Kintore Hydrogen Plant
Habitats Regulations Appraisal

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EXECUTIVE SUMMARY

EnviroCentre Ltd. was commissioned by Kintore Hydrogen Limited to undertake a Habitats Regulations Appraisal (HRA) to assess whether a proposed Hydrogen Electrolysis Plant for a site near Kintore will have any Likely Significant Effects (LSEs) on the Loch of Skene Special Protection Area (SPA) and the Ythan Estuary, Sands of Forvie and Meikle Loch SPA.

It was not possible to rule out LSEs for Loch of Skene SPA and the Ythan Estuary, Sands of Forvie and Meikle Loch SPA for specific designated features (Greylag Geese and Pink-footed Geese) during the HRA screening process. The effects on the qualifying features were therefore taken forward for further consideration in the next HRA stage, Appropriate Assessment.

The Appropriate Assessment concluded that based on the low and infrequent numbers of Greylag Goose and Pink-footed Goose associated with the site, the extensive similar habitats within the wider landscape between the site and the two SPAs and assuming the employment of mitigation outlined in section 6, no adverse effects on the integrity of the Loch of Skene SPA or the Ythan Estuary, Sands of Forvie and Meikle Loch SPA are predicted with regards to the conservation objectives for Greylag Geese and Pink-footed Geese.

Nonetheless, as best practice, the following mitigation will be employed to avoid and minimise the risk of disturbance to geese occurring both during the construction and operational phases of the proposed development:

- A toolbox talk will be provided to the construction team informing them of the presence of the qualifying features and the Loch of Skene SPA and Ythan Estuary, Sands of Forvie and Meikle Loch SPA as part of the site inductions.
- Vegetation clearance of arable fields to be undertaken in a phased approach, if being undertaken during the winter season (November-March) to avoid major disturbances to foraging Greylag Geese and Pink-footed Geese.
- An Ecological Clerk of Works (ECoW) will be employed during the construction phase to provide advice in relation to geese.
- When reasonably practicable a slow start should be implemented when undertaking activities which will result in loud noise or vibrations when geese are present.
- The site boundary will be clearly demarcated (and protected via fencing where possible) ahead of any works to avoid habitats outside of the working area being damaged (either temporarily or permanently) and resulting in reduced foraging opportunities for geese.

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1 INTRODUCTION

1.1 Terms of Reference

EnviroCentre Ltd. was commissioned by Kintore Hydrogen Limited to undertake a Habitats Regulations Appraisal (HRA) to assess whether a proposed Hydrogen Electrolysis Plant for a site near Kintore will have any Likely Significant Effects (LSEs) on the Loch of Skene Special Protection Area (SPA) and the Ythan Estuary, Sands of Forvie and Meikle Loch SPA.

1.2 Scope of Report

It is the responsibility of the competent authority (in this case Aberdeenshire Council) to conduct the HRA, however, this document aims to provide the information necessary for them to undertake the appraisal by:

- Providing an outline of the proposed works and any integral mitigation.
- Identifying how works may impact the qualifying features of the designated site(s), the test of LSE in the absence of mitigation;
- Conducting an 'Appropriate Assessment' for qualifying features of sites for which LSE cannot be ruled out; and
- Identify mitigation which would be required to avoid adverse impacts on the qualifying features of the European designated sites.

1.3 Legislative Context

The Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (hereafter called the Habitats Directive) requires 'appropriate assessment' of plans and projects that are likely to have a significant effect on European designated sites.

In Scotland, the Habitats Directive is translated into specific legal obligations by the Conservation (Natural Habitats, &c.) Regulations 1994 (usually known as the Habitats Regulations). The Habitats Regulations cover the requirements for:

- protecting sites that are internationally important for threatened habitats and species – i.e. European sites
- a legal framework for species requiring strict protection – i.e. European protected species

The requirements of Articles 6(3) and 6(4) in the Habitats Directive have been transposed into domestic law in Scotland, principally through regulations 48 and 49 of the Habitats Regulations (as amended). This provides the legal framework for protected sites, now defined as 'European sites' and for species requiring legal protection.

1.3.1 Special Protection Areas (SPAs)

SPAs are designated under Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (the Birds Directive), transposed into Scottish law through the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). Under the Directive, Scotland is obliged to protect the habitats of birds which are vulnerable to habitat change or due to their low population numbers i.e. rarity, especially species on Annex 1 of the Directive. Aspects of habitat protection are in the context of

pollution, deterioration of habitat and disturbance. SPAs, together with Special Areas of Conservation (SACs), form what is known as the "National Site Network".

1.3.2 Conservation Objectives

The overriding objective of the Habitats Directive is to ensure that the habitats and species covered achieve 'Favourable Conservation Status' and that their long-term survival is secured across their entire natural range within the European Union (EU). In its broadest sense, favourable conservation status means that an ecological feature is being maintained in a satisfactory condition, and that this status is likely to continue into the future. Definitions as per the EU Habitats Directive are given below.

Favourable Conservation Status as defined by Articles 1 (e) and 1(i) of the Habitats Directive

The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- its natural range and areas it covers within that range are stable or increasing; and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- the conservation status of its typical species is favourable'.

