifying features is expected to be unchanged.

AA for Loch Spynie SPA and Ramsar sites has identified no residual impacts likely to have an adverse effect on the integrity of the site.

6.5 Spey Bay SAC

Table 18 identifies the potential impact pathways from the proposed construction and operational works and the designated Spey Bay SAC (with consideration of the qualifying features and conservation objectives). It has been demonstrated that the qualifying species associated with the Spey Bay SAC, if in the vicinity of the LSO site, are considered to be sensitive to anthropogenic noise; however, disruption from construction is not expected to impact the integrity of the Spey Bay SAC qualifying species and their populations as a result of the adoption of a 500m buffer zone and use of MMO for the duration of the marine/coastal works. During operation, hydrographic modelling has demonstrated a negligible impact on water quality as a result of the new discharge from the LSO.

AA for Spey Bay SAC site has identified no residual impacts likely to have an adverse effect on the integrity of the site.

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Figures

Figure 1: Site Location Plan & Natura 2000 Sites within 20km

Figure 2: Proposed Drainage Diversion Scheme

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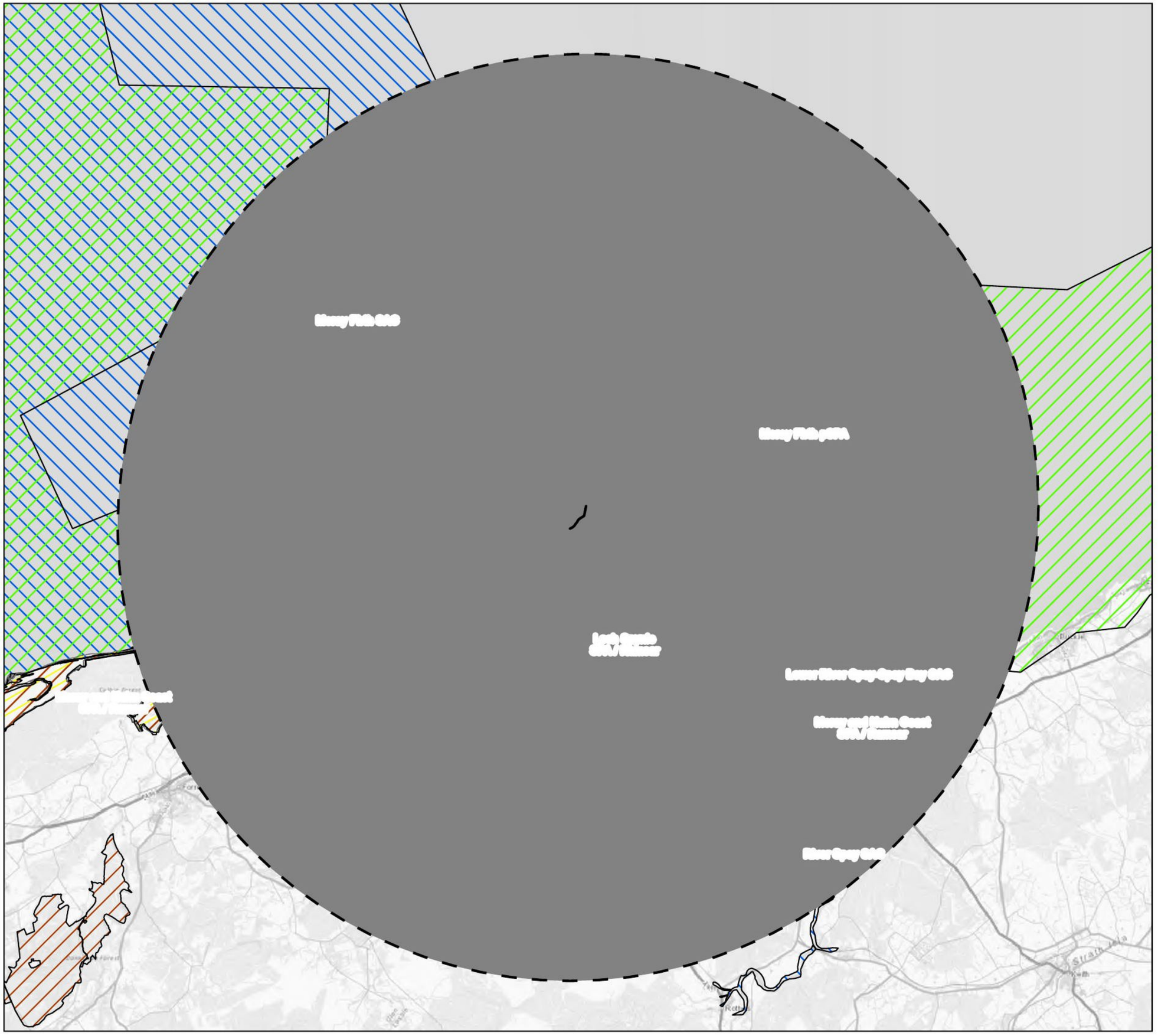

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DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

