Offshore Wind Power Limited

West of Orkney Windfarm Onshore EIA Report

Volume 1, Chapter 13 - Terrestrial Archaeology and Cultural Heritage

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West of Orkney Windfarm

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13 TERRESTRIAL ARCHAEOLOGY AND CULTURAL HERITAGE

Chapter summary

This chapter of the Onshore Environmental Impact Assessment (EIA) Report assesses the potential effects from the onshore Project on terrestrial archaeology and cultural heritage assets. This includes direct, indirect, whole project assessment, cumulative, inter-related effects, inter-relationships and transboundary effects.

The desk-based study and associated walkover survey of the onshore Project area identified archaeological remains from the Neolithic, Bronze Age, Iron Age, early medieval, post-medieval and modern periods, including scheduled monuments; and historic buildings from the post-medieval and modern periods, including listed buildings. An archaeological watching brief was maintained on site investigation works, which identified three areas of peat deposits which were of archaeological potential, however no archaeological remains were recorded.

The following impacts were identified as requiring assessment:

Construction and decommissioning:

- Loss of or damage to known historic environment assets;
- Loss of or damage to unknown historic environment assets;
- Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest; and
- Temporary impacts on the setting of onshore historic environment assets that temporarily reduces their value.

Operation and maintenance:

- Loss of or damage to known historic environment assets;
- Loss of or damage to unknown historic environment assets;
- Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest; and
- Long-term impacts on the setting of onshore historic environment assets that reduces their value.

The assessment has taken account of embedded mitigation measures for the assessment of potential effects. This includes a Project commitment to avoid designated assets and non-designated assets of medium and high value that could be of schedulable quality.

Potential impacts on known historic environment assets, including a medium value Bronze Age hut circle and an asset of uncertain value has been identified. Secondary mitigation in the form of a phased programme of archaeological evaluation and mitigation through excavation and recording are recommended, if required. Six potential non-significant direct impacts on the remains of post-medieval farm buildings are also identified, and a programme of historic building recording as secondary mitigation has been recommended, if required.

A three-stage process following Historic Environment Scotland (HES) guidance has been undertaken to assess the potential effect of the onshore substation on the setting of historic environment assets that were identified in consultation with HES and The Highland Council (THC). The assets identified comprised two Neolithic cairns and a Bronze Age hut circle that are designated as scheduled monuments. Embedded mitigation involving bund construction with associated planting has been developed in consultation with HES and THC, and with this included, no significant impacts relating to long-term changes to the setting of these onshore historic environment assets that reduces their value have been identified.

An assessment of cumulative effects found the combined effect to be not significant in EIA terms for each impact assessed. The potential for inter-related effects between the onshore Project stages have been considered and effects have been identified as not significant. In addition, there is no potential for transboundary impacts upon terrestrial archaeology and cultural heritage assets of the onshore Project.

13.1 Introduction

This chapter of the Onshore Environmental Impact Assessment (EIA) Report presents the terrestrial archaeology and cultural heritage assets of relevance to the onshore Project and assesses the potential impacts from the construction, operation and maintenance and decommissioning of the onshore Project on these assets. Where required, mitigation is proposed, and the residual impacts and their significance are assessed. Potential cumulative and transboundary impacts are also considered.

Table 13-1 below provides a list of all the supporting studies which relate to and should be read in conjunction with the terrestrial archaeology and cultural heritage impact assessment. All supporting studies are appended to this Onshore EIA Report and issued on the accompanying Universal Serial Bus (USB).

Table 13-1 Supporting studies

DETAILS OF STUDY	LOCATIONS OF SUPPORTING STUDY
Archaeological and Cultural Heritage Gazetteer of Sites	Onshore EIA Report, Supporting study (SS) 11: Terrestrial archaeology and cultural heritage gazetteer of sites.
Landscape and Visual Impact Assessment (LVIA) - Viewpoint assessment	Onshore EIA Report, SS16: Landscape and Visual Impact Assessment (LVIA) – Viewpoint assessment.
Terrestrial archaeology onshore setting supporting visualisations (Viewpoints Visualisations including baseline photographs, wirelines and photomontages in accordance with NatureScot and The Highland Council (THC) standards: LVIA: Figures 17.VP7 - 17.VP8)	Onshore EIA Report, SS19: Terrestrial archaeology onshore setting supporting visualisations.

The impact assessment presented herein draws upon information presented within other impact assessments within this Onshore EIA Report. Equally, the terrestrial archaeology and cultural heritage impact assessment also informs other impact assessments. This interaction between the impacts assessed within different topic-specific chapters on an asset is defined as an 'inter-relationship'. The chapters and impacts related to the assessment of potential effects on terrestrial archaeology and cultural heritage are provided in Table 13-2.

Table 13-2 Terrestrial archaeology and cultural heritage inter-relationships

CHAPTER	IMPACT	DESCRIPTION
Geology and hydrology (chapter 8: Onshore EIA Report)	Identifies solid and drift geology and identifies areas of peat which assists in identification of areas of archaeological potential.	The presence of peat can be indicative of increased archaeological potential for preserved organic remains.

CHAPTER	IMPACT	DESCRIPTION
Landscape and visual impacts (chapter 17: Onshore EIA Report)	Impacts of the onshore Project on a range of visual receptors, including the historic environment.	Visual impacts could affect the setting of historic environment assets.

The following specialists have contributed to the assessment:

- Orkney Research Centre for Archaeology (ORCA): undertook the site walkover, desk-based assessment and the terrestrial archaeology and cultural heritage impact assessment and chapter write up. They also undertook a watching brief during onshore site investigations which have contributed to an understanding of the archaeology in the onshore Project area; and
- WSP: prepared the photomontage for the setting impact assessment.

13.2 Legislation, policy and guidance

Over and above the legislation presented in chapter 3: Planning policy and legislative context, the following legislation, policy and guidance are relevant to the assessment from the onshore Project on terrestrial archaeology and cultural heritage:

- Legislation:
  - The European Convention on the Protection of the Archaeological Heritage (revised) (adopted on 16 January 1992), known as the Valletta Convention, contains provisions for the protection of archaeological heritage, preferably in situ, but with provisions for appropriate recording and recovery if disturbance is unavoidable;
  - The European Landscape Convention (ratified by the United Kingdom (UK) government in 2016), promotes the protection, management and planning of landscapes, including the historical and cultural aspects of landscapes;
  - The primary piece of UK legislation concerning archaeology is the Ancient Monuments and Archaeological Areas Act (1979), concerning sites or areas that warrant statutory protection due to being of national importance by reason of the historic, architectural, traditional, artistic or archaeological interest attached to it, and are Scheduled under the provisions of the Act. The Act is administered in Scotland by Historic Environment Scotland (HES); and
  - The Town and Country Planning (Scotland) Act (1997) and amendments, Planning (Listed Buildings and Conservation Areas (Scotland) Act 1997 and amendments, and The Planning etc (Scotland) Act 2006 and the Planning (Scotland) 2019 Act are the primary legislation which govern onshore development planning and development management in Scotland in relation to the historic environment. Planning Authorities, prior to granting planning permission, consult with HES as a statutory consultee on any development proposals that may affect the site or setting of a Scheduled Monument, a Category A Listed Building, an Inventoried Garden or Designed Landscape, or an Inventoried Historic Battlefield. This means that the presence of such sites within the area of a proposed development and the protection of its setting are material considerations in the planning process.

- Policy:
  - The Historic Environment Policy Statement for Scotland (HEPS) (HES, 2019a) includes policies that decisions affecting any part of the historic environment require understanding of its significance, its wider context and setting, and consideration of avoiding or reducing detrimental impacts;
  - National Planning Framework 4 (NPF4) (Scottish Government, 2023) (which replaces NPF3 and the Scottish Planning Policy (SPP)), Policy 7: Historic assets and places, is intended to protect and enhance historic environment assets and places, and to enable positive change as a catalyst for the regeneration of places, including the following which are relevant to the onshore Project:
    - Development proposals with a potentially significant impact on historic assets of places will be accompanied by an assessment which is based on an understanding of the cultural significance of the historic asset and/or place. The assessment should identify the likely visual or physical impact of any proposals for change, including cumulative effects and provide a sound basis for managing the impacts of change. Proposals should also be informed by national policy and guidance on managing change in the historic environment, and information held within Historic Environment Records (Policy 7 (a));
    - Development proposals for the demolition of listed buildings will not be supported unless it has been demonstrated that there are exceptional circumstances and that all reasonable efforts have been made to retain, reuse and/or adapt the listed building (Policy 7 (b));
    - Development proposals affecting the setting of a listed building should preserve its character, and its special or architectural interest (Policy 7 (c));
    - Development proposals affecting scheduled monuments will only be supported where: (i) direct impacts on the scheduled monument are avoided; (ii) significant adverse impacts on the integrity of the setting of a scheduled monument area avoided; or (iii) exceptional circumstances have been demonstrated to justify the impact on a scheduled monument and its setting and impacts on the monument or its setting have been minimised (Policy 7 (h));
    - Development proposals at the coast edge or that extend offshore will only be supported where proposals do not significantly hinder the preservation objectives of Historic Marine Protected Areas (Policy 7 (k)); and
    - Non-designated historic environment assets, places and their setting should be protected and preserved in situ wherever feasible. Where there is potential for non-designated buried archaeological remains to exist below a site, developers will provide an evaluation of the archaeological resource at an early stage so that Planning Authorities can assess impacts. Historic buildings may also have archaeological significance which is not understood and may require assessment. Where impacts cannot be avoided, they should be minimised. Where it has been demonstrated that avoidance or retention is not possible, excavation, recording, analysis, archiving, publication and activities to provide public benefit may be required through the use of conditions or legal/planning obligations. When new archaeological discoveries are made during the course of development works, they must be reported to the Planning Authority to enable agreement on appropriate inspection, recording and mitigation measures (policy 7 (o)).
  - The Highland-wide Local Development Plan (HwLDP) (The Highland Council (THC), 2012a) Policy 57 Natural, Built and Cultural Heritage states that:
    - All development proposals will be assessed taking into account the level of importance and type of heritage features, the form and scale of the development, and any impact on the feature and its setting. The following criteria apply:
    - For features of local/regional importance we will allow developments if it can be satisfactorily demonstrated that they will not have an unacceptable impact on the heritage resource;

    - For features of national importance, we will allow developments than be shown not to compromise the heritage resource. Where there may be significant adverse effects, these must be clearly outweighed by social or economic benefits of national importance. It must also be shown that the development will support communities in fragile areas who are having difficulties in keeping their population and services; and
    - For features of international importance developments likely to have a significant effect on a site, either alone or in combination with other plans or projects, and which are not directly connected with or necessary to the management of the site for nature conservation will be subject to an appropriate assessment. Where we are unable to ascertain that a proposal will not adversely affect the integrity of a site, we will only allow development if there is no alternative solution and there are imperative reasons of overriding public interest, including those of a social or economic nature.
  - The Caithness and Sutherland Local Development Plan (CaSPlan) (THC, 2018), Section 2 Strategy and Policies section states that:
    - Safeguarding and promoting appreciation of valued historic environment assets, by taking account of key historic features in choosing sites to allocate for development and in setting developer requirements included in this Plan and promoting tourism with a historic environment focus.
  - The Highland Historic Environment Strategy Supplementary Planning Guidance (THC, 2013) contains strategic aims relating to the protection of historic environment assets while accommodating change and development where possible and appropriate, similar to SPP 2020, those pertinent to the onshore Project are:
    - Strategic Aim 6: that listed buildings within Highland are protected from harmful developments, including extension and alteration, which may affect their special architectural and historic interest or their setting and that there is a presumption against the demolition of listed buildings;
    - Strategic Aim 13: that scheduled monuments, and their setting, within Highland are protected from harmful developments which may affect their national importance;
    - Strategic Aim 16: to ensure that the importance of non-designated archaeological sites and landscapes and their settings are understood and wherever possible are protected from harmful developments;
    - Strategic Aim 17: to ensure that no asset or its setting is lost or altered without adequate consideration of its significance and of the means available to preserve, record and interpret it in line with national and local policy and Highland Council's Standards for Archaeological Work;
    - Strategic Aim 30: to ensure that new development is sensitive to the historic environment and responds to and reflects the established qualities of the surroundings;
    - Strategic Aim 33: to ensure that proposed new developments have due regard to the archaeological, historical and cultural significance of all aspects of the local environment; and
    - Strategic Aim 34: to ensure that through the development management process appropriate measures of intervention are taken to protect the historic environment from harmful changes and inappropriate developments.
- Guidance:
  - HES Designation Policy and Selection Guidance (HES, 2019b) stands alongside HEPS (HES, 2019a) and outlines the principles and criteria that underpin the designation of historic buildings, sites and places;
  - HES Managing Change in the Historic Environment Guidance Series: Setting (HES, 2020), states that setting can be important to the way in which historic structures or places are understood, appreciated and experienced. It can often be integral to a historic asset's cultural significance. The setting of historic assets or places should be taken into account when considering environmental assessments/statements, and when making decisions on applications;

- HES and Scottish Natural Heritage's (SNH) (now NatureScot) Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland, 2018, v5 (HES and SNH, 2018);
- The Chartered Institute for Archaeologists (CIfA) Codes, Standards and Guidelines (CIfA, 2023); and
- THC's Standards for Archaeological Work (THC, 2012b).

