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Technical Appendix 8.6: Shadow Habitat

Department: ERM
Project: Springfield Solar Farm and BESS
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1 INTRODUCTION

1.1.1.1 This Shadow Habitats Regulations Appraisal (HRA) has been prepared to provide information to aid the Scottish Ministers as Competent Authority in discharging their duties under the Habitats Regulations[1],[2] and show that the project (the Proposed Development) will not adversely affect the integrity of a European site. The term 'European site' refers to what were previously known as 'Natura' sites when they were originally designated under European legislation and includes both Special Protection Areas (SPAs) and Special Areas of Conservation (SACs).

1.1.1.2 Whilst Ramsar Sites are not European Sites, their boundaries often overlap and therefore are typically protected through measures that protect and enhance European Sites. As a precaution, within this Shadow HRA Ramsar Sites with interests that coincide with European Site qualifying interests have been subjected to the HRA process.

1.1.1.3 This report has been provided to formalise the initial screening presented in the Scoping Report[3] for consideration as part of the planning application. The assessment has been expanded to provide further information where necessary.

[1] The Conservation (Natural Habitats, &c.) Regulations 1994. Available online at: https://www.legislation.gov.uk/uksi/1994/2716/contents/made
[2] Conservation of Habitats and Species Regulations 2017. Available online at: https://www.legislation.gov.uk/uksi/2017/1012/contents/made
[3] Prepared by ERM and dated 15th August 2024.

2 APPROACH TO HRA

2.1.1.1 The approach to the HRA takes account of guidance from NatureScot[4],[5] and the HRA Handbook[6].

2.1.1.2 The HRA process comprises of three key steps completed in a sequential fashion with the outcome from one stage triggering the requirement for the next, these:

- Step 1 – Screening
- Step 2 – Appropriate Assessment: and
- Step 3 – Derogation

2.1.1.3 In accordance with NatureScot guidance[7], these three steps are progressed through nine stages, however stages 6-9 (Step 3) are only considered in exceptional circumstances where it cannot be ascertained that the project will not adversely affect the integrity of a European site. The HRA Stages are:

- **Step 1: Screening**
  - **Stage 1**: Defining the Plan of Project
  - **Stage 2:** Determining if the plan or project is directly connected with or necessary to site management for nature conservation?
  - **Stage 3**: Determining whether the plan or project (either alone or in combination with other plans or projects) is likely to have a significant effect on a European site (without mitigation).

    This Stage determines whether an appropriate assessment is required by assessing whether there is any connectivity between the Proposed Development and each of the qualifying interests. If there is no connection, or it is obvious that the proposal will not undermine the conservation objectives, likely significant effects can be scoped out. If there is clear connectivity or a lot of detailed information is required to determine connectivity, then an appropriate assessment is required. If doubt exists about whether there is a likely significant effect, but the potential exists, likely significant effect cannot be scoped out.

- **Step 2: Appropriate Assessment:**
  - **Stage 4**: Undertake Appropriate Assessment through the scientific appraisal of the potential impacts of a plan or project on the qualifying interest(s), to ascertain the implications for the site in view of its conservation objectives. Mitigation to remove

[4] Available online, at: https://www.nature.scot/professional-advice/planning-and-development/environmental-assessment/habitats-regulations-appraisal-hra
[5] Available online, at : Habitats Regulations Appraisal (HRA) on the Firth of Forth - A Guide for developers and regulators | NatureScot
[6] Tyldesley, D., and Chapman, C. (2013) *The Habitats Regulations Assessment Handbook*. DTA Publications Limited
[7] NatureScot Professional Advice: Planning and Development. Environmental Assessment. Habitat Regulations Appraisal

or reduce impacts of the proposal can be considered at this stage, however compensatory measures cannot be considered within an appropriate assessment

  - **Stage 5:** Determine whether the plan or project will not adversely affect the integrity of a European site, based on there being no reasonable scientific doubt as to the absence of adverse effects.

- **Step 3: Derogation:**

  – **Stage 6**: Determine whether there are alternative solutions. If it cannot be ascertained that the proposal will not adversely affect the integrity of a European site it can only proceed if there are no alternative solutions and there are 'imperative reasons of overriding public interest (IROPI)' (Stage 8-9).

  – **Stage 7**: Determine if 'priority habitat' (Annex 1 habitats) will be adversely affected? There are no priority species in Scotland's SACs or SPA.

  – **Stage 8-9**: Determine if there are IROPI. Where a priority habitat could be affected IROPI are limited to those related to human health, public safety, beneficial consequences of primary importance to the environment, or any other imperative reason of overriding public interest subject to the opinion of the Scottish Minister.

3 STEP 1: SCREENING THE PROJECT

3.1 Stage 1: Defining the Project

3.1.1.1 Under the Habitat Regulations the Proposed Development fits the criteria for a 'Project'. It is not directly connected with or necessary to site management for nature conservation.

3.1.1.2 The Proposed Development comprises a solar powered energy generating station, including a co-located Battery Energy Storage System (BESS), together known as Springfield Solar Farm and BESS.

3.1.1.3 The Proposed Development is located on land approximately 0.5 kilometres (km) north of the village of Oldhamstocks in East Lothian (the Site; **Figure 8.6.1**). The Site will occupy an area of approximately 184 hectares (ha).