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- the population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats; and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Site-specific conservation objectives define the desired condition or range of conditions that a habitat or species should be in, in order for these selected features within the site to be judged as favourable. At site level, this state is termed 'favourable conservation condition.' Site conservation objectives also contribute to the achievement of the wider goal of biodiversity conservation at other geographic scales, and to the achievement of favourable conservation status at national level and across the national site network.

1.4 Report Usage

The information and recommendations contained within this report have been prepared in the specific context stated above and should not be utilised in any other context without prior written permission from EnviroCentre Limited.

If this report is to be submitted for regulatory approval more than 12 months following the report date, it is recommended that it is referred to EnviroCentre Limited for review to ensure that any relevant changes in data, best practice, guidance or legislation in the intervening period are integrated into an updated version of the report.

2 METHODOLOGY

2.1 The Habitats Regulations Appraisal Process

The HRA is a four-stage process with specific issues and tests outlined at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required. The stages are summarised in Table 2-1.

Table 2-1 Key Stages in the HRA Process

Stage 1	
Screening for Likely Significant Effect (LSE)	- Identify international sites in and around the project area. - Examine conservation objectives of the interest feature(s) (where available). - Review plan policies and proposals and consider potential effects on UK sites (magnitude, duration, location, extent). - Examine other plans and programmes that could contribute to 'in combination' effects.
	- If no effects likely – report no likely significant effect. - If effects are judged likely or uncertainty exists – the precautionary principle applies, proceed to Stage 2.If at the screening stage it is identified that the project includes inherent or integral mitigation measures which will ensure no likely significant effects, then no further Appropriate Assessment is needed. - However, if mitigation measures not integral to the project are required to ensure no likely significant effects, proceed to Stage 2 and consider mitigation through the Appropriate Assessment.
Stage 2	
Appropriate Assessment (AA)	- Complete additional scoping work including the collation of further information on sites as necessary to evaluate impact in light of conservation objectives. - Agree scope and method of AA with the competent authority. - Consider how the project 'in combination' with other projects will interact when implemented (the Appropriate Assessment). - Consider how effects on integrity of the site could be avoided by changes to the project and the consideration of alternatives. - Develop mitigation measures (including timescale and mechanisms). - Report outcomes of AA including mitigation measures.
	- If the project will not adversely affect European site integrity proceed with plan. - If effects or uncertainty remain following the consideration of alternatives and development of mitigation proceed to Stage 3.
Stage 3	
Alternative Solutions	- Consider alternative solutions, delete from project or modify. - Consider if priority species/habitats affected - identify 'imperative reasons of overriding public interest' (IROPI), economic, social, environmental, human health, public safety (only applicable in highly exceptional circumstances).
Stage 4	
Imperative Reasons of Overriding Public Interest (IROPI)	- Stage 4 is the main derogation process of Article 6(4) which examines whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project that will have adverse effects on the integrity of a UK site to proceed in cases where it has been established that no less damaging alternative solution exists. - The extra protection measures for Annex I priority habitats come into effect when making the IROPI case. Compensatory measures must be proposed and assessed. The Scottish Ministers must be informed of the compensatory measures. Compensatory measures must be practical, implementable, likely to succeed, proportionate and enforceable, and they must be approved by the Scottish Ministers.

2.2 Screening

With reference to the NatureScot guidance[1]the screening stage determines whether AA is required, by:

- Determining whether a project (or plan) is directly connected with or necessary to the conservation management of any European sites;
- Describing the details of the project (or plan) proposals and other projects that may cumulatively affect any European sites;
- Describing the characteristics of relevant European sites; and
- Appraising likely significant effects of the proposed project on relevant European sites.

The guidance gives the following definition of LSE:

"The test of significance is where 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."

*"A likely effect is one that cannot be ruled out on the basis of objective information. The test is a 'likelihood' of effects rather than a 'certainty' of effects. Although some dictionary definitions define 'likely' as 'probable' or 'well might happen', in the Waddenzee case the European Court of Justice ruled that a project should be subject to Appropriate Assessment "**if it cannot be excluded, on the basis of objective information, that it will have a significant effect on the site, either individually or in combination with other plans and projects**". 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."*

2.3 Appropriate Assessment

The AA establishes whether or not a project's LSE identified during the screening stage will have an adverse effect on the integrity of the affected site with regard to its conservation objectives. Based on the guidance provided by NatureScot (2023)[2] [3] the effects of the proposal on the designated sites' qualifying features will determined by:

- Gathering information required to assess impacts (from site documents, scientific literature, EU and UK guidance on impact assessment and impact assessments from similar projects);
- Predicting the type and nature of impacts e.g. direct or indirect, short or long term;
- Assessing whether there will be adverse effects on the integrity of the site as defined by the conservation objectives and the status of the site. The precautionary principle must be applied at this stage. If it cannot be demonstrated with supporting evidence that there will be no adverse effects then adverse effects will be assumed; and
- Ascertaining if it is possible to mitigate adverse effects.