13.3 Scoping and consultation

Stakeholder consultation has been ongoing throughout the EIA and has played an important part in ensuring the scope of the baseline characterisation and impact assessment are appropriate with respect to the onshore Project and the requirements of the regulators and their advisors.

The Scoping Report was submitted to Scottish Ministers (via Marine Scotland - Licensing Operations Team (MS-LOT[1])) and THC on 1st March 2022, who then circulated the report to relevant consultees[2]. A Scoping Opinion was received from THC on 9th May 2022. Relevant comments from the Scoping Opinion specific to terrestrial archaeology and cultural heritage are provided in Table 13-4 below, which provides a response on how these comments have been addressed within the Onshore EIA Report. The Scoping Opinion supersedes any pre-application advice provided by THC which was received on the 10th February 2021.

Further consultation has been undertaken throughout the pre-application stage. Table 13-3 summarises the consultation activities carried out relevant to terrestrial archaeology and cultural heritage.

Table 13-3 Consultation activities for terrestrial archaeology and cultural heritage

CONSULTEE AND TYPE OF CONSULTATION	DATE	SUMMARY
THC, OIC, University of the Highlands and Islands (UHI) and HES - meeting	19th July 2022	The main aim of the meeting was to agree the baseline characterisation, extent of the study area, assets to include in the assessment and scope and methodology.
HES and THC Historic Environment Team (THC HET) - meeting	23rd January 2023	The main objectives of the meeting was to provide HES and THC HET with an update on the project and the data which had been gathered to date in 2022 with feedback requested from the consultees. The key points noted from the meeting included:

[1] MS-LOT have since been renamed Marine Directorate - Licensing Operations Team (MD-LOT).

[2] The Scoping Report was also submitted to Orkney Islands Council (OIC), as the scoping exercise included consideration of power export to the Flotta Hydrogen Hub, however, this scope is not covered in this Onshore EIA Report and will be subject to a separate Planning Application to OIC.

CONSULTEE AND TYPE OF CONSULTATION	DATE	SUMMARY
		• HES: noted they would prefer avoidance of any direct impacts on historic environment assets and would require specific details of the onshore substation layout and structures; • HES: concerned that there are a number of Scheduled Monument cairns and the St Magnus Hospital & chapel are close to the onshore substation which will flag impacts on the setting of these assets; • HES: requested viewpoints from scheduled monuments looking towards the substation location and looking towards sites with the substation in view; and • THC HET: noted that only one viewpoint would be required at the cluster of Scheduled Monuments at Achanarras and not each one.
HES and THC HET - email	22nd May 2023	Prior to the consultation meeting scheduled for the 30th May 2023, an information package containing photomontages relating to views from affected scheduled monuments looking towards the proposed substation; and layout and mitigation planting and bunding plans were circulated to HES and THC HET.
HES and THC HET - meeting	30th May 2023	The main objectives of the meeting was to provide HES and THC HET with an update on the survey work and assessment which has been undertaken and more detail around the onshore substation layout, including bunding and planting strategy. The key outcomes of the meeting included: • HES: requested a ZTV based on the worst case scenario height for a Gas Insulated Substation (GIS); • HES: requested wirelines for GIS and Air Insulated Substation (AIS) designs relating to the scheduled monuments subject to setting assessment impact; • HES and THC HET: agreed with the conclusions of the setting impact assessment that impacts would unlikely be significant; and • HES: noted that the presence of existing plantations that currently screen assets (such as The Shean) from the proposed substation could be felled and therefore might not be considered to be screening.
HES - email	13th June 2023	HES confirmed that they were content with the proposed planting mitigation associated with the onshore substation near the scheduled hut circle (ORCA 90). HES confirmed that impacts on the setting of the scheduled monuments ORCA 89, 90 and 251 would not raise any issues of national interest based on the information provided.

Table 13-4 Comments from the Scoping Opinion relevant to terrestrial archaeology and cultural heritage

CONSULTEE	COMMENT	RESPONSE
THC	The EIAR needs to identify all designated sites which may be affected by the development either directly or indirectly. This will require you to identify: • The architectural heritage (Conservation Areas, Listed Buildings); • The archaeological heritage (Scheduled Monuments, Historic Battlefields); • The landscape (including designations such as National Scenic Areas, Special Landscape Areas, Gardens and Designed Landscapes, and general setting of the development; and • The inter-relationship between the above factors.	All designated sites that may be affected by the onshore Project either directly or indirectly have been identified and include; architectural heritage, archaeological heritage, landscape designations and the inter-relationships between these factors. The assessment of potential effects for the onshore Project is provided in section 13.6.
THC	We would expect any assessment to contain a full appreciation of the setting of these historic environment assets and the likely impact on their settings. It would be helpful if, where the assessment finds that significant impacts are likely, appropriate visualisations such as photomontage and wireframe views of the development in relation to the sites and their settings could be provided. Visualisations illustrating views both from the asset towards the proposed development and views towards the asset with the development in the background would be helpful.	Viewpoints 7 and 8 illustrate views from the setting of Scheduled Monuments in the vicinity of the onshore substation area and visualisations have been prepared to illustrate the nature of changes to the setting and views from the Scheduled Monuments (Figure VP7a to k and Figure VP8a to k (see SS19: Terrestrial archaeology onshore setting supporting visualisations. The finalised viewpoints have allowed the assets to be viewed in the mid-ground with views to the proposed development in the background, and views from the assets towards the proposed development. This approach was discussed and agreed with HES and THC, subsequent to receiving their Scoping Opinion where the requirements for viewpoints and setting assessment were discussed and refined, with the 3D model being used to support the locations of the finalised viewpoints. The assessment presented within this chapter considers a full appreciation of the setting of these historic environment assets and the assessment of potential effects are detailed in section 13.6.

CONSULTEE	COMMENT	RESPONSE
THC	Historic Environment Scotland have responded to the consultation and agree with the proposed methodology and scope of assessment for heritage assets in their remit and the sites included in the assessment. It has highlighted a range of concerns which require further consideration and in particular it has set out that the need for avoidance of impacts is critical. It has also highlighted that only the 2020 setting guidance should be used.	An assessment of potential impacts has been undertaken and provided in section 13.6. The 2020 setting guidance has been used and is referenced in the assessment. Specific detailed responses to HES comments are outlined below.
THC	There are a large number of heritage assets in the vicinity of the development, these need to be assessed. Our Historic Environment Team (THC HET) should be consulted further on the impact on heritage assets outwith the remit of Historic Environment Scotland.	The heritage assets in the onshore archaeology study area have been assessed and THC HET has been consulted throughout the pre-application process.
HES	The consultation response addresses the scope of the assessment as it relates to the proposed onshore works in Caithness. That is the proposed landfall connection locations on the north coast of Caithness at Melvich, Dounreay, Cling Glang and Crosskirk, the underground cable routes and the proposed substation at Spittal. In general, we welcome the proposed scope of the assessment which has been set out in detail in the Scoping Report. However, we do have some comments to make on aspects of the report as set out below.	There has been a refinement of landfall points since the Scoping Report, and the revised onshore Project area is provided in Figure 13-1. Melvich and Dounreay are no longer under consideration as landfall points.
HES	There are several options for the landfall point: Melvich Bay, followed by a corridor heading east towards the Reay area; Dounreay, with a corridor heading inland to join with the one from Melvich and then this corridor runs to the Knockglass area; Cling Glang, a geo on the coast north-east of Dounreay with a corridor running inland; and Crosskirk Bay, sharing the Cling Glang corridor as it heads inland to Knockglass. From Knockglass, the corridor heads directly for the Halkirk area then on towards Spittal.	There has been a refinement of landfall points since the Scoping Report, and the revised onshore Project area is provided in Figure 13-1. Melvich and Dounreay are no longer under consideration as landfall points, and Knockglass now lies outside the onshore Project area.
HES	The summary table at 3-42 succinctly sets out the likely issues. We agree that avoidance of direct physical impacts on scheduled monuments must be key, alongside minimisation of impacts on their settings, the latter especially being the case for the proposed substation at Spittal. This includes the impact of any screening works (for instance planting or bunding) to minimise the	Avoidance of direct impacts on scheduled monuments is outlined in section 13.5.4. The onshore Project has committed to avoidance of designated and

CONSULTEE	COMMENT	RESPONSE
	visual impact of the substation within the landscape that might have an impact on the setting of various monuments.	certain medium and high value non-designated assets, as detailed in section 13.5.4. In order to reduce the visual impact of the substation within the landscape, bunding and planting has been proposed as embedded (designed in) mitigation. This has been discussed and agreed in consultation with THC HET and HES (see Table 13-3). Further details are also provided in chapter 17: Landscape and visual.
HES	For our scheduled monument interests, there are some distinct clusters of scheduled monuments within these route corridors, such as inland at Reay, in the Knockglass area, and at the southern end of the Spittal substation search area, and these areas will inevitably be sensitive to change. However, given the breadth of the search corridor, we consider that there should be adequate scope for avoidance of all scheduled monuments to be possible.	Avoidance of direct impacts on scheduled monuments is outlined in section 13.5.4. The onshore Project has committed to avoidance of designated and certain medium and high value non-designated assets, as detailed in section 13.5.4. Reay and Knockglass are now outwith the onshore Project area and have therefore not been assessed further. For the scheduled monuments in the Spittal area (close proximity to the onshore substation), these will not be directly (physically) impacted by the onshore Project, and the setting impact assessment relating to them is set out in section 13.6.2.4.
HES	There are also three category A listed buildings that fall within the search area: Sandside House (LB14986), Bighouse Garden Pavilion (LB7160) and Reay Church (LB14992), as mentioned in the report.	Due to project refinement since scoping, these category A listed buildings are now outwith the onshore Project area and have not been assessed further.
HES	We welcome the intention to scope in long-term changes to the setting of heritage assets. We note the proposal in table 3-44 to scope out the impact of any temporary construction infrastructure on the setting of heritage assets. We recommend that these impacts are included within the assessment. We are aware in other cases that items such as temporary access tracks	The assessment of temporary changes to the setting of historic environment assets and temporary access tracks have been assessed and is provided in section 13.6.1.4.

CONSULTEE	COMMENT	RESPONSE
	can be subsequently retained *in situ* and it would be our preference to see all construction infrastructure included within the assessment from the outset.	
HES	We would be happy to provide further advice on potential impacts of the proposed development, including proposed new substations, for our historic environment interests as the design of the development progresses.	HES have been consulted throughout the EIA including with respect to landscape mitigation measures for the onshore substation and will continue to be consulted as the onshore Project design progresses post-consent.
HES	Finally, Table 2-61 indicates that not only will the 2020 setting guidance be referenced, but also the outdated 2016 setting guidance could be relied upon. Given that the 2016 guidance has been entirely superseded by the 2020 guidance, it carries no weight and should neither be referenced nor relied upon as part of the assessment.	2020 Setting guidance has been used and is referenced in the assessment.
HES	Guidance about national policy can be found in our 'Managing Change in the Historic Environment' series available online at www.historicenvironment.scot/advice-and-support/planning-and-guidance/legislation-and-guidance/managing-change-in-the-historic-environment-guidance-notes. Technical advice is available on our Technical Conservation website at https://conservation.historic-scotland.gov.uk.	Guidance has been accessed and used in the assessment where relevant.

13.4 Baseline characterisation

This section outlines the current baseline for terrestrial archaeology and cultural heritage within the terrestrial archaeology and cultural heritage onshore study area. This characterisation is based on desk-based studies, a walkover survey in the summer of 2022, an archaeological watching brief undertaken during site investigations in the winter of 2022 (OWPL, 2023), and a site visit in March 2023 to inform the setting impact assessment for the substation.

13.4.1 Study area

The onshore terrestrial archaeology and cultural heritage study area (hereafter referred to as the study area) for the historic environment in relation to direct impacts is defined by the onshore Project area Red Line Boundary (RLB), within which the landfall options, onshore export cable corridor and onshore substation are to be located, as shown in Figure 13-1.

13.4.2 Data sources

A review was undertaken of the key literature and data relevant to this assessment relating to onshore historic environment assets and was used to give an overview of the existing historic environment. The main data sources used in the preparation of this chapter are listed below in Table 13-5. Any other sources used are referenced in the text.

13.4.3 Project site-specific surveys

The site-specific surveys conducted to inform the baseline characterisation comprised:

- Desk-based survey of appropriate sources of information, as summarised in Table 13-5;
- Walkover surveys undertaken in 2022 by ORCA which covered the onshore archaeology study area;
- An archaeological watching brief maintained on site investigation works in the winter of 2022 (OWPL, 2023);
- Site visit by ORCA in March 2023 to inform the substation setting impact assessment; and
- Phase 1 peat depth survey within the onshore Project area undertaken by RSK Ltd in September and October 2022.

Detailed information of historic environment assets considered as part of the baseline is presented in Onshore EIA Report, SS11: Terrestrial archaeology and cultural heritage gazetteer of sites.