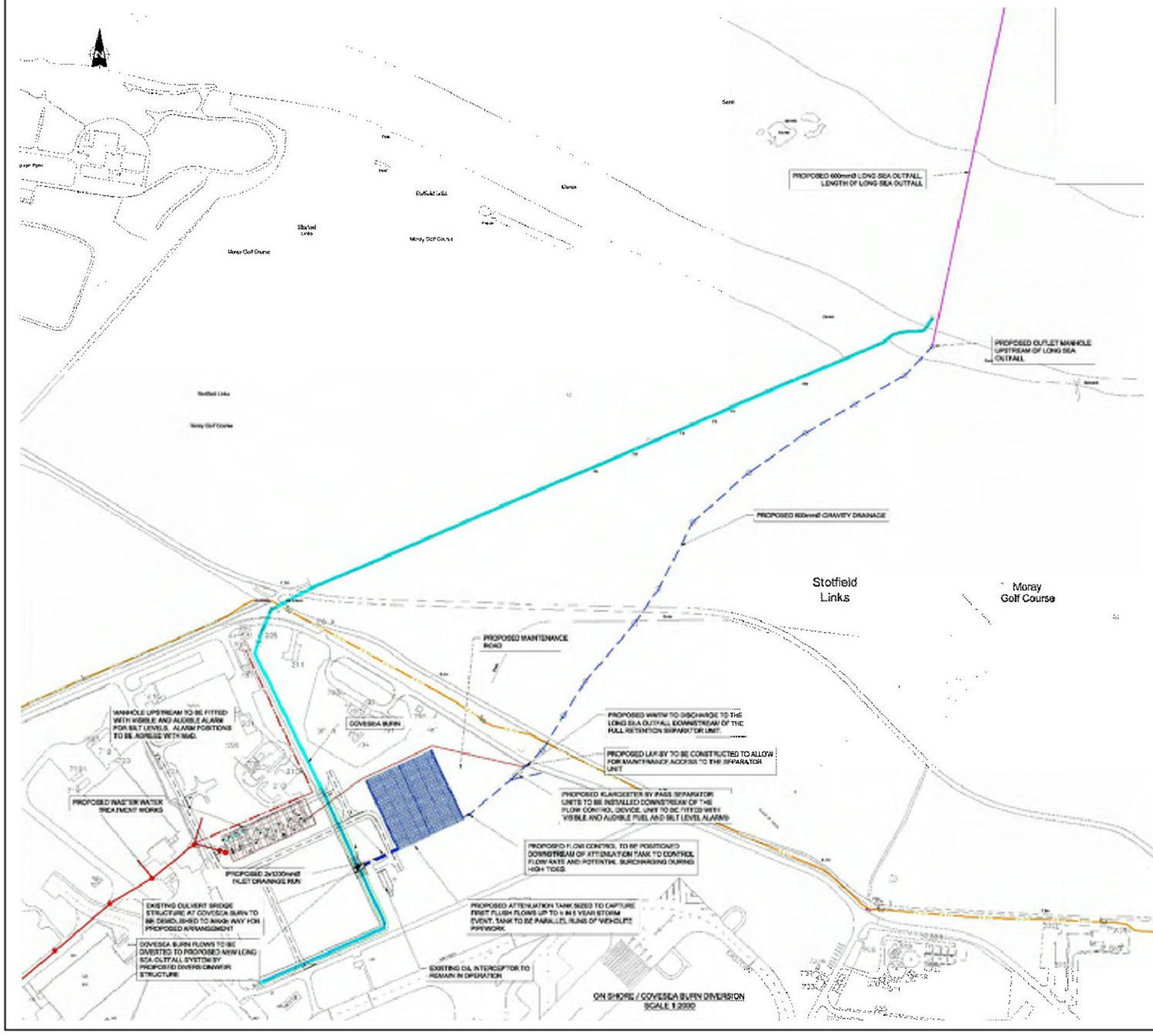
IMPORTANT CDM / H & S NOTE

ANY CONSTRUCTION PERSONNEL INCLUDING OPERATIVES INTENDING TO CONSTRUCT THE DESIGNS SHOWN ON THIS DRAWING SHOULD ENSURE THAT THEY HAVE BEEN THOROUGHLY BRIEFED BY THE PRINCIPAL CONTRACTOR ON ALL HEALTH AND SAFETY MATTERS AND HAVE SIGHT OF:

(1) THE FULL DESIGNERS AND CONTRACTORS HAZARD AND RISK ASSESSMENTS AND RISK REGISTERS.
(2) THE DEVELOPED CONSTRUCTION PHASE HEALTH AND SAFETY PLAN
(3) THE CONTRACTORS CONSTRUCTION METHOD STATEMENTS.

GENERAL NOTES

1. All drainage works and materials to comply with Civil Engineering Specification for Water and Sewerage Schemes, 7th Edition and Sewers for Scotland 4th Edition.
2. All drainage works to comply with Veolia Water Nevis Adoption Standards and Guidance
3. All details to be read in conjunction with BS 752-3, Drain & Sewer Systems Outside Buildings - 1987.
4. All drainage pipes to be Wavin/te 4KN pipework unless otherwise specified.
5. The contractor shall ensure that where unmodified by the proposals indicated, the current drainage regime is maintained in operation at all time and shall not be compromised by the proposed works.
6. The minimum cover to sewer pipes must be 1.2m from existing road surface in roads and 0.75m from surface level in fields, where these cannot be achieved the contractor must provide adequate protection to the pipes in the form of a reinforced concrete protection slab on receipt of the engineer's instruction.
7. The sewer shall be cleaned and flushed with clean water while being rodded from manhole to manhole with a rubber tipped plunger the same size as the pipe diameter.
8. Testing of the sewer shall be carried out between manholes using the air test as specified in CESWI 7th edition.
9. The sewers shall be tested after jointing and before placement of a reinforced concrete protection slab or backfilling is commenced other than such as may be necessary for structural stability whilst under test, once backfilling has been completed the sewers shall be tested again.
10. The contractor shall produce a CCTV internal inspection of the completed sewer. This shall be carried out prior to final reinstatement and with the site supervisor / project manager in attendance.
11. The contractor shall contact utility services and request on site identification and location of services prior to commencement of the works services indicated on this drawing are indicative only and should be confirmed on site by the contractor.
12. The contractor is to check the layout, type and level of all services prior to commencing excavation works. ant errors shall be reported to the project manager immediately construction.
13. All new drainage trenches shall be excavated down to firm bearing strata, extra over depth of excavation shall be made up in compacted type 1 granular material to the underside of the pipe bedding
14. All new drainage laid to falls of less than 1:100 to be installed by laser alignment method to ensure required accuracy
15. It is the contractors responsibility to ensure that before any sewer is abandoned it shall be CCTV surveyed to confirm it is redundant, this may involve surveying branch connections to their origin.
16. Where existing ground levels have be altered the contractor shall raise or lower access covers to match new levels.
17. The Contractor may be required to undertake the excavation of Test Holes prior to commencing the contract to ascertain the location of any services.
18. The Contractor is required to excavate trials holes to ascertain levels of existing pipes prior to commencement of pipelaying and advise Engineer of any errors.
19. Contractor is required to read all Site information in connection with Scope documentation.
20. Contractor is required to divert existing services to allow proposed infrastructure installation where necessary contractor seek approval.



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13 August 2020

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Appendix A – Report Conditions

This Report has been prepared using reasonable skill and care for the sole benefit of Defence Infrastructure Organisation ("the Client") for the proposed uses stated in the report by [WYG Environment Planning Transport Limited] ("WYG"). WYG exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

No liability is accepted or warranty given for; unconfirmed data, third party documents and information supplied to WYG or for the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report. WYG does not purport to provide specialist legal, tax or accounting advice.

The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The "shelf life" of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.

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13 August 2020

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The Moray Council

Appendix B – Consultation Summary

The key points discussed with consultees and stakeholders are detailed in the table below. Full details of correspondence with the consultees is available upon request. Note that there is previous correspondence relating to works on the main site that are not included here as not of relevance to the LSO/drainage project.