[1]NatureScot, formerly SNH guidance available at : https://www.nature.scot/sites/default/files/2019-07/Habitats%20Regulations%20Appraisal%20of%20Plans%20-%20plan-making%20bodies%20in%20Scotland%20-%20Jan%202015.pdf (Accesses December 2023)
[2] NatureScot HRA Guidance, available at: https://www.nature.scot/professional-advice/planning-and-development/environmental-assessment/habitats-regulations-appraisal-hra
[3] The 2015 Guidance was subsequently updated in 2023 to, among others, simplify the process and align it better with other web guidance prepared by NatureScot

3 PROJECT DESCRIPTION

3.1 Site Location and Description

The site is located south of Kintore, centred at National Grid reference: NJ 78276 14343, 91m above sea level. The site comprises three main areas and a series of thin corridors between and to the south of the three main areas. The site consists of a mosaic of agricultural land, grassland, scrub, trees, heathland, woodland, residential cottage, ruined building and horse steading. The site also includes parts of several watercourses including the River Don, Park Burn, Dewsford Burn, Tuach Burn and Silver Burn and a pond in the central region.

The site is bounded to the north by the B977, the Harthills plantation and agricultural fields, to the east by the River Don, and to the south and west by agricultural fields. The site is crossed by the B977 in the west and the A96 and the Rushlach in the east.

In the wider landscape, a mostly industrial area is found east of the site, the town of Kintore to the northeast and with the remaining surrounding landscape being dominated by woodland, pastures and agricultural land.

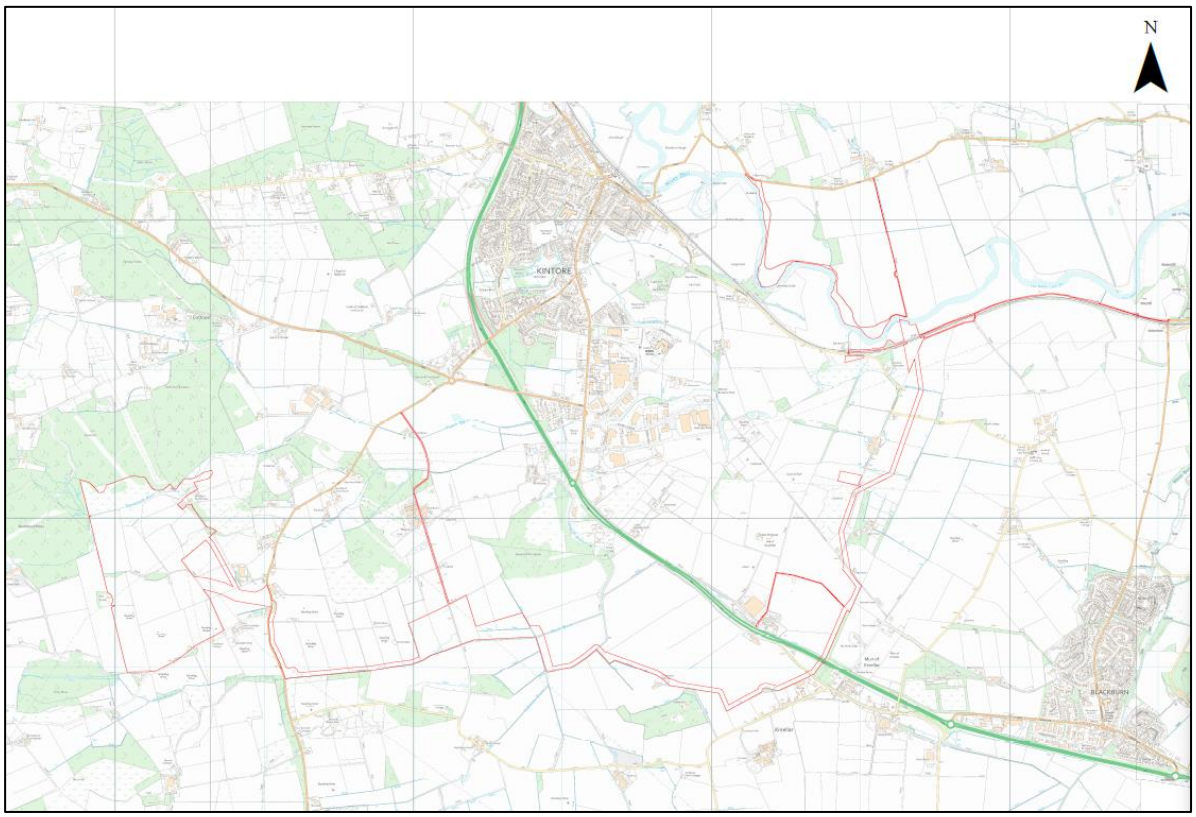


Figure 3-1: Site Boundary (red)

3.2 Proposed Development

The main elements of the development are the construction of an electrolysis plant, with associated flare stack and attenuation basin, located west of Kintore 400 kV substation; a short underground electrical connection into the substation; an underground hydrogen export pipeline to a connection

point on the existing high-pressure natural gas pipeline west of the A96; and underground water intake and discharge pipelines to the River Don.

The inclusion of an enclosed ground flare is the preferred solution to safely manage hydrogen should the high-pressure elements of the system need to be de-pressurised and the hydrogen inventory removed during an abnormal operational event.