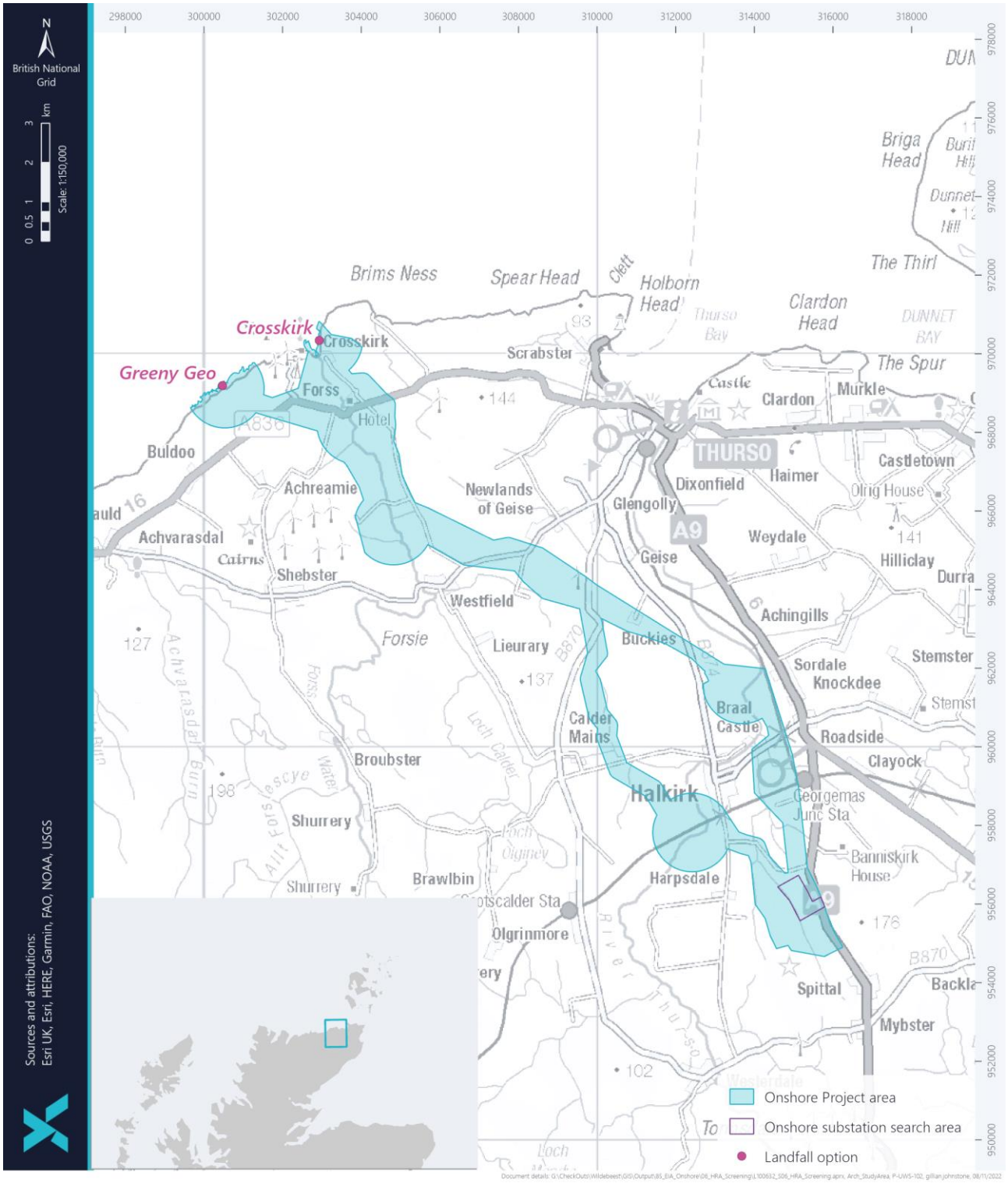

Figure 13-1 Onshore terrestrial archaeology and cultural heritage assets study area

Table 13-5 Summary of key datasets and reports

TITLE	SOURCE	YEAR	AUTHOR
British Geological Survey (BGS) Bedrock and Superficial Geology map	Geology of Britain viewer: https://www.bgs.ac.uk/map-viewers/geology-of-britain-viewer/	2023	BGS
The National Record of the Historic Environment (NRHE) of Scotland	Canmore (https://canmore.org.uk) and PastMap database (https://pastmap.org.uk)	2022 and 2023	HES
Statutory lists, registers and designated areas, including Lists of Scheduled Monuments, Listed Buildings, Gardens & Designed Landscapes, Designated Wrecks and Historic Marine Protected Areas	The Historic Environment Scotland Data Portal (http://portal.historicenvironment.scot)	2022	HES
The Highland Historic Environment Record	https://her.highland.gov.uk/	2022	THC
County Series. 6 inch to the mile, first edition	National Library of Scotland (www.nls.uk)	1876	Ordnance Survey (OS)
County Series. 6 inch to the mile, first edition	National Library of Scotland (www.nls.uk)	1907	OS
Historic maps	National Library of Scotland (www.nls.uk)	2023	National Library of Scotland

13.4.4 Existing baseline

13.4.4.1 Geology and land use

The bedrock geology of the south-east part of the onshore Project area consists of Diamicton formed in the Pleistocene epoch overlain by Devensian Till, the north-west part of the onshore Project area predominantly consists of Diamicton overlain by Forse Till Member or Siltstone, Sandstone and Limestone from the Mid Devonian Epoch overlain by Flagstone Member (BGS, 2021).

The Historic Landuse Assessment (HLA (hlamap.org.uk)), describes the majority of the onshore Project area as comprised of rectilinear fields and farms which are indicative of agricultural improvements in the 18th and 19th

centuries. There are also areas of smallholdings which consist of irregular plots of land, generally created in the 19th and 20th centuries for poorer tenants, and many areas of rough grazing comprised of heather moorland or rough grassland. In addition, there are several areas of plantation located within the onshore Project area boundary, mostly towards the south-west, and a windfarm and industrial area to the far north-west.

13.4.4.2 Archaeological and historical background

Caithness is rich in archaeology, and its relatively remote location, combined with the use of stone as the main building material, has ensured the survival of a variety of well-preserved monuments; and should be considered an important part of the archaeological landscape of Atlantic Scotland, being widely considered as one of the richest in Europe (Heald and Barber, 2019; Society of Antiquaries of Scotland (SAS), 2020).

The main archaeological periods of Caithness are outlined below together with discussion of the sites within the study area. For the sake of clarity, this report follows the archaeological periods and dates set out in section 1.3 of the Highland Archaeological Research Framework (HighARF) (SAS, 2020).

Scheduled monuments included in the background description are accompanied by their National Record of Historic Environment (NRHE) reference prefixed with 'SM' and listed buildings are accompanied by their NRHE reference prefixed with 'LB'. Non-designated historic environment assets identified in THC's Historic Environment Record (HER) are prefixed 'MHG'.

13.4.4.2.1 Late Upper Palaeolithic and Mesolithic (12,000 Before Common Era (BCE) – 4,000 BCE)

Despite substantial evidence for Palaeolithic settlement in England as far back as 400,000 years ago at sites like Pakefield in Suffolk and Boxgrove in West Sussex, in the north of Scotland there is as yet, no secure evidence for human activity prior to the Late Upper Palaeolithic at the end of the last Ice Age.

The earliest evidence for human activity in Caithness comes from the Mesolithic, this being characterised by transient hunter gatherer communities. Examples of archaeological evidence in Caithness includes the remains of a seasonal camp discovered during roadworks at Berriedale around 35 km to the south of Halkirk (Pannett and Baines, 2002) and a scatter of flint tools in the Ulbster Estate near Lybster (Peteranna and Williamson, 2018). There is no current evidence for Mesolithic activity within the study area.

Within the onshore Project boundary there is moderate potential for areas of deep peat to be present. While not running through the Flow Country *per se*, such peat can contain palaeoenvironmental evidence for the full palaeoenvironmental history of the area after the last Ice Age. The onshore Project area was identified to include areas of peat, as indicated by superficial geology and soils mapping for the region and confirmed through the Phase 1 peat depth surveys undertaken by RSK (see Figure 13-9, Figure 13-10 and Figure 13-11 for locations of peat); further information on the peat coverage within the onshore Project area is provided in the Outline Management Plan (OMP) 3: Outline Peat Management Plan (PMP).

13.4.4.2.2 Neolithic (4,000 BCE – 2,500 BCE)

There is evidence of prehistoric ritual and ceremonial activity within the environs of the study area in the Bad á Cheò and Achkeepster area that includes the upstanding monuments dating to the Neolithic and Iron Age. The design of the Neolithic structures is unique to Caithness and comprises arrangements of small stones aligned in multiple rows such as the example at Tormsdale (MHG1286) approximately 5 kilometres (km) to the south-west of the onshore substation search area. There are also individual standing stones in the area such as the Grey Mare Stone at Mybster (MHG39372) approximately 3 km to the south of the onshore substation search area, and at Halsary (SM5301) approximately 5 km to the south of the onshore substation search area. The Neolithic period saw the gradual change of life from transience to a life based on both pastoral and arable agriculture, and the adoption of new technologies, use of new types of tools and the construction of megalithic monuments. Within Caithness there is an extensive archaeological record of Neolithic activity, and this includes conspicuous examples like the chambered cairns near Lybster at Camster and the Cairn of Get, as well as settlement sites and a vast number of findspots of artefacts like polished stone tools, flint tools and pottery.

Within the onshore Project area there are eight recorded sites of Neolithic date (ORCA 7, 31, 47, 54, 89, 91, 94, 251), including a cairn with remnant stone circle and seven cairn sites all of which are characteristic of the Neolithic period and are likely to date to this period (see Figure 13-4 to Figure 13-8 for the asset locations).

13.4.4.2.3 Chalcolithic and Bronze Age (2,500 BCE – 800 BCE)

The Bronze Age in Caithness was a period of social change which saw the introduction of metal working and new types of pottery. There were changes in settlement patterns with the occupation of timber or stone round houses with thatched roofs which survive as 'hut circles' although many of these ephemeral structures may have been lost to intensive agriculture. There were also changes in funerary practice with a move to individual internments. A site type known as 'burnt mounds', large piles of heated stones, the purpose of which is largely unclear also date to this period. Other, even more enigmatic monuments- stone rows and stone settings (such as the Hill O' Many Stanes or Achavanich), types of monuments unique to north-east Scotland, are also often dated to this period but they are currently poorly understood.

Within the study area, there are several examples of hut circles or possible hut circles. While the walkover survey discovered that there are not always surface remains present at sites recorded previously, it should be noted that hut circles are notoriously inconspicuous, and visibility may vary in different conditions, and it is possible that remains do survive even if they cannot be seen. There is also a cist burial likely to date from this period and a cist inserted into a mound likely to be Neolithic although it is unclear if either of these survive.

13.4.4.2.4 Iron Age 800 BCE – AD 300

Later prehistoric activity comprises sophisticated stone-built towers (brochs), dating from the Iron Age, including two examples located approximately 4 km to the south-west and 3.5 km south-east of the onshore substation search area at Ballone (SM521) and Knockglass (SM561). The Iron Age in Caithness is dominated by brochs and their associated settlements, and there are more examples in Caithness than in any other area of Scotland. The settlement record of the period also includes other sorts of roundhouses, enclosures and promontory forts.

There are seven broch sites located within the onshore Project area, three of which are scheduled monuments (SM), comprising (shown on Figure 13-2 to Figure 13-8):

- ORCA 8 Green Tullochs (HER MHG1227);
- ORCA 9 Tulloch of Lybster (HER MHG1230);
- ORCA 55 Brimside Tulloch (SM2402);
- ORCA 56 Tulloch of Stemster (SM475);
- ORCA 60 Oust (SM554);
- ORCA 97 Achanarras Farm (HER MHG673); and
- ORCA 247 Stemster Hill (Canmore ID 7843).

In addition, there is the recorded site of an enclosure, mound and souterrain at Tulloch Park (ORCA 59) that also likely dates to this period.

13.4.4.2.5 Early medieval AD 300 – AD 1000

The inhabitants of Caithness in the later Iron Age and early medieval period are commonly known as the Picts, who had a distinctive culture known largely from placenames, artefacts, structures and burials and from intricate carved stones. The sites in the Iron Age (as outlined above) may also have been inhabited during this period.

Christianity arrived in the area in the late 6th century and there are many sites associated with early activity, and by the 8th century the influence of Viking and later Norse settlement, particularly in coastal areas, saw close political ties being formed between Caithness and Scandinavia. The evidence for Viking and Norse activity in Caithness is provided by historical sources, placenames, settlements (such as longhouses and re-use of earlier settlements like Freswick), graves and artefacts.

Within the onshore Project area, there is a chapel and cemetery site at Skinnet (ORCA 253; Figure 13-8) which may date to this period although it could also be medieval. It is associated with two carved stones, and the cemetery at least continued to be used into the post-medieval period.

13.4.4.2.6 Medieval AD 1000 – AD 1500

The medieval period in Caithness is characterised by the progressive integration into the kingdom of Scotland. This period was a time of great insecurity and poverty for many which drove the rise of the clan system. It was during this period that many castles such as Sinclair Girnigoe and Old Wick were constructed. Apart from the castles and some ecclesiastical sites, there is little surviving medieval archaeology apparent in Caithness, however it is likely that sites were re-used, and many settlements may lie beneath those of the post-medieval period, so it may be that some of the domestic and agricultural sites listed below actually have earlier origins.