Table 19: Summary of Key Points Discussed with Consultees of Relevance to LSO / Drainage Project

Consultee	Summary of Key Points Discussed/Addressed of Relevance to LSO/Drainage Project

SNH	• SNH were to provide advice on seabed mapping and advised that bottlenose dolphins and Atlantic salmon were likely to be important as well as the benthic habitats.
	• SNH later confirmed that the survey works, as planned, would not have any significant impact on the dolphins. In light of this SNHs' view was that a Marine Mammal Observer (MMO) would not be needed *[this stance changed at a later date so that MMO would be necessary for the geotechnical surveys only]*.
	• SNH would entrust SEPA to consider the nature and effects of the discharge itself.
	• It was agreed that a separate HRA for the Long Sea Outfall/drainage works was a required approach given the differences in these project programmes/availability of design detail.
	• SNH noted that piling is the only potential aspect of construction which would be likely to require a HRA.
	• SNH advised further advice would be required to determine whether the geotechnical survey required an MMO.
	• SNH were satisfied with the construction plans as long as no pile driving was to be undertaken. Their main concern was what will come out of the outfall in terms of water quality.
	  ○ Salmon being the main concern in this area, both in their own right and as the main food source for the Dolphins.
	  ○ SNH recommended that contacting the Findhorn, Nairn and Lossie Trust and the Spey Fishery Trust to discuss their likely interactions with, and sensitivity to the development.
	• SNH later indicated they were satisfied with the outfall water quality issue following discussions with SEPA.
	• SNH emailed referring to Marine Scotland European Protected Species (EPS) guidance and provided a link. Noted that an MMO would be required for geotechnical survey work (not other pre-construction investigations like the hydrographic survey) and that an **EPS licence** would be needed for the construction phase only (licence not required for the pre-construction geotechnical survey).

Consultee	Summary of Key Points Discussed/Addressed of Relevance to LSO/Drainage Project
	• During later discussions, SNH stated that it was helpful to know that WYG had been liaising closely with SEPA throughout the process as SNH would normally defer to their expertise for projects meeting the required standards of discharge water quality and quantity. ○ SNH also stated it was very reassuring to know and welcomed that that this project will offer a considerable improvement to the current situation regarding drainage. • In discussions between SNH and WYG it seemed likely that the Habitats Regulations Appraisal (HRA) for the Moray Firth SAC and SPA would conclude either 'no likely significant effect' or probably more realistically 'no adverse effect on site integrity' following the implementation of some relatively straightforward mitigation measures, such as MMO supervision of pipe laying for example. • SNH were to keep liaising with WYG to ensure any mitigation deemed necessary is identified and sufficiently detailed to enable the HRA to be concluded at a formal application stage. • SNH recommended that a list of mitigation 'in principle' was prepared and submitted at the application/consultation stage as a contractor was not yet in place. It could include anything specific needed to protect the habitats and species and also generic mitigation to minimise the risk of pollution etc.
Moray Council	• Initial correspondence indicated that as Moray Council have no in-house ecological specialists, they would defer to SNH for ecological advice. • Moray Council requested for a formal screening opinion to be submitted. • **EIA** - The drainage/Long Sea Outfall proposals will require EIA screening/scoping. • **HRA** - Moray Council had not progressed a HRA as they were awaiting the requisite ecological information from WYG to inform the HRA process. • **Potential planning permission –** Planning permission was discussed for the main site works and construction of the contractor's compound.
Marine Scotland	• Marine Scotland noted that works would fall below the Mean High Tide Springs level. • Marine Scotland had previously stated: ○ They would expect SNH to provide comment on the appropriateness of Habitat Regulations Appraisal and any survey methodologies, proposed plans and mitigation; including, the approach/requirement for any marine mammal surveys. ○ Marine Scotland requested additional information on any proposed works in marine environment since this would be necessary for Marine Scotland to determine what additional responsibilities and licences, if any, would be required.

Consultee	Summary of Key Points Discussed/Addressed of Relevance to LSO/Drainage Project
	○ WYG consulted the SNH website pages on marine mammal licensing which clarified that Marine Scotland have the delegated authority to comment on the need for commercial activities. ○ Marine Scotland informed WYG that a licence is necessary for works at or above 185 decibels and/or with a frequency less than 200 kilohertz. WYG geo were to provide noise outputs to Marine Scotland for consideration. ○ Marine Scotland were to confirm if they are the delegated authority for the licensing of works. • **For the LSO/drainage works, the Defence Infrastructure Organisation (DIO) acted as Competent Authority on the Marine Licence** to consider the Marine (Scotland) Act 2010 and associated licensing responsibilities that would otherwise be relevant to Marine Scotland.
Fisheries Trusts (Scottish Fisherman's Federation, Spey fishery board, Findhorn, Lossie and Nairn River Trust)	• Initial difficulties in establishing a line of contact with members of the trust meant that consultation had not been undertaken. • **Scottish Fisherman's Federation questioned the Marine Licence exemption process for the MOD -** The project team explained that the MOD are exempt from the Scottish Marine Licence process, the process undertaken mirrors that of Marine Scotland and was followed by holding the Pre-Application consultation. • **Scottish Fisherman's Federation queried if there was an assessment on the effect on Crabs, Squid, Lobster etc.** - The project team explained that an assessment had been done and any levels of discharge were incredibly low and below any levels which may cause effect: ○ The Federation were then informed that salmon studies were being done involving tagging, migration etc. to allow WYG to understand when salmon are moving in and around the area. ○ The project team reiterated that the current method of surface water disposal, which includes de-icer, is straight into the Covesea Burn and into the Moray Firth and that this proposed project is a significant improvement to remove this method of disposal and will be in accordance with **SEPA regulations.**
North and East Coast Regional Inshore Fisheries Group	• An initial line of contact was made with the Fisheries Group who recommended contacting local fishermen. • Attempts to establish a line of contact with local fishermen were unsuccessful. • A Commercial Fishery consultation exercise is being planned for April 2020 should this be possible (noting COVID-19 restrictions).

Appendix C – Designated Sites Citations

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MORAY FIRTH SPECIAL AREA OF CONSERVATION (SAC)

Designation date: 17 March 2005

Administrative area: Highland; Moray

Qualifying Interests for which the site is designated:

SCIENTIFIC NAME	COMMON NAME
Sandbanks which are slightly covered by sea water all the time	Subtidal sandbanks
Tursiops truncatus	Bottlenose dolphin

Moray Firth

Proposed Special Protection Area

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Moray Firth, Chanonry Point and Fort George. © P&A Macdonald/SNH