3.1.1.4 The Proposed Development will have a generating capacity of up to approximately 165 MW from the solar PV modules (solar panels), while the BESS will have a generating capacity of up to approximately 80 MW. It will involve the construction and operation of solar panels, BESS units, and associated infrastructure. This will include:

- Solar panels will be included within the Proposed Development to provide a generating capacity of up to 165 MW. These will be mounted on steel frames and angles at approximately 25 degrees from horizontal, resulting in a height of 0.8m above ground level at its lowest and 3.2 m at its highest.
- 40 BESS units will be included in the Proposed Development, with dimensions up to 2.4m x 6m x 3m (W x L x H). Each unit will sit on 6 concreate foundations up to 0.2m above ground level, and up to 3m below ground level.
- An Electrical Substation will be located at approximately NGR 787 720. This location will be the site of the BESS compound.
- Access tracks to serve the construction and operation of the Proposed Development, with a width of 5m, with a likely verge of 1 – 1.5m either side of the track itself.

3.1.1.5 Further technical details of the Proposed Development can be found in the Environmental Impact Assessment Report (EIAR), **Chapter 3 (Development Description)** and associated figures.

3.1.1.6 The baseline habitat at the Site is primarily cropland, with areas of seasonally grazed grassland and small parcels of woodland, scrub and neutral grassland. Fields are typically bordered by arable margins, native hedgerow and/or ditches. The cropland at the time of the surveys was primarily non-cereal crop, with some winter stubble and arable.

3.1.1.7 Further details of the baseline ecological conditions at the Site can be found in the EIAR, **Chapter 8 (Ecology and Nature Conservation) and associated Technical Appendices and figures**.

3.2 Stage 2-3: Screening Assessment & Determination

3.2.1.1 To determine if the Project is likely to have a likely significant effect(s) on a European site, the following issues are considered:

- Potential pathways that could lead to effects on the qualifying interest(s) of the European site, taking account of the Project's characteristics (e.g. location relative to the European site, the magnitude, extent, duration, frequency timing of the effects).

- If so, what is the probability of an effect happening (e.g. how do the qualifying features respond to the effect, how sensitive the features are, the extent of exposure, conservation status and condition and its vulnerability) and what is the likely consequence for the site's conservation objectives if effects occur.

3.2.1.2 European sites that could be affected were identified using NatureScot's Sitelink[8] website, including their qualifying interest features and conservation objectives. Distances from the Site for inclusion in the screening are as follows:

- 20 km for SPAs with geese as a qualifying feature;

- 10 km for all other SPAs;

- 5 km for all SACs; and

- Ramsar sites with overlapping interest features with the above associated European Sites.

3.2.1.3 Consideration was given also to functionally linked land, a term often used to describe habitats outside a designated site boundary considered critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a SAC, SPA, and/or Ramsar site has been designated.

3.2.1.4 In accordance with the European Court judgement[9] mitigation measures which are not intrinsic or essential parts of the Proposed Development that are intended to avoid or reduced harmful effects are not taken into consideration at the screening stage.

3.2.1.5 **Table 3.1** provides a summary of the screening exercise undertaken for Springfield Solar Farm and BESS. The locations of the sites considered are shown on **Figure 8.6.2**.

[8] Available online at: https://sitelink.nature.scot/home
[9] People Over Wind and Sweetman v Coillte Teoranta (Case C-323/17).

TABLE 3.1 SCREENING OF DESIGNATED SITES

DESIGNATED SITE	QUALIFYING FEATURES & CONSERVATION OBJECTIVES	SCREENING
SPA and Ramsar Sites with Geese as a Qualifying Feature within 20 km of the Site		
Firth of Forth SPA Approximately 9.4 km northwest of the Site	Qualifies under **Article 4.1** by regularly supporting populations of European importance of red-throated diver (*Gavia stellata*), Slavonian grebe (*Podiceps auritus*), golden plover (*Pluvialis apricaria*) and bar-tailed godwit (*Limosa lapponica*). Qualifies under **Article 4.1** by regularly supporting a population of European importance of the Annex I species: sandwich tern (*Sterna sandivensis*) during the passage period. Qualifies under **Article 4.2** by regularly supporting populations of European importance of the migratory species pink-footed goose (*Anser brachyrhynchus*), shelduck (*Tadora tadorna*), knot (*Calidris canutus*), redshank (*Tringa totanus*) and turnstone (*Arenaria interpres*). Qualifies under **Article 4.2** by regularly supporting more than 20,000 individual waterfowl, including nationally important populations of the following species: Scaup (*Ayhya marila*), Slavonian grebe, Golden plover, Bar-tailed godwit, Pink-footed goose, Shelduck, Knot, Redshank, Turnstone, Great crested grebe (*Podiceps cristatus*), Cormorant (*Phalacrocorax carbo*), Red-throated diver, Curlew (*Numenius arquata*), Eider (*Somateria mollissima*), Long-tailed duck (*Langula hyemalis*), Common scoter (*Melanitta fusca*), Velvet scoter (*Melannita fusca*), Goldeneye (*Bucephala clangula*), Red-breasted merganser (*Mergus serrator*), Oystercatcher (*Haematopus ostralegus*), Ringed plover (*Charadrius hiaticula*), Grey plover (*Pluvialis squatarola*), Dunlin (*Calidris alpina alpina*). **Conservation Objectives:** To ensure for the qualifying species that the following are maintained in the long term: 1. Population of the species as a viable component of the site. 2. Distribution of the species within the Site.	Pink-footed goose have an accepted core foraging distance of 15-20 km from the night roost[10]; therefore, this species is the only feature that has the potential for regular connectivity with the Site. In response to the Scoping report, NatureScot requested further information to inform the HRA. **Likely Significant Effects cannot be ruled out, and pink-footed goose will be considered further in an AA.**