Within the study area there are chapel sites likely to date to the medieval period (and these could have earlier foundations). Close to Spittal lies a chapel, cemetery and hospital dedicated to St Magnus. The importance of Spittal as a resting place for travellers in the medieval period is inferred by St Magnus Hospital (ORCA 101, SM5413; Figure 13-8), directly to the south-east of the existing Scottish Hydro Electric Transmission plc (SHET-L) Spittal substation. The placename Spittal is derived from hospital, but unlike modern hospitals medieval institutions were more akin to hostels, in the case of St Magnus hospital perhaps providing shelter for pilgrims making their way to and from the

shrine of St Magnus in Kirkwall, Orkney. Spittal Hill, the highest point in the area of the onshore substation search area has been a traditional meeting place where a yearly market was held until 1827.

13.4.4.2.7 Post-medieval 1560 AD- 1900 AD

The post-medieval period saw dramatic agricultural and industrial development across the whole area. Quarrying of Caithness flagstones on a commercial scale began for export as well as local use. In addition, the herring fishing industry greatly expanded in the 18th and 19th centuries, with Wick becoming the largest fishing station in Europe. These developments necessitated the construction of harbours, piers, quays and fishing stations around the coastline. Farming became increasingly productive with much agricultural reform, and by 1850 Caithness had been reorganised for both grazing and arable production. The vast majority of identified sites belong to this period and are representative of the expected site types associated with the contemporary changes.

The most conspicuous post-medieval site types in the landscape are the numerous traditional longhouses, farmsteads and other types of domestic accommodation. Not all of these sites survive above ground and many of these locations are now occupied by modern farmsteads or other occupied properties, and it is often unclear to what extent the original buildings survive. The later rise in prosperity during this period is demonstrated within the study area by the country house at Forss and much larger planned farms at Lybster and Aimster.

There are also other sites associated with agriculture and its associated inhabitation such as: wells, quarries, sheep folds / shelters, a gravel pit, a reservoir, stepping-stones, a chalybeate spring and a footbridge, although again many of these sites are no longer extant. There are also other unidentified structures likely to be associated with post-medieval agriculture.

There is some direct evidence for cultivation provided by traces of rig and furrow although it is possible this could in some cases be medieval in date. In all cases it is very ephemeral or not visible at all. There are also a number of cairns most likely to be associated within clearance for cultivation. Whilst the walkover survey did not record current field boundaries, the desk-based survey has noted examples of previously recorded dykes and banks, enclosures and other types of land divisions and drainage within the study area.

The development of milling associated with agricultural expansion is well represented across the study area by numerous related sites, either associated with individual farms or small-scale operations or with larger scale activity such as at Forss Village. These sites comprise both upstanding mill buildings and associated components such as dams, lades, sluices and ponds although many of these sites are no longer extant.

The continued use and development of the route roughly defined by the A9 between Spittal and Thurso includes the establishment of resting places such as the inns at Achkeepster, and later at Mybster crossroads. The 19th century saw a concerted campaign of land improvement and road building by Sir John Sinclair of Ulbster, which included the building of a causeway across Causewaymire, one of the more challenging sections of the route south. The broad structure of the area's modern landscape dates to this period of agricultural improvement including the development of crofts to the north of the onshore substation search area, now largely abandoned, either side of the A9 at Mybster and Spittal.

Droving was a common practice throughout Scotland by which livestock were walked south to be sold at trysts or markets in southern Scotland and into England. By the middle of the 18th century, Caithness cattle were driven south mainly for sale at Crieff and Falkirk.

In addition to the sites directly associated with the rise of agriculture and industry, there are several examples of the expanding infrastructure associated with it and with the increased population and prosperity such as: the railway stations at Halkirk and Georgemas Junction; road bridges; a schoolhouse and two toll houses.

There were also additional sites which are likely to date to this period such as cairns and mounds, stone spreads or piles.

13.4.4.2.8 Modern 1901 AD - present

Although relatively brief, perhaps the most significant event to impact on the archaeological record in modern times was the Second World War. Caithness is in what was an important strategic location for the control of the North Atlantic and received considerable resources to tackle the perceived threat. Royal Air Force (RAF) Wick was constructed at this time together with numerous coastal defences. Radar stations were also built to warn of potential attacks. More recently, the construction of the Nuclear Research Establishment at Dounreay and the Vulcan Navel Reactor Test Establishment (NRTE) have transformed the local economy.

There are eight recorded modern sites within the onshore Project area (ORCA 166, 174, 177, 242, 243, 272, 292a-e). Five of these are military installations; a radio station, oil storage tanks, two roadblocks and a further building of unclear function but likely to be military. The walkover survey did not record modern sites which were not wartime however within the baseline there are modern sites which have been recorded previously, these all relate to modern housing and farming.

13.4.4.3 Historic environment assets

A review of literature and available data sources, augmented by consultation and a walkover survey has been undertaken to describe the characterisation of the historic environment assets. More detailed information of historic environment assets considered as part of the baseline is presented in the Onshore EIA Report, SS11: Terrestrial archaeology and cultural heritage gazetteer of sites.

While being located outside the study area, the scheduled monument Crosskirk, St Marys Chapel and broch south of Chapel Pool (SM90086, hereafter referred to as 'the Chapel') is located on a promontory of land overlooking Crosskirk Bay, and the carpark through which people access the monument is within the onshore study area. Potential impacts on this asset were raised during pre-application consultation events. The Chapel consists of the roofless remains of the chapel of St Mary lying east-west within a square burial ground, together with the adjacent remains of a broch and outer defensive works. The monument is identified by HES of being of national importance as the well-preserved remains of a chapel probably of the late 12th century, associated with the earlier remains of a broch from which there may be continuity of occupation on the site, and for its potential to contribute to an understanding of prehistoric and medieval architecture, settlement, social and ecclesiastical organisation in prehistoric and medieval Scotland.

The proposed development at this location would not adversely impact on the national importance of the monument, and any potential temporary indirect setting impacts during the construction period would be negligible and it is therefore not considered further in the assessment.

From the sources used, 328 historic environment assets are included in the terrestrial archaeology and cultural heritage baseline, comprising archaeological remains and historic buildings. Of these, 258 are archaeological remains and 70 are historic buildings. A summary of the total number of historic environment assets and their value is provided in Table 13-6. The locations of all scheduled monuments and listed buildings within the onshore Project area are shown on Figure 13-2 and Figure 13-3; and the locations of non-designated historic environment assets within the onshore Project area are shown on Figure 13-4 to Figure 13-8.

Table 13-6 Total numbers and value of historic environment assets within the onshore Project area

	UNCERTAIN	NEGLIGIBLE	LOW	MEDIUM	HIGH	TOTAL
Archaeological remains (see section 13.4.4.4)	32	157	45	7	17 (Eight Scheduled Monuments)	258
Historic buildings (see section 13.4.4.5)	5	5	52 (Two Category C Listed)	8 (Eight Category B Listed)	0	70
Total number of assets	37	162	97	15	17	328

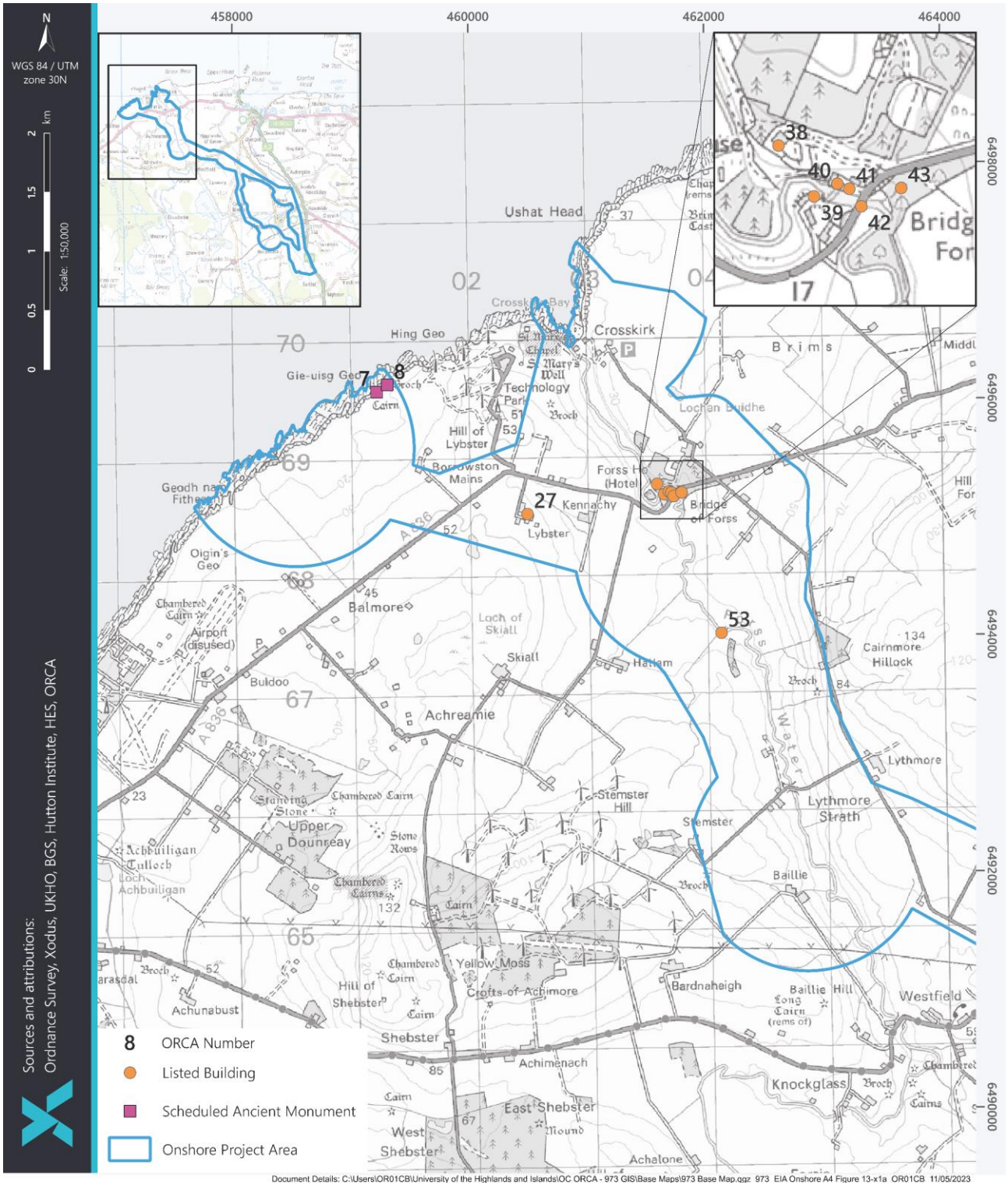

Figure 13-2 Scheduled monuments and listed buildings in the onshore Project area (north)

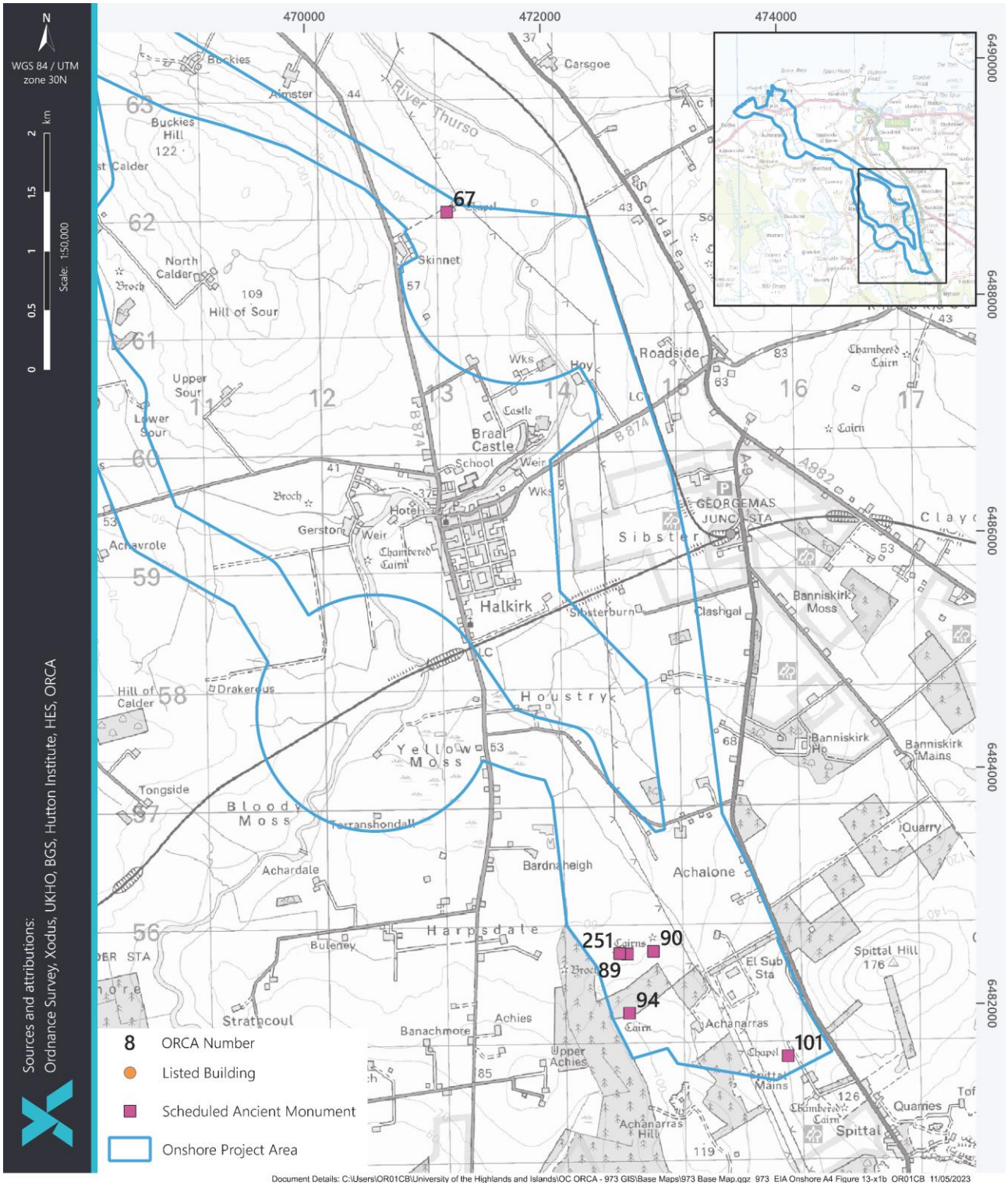

Figure 13-3 Scheduled monuments and listed buildings in the onshore Project area (south)