One of Europe's best wildlife sites

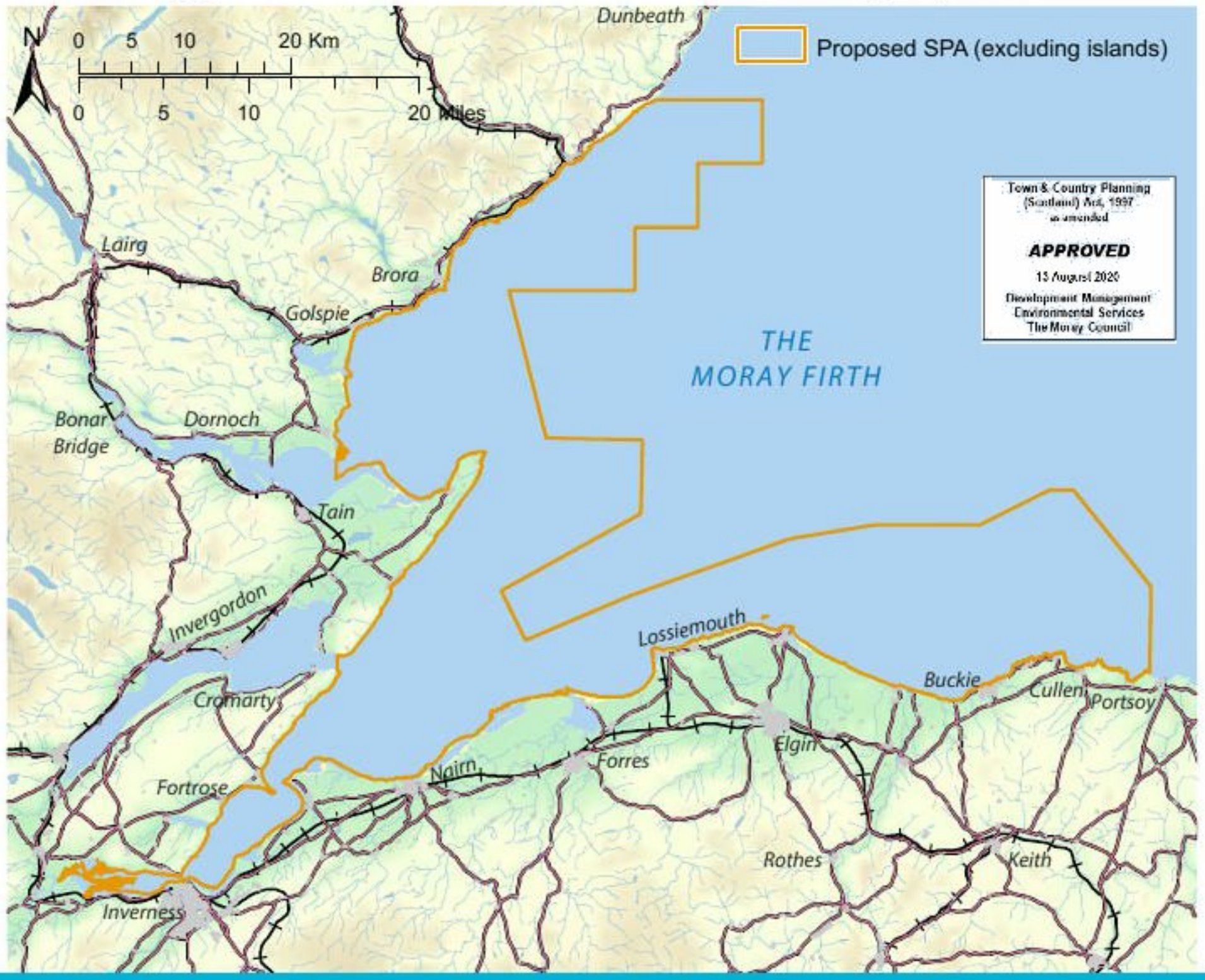
Moray Firth

Proposed Special Protection Area

Our Scottish seas are rich in marine life and in winter, the waters of the Moray Firth are a stronghold for one of the largest concentrations of sea ducks and European shag in Great Britain.

The Moray Firth attracts the largest British (GB) wintering populations of long-tailed duck, velvet scoter and shag; the third largest population of scaup; and the largest Scottish wintering populations of common scoter and goldeneye. Important numbers of four other marine birds also spend winter in the Firth. In summer, these waters continue to provide feeding grounds for breeding shag.

The area shown below is proposed as a Special Protection Area (SPA) because it supports these important wintering and breeding populations of marine birds. This area will help protect the birds themselves as well as the rich feeding grounds and sheltered waters on which they depend.



Location: 58° 03.595' N 003° 38.450' W **Area: 1,762 km²**

1 Long-tailed duck; 2 Scaup

Proposed qualifying interests:

Breeding & Non-breeding

European shag

Non-breeding

Common eider
Common goldeneye
Common scoter
Great northern diver
Greater scaup
Long-tailed duck
Red-breasted merganser
Red-throated diver
Slavonian grebe
Velvet scoter

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The Moray Firth is the most northerly large estuary in mainland Britain. The proposed SPA is an extensive site stretching seaward from the Helmsdale coast in the north, to Portsoy in the east and it includes the outer Dornoch and Cromarty Firths, Beauly and Inverness Firths, as well as part of the wider Moray Firth.

The numerous firths, inlets and sandy bays provide sheltered areas where birds can moult, roost, rest and feed. These areas are important refuges for wintering birds, some of which have migrated thousands of miles from their breeding grounds in northern Europe and western Siberia. Common eider are present all year round with males forming moulting flocks as early as May.

The area is also important during the summer months for shags. These birds remain in the area making short foraging trips from their breeding grounds along the sea cliffs to the north of Helmsdale.

The variety of habitats within the Moray Firth (e.g. shallow sandy substrates, coastal rocky outcrops and a deep muddy channel) provide an abundance of invertebrates such as crabs, mussels and marine worms as well as supporting important nursery areas for a number of fish species; all of these species provide an important food source for the birds.

All of the birds feed by diving from the water's surface. So these sheltered, rich and shallow waters provide excellent foraging habitat for wintering and breeding birds.

Making a response and further information

To make a response online or for more information about the proposals please go to **www.snh.gov.uk/MarineBirdSPAs**.

If you are unable to make an online response, please contact us and we will send you a copy of the response form.