At the River Don, there will be intake and outfall structures on the south bank and a pumping station. A compensation area along the north of the River Don is also to be included, alongside access routes and temporary compound areas. The pipeline routes would be primarily laid in trenches with soil cover reinstated above the pipes. Where there is habitat loss in the electrolysis plant, gas connection and intake/outfall area, the loss will be permanent, whereas in all other areas (pipeline routes, temporary compounds and existing or temporary access roads) the loss will be temporary and reinstated post-construction.

4 SCREENING FOR APPROPRIATE ASSESSMENT

NatureScot identified the Loch of Skene (approx. 5km south of the development site) and the Ythan Estuary, Sands of Forvie and Meikle Loch SPA (located approximately 14.5km east at the nearest point to the development) as sites to be considered in its consultation response to the EIA Scoping Request for the project. No other National Site Network sites were identified for screening. The location of the designated sites in relation to the proposed development are shown in Appendix A.

For LSE to arise, there must be a risk enabled by having a 'source' (e.g., construction works at a proposed development site), a 'receptor' (e.g., a European site or its qualifying interests), and a pathway between the source and the receptor (e.g., a watercourse connecting a proposed development site to a European site). The identification of a pathway does not automatically mean that significant effects will arise. The likelihood for significant effects will depend upon the characteristics of the source (e.g., duration of construction works), the characteristics of the pathway (e.g., water quality status of watercourse receiving run-off from construction) and the characteristics of the receptor (e.g., the sensitivities of the European site and its qualifying interests).

NatureScot guidance states that sites with mobile species should be considered within the screening process where there is a significant ecological link between the designated site and the proposed development site.

The Loch of Skene SPA is located approximately 5km south of site. The SPA is not hydrologically connected to the development site; however, a designated feature of the SPA is wintering Greylag Goose (*Anser anser*). Geese are known to travel up to 20km to forage and therefore this site is considered within the screening for AA.

The Ythan Estuary, Sands of Forvie and Meikle Loch SPA is located approximately 14.5km east of the site. The site is hydrologically connected to the site via the River Don and a designated feature of the SPA is Pink-footed Goose (*Anser brachyrhynchus*) and therefore (as above) this site is considered within the screening for AA.

4.1 The Loch of Skene SPA Description and Features

The Loch of Skene is a shallow, nutrient-rich, freshwater lake fringed by beds of reed canary grass and wet woodlands of birch, willow and alder and comprises 121.76 hectares. The woodland fringing the north-east of the loch, comprising willow-birch carr and beech is categorised as an ancient woodland, whilst the alder woodland by the inlet is shown on the Roy Map[4]. The pine plantations to the west of the loch were established more recently. The loch and the semi-natural habitats around the loch also support a number of local or rare plant species.

The Loch of Skene is known to host over 5% of the Iceland/UK/Ireland Greylag Goose population[5] and is designated as an SPA for non-breeding Greylag Goose, Goldeneye (*Bucephala clangula*) and Goosander (*Mergus merganser*).

[4] Public statement prepared by NatureScot (formerly Scottish Natural Heritage) for owners and occupiers of the SSSI: Loch of Skene Site of Special Scientific Interest Site Management Statement (2011) (Accessed December 2023)
[5] Loch of Skene SPA information, available at: https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9002261.pdf (Accessed December 2023)

The Loch of Skene is also designated as a Site of Special Scientific Interest (SSSI) for non-breeding Common gull (*Larus canus*), Goldeneye, Greylag Goose and Pink-footed Goose, as well as a RAMSAR site for non-breeding Goldeneye, Goosander and Greylag Goose.

The site's designated features and condition monitoring assessment are listed in Table 4-1 below.

Table 4-1: Loch of Skene SPA Designated Features and Site Condition Assessment

Qualifying Feature	Condition Assessment	Date
Goldeneye	Favourable Maintained	01 March 2014
Greylag Goose	Unfavourable Declining	01 March 2014
Goosander	Unfavourable Declining	01 March 2014

4.2 The Ythan Estuary, Sands of Forvie and Meikle Loch SPA Description and Features

The Ythan Estuary, Sands of Forvie and Meikle Loch SPA comprises 7062.03 hectares (89.56% marine) and covers a complex area in the north east of Scotland that contains the long, narrow estuary of the River Ythan, the Sands of Forvie on the east bank of the estuary; and the eutrophic Meikle Loch[6]. The linear coast immediately north of and within Aberdeen is intersected by three large rivers; the Dee, Don and Ythan. To the north the coast is cliff but to the south of the Sands of Forvie and the Ythan, as far as Aberdeen, it is long sandy beaches with relatively shallow water inshore.

The SPA supports a breeding population of European importance of Annex 1 species Sandwich Tern (*Sterna sandvicensis*) and Little Tern (*Sternula albifrons*) as well as breeding Common Tern (*Sterna hirundo)* and non-breeding Pink-footed Goose, Common Eider (*Somateria mollissima mollissima*), Lapwing (*Vanellus vanellus*), Redshank (*Tringa totanus*) and other non-breeding waterbird assemblages. The Ythan Estuary, Sands of Forvie and Meikle Loch SPA is known to host 9% of the Eastern Greenland/Iceland/UK biogeographic Pink-footed Goose population over winter.