[10] NatureScot (2016) Assessing Connectivity with Special Protection Areas (SPAs). Available online at: https://www.nature.scot/doc/assessing-connectivity-special-protection-areas

DESIGNATED SITE	QUALIFYING FEATURES & CONSERVATION OBJECTIVES	SCREENING
	3. Distribution and extent of habitats supporting the species 4. Structure, function and supporting processes of habitats supporting the species 5. No significant disturbance of the species	
Firth of Forth Ramsar Approximately 9.4 km northwest of the Site	**Ramsar Criterion 2** Supporting red throated diver and Golden plover **Ramsar Criterion 4** Supports the following waterbird species at a critical stage in their life cycles: Scaup, Great crested grebe, Cormorant, Curlew, Eider, Long-tailed duck, Common scoter, Red-breasted merganser, Oystercatcher, Ringed plover, Grey plover, Dunlin, The assemblage also includes nationally important populations greater than 2,000 individuals of mallard (*Anas platyrhynchos*), lapwing (*Vanellus vanellus*) and Wigeon (*Anas penelope*) **Ramsar Criterion 5** Regularly supports waterbirds in numbers of 20,000 individuals or more. **Ramsar Criterion 6** Regularly supports 1 % or more of the individuals in a population of waterbirds: Slavonian grebe, Pink-footed goose, Shelduck, Knot, Redshank, Turnstone, Goldeneye (*Bucephala clangula*), Bar-tailed godwit, Sandwich tern.	Pink-footed goose have an accepted core foraging distance of 15-20 km from the night roost[16]; therefore, this species is the only feature that has the potential for regular connectivity with the Site. In response to the Scoping report, NatureScot requested further information to inform the HRA. **Likely Significant Effects cannot be ruled out and pink-footed goose will be considered further in an AA.**
SPA and Ramsar within 10 km of the Site		
Outer Firth of Forth and St. Andrew's Bay Complex SPA Approximately 1.2 km northeast of the Site	Qualifies under **Article 4.1** by regularly supporting a non-breeding population of European importance of the following Annex I species: red-throated diver, Slavonian grebe, little gull (*Larus minutus*), common tern (*Sterna Hirundo*) and Arctic tern (*Sterna paradisaea*). Qualifies under **Article 4.2** by regularly supporting populations of European importance of the following migratory waterfowl species: common eider, and by regularly supporting in excess of 20,000 individual waterfowl including nationally important populations of the	Many features are restricted to wetland or marine environments. There were no records of features during the bird surveys and, habitats are generally suboptimal or

DESIGNATED SITE	QUALIFYING FEATURES & CONSERVATION OBJECTIVES	SCREENING
	following species: long-tailed duck, common scoter, velvet scoter, common goldeneye, red-breasted merganser. Qualifies under **Article 4.2** by regularly supporting populations of European importance of the following migratory species of seabird: European shag (*Phalacrocorax aristotelis*) and northern gannet (*Morus bassanus*). Qualifies under **Article 4.2** by regularly supporting in excess of 20,000 individual seabirds during the breeding season, including nationally important populations of the following species: Atlantic puffin (*Fratercula arctica),* Black-legged kittiwake (Rissa tridactyla), Manx shearwater (*Puffinus puffinus*), Common guillemot (*Uria aalge*), Herring gull (*Largus argentatus*). Qualifies under **Article 4.2** by regularly supporting in excess of 20,000 individual seabirds during the non-breeding season including nationally important populations of the following species: Black-headed gull (*Chroicocephalus ridibundus*), Common gull (*Larus canus*), Herring gull, Common guillemot, European shag, Black-legged kittiwake, Razorbill (*Alca torda*).	unsuitable during the breeding season. As per Scoping report, **Likely Significant Effects can be ruled out**[11]**.**
St Abb's Head to Fast Castle SPA Approximately 7.4 km north of the Site	Qualifies under Article 4.2 by regularly supporting more than 20,000 seabirds, including nationally important populations of the following species: Razorbill, Common guillemot, Black-legged kittiwake, Herring gull, European shag. **Conservation Objectives:** To ensure for the qualifying species that the following are maintained in the long term: 1. Population of the species as a viable component of the site. 2. Distribution of the species within the Site. 3. Distribution and extent of habitats supporting the species. 4. Structure, function and supporting processes of habitats supporting the species	St Abb's Head to Fast Castle SPA is designated for its seabird populations, most of which are ecologically dependent upon the marine environment and would not interact with farmland habitats within and surrounding the Site. As per Scoping report, **Likely Significant Effects can be ruled out**[11]**.**

[11] As confirmed by NatureScot in their response to the scoping report (dated 9th December 2024, Ref: CDM178017).