Email: **MarineBirdSPAs@snh.gov.uk**

Phone: 01463 725025

Post: Marine Bird SPAs Consultation, Great Glen House, Leachkin Road, Inverness, IV3 8NW

*To see this leaflet in Gaelic please go to **www.snh.gov.uk/MarineBirdSPAs***

1 Great northern diver; 2 European shag; 3 Goldeneye; 4 Common scoter; 5 Red-throated diver

The Scottish Government
Riaghaltas na h-Alba

marinescotland

Scottish Natural Heritage
Dualchas Nàdair na h-Alba
All of nature for all of Scotland
Nàdar air fad airson Alba air fad

JNCC
Joint Nature Conservation Committee

Town & Country Planning (Scotland) Act, 1997 as amended

APPROVED

13 August 2020

Development Management
Environmental Services
The Moray Council

EC Directive 79/409 on the Conservation of Wild Birds

SPECIAL PROTECTION AREA (SPA) CITATION
FOR PUBLIC ISSUE

MORAY BASIN FIRTHS AND BAYS, HIGHLAND & GRAMPIAN (162)
5: MORAY AND NAIRN COAST, HIGHLAND & GRAMPIAN (162E)

The **Moray and Nairn Coast** is an integral part of the **Moray Basin Firths and Bays** Special Protection Area. It comprises the Culbin Bars, Findhorn Bay and Spey Bay which together form the easternmost estuarine component of the Moray Basin ecosystem. The boundary of the site generally follows the shoreline within the Culbin Sands, Forest & Findhorn Bay SSSI, the estuarine limit of Spey Bay SSSI, and the whole of the Lower River Spey SSSI. Moray and Nairn Coast Special Protection Area supports a diverse assemblage of wintering waterfowl of outstanding nature conservation and scientific importance.

The site qualifies under **Article 4.1** of the **EC Wild Birds Directive** by providing foraging grounds for nationally important numbers of breeding osprey *Pandion haliaetus*.

The site qualifies under **Article 4.2** by regularly supporting over 20,000 wintering waterfowl in the late 1980s/early 1990s with a mean of 24,000 waterfowl comprising 9,500 waders and 14,500 wildfowl.

The site further qualifies under **Article 4.2** by supporting internationally important wintering populations (1988/89-92/93 winter peak means) of Icelandic/Greenlandic pink-footed goose *Anser brachyrhynchus* (7,538, 4% of total population, all of which winters in Great Britain), Icelandic greylag goose *Anser anser* (3,023, 3% of total population, all of which winters in Britain) and redshank *Tringa totanus* (1989/90-93/94 winter peak mean of 1,690, 2% of British and 1% of East Atlantic Flyway wintering populations).

Notable also are nationally important wintering populations of velvet scoter *Melanitta fusca* (3% of GB), red-breasted merganser *Mergus merganser* (1% of GB), bar-tailed godwit *Limosa lapponica* (2% of GB).

The breeding bird assemblage includes an important breeding population of common tern *Sterna hirundo*, an Annex I species

This citation is accompanied by the citation for the entire Moray Basin Firths and Bays Special Protection Area which explains the overall international importance of the wintering waterfowl and breeding bird populations of the Moray Basin.

Area: 2,410 ha
Grid Ref: NH 990695, NJ 325660
Longitude and Latitude: 57°42'15 -3°41'42, 57°40'46 -3°7'52
OS Sheets 1:50,000 - 27, 28

RJ/GPM
December 1995
Research and Advisory Services Directorate
Scottish Natural Heritage

EC Directive 79/409 on the Conservation of Wild Birds

SPECIAL PROTECTION AREA (SPA) CITATION FOR PUBLIC ISSUE

MORAY BASIN FIRTHS AND BAYS, HIGHLAND & GRAMPIAN (162)

The Moray Basin proposed SPA is a complex area of coastal and estuarine habitats, extending from Loch Fleet in the north to Spey Bay in the south-east. It includes the Dornoch, Cromarty, Beauly and Inverness Firths, Loch Fleet, Culbin Bars, Findhorn Bay and Spey Bay, together with intervening stretches of more open coast and the freshwater Loch Eye. It is one of the most northerly major wintering waterfowl sites in Western Europe.

The Moray Basin SPA qualifies under **Article 4.1** of the **Wild Birds Directive** by regularly supporting a nationally important breeding population of common tern (720 pairs, 6% of GB), providing foraging grounds for around 27 pairs of osprey (27% of GB), and by regularly supporting internationally important wintering populations (1989/90-93/94 winter peak means) of around 57 Slavonian grebe (14% of GB, 1% of North West (NW) European) and 721 whooper swan (4% of the total population, 14% of GB).

The Moray Basin SPA qualifies under **Article 4.2** by regularly supporting in winter over 20,000 waterfowl. In the five-year period 1991/92 to 1995/96 the average peak count was around 116,000 wintering waterfowl, comprising approximately 73,500 wildfowl and 42,500 waders.

The Moray Basin SPA further qualifies under **Article 4.2** by regularly supporting in winter, in the early 1990s, internationally important populations of 10 waterfowl species: 2,137 pink-footed geese (1% of the total population, all of which winters in Britain), 13,226 Icelandic greylag geese (13% of the total population, all of which winters in Britain), 31,745 wigeon (4% of NW European, 11% of British), 3,930 teal (1% of NW European, 3% of British), 1,629 red-breasted merganser (2% of NW European, 16% of British), 10,362 oystercatcher (1% of the NW European population, 3% of British), 5,396 knot (2% of GB and NW European), 3,676 bar-tailed godwit (4% of Western European, 7% of British), 4,719 curlew (1% of East Atlantic Flyway (EAF), 4% of British) and 4,448 redshank (3% of EAF, 4% of British).

Notable also on the Moray Basin is the largest wintering concentration of seaduck in Britain including nationally important populations of red-throated diver, scaup, eider, long-tailed duck, common scoter, velvet scoter, goldeneye, red-breasted merganser and goosander.

Other waterfowl wintering in nationally important numbers on the Moray Basin are mute swan, cormorant, shelduck, pintail, tufted duck, ringed plover, knot and dunlin.

During severe winter weather the site assumes even greater international importance as a cold weather refuge. Waterfowl from other parts of North West Europe concentrate here, attracted by the relatively mild climate and abundant food resources available. The Moray Basin also supports nationally important breeding populations of cormorant and redshank.

Area: 17,761 ha
OS 1:50,000 sheets: 21, 26, 27, 28

October 1996,
RASD, SNH

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002), and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY

DD MM YY

Designation date | Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / –44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:

Designated: 02 February 1997

3. Country:

UK (Scotland)

4. Name of the Ramsar site:

Moray and Nairn Coast

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □;
ii) **an electronic format** (e.g. a JPEG or ArcView image) Yes
iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* □;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

57 38 54 N 03 43 48 W

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Elgin

Situated between Nairn, east of Inverness and Spey Bay, east of Elgin. It is an integral part of the Moray Firth on the coast of north-east Scotland.

Administrative region: Grampian; Highland

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 2412.27

Min. -1
Max. 19
Mean 2

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The Moray and Nairn Coast site is comprised of two areas: the intertidal flats, saltmarsh and sand dunes of Findhorn Bay and Culbin Bar, and the alluvial deposits and associated woodland of the lower River Spey and Spey Bay. It is of outstanding nature conservation and scientific importance for coastal and riverine habitats, and for migrating geese and over-wintering waders.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 2, 5, 6

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

The site supports a variety of important wetland features, including particularly good examples of intertidal flats, saltmarsh and floodplain alder *Alnus glutinosa* woodland.