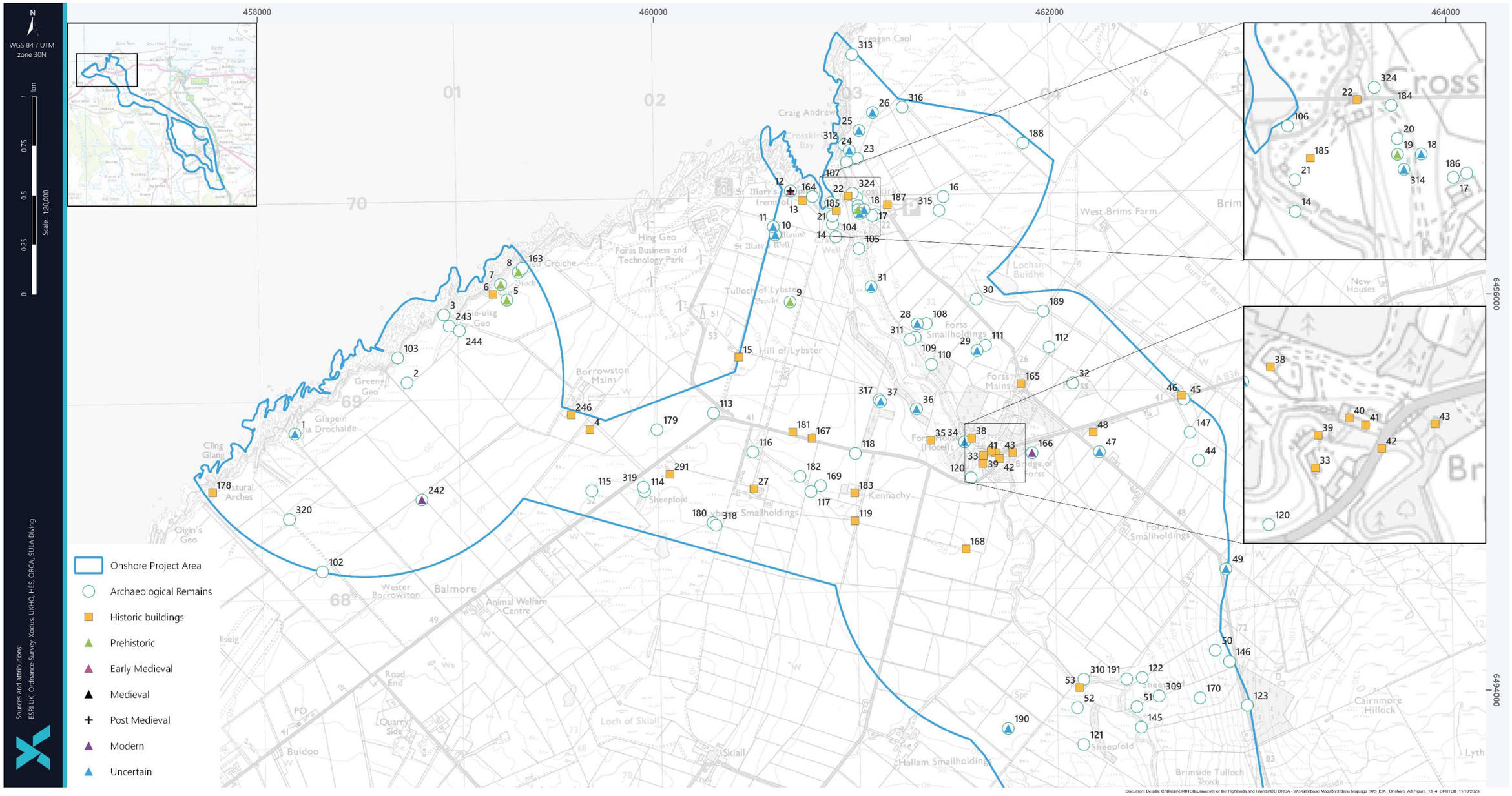

Figure 13-4 Non-designated historic environment assets within the onshore Project area

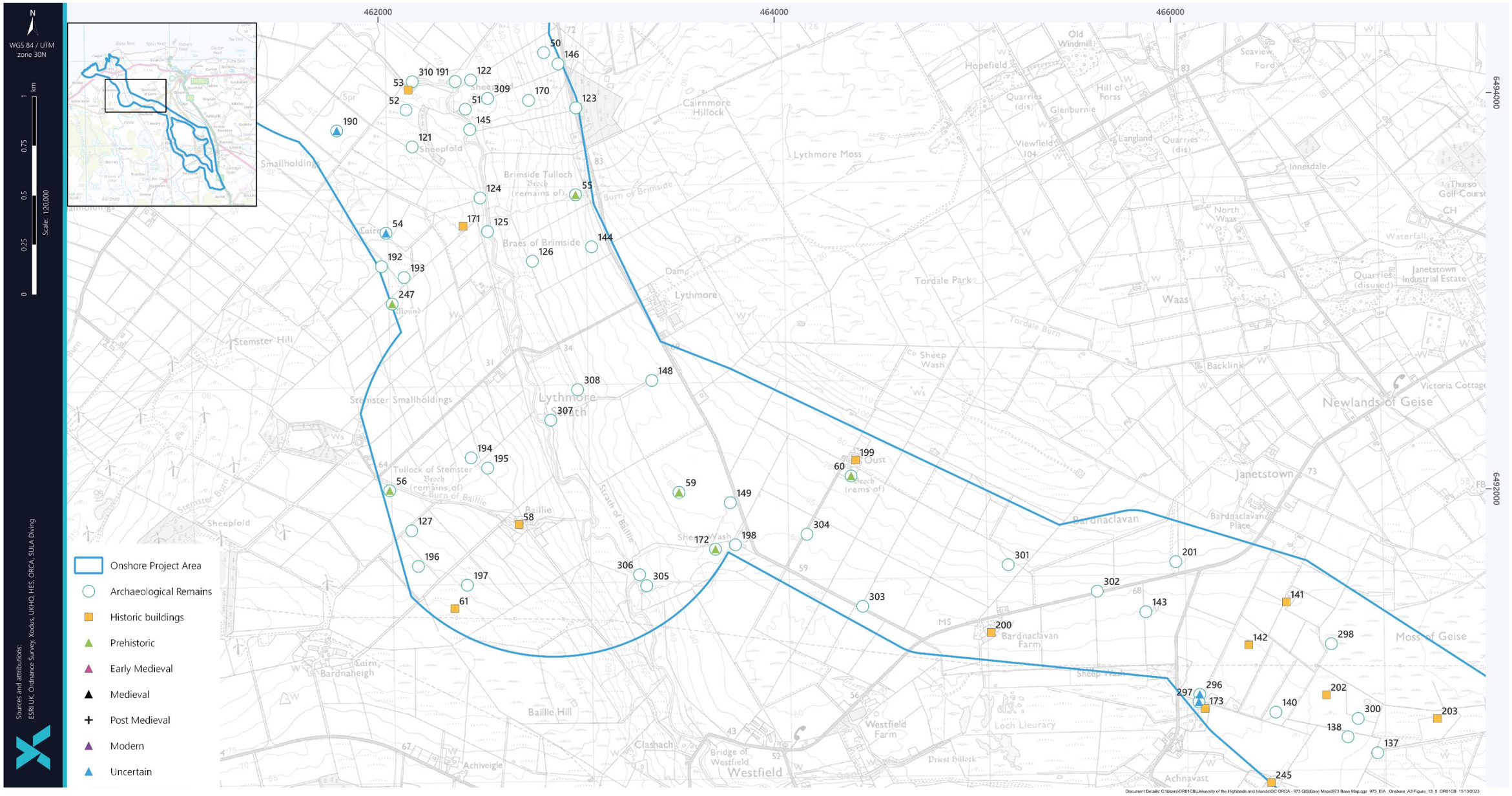

Figure 13-5 Non-designated historic environment assets within the onshore Project area

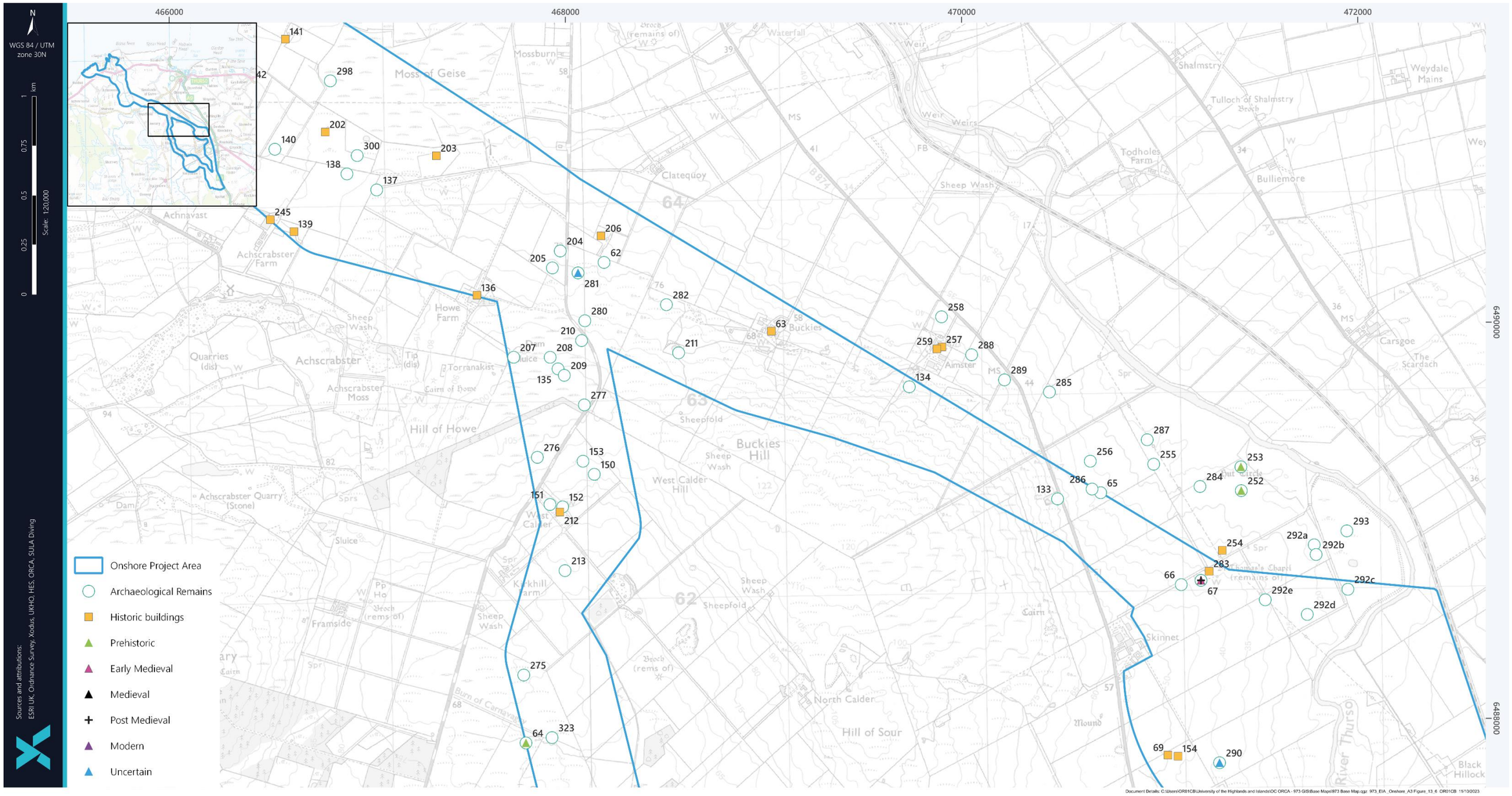

Figure 13-6 Non-designated historic environment assets within the onshore Project area