The site's designated features and condition monitoring assessment are listed in Table 4-1 below.

Table 4-2: The Ythan Estuary, Sands of Forvie and Meikle Loch SPA Designated Features and Site Condition Assessment

Qualifying Feature	Condition Assessment	Date
Common Tern	Unfavourable No change	01 August 2012
Eider	Favourable Declining	21 August 2012
Lapwing	Favourable Maintained	18 August 2012
Little Tern	Favourable Maintained	01 August 2012
Pink-footed Goose	Favourable Maintained	06 November 2012
Redshank	Favourable Maintained	19 October 2012

[6] The Ythan Estuary, Sands of Forvie and Meikle Loch SPA information, Available at: https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9002221.pdf (Accessed December 2023)

Sandwich Tern	Favourable Maintained	01 August 2012
Waterfowl assemblage, non-breeding	Favourable Maintained	19 October 2012

4.3 Likely Significant Effects (LSE)

As the Loch of Skene SPA and the Ythan Estuary, Sands of Forvie and Meikle Loch SPA are located 5km and 14.5km (respectively) from the development site, it is considered that designated features Greylag Goose and Pink-footed Goose would be the only qualifying features of the two SPAs for which LSEs cannot be ruled out. This is due to no direct connection between the development and the designated sites and a consideration of the foraging range of the species which are qualifying features.

Potential impact pathways to these qualifying features are considered as follows.

Pathway Identified: Air Pollutant Impacts
Nitrogen and acid gas deposition from air pollutants (oxides of nitrogen) emitted by the proposed development's hydrogen flare could affect habitat (freshwater) that Greylag Goose and Pink-footed Goose reside within, associated with the Loch of Skene SPA. The designated features have critical loads for nutrient nitrogen of 20 kg/N/ha/yr[7] and are also sensitive to acidity, though no specific critical load is specified in this case.

The Ythan Estuary, Sands of Forvie and Meikle Loch SPA is 20 km away from the hydrogen flare at the SPA's closest boundary. The annual mean air pollutant dispersion modelling reported in Chapter 11 and Appendix 11.1 of the EIAR for a highly conservative (worst-case) scenario shows that this is well beyond the distance at which there would be any appreciable change in air pollution, and thus there would be no appreciable effect on nutrient nitrogen or acid gas deposition.

The Loch of Skene SPA is 6.4 km away from the hydrogen flare at the SPA's closest boundary. Likewise, the air pollutant dispersion modelling shows that this is beyond the distance at which there would be any appreciable change in air pollution, and thus there would be no appreciable effect on nutrient nitrogen or acid gas deposition.

The APIS background nitrogen deposition mapping shows that this is well below the relevant critical load of 20 kg/N/ha/yr at the SPA locations[7].

For these reasons, in relation to the flare, operation of the proposed development is considered not to have a negative effect on the designated features and no expected negative impacts on species due to impacts on the habitats used by them within the SPAs. Therefore, this potential impact pathway is not considered to be an LSE.

Pathway Identified: Habitat Loss/ Alteration
Removal of terrestrial habitats (arable, cover crops and improved grassland) to accommodate the development which may support foraging Greylag Goose and Pink-footed Goose during winter. This could reduce the distribution and extent of habitats supporting the species and therefore, have a negative effect on the designated features.

Pathway Identified: Disturbance
Impacts to foraging Greylag Goose or Pink-footed Goose may occur due to increased noise, vibration, lighting etc as a result of investigation, construction and operational works during winter and therefore, have a negative effect on the designated features.

[7] Air Pollution Information System (APIS) reports for Loch of Skene SPA, available at: https://www.apis.ac.uk/app

4.4 Screening Conclusion

Following an examination, analysis and evaluation of the relevant information including, in particular, the nature of the proposed development and the likelihood of significant effects on the Loch of Skene SPA and the Ythan Estuary, Sands of Forvie and Meikle Loch SPA and applying the precautionary principle, it is the professional opinion of the authors that at present there is insufficient information to rule out likely (or possible) significant effects to the qualifying features Greylag Goose and Pink-footed Goose within the designated sites through the impact pathways of habitat loss/alteration and disturbance. An AA for the proposed project will therefore be required to ascertain whether or not the proposed works will adversely impact on the integrity of these two SPAs in regards to Greylag Goose and Pink-footed Goose.

5 APPROPRIATE ASSESSMENT

5.1 The Loch of Skene SPA

5.1.1 Greylag Goose

The Loch of Skene is a shallow (less than 2m deep[8]), nutrient-rich loch, fringed by reedbed and willow carr. As one of relatively few large water bodies in north-east Scotland, the Loch of Skene is considered regionally important as an autumn and winter roost for a variety of wildfowl.

The loch attracts internationally important numbers of Greylag Geese, present in autumn and winter when they roost on the loch, mostly at night. Greylag goose numbers became increasingly important in the 1980s, with peaks averaging 5500 by 1986, representing over 5% of the Iceland/UK/Ireland biogeographic population at the time of classification (1986). However, populations have gradually dropped to lower levels in the 2000s, falling to only 32 in 2007/8. 60% of the wintering Greylag Geese are now found on Orkney, indicating a northward shift in the distribution of wintering Greylags in Scotland. The feature was assessed in 2014 to be unfavourable declining.