Ramsar criterion 2

Town & Country Planning (Scotland) Act, 1997 as amended

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13 August 2020

Development Management
Environmental Services
The Moray Council

At least six nationally scarce aquatic and coastal plants are present, sea centaury *Centaurium littorale*, Baltic rush *Juncus balticus*, oysterplant *Mertensia maritima* and the eelgrasses *Zostera noltei, Z. angustifolia* and *Z. marina*. The British Red Data Book invertebrates, *Ochthebius lenensis* (a small water beetle) and *Tetanocera freyi* (a snail-killing fly) are also found.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:
22609 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in winter:

Pink-footed goose , *Anser brachyrhynchus*, Greenland, Iceland/UK	1855 individuals, representing an average of 0.7% of the population (5 year peak mean 1996-2000)
Greylag goose , *Anser anser anser*, Iceland/UK, Ireland	3023 individuals, representing an average of 3.3% of the population (Source period not collated)
Common redshank , *Tringa totanus totanus*,	757 individuals, representing an average of 0.6% of the GB population (5 year peak mean 1998/9-2002/3)

Species/populations identified subsequent to designation for possible future consideration under criterion 6.

Species with peak counts in winter:

Long-tailed duck , *Clangula hyemalis*, W Siberia/N Europe	1366 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.
Details of bird species occuring at levels of National importance are given in Section 22

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15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

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16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	acidic, shingle, alluvium, mud, sand, gravel, pebble, cobble, boulder
Geomorphology and landscape	coastal, floodplain, shingle bar, subtidal sediments (including sandbank/mudbank), intertidal sediments (including sandflat/mudflat), open coast (including bay), estuary
Nutrient status	mesotrophic, oligotrophic
pH	acidic
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	mainly mineral
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Kinloss, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/kinloss.html) Max. daily temperature: 12.2° C Min. daily temperature: 5.1° C Days of air frost: 53.5 Rainfall: 624.4 mm Hrs. of sunshine: 1261.4

General description of the Physical Features:

The site comprises the intertidal flats, saltmarsh and sand dunes of Findhorn Bay and Culbin Bar, and the alluvial deposits and associated woodland of the Lower River Spey and Spey Bay.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The site comprises the intertidal flats, saltmarsh and sand dunes of Findhorn Bay and Culbin Bar, and the alluvial deposits and associated woodland of the Lower River Spey and Spey Bay.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

No special values known

19. Wetland types:

Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	65
H	Salt marshes	17
E	Sand / shingle shores (including dune systems)	8
Other	Other	6
F	Estuarine waters	3
Q	Saline / brackish lakes: permanent	1

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The Spey Bay/Lower River Spey supports a large range of shingle-related habitats reflecting the succession from presently mobile, unstable conditions to those which have been stable for

considerably longer. Areas of recently deposited shingle and sand support a diverse flora of plant species including those associated with coastal habitats and those associated with upland or montane habitats. More stable shingle supports a mosaic of scrub/heath/dry grassland. River channels and adjacent areas of shingle support valley alder woodland and willow scrub. Some of the older channels also support aquatic and fen communities.

Findhorn Bay/Culbin Bars contain a wide variety of coastal habitats including extensive intertidal flats and saltmarsh, sand and shingle bars, dunes, and dune-slacks. Successional processes associated with coastal processes, such as accretion and development of saltmarsh, are of particular interest.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12.** Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Assemblage.

The site is internationally important because it contains the following Habitats Directive Annex I features:

H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
H2110 Embryonic shifting dunes
H1220 Perennial vegetation of stony banks
H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)

Nationally important species occurring on the site.

Higher Plants.

Centaurium littorale, Juncus balticus, Mertensia maritima, Zostera angustifolia, Zostera marina, Zostera noltei

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12.** Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Species currently occurring at levels of national importance:

Species regularly supported during the breeding season:

Osprey , *Pandion haliaetus*, Europe	14 individuals, representing an average of 11% of the GB population (Count as at early 1990s)

Species with peak counts in spring/autumn:

Red-breasted merganser , *Mergus serrator*, NW & C Europe	104 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Greater scaup , *Aythya marila marila*, W Europe	81 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)
Black (common) scoter , *Melanitta nigra nigra*,	3246 individuals, representing an average of 6.4% of the GB population (5 year peak mean 1998/9-2002/3)

Velvet scoter , *Melanitta fusca fusca*, Baltic/W Europe	1146 individuals, representing an average of 38.2% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site.

Invertebrates.

Ochthebius lenensis, Tetanocera freyi.

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23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic
Environmental education/ interpretation
Forestry production
Livestock grazing
Non-consumptive recreation
Scientific research
Sport fishing
Sport hunting
Tourism

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

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24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	–	+
Local authority, municipality etc.	–	+
National/Crown Estate	–	+
Private	–	+

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25. Current land (including water) use:

Activity	On-site	Off-site

Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	+
Commercial forestry	+	+
Fishing: recreational/sport	+	
Gathering of shellfish	+	
Bait collection	+	
Rough or shifting grazing	+	
Hunting: recreational/sport	+	+
Sewage treatment/disposal	+	
Harbour/port	+	
Transport route		+
Domestic water supply		+
Non-urbanised settlements		+
Military activities		+

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
No factors reported	NA				

For category 2 factors only. What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Is the site subject to adverse ecological change? NO

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	+

Special Protection Area (SPA)	+	
Site management statement/plan implemented	+	
Special Area of Conservation (SAC)	+	

b) Describe any other current management practices:
The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Fauna.
Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

Environment.
The Culbin Bars part of the site is used by Aberdeen University for research into intertidal ecology. The Lower River Spey/Spey Bay section is used by Glasgow University for research into coastal and fluvial geomorphological processes.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Interpretative panels have been installed at Findhorn Bay and Spey Bay with support from Scottish Natural Heritage (SNH). SNH has recently produced an education pack for school users to promote the educational use of Findhorn Bay; the potential educational value of this site is considered to be high.
There is an ice house at Spey Bay used as a museum run by the Moray Authority focusing on the salmon-fishing industry. At Findhorn Bay there is a small museum run by the local community funded by Scottish Natural Heritage which provides information on the history and conservation interest of the village and Bay. Both are only open during the summer.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.
The site is of importance for recreational angling, wildfowling, walking (the Speyside Way Long Distance footpath runs adjacent to part of the site), watersports (concentrated in Findhorn Bay) and birdwatching. No figures for tourism are available but a very rough estimate would be in the order of 50,000-100,000 visitors per annum.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Scottish Executive, Environment and Rural Affairs Department

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Scottish Natural Heritage, 2 Anderson Place, Edinburgh, EH6 5NP

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **15** above), list full reference citation for the scheme.