DESIGNATED SITE	QUALIFYING FEATURES & CONSERVATION OBJECTIVES	SCREENING
	5. No significant disturbance of the species	
SACs within 5 km of the Site		
None, the closest SAC is St Abb's Head to Fast Castle SAC approximately 5.1 km southwest of the Site		

3.3 Step 1 Conclusion

3.3.1.1 A screening exercise has been carried out as part of a Shadow Habitats Regulations Appraisal for Springfield Solar Farm and BESS.

3.3.1.2 The Screening has determined that likely significant effects on pink-footed goose from the Firth of Forth Ramsar/SPA cannot be ruled out. As such, Stage 2 of the HRA process, Appropriate Assessment, is triggered to assess this further.

4 STEP 2: APPROPRIATE ASSESSMENT

4.1.1.1 Step 2 of the assessment considers whether the likely significant effects identified during Step 1 of the HRA process will have an adverse effect on the integrity of a European site(s).

4.1.1.2 The emphasis for Appropriate Assessment (AA) is to prove that no adverse effects due to a project will occur which would undermine a European site's conservation integrity. Site integrity can be defined as: "*the coherence of its structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified*"[12].

4.2 Stage 2: Appraisal of the Potential Impacts of a Plan or Project on the Qualifying Interest(s)

4.2.1 Introduction

4.2.1.1 In their response to the Scoping report, NatureScot noted that there is insufficient information on foraging distribution of pink-footed goose in the area and the presence of geese had been highlighted by the local community[13]. As such NatureScot were of the opinion there was insufficient evidence to rule out likely significant effects. This AA includes a literature review and desk study to source records of pink-footed goose sought from the area to increase the knowledgebase and address the concerns raised.

4.2.1.2 If there is potential for geese from the Firth of Forth SPA to occur at or near the Site, the following potential adverse effects will be considered:

- Displacement, due to habitat changes within the Site,
- Disturbance, during construction and operation of the Site.

4.2.2 Published Studies

4.2.2.1 NatureScot guidance[14] often refers to Mitchel (2012)[15] as a source of information on goose foraging distribution in Scotland. The paper is considered a "*tool which enables the identification of areas where impacts from proposed developments on geese may be of concern and, conversely, areas which despite being within 20 km of a goose SPA have no connectivity with the qualifying interests*"[16]. The report shows no foraging areas close to the Site. In relation to the roost at Aberlady Bay, it states: "*The feeding areas are generally to the*

[12] European Communities (2000) Managing Natura 2000 sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/CEE. EC
[13] NatureScot in their response to the scoping report (dated 9th December 2024, Ref: CDM178017).
[14] E.g. Assessing Connectivity with SPAs (2016), Recommended bird survey methods to inform impact assessment of onshore wind farms (2021).
[15] Mitchell, C. (2012) *Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland*. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge. 108pp
[16] NatureScot (2016) Assessing Connectivity with Special Protection Areas (SPAs). Available online at: https://www.nature.scot/doc/assessing-connectivity-special-protection-areas

south and east in the rolling farmland south of Gullane and usually within 10km of the estuary. The area from Spittal to Drem and Dirleton is often used, but occasionally further beyond North Berwick towards Haddington and East Linton".

4.2.2.2 NatureScot (2016)[16] guidance provides a framework for identifying connectivity with SPAs, based on a literature review that examined ranging behaviour. For pink-footed goose, the guidance gives 15-20 km as the "*Foraging range from night roost during winter season*".

4.2.2.3 Further published studies relating to pink-footed geese foraging ranges, some of which likely informed the NatureScot guidance, include:

- Newton *et al.* (1973)[17] found 66% of birds foraged within 5 km of a roost, 85% within 10 km, and 99% within 20 km;
- Bell (1988)[18] found 85% of pink-footed geese foraged within 8 km (median distance 4 km) of traditional roost sites during a study in north-east Scotland;
- Giroux and Patterson (1995)[19] found pink-footed geese predominantly within 5 km of a roost (median 4.8 km) during a radio-tracking study in north-east Scotland;
- Gill (1996)[20] identified the core feeding area to be within 10 km of a roost site during study based in Norfolk;
- Vickey *et al.* (1997)[21] found geese rarely used fields greater than 8 km from their roosts in a study in Norfolk;
- Patterson and Thorpe (2006)[22] found 75% of pink-footed geese feeding within 8.2 km, and all within 13.1 km during study in north-east Scotland;
- Mitchell (2012)[15] found both flight activity and numbers of feeding geese were highest at 4-5 and 6-7 km from the roost and both declined at greater distances from the roost at Loch of Strathbeg;
- Percival *et al.* (2020)[23] found 96% of pink-footed goose records in Norfolk were within 10 km of the coastal roosts;

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[17] Newton, I., & Campbell, C. R. G. (1973). *Feeding of Geese on Farmland in East-Central Scotland.* Journal of Applied Ecology, 10(3), 781–801.
[18] Bell, M. V. (1988) *Feeding behaviour of wintering Pink-footed and Greylag Geese in north-east Scotland*. Wildfowl 39:43-53.
[19] Giroux, J.-F., and I. J. Patterson. (1995) *Daily movements and habitat use by radio-tagged Pink-footed Geese wintering in northeast Scotland.* Wildfowl 46:31-44.
[20] Gill, J. A. (1996) *Habitat choice in pink-footed geese: quantifying the constraints determining winter site use*. Journal of Applied Ecology 33:884-892
[21] Vickery, J. A. et al. (1997) *Managing coastal grazing marshes for breeding waders and over wintering geese: Is there a conflict?* Biological Conservation 79(1): 23–34.
[22] Patterson, I. J., and A. Thorpe. (2006) Monitoring of Goose Use of the Refuges in the Loch of Strathbeg Goose Management Scheme 2006. Report to Scottish Natural Heritage.
[23] Percival, S.M., et al. (2020). Jack's Lane Wind Farm and Goose Refuge: PinkFooted Goose Post-Construction Monitoring 2019-20 (Year 5). Ecology Consulting report to Jack's Lane Wind Farm Ltd.