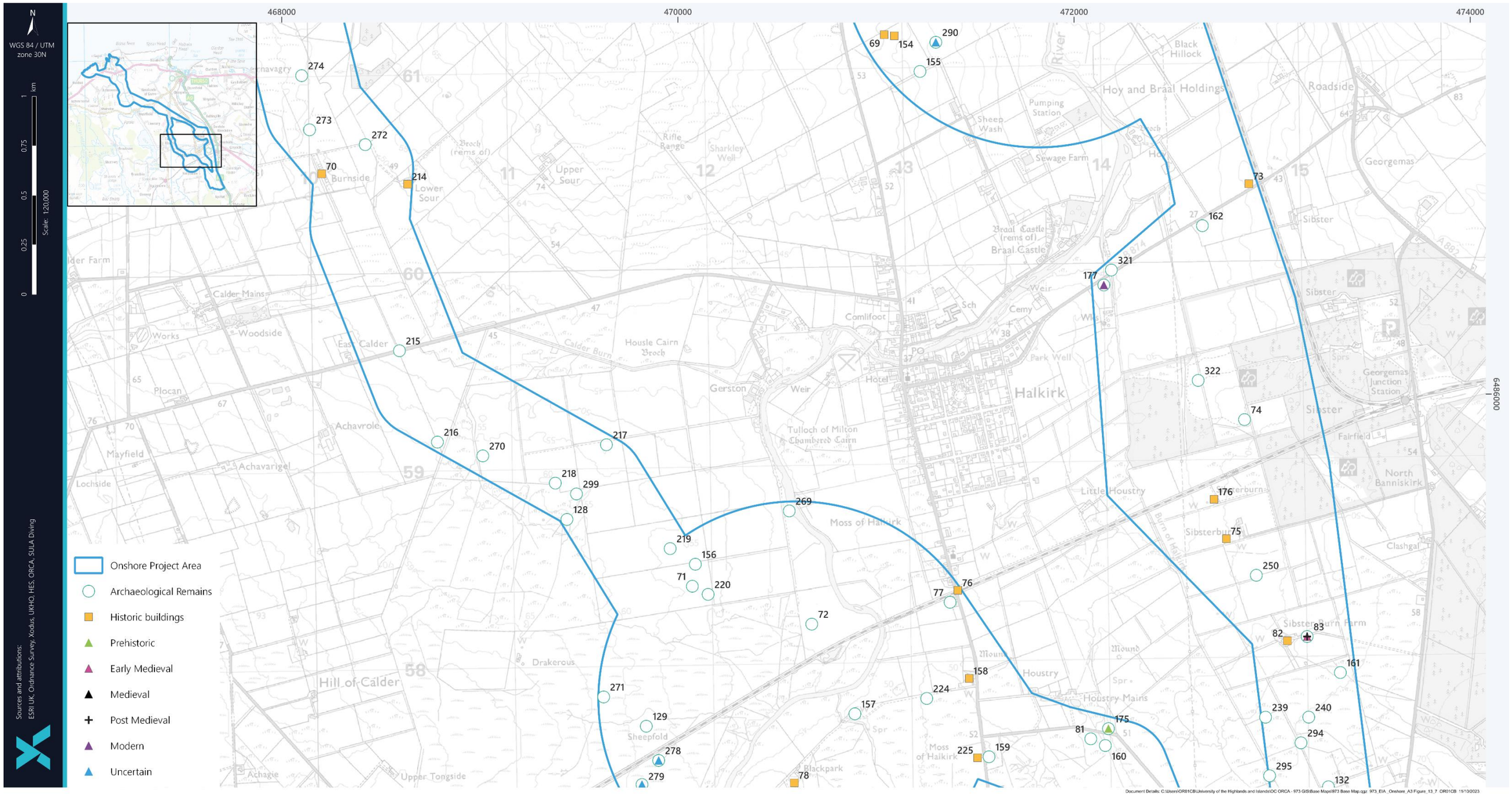

Figure 13-7 Non-designated historic environment assets within the onshore Project area

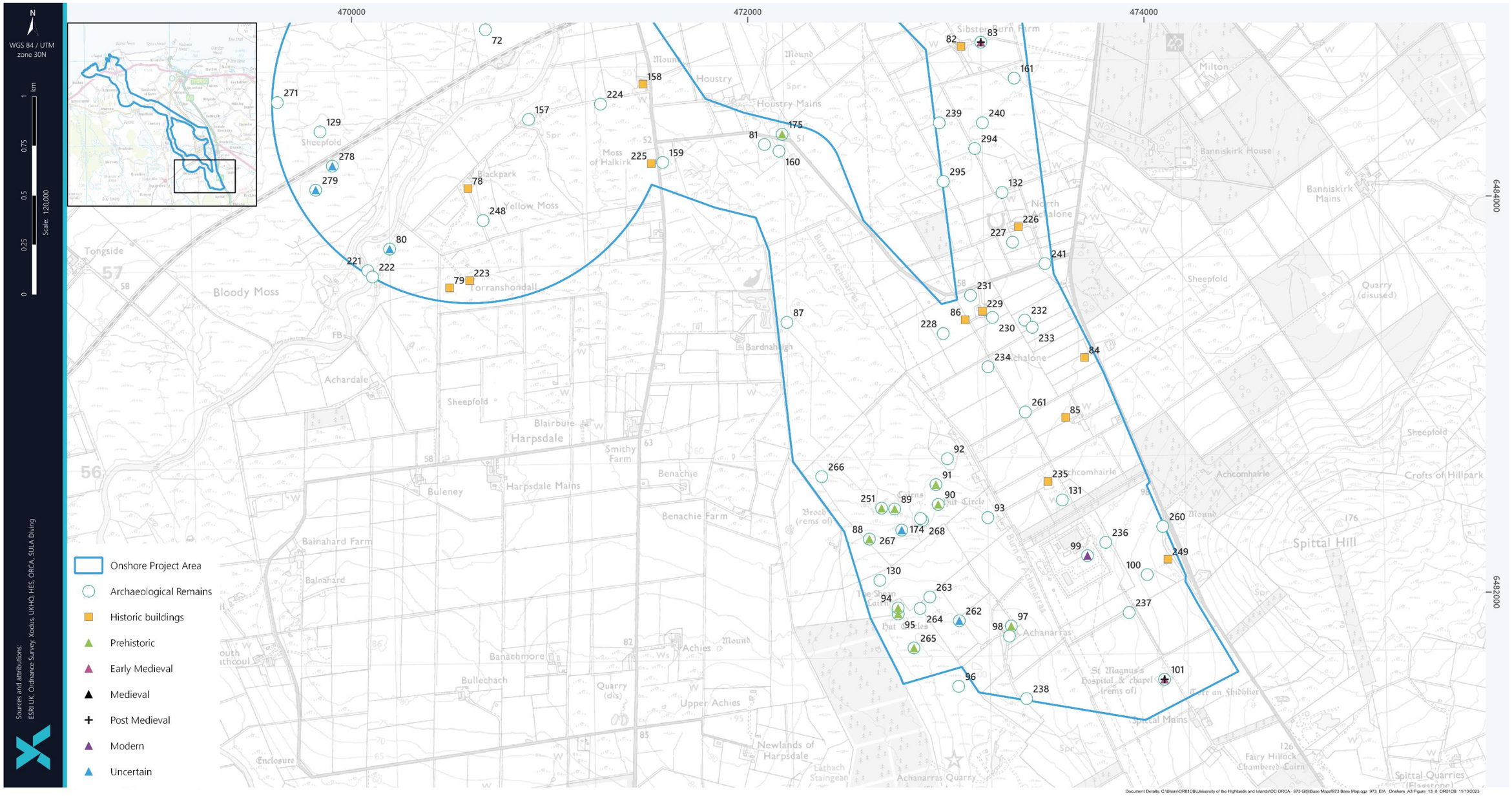

Figure 13-8 Non-designated historic environment assets within the onshore Project area

13.4.4.4 Archaeological remains

A total of 258 archaeological remains are recorded in the onshore Project area. These include prehistoric settlement evidence comprising hut circles, brochs and souterrains[3]; and ritual and funerary remains including a stone circle and the remains of burial mounds, cairns and cists. The presence of these remains indicates activity within the study area that likely started in the Neolithic period, through to the later Iron Age. Given their rarity and importance, eight archaeological remains are designated as scheduled monuments and therefore have been assessed to be of high value. The majority of the archaeological remains within the baseline are post-medieval in date and are characterised by the remains of agricultural settlements, such as the sites of individual farmsteads, crofts and houses, and the remains of associated structures such as quarries, enclosures, sheepfolds, wells, rig and furrow and clearance cairns.

13.4.4.4.1 Prehistoric (12,000 BCE – AD 300)

During the watching brief associated with the onshore Project, geotechnical site investigations were undertaken in 2022, and three test pits were identified as being located within areas of peat (OWPL, 2023), shown in Figure 13-9 to Figure 13-11. These areas, and areas of peat identified in the OMP3: Outline PMP (submitted alongside this Planning Permission in Principle (PPP) Application), as well as areas of alluvial deposits, can contain palaeoenvironmental evidence for the full palaeoenvironmental history of the area after the last Ice Age.

Prehistoric ritual and funerary remains are represented in the majority by cairns such as those at The Shean, Achanarras (ORCA 94, Scheduled Monument), Achanarras (ORCA 251, Scheduled Monument), and Achanarras Hill (ORCA 91, Scheduled Monument, Figure 13-12). More detailed descriptions of these assets are provided in SS11: Terrestrial archaeology and cultural heritage gazetteer of sites.

The Shean at Achanarras (ORCA 94) has been dated typologically to the Neolithic period, that survives above ground as a grass-covered mound 15.5 m x 12.5 m in diameter with a central depression of 2 m x 2.25 m that indicates it has been excavated in the past. Little more is known about the cairn as it has not been subject to thorough archaeological investigation, however taking into account its designation and its ability to inform on Neolithic funerary practices it has been assigned a high value.

The cairns at Achanarras (ORCA 251) and Achanarras Hill (ORCA 91) potentially date to the Neolithic period and survive above ground as low sub-oval grassy mound with gently sloping sides in boggy heathland. Neither cairn has been subject to modern archaeological investigation and therefore their dating interpretation is based on typological similarities to known Neolithic cairns. Taking into account their designation and potential ability to inform on Neolithic funerary practices they have been assigned high value.

A potential stone circle with associated cairns is located at Benachie (ORCA 89) which survives as a grass-covered mound lying within a circle of five prostrate stones 17 m in diameter, located within marshy open moorland. As with the other prehistoric funerary and ritual sites in the baseline, this site has not been subject to modern archaeological investigation, however it has been assigned a Neolithic / Bronze Age date. Considering its designation, and that it has the ability to inform on Neolithic and Bronze Age funerary and ritual practices it has been assigned a high value.

[3] *An underground chamber or passage.*

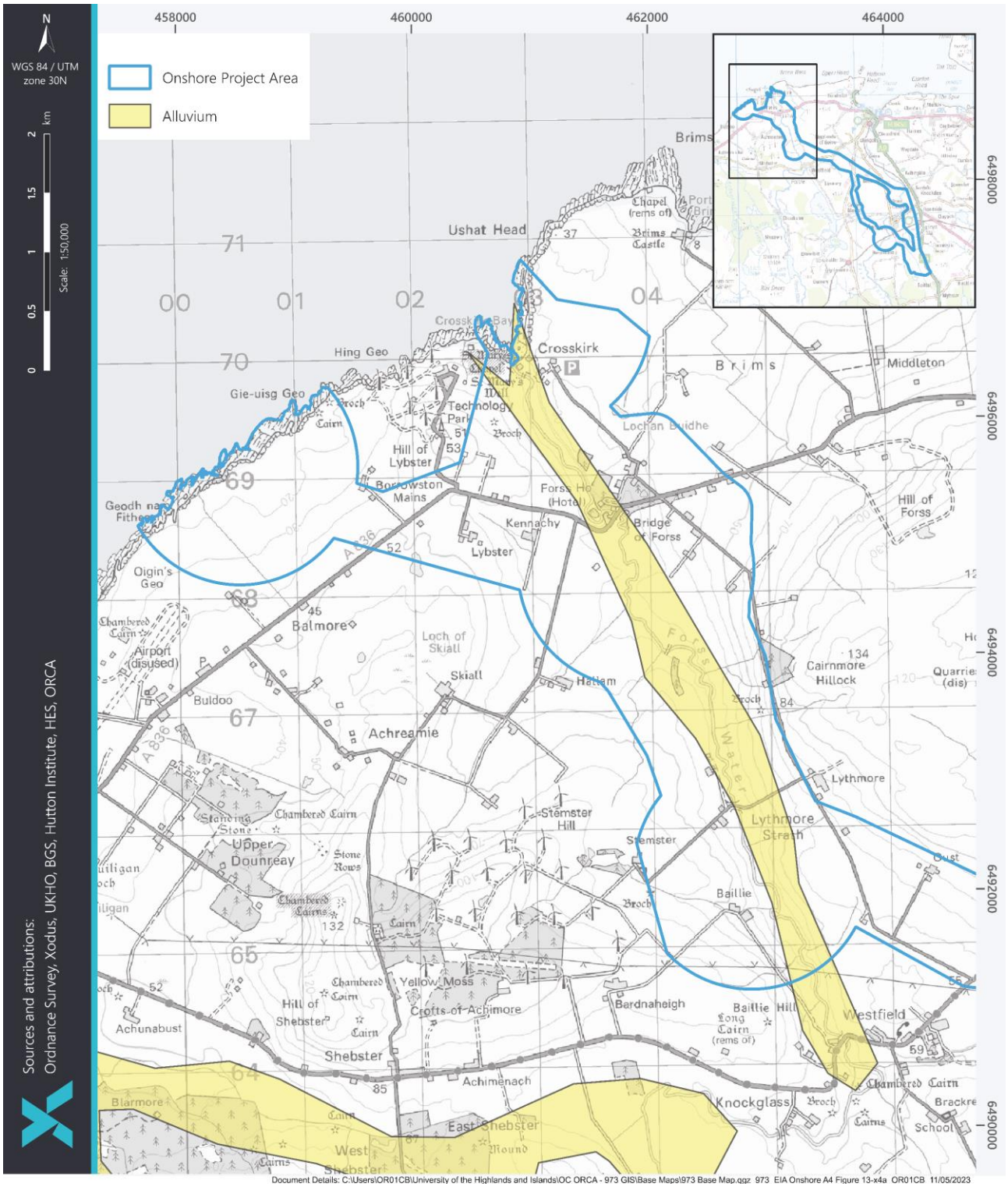

Figure 13-9 Locations of peat, alluvial and wind-blown sand deposits (north)