Site-relevant references

Barne, JH, Robson, CF, Kaznowska, SS, Doody, JP & Davidson, NC (eds.) (1996) *Coasts and Seas of the United Kingdom. Region 3. North-east Scotland: Cape Wrath to St Cyrus*. Joint Nature Conservation Committee, Peterborough (Coastal Directories Series)

Bennett, TL & McLeod, CR (1998) Chapter 4. East Scotland (Duncansby Head to Dunbar) (MNCR Sector 4). In: *Benthic marine ecosystems of Great Britain and the north-east Atlantic*, ed. by K. Hiscock, 123-154. Joint Nature Conservation Committee, Peterborough. (Coasts and Seas of the United Kingdom. MNCR series)

Buck, AL (ed.) (1993) *An inventory of UK estuaries. Volume 4. North and east Scotland*. Joint Nature Conservation Committee, Peterborough

Burd, F (1989) *The saltmarsh survey of Great Britain. An inventory of British saltmarshes*. Nature Conservancy Council, Peterborough (Research & Survey in Nature Conservation, No. 17)

Cranswick, PA, Waters, RJ, Musgrove, AJ & Pollitt, MS (1997) *The Wetland Bird Survey 1995–96: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge

Dargie, T (2001) Sand dune vegetation survey of Scotland: East coast. Volume 2: Site reports. *Scottish Natural Heritage Research, Survey and Monitoring Report*, No. **179**

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Musgrove, AJ, Langston, RHW, Baker, H & Ward, RM (eds.) (2003) *Estuarine waterbirds at low tide. The WeBS Low Tide Counts 1992–93 to 1998–99*. WSG/BTO/WWT/RSPB/JNCC, Thetford (International Wader Studies, No. 16)

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Tidswell, R (1997) *A botanical survey of the lower Spey Woods*. Scottish Natural Heritage

Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone: **+41 22 999 0170** • Fax: **–41 22 999 0169** • email: **ramsar@ramsar.org**

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002), and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY

DD MM YY

Designation date | Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / –44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

Town & Country Planning (Scotland) Act, 1997 as amended

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13 August 2020

Development Management
Environmental Services
The Moray Council

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2. Date this sheet was completed/updated:
Designated: 31 August 1992

3. Country:
UK (Scotland)

4. Name of the Ramsar site:
Loch Spynie

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5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

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6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □;
ii) **an electronic format** (e.g. a JPEG or ArcView image) Yes
iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* □;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

57 41 00 N 03 16 42 W

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Elgin

3 km north of Elgin, north-east Scotland.

Administrative region: Moray

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 93.62

Min. 3
Max. 4
Mean 3

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Loch Spynie is one of the few large and naturally eutrophic waterbodies in northern Scotland. It supports a diverse aquatic flora with extensive reedbeds fringing and adjacent to the open water body and various stages of hydroseral succession including mesotrophic fen, willow scrub and swamp alder woodland. The reedbeds and fen support a number of regionally scarce species of southern distribution. The abundance of yellow iris *Iris pseudacorus* in the fen and in the adjacent fen-meadow is an unusual feature in the Moray Firth and Grampian area. It is also one of the few Scottish localities for alder swamp woodland. The loch itself contains a nationally uncommon aquatic community and a nationally scarce pondweed species. Loch Spynie regularly supports internationally important numbers of roosting Icelandic greylag geese *Anser anser*.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 2, 6

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

Loch Spynie is one of very few large and naturally eutrophic waterbodies in northern Scotland. It contains extensive areas of water-fringing vegetation and all stages of succession, through swamp and fen to willow and alder woodland.

Ramsar criterion 2

Loch Spynie supports three nationally scarce wetland vascular plants and several wetland species which are rare in northern Scotland.

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in winter:

Greylag goose , *Anser anser anser*, Iceland/UK, Ireland	4700 individuals, representing an average of 5.2% of the population (5 year peak mean for 1996/7-2000/01)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.

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15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

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16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	neutral, sand, mud, alluvium, nutrient-rich, sandstone
Geomorphology and landscape	lowland, coastal, floodplain
Nutrient status	eutrophic, mesotrophic
pH	alkaline
Salinity	fresh
Soil	mainly organic
Water permanence	
Summary of main climatic features	Annual averages (Kinloss, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/kinloss.html) Max. daily temperature: 12.2° C Min. daily temperature: 5.1° C Days of air frost: 53.5 Rainfall: 624.4 mm Hrs. of sunshine: 1261.4

General description of the Physical Features:

Loch Spynie is one of the few large and naturally eutrophic waterbodies in northern Scotland. It supports a diverse aquatic flora with extensive reedbeds fringing the open water body and various stages of hydroseral succession including mesotrophic fen, willow *Salix* spp. scrub and alder *Alnus glutinosa* woodland.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Loch Spynie developed during the 16th century following the closure of a tidal inlet by a shingle spit. This gave rise to a shallow, fertile lagoon, surrounded by marshes. Much of this area was subsequently drained by the 10 km-long Spynie Canal, built around 1808, which flows into the Moray Firth at Lossiemouth.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

No special values known

19. Wetland types:

Inland wetland

Code	Name	% Area
Tp	Freshwater marshes / pools: permanent	32.1
O	Freshwater lakes: permanent	26.8
Xf	Freshwater, tree-dominated wetlands	22.5
9	Canals and drainage channels	6.6
U	Peatlands (including peat bogs swamps, fens)	6.6
Other	Other	5.4

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

Loch Spynie contains extensive reedbeds, and smaller areas of mesotrophic fen, and willow and alder woodland. The reedbeds vary from pure stands of *Phragmites* to more mixed stands with other swamp and fen species, and include NVC types S4a, S4b, S4c, S26a and S26b, and regionally scarce species of southern distribution such as *Epilobium hirsutum* and *Berula erecta*. The mixed fen is dominated by combinations of tall herb and sedge species (NVC type S27), and supports several regionally rare species such as *Carex diandra* and *Ranunculus lingua*. The abundance of *Iris pseudacorus* in the fen, and in the adjacent fen-meadow (cf M28), is an unusual feature in the Moray Firth Basin and in Grampian. As well as extensive willow scrub (NVC types W1 and W3) there is also alder swamp woodland (cf. W5). The loch itself is eutrophic and contains a particularly diverse aquatic water flora, including the local and nationally uncommon NVC type A11 and a nationally scarce pondweed species, *Potamogeton filiformis*.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12.** Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

Potamogeton filiformis, Corallorhiza trifida, Juncus balticus

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12.** Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Species Information

None reported

23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic
Archaeological/historical site
Environmental education/ interpretation
Scientific research
Sport fishing
Sport hunting

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilisations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Private	–	+

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Recreation	+	
Current scientific research	+	
Commercial forestry	+	+
Arable agriculture (unspecified)		+
Grazing (unspecified)		+
Hunting: recreational/sport	+	
Irrigation (incl. agricultural water supply)		+
Transport route		+

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
No factors reported	NA				

For category 2 factors only. What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Is the site subject to adverse ecological change? NO

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
Special Protection Area (SPA)	+	
Management agreement	+	
Site management statement/plan implemented	+	
Other	+	

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as amended

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b) Describe any other current management practices:
The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Contemporary.