- Wood *et al.* (2020)[24] carried out a GPS-tracking study in the UK and found 62 % of the pink-footed goose records were within 5 km of the roost, 84 % within 10 km, and 93 % within 15 km; and

- Stone (2020)[25] carried out GPS tracking in Norfolk and found pink-footed goose foraging a mean range of 6-10 km from a roost site.

4.2.2.4 A study by Cranswick (1992)[26] was conducted in southeast Scotland, focusing on four roosts including Aberlady Bay. The study found the primary foraging area was farmland between Aberlady and Tyninghame, south of North Berwick.

4.2.2.5 Mitchell & Hearn (2004)[27] list several alternative roosts that are closer to the Site, although use is assumed to be opportunistic, seasonal and limited to relatively small numbers: "*In the middle of the Lammermuir Hills, Hopes Reservoir (NT5462) is rarely visited by Pink-footed Geese (max 100 in November 1994). Further east, Whiteadder Reservoir (NT6563) also holds few Pink-footed Geese (max 250 in October 1995).*"

4.2.2.6 The Birds of South-East Scotland 2027-2013[28] shows presence of pink-footed goose is very strongly correlated with roost sites, with greatest numbers in the north of Lothian in the vicinity of the Firth of Forth SPA. There are no records from the tetrad containing the Site and comparatively few records in the vicinity.

4.2.2.7 The following report may contain relevant information but could not be sourced during the literature review: Brown, A. & Brown. L. (2009) *Pink-footed Goose (Anser brachyrhynchus) feeding distribution in relation to Goose roosting sites in the Lothians*. Report to Scottish Natural Heritage, 23pp.

4.2.3 Desk-Study Records

4.2.3.1 The primary night roost in the south of the Firth of Forth SPA / Ramsar is located at Aberlady Bay, approximately 28 km from the Site[29].

4.2.3.2 To help build a picture of pink-footed goose occurrence in the area, records have been sought from publicly available sources online, and requested from local and national organisations, including:

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[24] Wood, K.A., Mitchell, C., Griffin, L. & Hilton, G.M. (2020). Predicting cumulative wind turbine and power line collision mortality for Pink-footed Geese using an individual-based model. Wildfowl & Wetlands Trust Report, Slimbridge. 179pp.
[25] Stone, M. J. M. (2020). An evaluation of the temporal changes, distribution and abundance of the UK overwintering population of pink-footed geese and an assessment of the North Norfolk population wintering foraging ranges. MSc. Thesis, University of Hull.
[26] Cranswick, P. A. (1992) Distribution of Pink-footed and Greylag Geese in South-east Scotland, especially in relation to disturbance. Report to Nature Conservancy for Scotland.
[27] Mitchell, CR & RD Hearn (2004) *Pink-footed Goose Anser brachyrhynchus (Greenland/Iceland population) in Britain 1960/61–1999/2000*. Waterbird Review Series, The Wildfowl & Wetlands Trust/Joint Nature Conservation Committee, Slimbridge.
[28] Murray, et al (2019) Birds in South-East Scotland 2007-13. A Tetrad Atlas of the Birds of Lothian and Borders. Scottish Ornithologists Club
[29] Various sources, including the Firth of Forth SSSI citation and Mitchell (2012).

- Royal Society for the Protection of Birds (RSPB),
- British Trust for Ornithology (BTO,
- Lothian Bird Club,
- The Wildlife Information Centre (TWIC)
- Online sources, such as eBird and National Biodiversity Network (NBN).
- Nearby planning applications.

4.2.3.3 The RSPB does not hold any records of pink-footed goose within 10 km of the Site.

4.2.3.4 The BTO returned 831 records of pink-footed goose within 10 km of the Site in the last 10 years. The number of records peak in October (228 records), with smaller numbers in January (127 record) and September (105 records). The majority of records are from coastal fields, with a small proportion (18 records, 2.2 %) inland of the A1. The nearest record is from NT7570, at least 300 m east of the Site.

4.2.3.5 Lothian Bird Club returned 654 records of pink-footed goose within 10 km of the Site in the last 10 years. These are predominantly in the coastal fields or close to the A1. The closest record to the Site is within the tetrad NT77L which, at its closest point, is approximately 640 m northeast of the Site.