The development site is located 5km north of the Loch of Skene SPA, within travel distance for foraging (up to 20km) for Greylag Geese. The Greylag is the largest and bulkiest of the wild geese native to the UK and Europe. The native birds and wintering flocks found in Scotland retain the special appeal of truly wild geese. Greylag Goose forage on roots, cereal leaves and spilled grain[9] [10], thus the development site which hosts a large number of arable and agricultural fields could provide foraging opportunities for overwintering Greylag Geese.

The local landscape including the site is known to contribute to the overwintering of geese in the North East of Scotland. Winter Geese surveys undertaken by EnviroCentre between 2022-2023 (November-March) recorded Greylag Geese associated with the site during two out of the six visits over the survey period. The peak count was 185, in a field west of the site where the pumping station is proposed, in March 2023. The peak count represents 3% of the population, based on Loch of Skene peak counts of 5500. A likely reason for the lower number of geese recorded could be due to the northward winter range shift of Icelandic Greylag Geese since the Loch of Skene SPA was classified, which has led to few now wintering in North-East Scotland and an almost complete abandonment of the Loch of Skene roost[11]. This is evidenced by the mean counts of Greylag Geese at Loch of Skene for 2018/19-2022/23 of 43[12]. It is also assumed that most Greylag Geese encountered at Loch of Skene and surrounds are now from the resident feral breeding population in North-East Scotland, which has increased substantially in recent years[13], rather than from either the Icelandic or native British breeding populations.

[8] BirdLife International (2023) Important Bird Area factsheet: Loch of Skene. Downloaded from http://datazone.birdlife.org/site/factsheet/loch-of-skene-iba-united-kingdom (Accessed December 2023)
[9] Greylag Goose Royal Society for Protection of Birds (RSPB) information, available at: https://www.rspb.org.uk/birds-and-wildlife/greylag-goose (Accessed December 2023)
[10] Greylag Goose British Trust for Ornithology (BTO), available at: https://www.bto.org/understanding-birds/birdfacts/pink-footed-goose (Accessed December 2023)
[11] Mitchell C. (2012). Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge.
[12] BTO WeBS Reports
[13] Francis I. & Cook M. eds. (2011). The Breeding Birds of North-East Scotland. Scottish Ornithologists' Club, Aberdeen.

5.2 The Ythan Estuary, Sands of Forvie and Meikle Loch SPA

5.2.1 Pink-footed Goose

The Ythan Estuary, Sands of Forvie and Meikle Loch SPA comprises a long, narrow estuary of the River Ythan which flows in a north to south direction, before entering the sea 18 km north of Aberdeen[14]. Large sand-dunes exist either side of the river mouth, which itself comprises extensive mud and gravel flats. The Sands of Forvie sand-dune system contains a complete range of dune types and supports lichen-rich heath. Meikle Loch consists of a small eutrophic loch which hosts little aquatic vegetation and lies in an area of intensive farming.

In Scotland, Pink-footed Geese are found along the eastern coastal plain, through the central lowlands, mainly in the east, and around the Solway Firth[15]. In relation to the Ythan Estuary, Sands of Forvie and Meikle Loch SPA, the feature was assessed to be favourable maintained in 2012.

The development site is located 14.5km east of the SPA, within travel distance for foraging (up to 20km) for Pink-footed Goose. Pink-footed Geese forage on grain, winter cereals, potatoes and grass[16], thus the site which hosts a large number of arable and agricultural fields could provide foraging opportunities for overwintering Pink-footed Geese.

The landscape including the site is known to contribute to the overwintering of geese in the North East of Scotland. Winter Geese surveys undertaken by EnviroCentre between 2022-2023 (November-March) recorded Pink-footed Geese associated with the site during four out of the six visits over the survey period, with a peak count of 1050 in two flocks on fields at the west of the survey area, on land proposed for the electrolysis plant and grid connection, in January 2023. This peak count represents 6% of the population, based on the Ythan Estuary, Sands of Forvie and Meikle Loch SPA peak counts of 18840 (in the early part of the year in 2023)[12].

However, the locations of night roosts within this SPA are on the Ythan Estuary and Meikle Loch, both of which are over 20km from the site, with the closer, southern extent of the SPA comprising part of a marine component added due to use by foraging terns. The main feeding grounds for these Pink-footed Goose roosts are identified as widely spread, especially to the northeast of the roosts, to the south along the Aberdeenshire coast to Balmedie and west to Ellon and likely around Oldmeldrum[11]. This area does not extend as far as the proposed development site. Therefore, connectivity of the proposed development with the Ythan Estuary, Sands of Forvie SPA is not considered likely.