Fauna.
Occasional research on fish.

Completed.

Flora.
Fen vegetation survey completed (Smedley 1998).

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

A limited amount of interpretation is provided in the bird hide.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.
Bird watching occurs on the site, for which a bird hide has been provided.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Scottish Executive, Environment and Rural Affairs Department

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Scottish Natural Heritage, 2 Anderson Place, Edinburgh, EH6 5NP

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **15** above), list full reference citation for the scheme.

Site-relevant references

Barne, JH, Robson, CF, Kaznowska, SS, Doody, JP & Davidson, NC (eds.) (1996) *Coasts and Seas of the United Kingdom. Region 3. North-east Scotland: Cape Wrath to St Cyrus*. Joint Nature Conservation Committee, Peterborough (Coastal Directories Series)

Cranswick, PA, Waters, RJ, Musgrove, AJ & Pollitt, MS (1997) *The Wetland Bird Survey 1995–96: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge

Doody, JP, Johnston, C & Smith, B (1993) *Directory of the North Sea coastal margin*. Joint Nature Conservation Committee, Peterborough

Musgrove, AJ, Pollitt, MS, Hall, C, Hearn, RD, Holloway, SJ, Marshall, PE, Robinson, JA & Cranswick, PA (2001) *The Wetland Bird Survey 1999–2000: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge. www.wwt.org.uk/publications/default.asp?PubID=14

Ratcliffe, DA (ed.) (1977) *A Nature Conservation Review. The selection of biological sites of national importance to nature conservation in Britain.* Cambridge University Press (for the Natural Environment Research Council and the Nature Conservancy Council), Cambridge (2 vols.)

Ross, S (1992) *The Culbin Sands – fact and fiction.* University of Aberdeen, Centre for Scottish Studies, Aberdeen

Smedley, MD (1998) *Loch Spynie SSSI. Fen vegetation survey (NVC) and monitoring baseline, 1995.* Scottish Natural Heritage (unpublished survey report)

Stroud, DA, Chambers, D, Cook, S, Buxton, N, Fraser, B, Clement, P, Lewis, P, McLean, I, Baker, H & Whitehead, S (eds.) (2001) *The UK SPA network: its scope and content.* Joint Nature Conservation Committee, Peterborough (3 vols.) www.jncc.gov.uk/UKSPA/default.htm

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EC Directive 79/409 on the Conservation of Wild Birds: Special Protection Area

LOCH SPYNIE (MORAY DISTRICT, GRAMPIAN REGION)

Loch Spynie is located in a lowland, predominantly agricultural area of NE Scotland. It is a eutrophic loch surrounded by fen, swamp and carr woodland.

The site qualifies under Article 4.2 by regularly supporting in winter, during the late 1980s, an internationally important roosting population of greylag geese *Anser anser* from the Icelandic biogeographical population. In the five-winter period 1985/86 to 1989/90 the average peak count was 8,830 birds (9% of the world population). Loch Spynie is important also as a spring staging site for Icelandic greylag geese.

As well as its importance for greylag geese, the site is also of strong scientific interest for supporting rich assemblages of breeding and wintering waterfowl.

SPA citation
GPM
November 1991

CITATION

LOCH SPYNIE
SITE OF SPECIAL SCIENTIFIC INTEREST

Moray

Site code: 1054

NATIONAL GRID REFERENCE : NJ234661

OS 1: 50 000 SHEET NO : Landranger Series 28
1: 25 000 SHEET NO : Explorer Series 423

AREA : 93.6 hectares

NOTIFIED NATURAL FEATURES

Biological :	Freshwater habitats :	Eutrophic loch
	:	Open water transition fen
	:	Fen-meadow
:	Woodland :	Wet woodland
:	Birds :	Breeding bird assemblage
	:	Greylag goose *Anser anser*, non-breeding

DESCRIPTION

Loch Spynie is located 3 km to the north-east of Elgin. This formerly more extensive shallow loch and wetland site is one of very few large eutrophic waterbodies in northern Scotland. It contains extensive and well developed areas of alder and willow carr, reedbeds and mesotrophic fen as well as a fairly diverse submerged flora. The loch is also important for its assemblage of breeding birds and as a winter roost for geese.

Habitats

Loch Spynie demonstrates many of the classic features of seral succession from open water, through reed beds to fen-meadow and wet woodland. The wide variety of habitats supports a rich aquatic and terrestrial fauna and flora. The site contains a variety of northern plant species but is particularly noteworthy for the occurrence of several southern species which are rare in northern Scotland e.g. greater spearwort *Ranunculus lingua*, hemlock water dropwort *Oenanthe crocata*, lesser water-parsnip *Berula erecta* and great reedmace *Typha latifolia*.

Birds

In the winter Loch Spynie regularly supports internationally important numbers of Icelandic greylag geese, representing 9 % of the total population. The loch is an important spring staging site for these geese. Significant numbers of other wildfowl are also found in winter.

The site supports an exceptional diversity of breeding wildfowl and other species associated with reedbeds, e.g. shoveler, great-crested grebe, water rail and grasshopper warbler. Several rare species have also bred or summered.

NOTIFICATION HISTORY

First notified under the 1949 Act: 1965.
Re-notified under the 1981 Act: 30 September 1983.
Notification reviewed under the 2004 Act: 18 May 2011

REMARKS

Measured area of site corrected (from 93 ha).

Loch Spynie SSSI is designated as Loch Spynie Special Protection Area (SPA), for the following bird.

Greylag goose *Anser anser*, non-breeding

Town & Country Planning
(Scotland) Act, 1997
as amended

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Development Management
Environmental Services
The Moray Council

LOWER RIVER SPEY – SPEY BAY SPECIAL AREA OF CONSERVATION (SAC)

Designation date: 17 March 2005

Administrative area: Moray

Qualifying Interests for which the site is designated:

SCIENTIFIC NAME	COMMON NAME
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion alvae*)*	Alder woodland on floodplains
Perennial vegetation of stony banks	Coastal shingle vegetation outside the reach of waves

Town & Country Planning
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as amended

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* Indicates a priority habitat