4.2.3.6 The BTO organises an Icelandic-breeding Goose Census (IGC) project as part of their Goose & Swan Monitoring Programme. The IGC includes counts at roost and potential roost sites such as at Whitesands Quarry, 3 km southwest of the Firth of Forth SPA and 6.3 km northeast of the Site. Whitesands Quarry was flooded around 2008 and restoration began in 2013 as a partnership between the RSPB and Tarmac[30]. Dusk goose counts have been conducted since 2018 showing the quarry has become a regular roost. Records from Whitesands Quarry were provided by both BTO and Lothian Bird Club, likely with some duplication of records across organisations. A peak count of 3,250 birds has been recorded (dusk count in November 2020), with notable counts in other recent years including 2,000 (dawn count in October 2023) and 1,260 (dawn count in November 2024). One diurnal count noted birds flying off to the southeast.

4.2.3.7 TWIC returned 21 records from at least four locations between 2015 and 2019. The number of birds observed or behaviour (i.e. foraging, flying over) was not included in any of the records. The closest record to the Site is likely from NT77R, near Dunglass, between approximately 0.3 and 3.1 km east from the Site; however, the precision of the records (to Tetrad level) makes it difficult to be sure on the exact location of the observations. The months with most records were passage (September & October; seven records) and January (also seven records).

4.2.3.8 eBird[31] is a community science project where people record birds they have observed. There are 75 records within 5 km of the Site since 2020, the majority of which are in the coastal

[30] https://afterminerals.com/case-study/whitesands-quarry/
[31] Available online at: https://ebird.org/home

strip east of the A1[32]. Of the records, 51 (68 %) are within the main passage periods (September to November, and March to April). Most records are <400 birds and several of those greater were noted as overflying the area.

4.2.3.9 NBN does have several records of pink-footed goose in the area, but many are provided by the BTO and it is assumed there is duplication with records sourced directly from the organisation.

4.2.3.10 The Global Biodiversity Information Facility (GBIF) has 50 records within approximately 5 km of the Site since 2020. Of these, all are located close to the coast and 36 (72%) are during main passage periods.

4.2.3.11 The desk study records show that pink-footed does occur in the area but there is a bias towards records in fields closer to the coast and during the main passage periods. Most records did not detail behaviour (e.g. foraging or flying over). There is one regular roost significantly closer to the Site than roosts associated with the Firth of Forth SPA.

4.2.4 Nearby Planning Applications

4.2.4.1 Nearby planning applications have been reviewed for records of geese.

4.2.4.2 The Eastern Green Link 1 begins at Torness, approximately 2.4 km north of the Site, screened out the Firth of Forth SPA in the HRA due to infrequent observations of low numbers noted during surveys. A peak count of 117 pink-footed goose were recorded and the HRA states: "*No regular aggregations of pink-footed geese were identified foraging within or adjacent to the proposed development*".

4.2.4.3 Branxton BESS (Ref: ECU00004659) is a consented Development, with the main BESS located approximately 0.5 km north of the Site. It is not known if any surveys were completed as no details were found on the ECU website; however, the HRA notes that the site is not known to be a foraging area for pink-footed goose and the proposal will not adversely affect the integrity of the Firth of Forth SPA.

4.2.4.4 Other applications reviewed either do not contain any relevant information (i.e. the early stages of an application) or are sufficiently far from the Site and/or have sufficiently different habitats that the information is not applicable to this assessment.

4.2.5 Anecdotal Evidence

4.2.5.1 A response to the public consultation raised concerns about effects of the Proposed Development on pink-footed goose, but the species is listed among other ecology features and no further details are provided on occurrence in the area.

[32] This likely reflects a bias in where people go birdwatching; however, a search for a common and ubiquitous species in the area – carrion crow, *Corvus corone* – did include some records inland close to the Site and did not have such a strong bias to passage periods.

4.2.5.2 The tenant farmer at the Site confirmed geese are occasionally present on his land. Flocks of up to approximately 200 occur but presence is irregular.

4.2.6 Summary of Information Gathered

4.2.6.1 The literature review includes studies conducted over a long timeframe and shows that a large proportion of geese forage within 10 km of their winter night roost. This was consistent both over time and between different geographic areas. Gill (1996)[20] suggested that it is likely that at some point the costs of travelling to fields far from the roost will outweigh the benefits of staying at or close to that roost, even if foraging resources nearby are lower quality. The consistency of results in studies since may support this.

4.2.6.2 At approximately 28 km from the nearest pink-footed goose roost in the Firth of Forth SPA, the Site is substantially further than typical foraging distances for this species, as demonstrated by numerous studies carried out over more than 50 years. It is very unlikely that birds would routinely commute over such distances.

4.2.6.3 The Site contains apparently suitable foraging habitat for pink-footed goose.

4.2.6.4 Desk study records do suggest that pink-footed goose occur in the area but the nature of the data sources (i.e. mostly public reports) means records are biased toward areas and sites where people go, which do not include the Site itself.

4.2.6.5 A regular pink-footed goose roost is present at Whitesands Quarry, approximately 6.3 km northwest of the Site, with numerous reports from the area and counts of several thousand birds at dawn and dusk in recent years, Whitesands quarry is outside the boundary of the Firth of Forth SPA and the distance to the Site and surrounds is well within the typical foraging range of pink-footed goose. Whitesands Quarry is therefore considered the source of the birds present in the vicinity of the Site.

4.2.7 In-combination Assessment

4.2.7.1 Consideration is given to the effects in combination with other projects and whether they were likely to be significant.