5.3 Assessment of Potential Impacts on Conservation Objectives

5.3.1 The Loch of Skene SPA

1. *To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.*
2. *To ensure for the qualifying species that the following are maintained in the long term:*
    a. *Population of the species as a viable component of the site*

[14] BirdLife International (2023) Important Bird Area factsheet: Ythan Estuary, Sands of Forvie and Meikle Loch. Downloaded from http://datazone.birdlife.org/site/factsheet/ythan-estuary-sands-of-forvie-and-meikle-loch-iba-united-kingdom (Accessed December 2023)
[15] Pink-footed Goose BTO, available at: https://www.bto.org/understanding-birds/birdfacts/pink-footed-goose (Accessed December 2023)
[16] Pink-footed Goose RSPB, available at: https://www.rspb.org.uk/birds-and-wildlife/pink-footed-goose (Accessed December 2023)

b. *Distribution of the species within site*
c. *Distribution and extent of habitats supporting the species*
d. *Structure, function and supporting processes of habitats supporting the species*
e. *No significant disturbance of the species*

Greylag Goose
The area where the proposed electrolysis plant is to be developed will result in permanent removal of foraging habitat, whilst the pipeline and temporary compounds in the remainder of the development will result in temporary habitat removal. Therefore, Greylag Geese foraging habitat may be altered or lost as a result of ground clearance of arable fields to facilitate the proposed development. However, due to the low numbers recorded associated with the site over the 2022-2023 winter season and the irregular presence recorded within the survey area, the alteration/ loss of habitat within the site is thought to be minor, with extensive similar habitats within the 5km distance between the SPA and site that Greylag Geese could utilise. In addition, the landscape is subject to change through farming practices and crop rotation, therefore, Greylag Geese that utilise this landscape will likely be used to changes in foraging habitat availability on a yearly basis.

Construction and operational works may cause disturbance to a low number of foraging or resting Greylag Geese from noise, vibration and lighting associated with the works. However, given that Greylag Geese are mobile and that the numbers recorded associated with the site are low and assuming mitigation detailed in section 6 is employed, it is expected that the works will not likely have an adverse effect on Greylag Geese.

Therefore, assuming good practice species-specific mitigation is in place during construction and operation, no adverse effect on the current condition of Greylag Geese should occur as a result of the proposed development. No adverse effect to the population of the species as a viable component of the site, distribution of the species within the site, distribution of the habitats supporting Greylag Geese as well as the structure, function and supporting processes of habitats supporting Greylag Geese or significant disturbances to the species are expected to occur as a result of the proposed development.

In addition, although a small amount of habitats which Greylag Geese could use will be removed to facilitate the development, this is only a small portion of what is available in the wider landscape. This combined with the areas of habitat which will be temporarily removed, will likely not result in the deterioration of the habitats of the Greylag Geese or cause significant disturbances to Greylag Geese, ensuring that the integrity of the SPA is maintained.

5.3.2 The Ythan Estuary, Sands of Forvie and Meikle Loch SPA

1. *To ensure that the qualifying features of Ythan Estuary, Sands of Forvie and Meikle Loch SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.*
2. *To ensure that the integrity of Ythan Estuary, Sands of Forvie and Meikle Loch SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:*
    a. *The populations of the qualifying features are viable components of the site.*
    b. *The distributions of the qualifying features throughout the site are maintained by avoiding significant disturbance of the species.*
    c. *The supporting habitats and processes relevant to the qualifying features and their prey/food resources are maintained, or where appropriate, restored.*

Pink-footed Goose

Pink-footed Geese foraging habitat may be altered or lost as a result of ground clearance. However, due to the low numbers recorded associated with the site over the 2022-2023 winter season, as a proportion of the total population using the SPA, the alternation/ loss of habitat within the site is thought to be minor, with extensive similar habitats within the 14.5km distance between the SPA and the site that Pink-footed Geese could utilise. In addition, the landscape is subject to change through farming practices and crop rotation, therefore, Pink-footed Geese that utilise this landscape will likely be used to changes in foraging habitat availability on a yearly basis.

Construction and operational works may cause disturbance to a low number of foraging or resting Pink-footed Geese from noise, vibration and lighting associated with the works. However, given that Pink-footed Geese are mobile and that the numbers recorded associated with the site are low and assuming mitigation detailed in section 6 is employed, it is expected that the works will not have any adverse effect on Pink-footed Geese.

Therefore, assuming good practice species-specific mitigation is in place during construction and operation, the favourable status of Pink-footed Geese will be maintained. Additionally, no adverse effect to the population, distribution or habitat used by Pink-footed Geese are expected to occur as a result of the proposed development.

5.4 Appropriate Assessment Conclusion

Based on the relatively low and infrequent numbers of Greylag Goose and Pink-footed Goose associated with the site, the extensive similar habitats within the wider landscape between the site and the two SPAs and assuming the employment of mitigation outlined in section 6, no adverse effects on the integrity of the Loch of Skene SPA or the Ythan Estuary, Sands of Forvie and Meikle Loch SPA are predicted with regards to the conservation objectives for Greylag Geese and Pink-footed Geese.