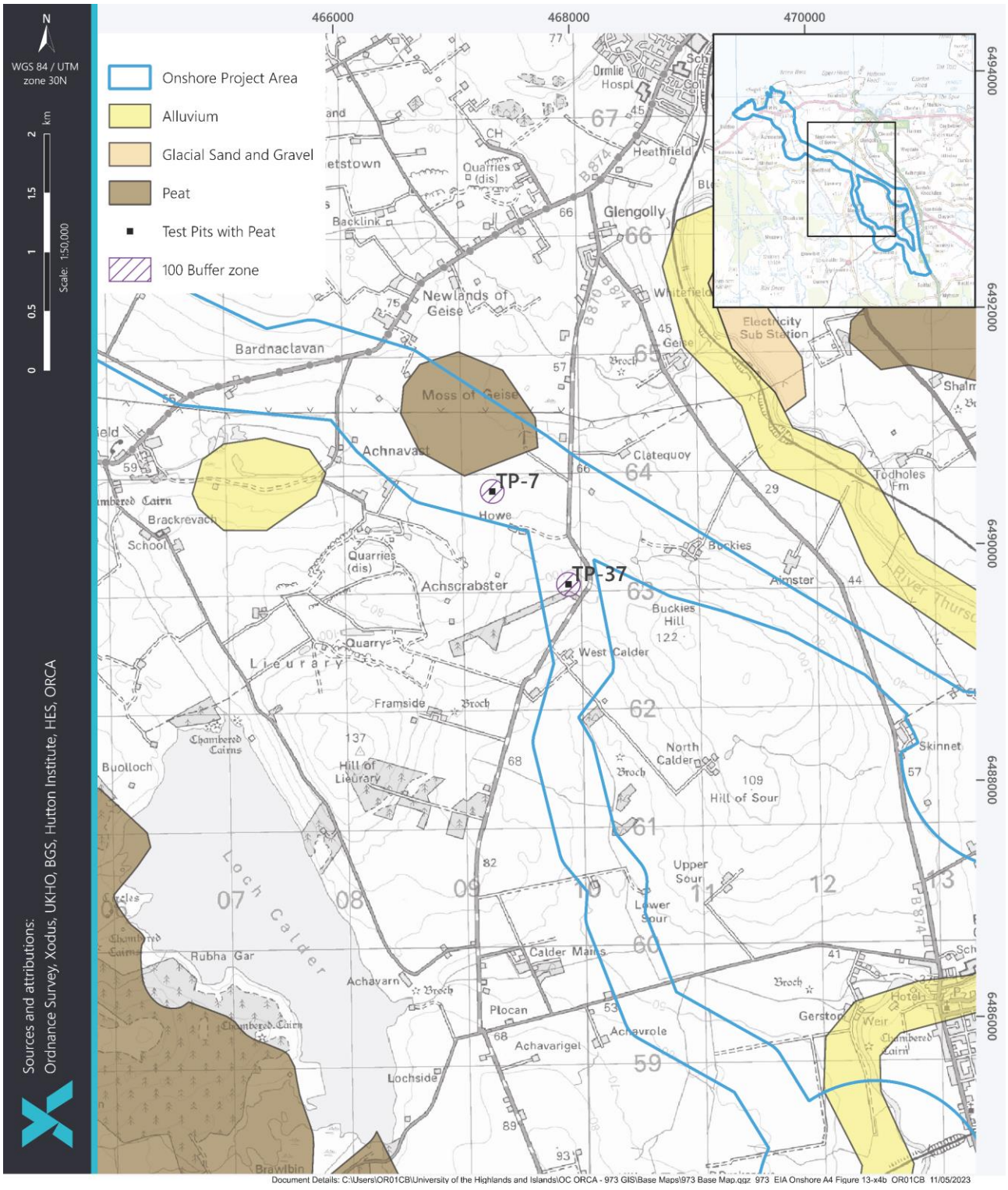

Figure 13-10 Locations of peat, alluvial and wind-blown sand deposits (central)

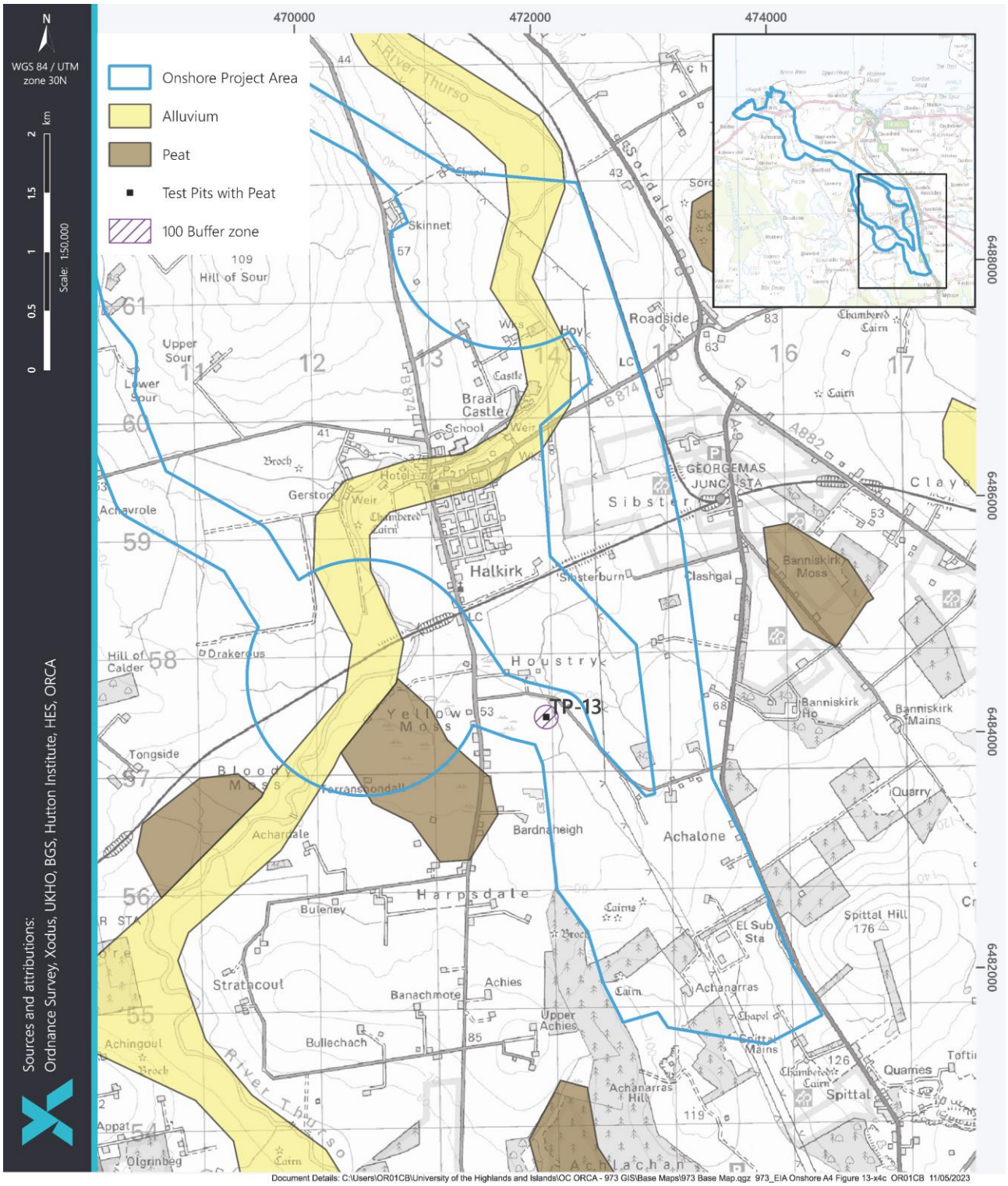

Figure 13-11 Locations of peat, alluvial and wind-blown sand deposits (south)

Figure 13-12 Cairn at Achanarras Hill (ORCA 91) recorded during the walkover survey

During the Early to Middle Bronze Age there was an expansion of settlement into the uplands of Scotland and beyond. The process has generally been interpreted in terms of population expansion from lower-lying areas, some of which overlaps with evidence for climactic deterioration (ScARF, 2020). Within the onshore Project area there is evidence for settlements of Bronze Age (2,400BCE to 551 BCE) date at Carnavagry (ORCA 64), Achanarras Hill (ORCA 90, Scheduled Monument, Figure 13-13), Skinnet (ORCA 253), Oust Farm (ORCA 172), Houstry (ORCA 175) and Crosskirk (ORCA 19). All of these settlement sites have been assigned a high or medium value based on their ability to contribute towards our understanding of the development and evolution of human settlement in Caithness during the Bronze Age.

Figure 13-13 Hut circle cairn at Achanarras Hill (ORCA 90) shown as a raised area to the right

Evidence for later, Iron Age, settlement within the onshore Project area takes the form of seven broch sites. Brochs were impressive, tower-like structures that were a highly conspicuous part of the Iron Age landscape in Caithness. The brochs recorded within the onshore Project area vary in survival, with the best surviving of which are Tulloch of Lybster (ORCA 9), Achanarras Farm (ORCA 97) and Green Tullochs (ORCA 8, Figure 13-14) which includes a souterrain (ORCA 59); with other examples being recorded at Oust (ORCA 60), Brimside Tulloch (ORCA 55) and close to Achreamie (ORCA 247). All these sites have been assigned a high or medium value based on their ability to contribute towards our understanding of the network of brochs in Caithness and across Scotland and the Northern Isles.

Figure 13-14 Green Tullochs broch (ORCA 8)

It is indicated from the available evidence, which has been supported by visual observations during the walkover survey, that the study area was attractive for human settlement from at least the Bronze Age onwards with a number of hut circles (both known and conjectured) and Iron Age broch sites.

13.4.4.4.2 Early Medieval and Medieval (AD 300 to AD 1500)

The early medieval period is not well represented within the study area, with one recorded site comprising the conjectured site of a chapel at the *Field of the Altar* at Achanarras (ORCA 98). THC's HER entry notes that the exact location of the site is unknown, and it could not be located during the walkover survey. Based on the conjectured nature of this asset, and the lack of available evidence for its existence, it has been assigned a negligible value.

While the medieval period is not well represented within the study area, it should be noted that many post-medieval farmsteads and villages (of which there are a wealth in the baseline) could have been located on the foundations of earlier, medieval, sites.

There are three high value assets within the baseline, all of which are Scheduled Monuments. There is one religious' site with two discrete Scheduled Monuments comprising St Thomas's Chapel, Skinnet (ORCA 67, Figure 13-15) and associated cross slab (ORCA 68). The ruins of the chapel are located about 500 m north-east of Skinnet Farm near

Halkirk and survive as a rectangular drystone structure at a height of 1 m, with tombstones set in the interior. Standing out from the wall of the chapel towards its western end is an upright slab, on the west face of which is carved an equal-limbed Celtic-style cross which is thought to date to the 8th century AD indicating that the foundations of the current chapel might well have been placed on top of an earlier religious site. The monument has been assigned a high value due to its designation, and the fact that they represent an ecclesiastical site with potential early medieval origins that has upstanding remains.

Figure 13-15 St Thomas's Chapel, Skinnet (ORCA 67)

The Scheduled Monument of St Magnus Hospital and chapel at Spittal (ORCA 101, Figure 13-16) are located just to the south-east of the existing SHET-L Spittal substation, close to the onshore substation search area. The monument consists of the remains of St Magnus chapel, hospital and graveyard, first recorded in a royal charter of 1476. The upstanding remains belong to the chapel, which sits within a raised bank, containing a burial ground used by the Clan Gunn. The chapel of the hospital served as the parish church of Spittal until the 16th century. The monument has been assigned a high value due to its designation and the fact that it contains upstanding medieval ecclesiastical remains that can be documented from 1476, and because it is the site of a hospital that was an important stage on two pilgrimage routes: the route north to St Magnus in Orkney and that south to St Gilbert's at Dorney.