4.2.7.2 For the purpose of this assessment, the following types of projects were considered as part of the in-combination assessment:

- projects under construction;
- permitted application(s) not yet developed;
- submitted application(s) not yet decided;
- refused projects subject to appeal, but not yet decided; and
- projects identified in the development plans (and emerging development plans).

4.2.7.3 A list of plans and projects within 5 km of the Site considered for the in-combination assessment is provided in the EIAR, **Chapter 4**.

4.2.7.4 For projects where details of the baseline and/or assessment are available, all are relatively small scale, and none identified any high numbers or regular occurrence of pink-footed goose.

4.3 Stage 5: Determine Whether the Project will not Adversely Affect the Integrity of a European Site

4.3.1.1 Further information about pink-footed goose presence in the area has been gathered and presented within an AA for Springfield Solar Farm and BESS.

4.3.1.2 Pink-footed goose occur in the wider area (as evidenced through desk study records) and it is assumed that they may occur within the Site. Based on nearby records, presence within the Site is likely to be opportunistic (when habitats are suitable) and involve relatively small numbers.

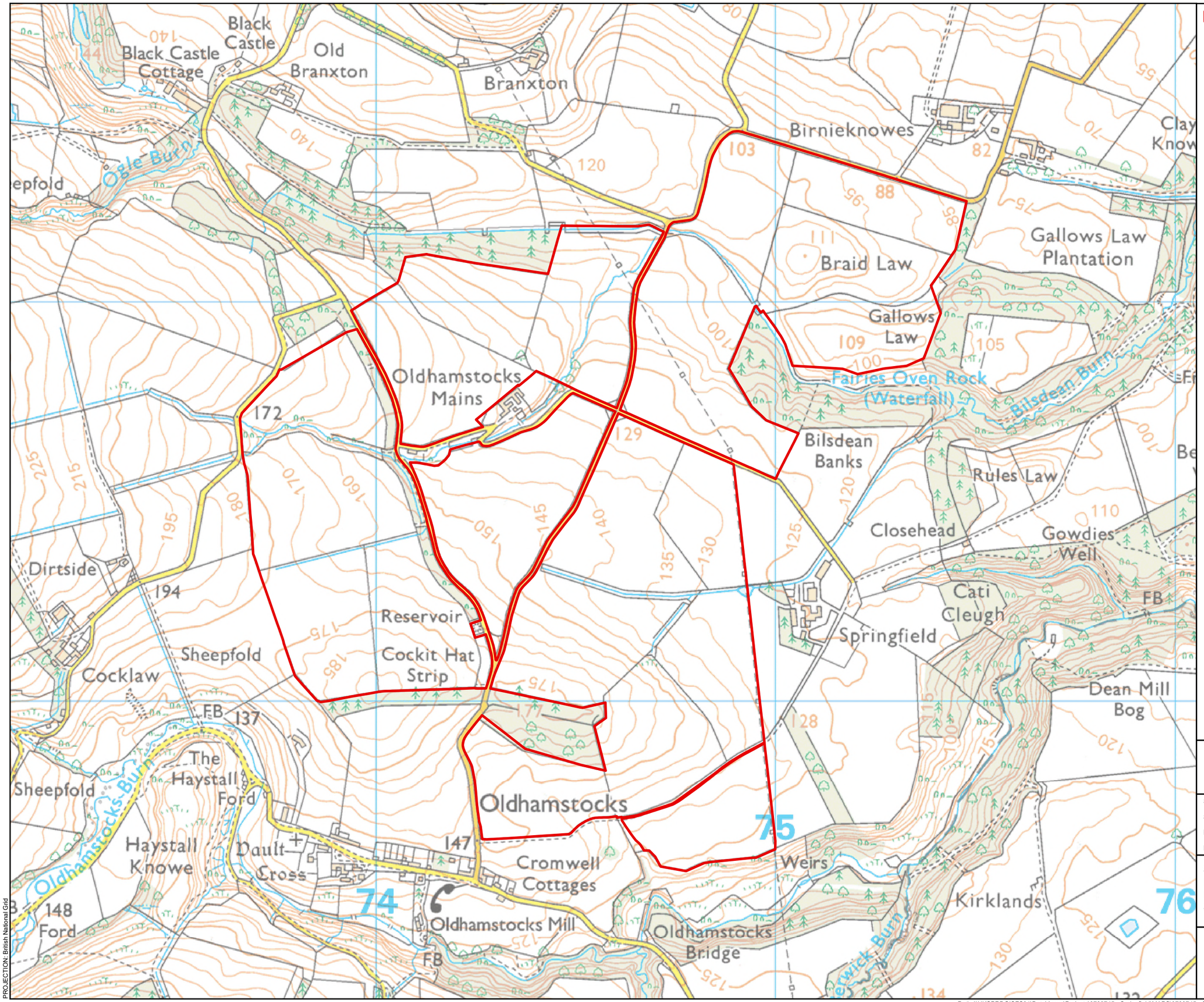
4.3.1.3 Based on the literature review, the Site is notably further from any roost location associated with the Firth of Forth SPA than is typical for birds to commute regularly.

4.3.1.4 Based on the current understanding of pink-footed goose foraging ecology, which has remained consistent in studies carried out over many decades, birds that occur in or near the Site are considered to originate from roost at Whitesands Quarry, and/or relate to migrant birds passing through the area. Therefore, the birds are not part of the Firth of Forth SPA (or Ramsar) population as the distance is too great for them to commute from SPA roost/s on a regular basis.