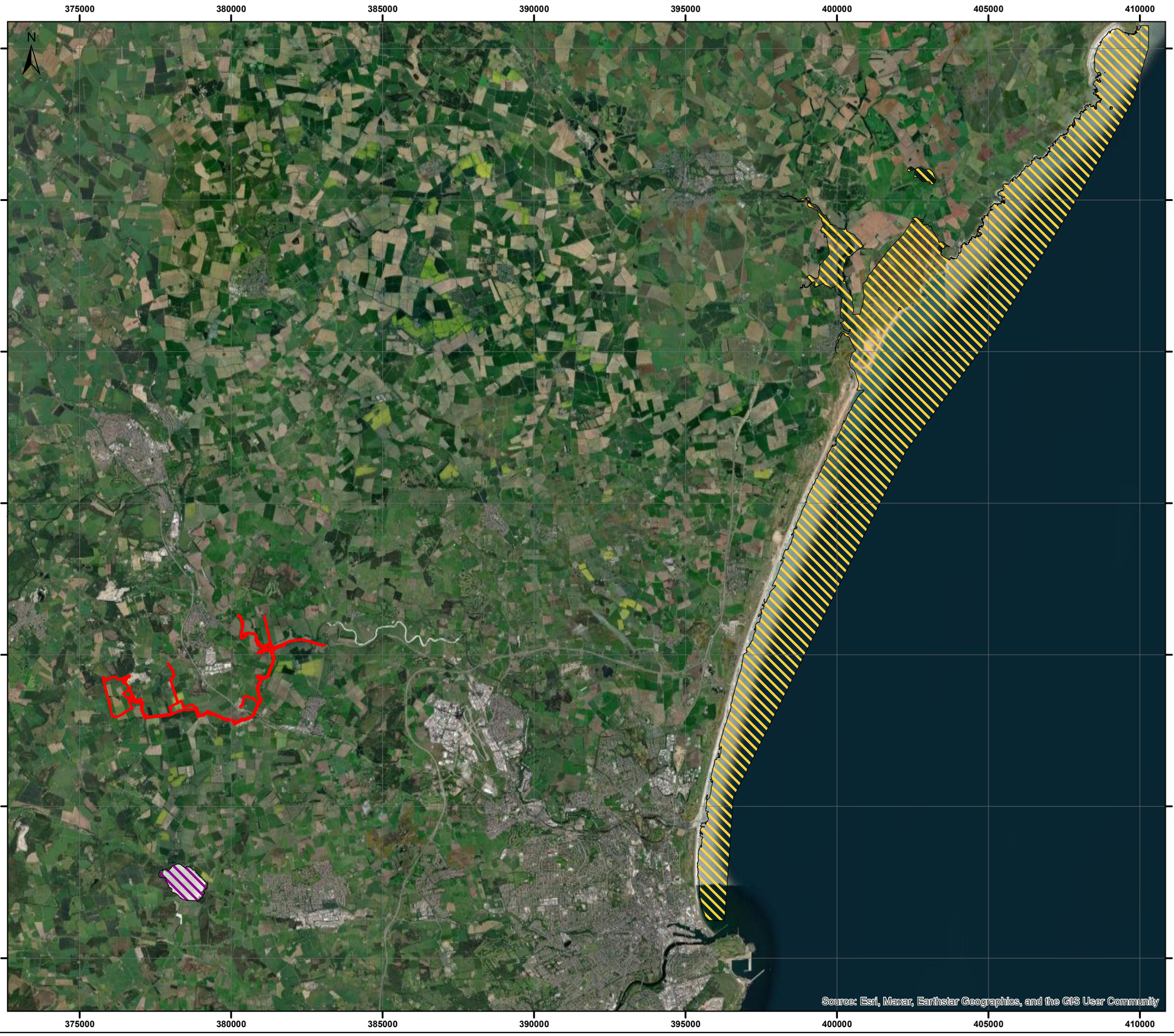
6 MITIGATION

Nonetheless, as best practice, the following mitigation will be employed to avoid adverse effects to geese occurring both during the construction and operational phases of the proposed development, as secured as part of the Construction Environmental Management Plan (CEMP):

- An Ecological Clerk of Works (ECoW) will be employed during the construction phase to provide advice in relation to geese.
- A toolbox talk should be produced by the project ECoW/ ecologist and provided to the construction team informing them of the presence of the qualifying features and the Loch of Skene SPA and Ythan Estuary, Sands of Forvie and Meikle Loch SPA as part of the site inductions.
- Vegetation clearance of arable fields to be undertaken in a phased approach, if being undertaken during the winter season (November-March) to avoid major disturbances to foraging Greylag Geese and Pink-footed Geese. This will be secured through the Construction Environmental Management Plan and Biodiversity Enhancement and Management Plan.
- When reasonably practicable, a slow start should be implemented when undertaking activities which will result in loud noise or vibrations when geese are present.
- The site boundary will be clearly demarcated (and protected via fencing where possible) ahead of any works to avoid habitats outside of the working area being damaged (either temporarily or permanently) and resulting in reduced foraging opportunities for geese.

APPENDICES

A SITE LOCATION AND SPA BOUNDARIES



Legend

- PAN boundary

Special Protected Area (SPA)

- Loch of Skene
- Ythan Estuary, Sands of Forvie and Meikle Loch

Do not scale this map

Client
Statera Energy

Project
Kintore Hydrogen Plant

Title
Site Location and SPA Plan

Status
Final

Drawing No.	Revision	Date
376782-GIS029	A	25 June 2023
Drawn	**Checked**	**Approved**
JEP	GN	GN

Scale
1:120,000 @A3
0 600 1,200 2,400 3,600 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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