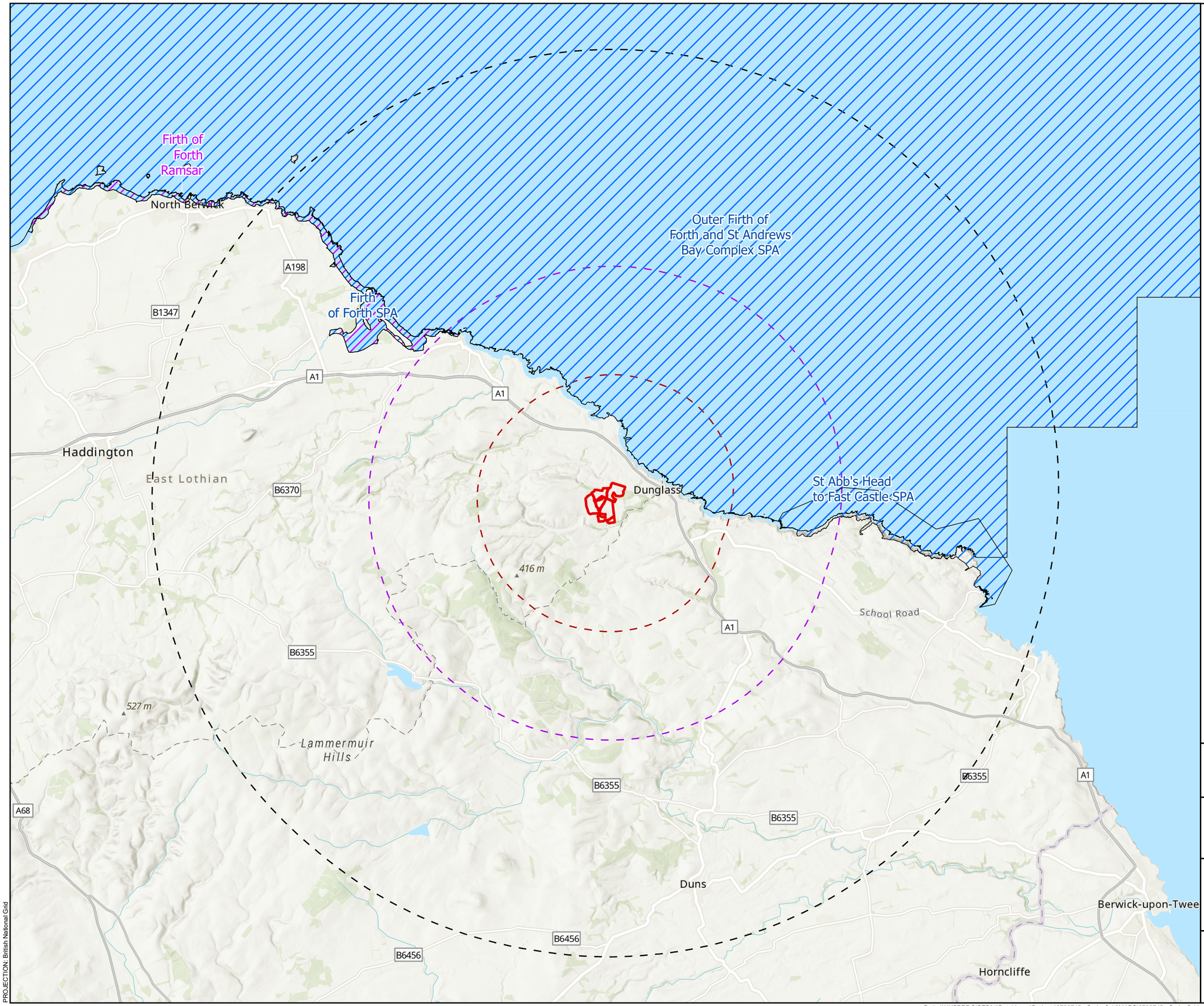
4.3.1.5 Based on the best available information, adverse effects on pink footed goose from the Firth of Forth SPA can be ruled out, both alone and in-combination with other Developments.

4.3.1.6 Further Steps of the HRA process are therefore not required.

APPENDIX A FIGURES



Path: \\UKSPRDGISFS01\Data\Arcus\Projects\0733745 - Springfield\MAPS\0733745 - Springfield - EIA Figures.aprx\0733745 - Springfield - Figure 8.6.1 - Site Boundary - A01



Site Boundary
5 km Buffer
10 km Buffer
20 km Buffer
Ramsar Site
Special Protection Area

0 1 2 3 4 5
Kilometres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A3	DRAWN: RW
PROJECT: 0733745	CHECKED: MS
DATE: 30/05/2025	APPROVED: MW

Springfield Solar Farm and BESS
EIA Report
Figure 8.6.2
Designated Sites Screened

ERM voltalia

PROJECTION: British National Grid

Path: \\UKSPRDGISFS01\Data\Arcus\Projects\0733745 - Springfield\MAPS\0733745 - Springfield - EIA Figures.aprx\0733745 - Springfield - Figure 8.6.2 - Designated Sites Screened - A01