The remaining medieval remains within the baseline comprise the sites of rig and furrow at Crosskirk (ORCA 12) and Blar Liath (ORCA 83). The remains at Crosskirk run north-south to the cliff edge and were identified as surviving above ground (albeit ephemerally) by the walkover survey. The remains at Blar Liath have no surface expression as recorded by the walkover survey. The rig and furrow sites have both been assigned a low value as they have the potential to inform on medieval agricultural practices at a local level.

Figure 13-16 St Magnus Hospital and chapel (ORCA 101)

13.4.4.4.3 Post-medieval (AD 1500 to 1900 AD)

The post-medieval period is the best represented within the baseline, with 185 recorded heritage assets. There is nothing within the baseline that is unusual for Caithness, and none of the recorded assets have been assigned high or medium values. The assets within the baseline comprise ruined and derelict farmsteads, areas of agricultural activity, quarries, mills, enclosures, sheepfolds, limekilns, houses and wells. In consideration of their ubiquity within Caithness and their limited potential to increase our knowledge of this period, archaeological remains from this period have been assessed to be of low and negligible value.

13.4.4.4.4 Modern (1901AD to present)

Archaeological remains from the modern period forming the baseline include the sites of two Second World War roadblocks at Forss House (ORCA 166) and Halkirk (ORCA 177), neither of which survives above ground and have been assigned a low value as they have the potential to increase our knowledge of wartime defences in the area.

Other modern remains relate to drainage work at Achanarras (ORCA 99) and a structure built of breezeblocks, the purpose of which remains unknown (ORCA 242). Both assets have been assigned a negligible value.

13.4.4.4.5 Uncertain

There are 28 assets within the baseline that have been assigned uncertain periods and values as there is currently insufficient information on them to allow sufficient interpretation. These include the possible remains of prehistoric hut circles at Achlure (ORCA 88), and prehistoric cairns at Crosskirk (ORCA 31) and Stemster (ORCA 54). In order to allow for these assets to be confidently dated and interpreted archaeological investigations are required. Other remains of uncertain date, function and value relate to the sites of mounds, turf banks, possible enclosures and other earthworks.

13.4.4.4.6 Archaeological potential

The archaeological watching brief maintained on the onshore site investigation works in 2022 (OWPL, 2023) did not identify any deposits or features of archaeological significance within the 41 trial pits that were excavated across the onshore Project area. Deposits encountered across much of the study area represented 20th century agricultural activity and improvement.

The watching brief did identify some areas where there was greater potential for preservation of archaeological features and deposits, and these generally corresponded with less intensively improved areas of land surface, dominated by mosses, heather and sedges around the northern and western peripheries of the onshore Project area. These locations (TP 17, 21 and 36 shown on Figure 13-9 to Figure 13-11) were characterised by the presence of undisturbed peat deposits, and these can have archaeological significance due to the potential for preservation of palaeoenvironmental evidence within them. There is also greater potential for preservation of features relating to prehistoric activity within undisturbed peat deposits.

Areas of archaeological potential relating to peat, alluvial deposits and glacial sand and gravel are shown on Figure 13-9 to Figure 13-11, and the following sections outlines the specific potential of peat and alluvial deposits to provide context to the archaeological potential of the onshore Project area.

13.4.4.4.7 Peat

In Caithness prehistoric archaeological remains, particularly Bronze Age hut circles and associated field systems and cairnfields, have 'disappeared' into deep peat deposits, and peat growth accelerated at the time of the abandonment of upland hut circles. Thus, it is possible for prehistoric remains potentially from the Neolithic onwards to be covered in peat and lost to view (Heald and Barber, 2019).

Peat deposits have been identified across the onshore Project area. Areas with shallow or no peat recorded were generally consistent with well-drained, heavily grazed land and areas used for crops. Deep peat was generally associated with boggy areas which were not associated with agriculture, or which appeared to be used for rough grazing only. Depths of peat recorded were less than 0.5 m, with the deepest value (4.0 m) being found in the south just to the east of Harpsdale. North of this and south of Houstry another area of deep peat was recorded with a depth of 3.1 m. Some other substantial areas of peat were recorded at Yellow Moss and Moss of Halkirk, with peat depths up to 2.4 m. North of this, across the railway line and east of Drakerous an area of peat with a maximum depth of 1.85 m was recorded. Some smaller areas of peat were found across the onshore Project area, most notably:

- Along the Forss Water valley, mainly adjacent to the river;
- Along the south-western margin of the Moss of Geise;
- Adjacent to the River Thurso north-east of Halkirk; and
- Around the Calder Water east of Calder Mains.

More detail on the peat conditions within the onshore Project area are provided in the OMP3: Outline PMP which is submitted alongside this PPP Application.

13.4.4.4.8 Alluvium

In addition to the areas of peat, there are areas of alluvial deposits (or alluvium) within the study area. Alluvial deposits result from processes associated with flowing water, usually but not exclusively associated with river valleys. River valleys contain numerous micro-environments, each of which is associated with distinctive suites of deposits that can be used to aid palaeoenvironmental reconstruction. Alluvium is generally present as channel fills or as blanket floodplain and can be several metres thick.

Alluvial deposits can be used for sediment provenancing, pollution histories and various forms of landscape study, but are particularly valuable for examining the last environments of river valleys. Furthermore, since these river valleys can represent inhabited landscapes of the entire archaeological record alluvium can contain detailed information about past human settlement and cultural change (Historic England, 2015).

13.4.4.5 Historic buildings

The built heritage baseline is characterised by historic buildings of post-medieval and modern date. These historic buildings are associated with farming, transportation (rail and road), dwellings, schoolhouses and a Second World War radio station) and associated farm labourer's cottages (ORCA 259, Category C Listed Building) near Thurso. The farmhouse is of late 18th century date, and is a three-bay building, rising to two storeys with attic in harled rubble (Figure 13-17. The house was the home of Captain John Henderson, author of the General View of the Agriculture of the County of Caithness. The building is on the Buildings at Risk Register (Buildings at Risk Register of Scotland, 2023) and is said to be in a poor state of repair. Taking its designation into account the building has been assigned a medium value.

Figure 13-17 Aimster Farmhouse (ORCA 257) © Crown Copyright: HES

The workers cottages, known as Aimster Farm dwellings are contemporary with Aimster Farmhouse, and are noted as being an unusual row of farm servant's dwellings. Taking their designation into account, and their clear relationship with Aimster Farmhouse they have been assigned a low value. There is another good surviving example of a mid-19th century farm steading at Lybster (ORCA 27), which is also a Category B Listed Building and has therefore been assigned a medium value.

There are a number of mills and watermills within the baseline, of these the most notable are three Category B Listed Buildings in Forss comprising the West Mill (ORCA 39) and East Mill (ORCA 40) watermills, and the Forss Mill and Miller's House mill at East Mill (ORCA 41), Figure 13-18 shows these buildings within their immediate setting. All three mills represent excellent surviving examples of early 19th century mills and watermills, and taking this into account, as well as their designation they have been assigned a medium value.

Figure 13-18 Forss mills and watermills (ORCA 39, 40 and 41)

Road transport infrastructure within the baseline is represented by two Category B Listed Buildings comprising the Forss Water, Humpback Bridge (ORCA 53, Figure 13-19) a mid-18th century single, high-round-arched bridge that is no longer in use and is similar in form to the well-known Old Bridge in Carrbridge. The Bridge of Forss over Forss Water (ORCA 42) is a late 18th century two-span bridge. Given their designations and that they represent surviving remains of the 18th century road / path network they have been assigned a medium value.

Figure 13-19 Forss Water humpback bridge (ORCA 53)

The remaining historic buildings within the baseline all date from the post-medieval and modern periods, and there is nothing that is unusual for Caithness, and none have been assigned high or medium value. The historic buildings within the baseline comprise farmsteads (both occupied and derelict, e.g. Skinnet ORCA 69, Figure 13-20), mills, cottages and croft houses, wells and walls.

Figure 13-20 Derelict farmhouse at Skinnet (ORCA 69)

The remains of Halkirk railway station (ORCA 76), the remains of oil tanks at the former station that held aircraft fuel for Castletown, Wick and Skitten airfields at Hoy Station (ORCA 73, Figure 13-21), and a Second World War radio station on the Hill of Lybster (ORCA 15) are located within the onshore Project area. Given their potential to increase

our knowledge of the post-medieval and modern periods at a local level the assets described above have been assigned a low value, with the remaining assets being assigned negligible value where they have limited potential to increase our knowledge of this period.

Figure 13-21 Oil tanks at the former station that held aircraft fuel for Castletown, Wick and Skitten airfields at Hoy Station (ORCA 73)

13.4.4.5.1 Other Sites

There are 33 further sites within the onshore Project area. While it is generally certain that these sites are of archaeological origin, they could not be confidently placed in any of the above categories, primarily because of insufficient existing records and/or because there were no, or insufficient, visible surface remains present to be assessed during the walkover survey. This number also includes sites which could not be accessed during the walkover survey. This group comprises a range of turf-covered mounds, banks, structures, walls, enclosures, cairns, ditches, and a grave site.

13.4.5 Future baseline

In the Intergovernmental Panel on Climate Change's (IPCC's) recent Sixth Assessment Report, the Summary Report for Policymakers (2022) states *"Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, and, in particular, their attribution to human influence, has strengthened since AR5"*. Further details on climate change and how climate change may influence the future baseline are provided in SS1: Climate and carbon assessment.

It is not anticipated that climate change will cause any changes to the baseline of buried archaeology assets within the terrestrial archaeology and cultural heritage onshore study area.

It is important to note that the future baseline is a projection, with a range of possible future conditions, and it is subject to uncertainty associated with the available projections. Across the lifetime of the Project, it is considered highly likely that the future baseline will be broadly comparable to the existing baseline described above.

13.4.6 Summary and key issues

The key sensitive assets and key issues for terrestrial archaeology and cultural heritage are provided below in Table 13-7.

Table 13-7 Summary and key issues for terrestrial archaeology and cultural heritage

SUMMARY AND KEY ISSUES	ONSHORE PROJECT AREA
	• The onshore Project has committed to avoiding any direct, physical impacts during construction on scheduled monuments, listed buildings and non-designated historic environment assets of medium and high value which were identified during the walkover survey that could be of schedulable quality (see Table 13-15 and Figure 13-23); and • The proximity of the onshore substation at Spittal to three scheduled monuments (Benachie cairn (ORCA 89), Achanarras Hill North hut circle (ORCA 90) and Achanarras cairn (ORCA 251)) which have a high heritage value and a high contribution of setting. Long term changes to their setting may cause them to reduce their value. • There is the potential for archaeological remains within land not previously disturbed by development or ploughing to be uncovered. There is potential for palaeoenvironmental or geoarchaeological deposits within areas of peatland and construction works may result in a loss of or damage to these deposits.

13.4.7 Data limitations and uncertainties

The walkover survey did not record any field boundaries (or their component parts such as gate pillars, culverts etc), however many of these are traditional Caithness dykes and drystone dykes and should be considered part of the archaeological record. Structures attached to field boundaries (sheep pens etc) were recorded. Other linear features (such as ditches or turf banks) were only recorded if they did not appear on the current Ordnance Survey mapping and were not clearly modern. All other pre-modern sites were recorded. The walkover survey did not record modern sites (apart from wartime sites) however some such sites have been included in the desk based assessment (DBA) as they have been previously recorded and thus appear on the Canmore database, this is also the case for some linear sites.

While every effort was made to survey the entire onshore Project area and to visit every site identified by the desk-based assessment, this was not possible due to no permission for access being granted, fields containing livestock and areas being too waterlogged to traverse safely. However, where possible, these areas were surveyed from the side, and it is considered that the impact of these omissions on the overall characterisation of the archaeological record of the onshore Project area will be negligible.

13.5 Impact assessment methodology

13.5.1 Impacts requiring assessment

This assessment covers all potential impacts identified through the scoping, as well as any further potential impacts that have been highlighted as the EIA has progressed. It should be noted that impacts are not necessarily relevant to all stages of the onshore Project.

The impacts identified as requiring consideration for terrestrial archaeology and cultural heritage are listed in Table 13-8. Information on the nature of impact (i.e. direct or indirect) is also described.

Table 13-8 Impacts requiring assessment for terrestrial archaeology and cultural heritage

POTENTIAL IMPACT	NATURE OF IMPACT
Construction and decommissioning*	
Loss of or damage to known onshore historic environment assets	Direct
Loss of or damage to unknown onshore historic environment assets	Direct
Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest	Direct
Temporary changes to the setting of historic environment assets	Indirect
Operation and maintenance	
Loss of or damage to known onshore historic environment assets	Direct
Loss of or damage to unknown onshore historic environment assets	Direct
Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest	Direct
Long-term changes to the setting of onshore historic environment assets that reduces their value	Indirect

** In the absence of detailed information regarding decommissioning works, and unless otherwise stated, the impacts during the decommissioning of the onshore Project considered analogous with, or likely less than, those of the construction stage as detailed in section 13.6.3.*

13.5.2 Impacts scoped out of the assessment

No impacts have been scoped out of the assessment.

13.5.3 Assessment methodology

An assessment of potential impacts is provided separately for the construction, operation and maintenance and decommissioning stages.

The assessment for terrestrial archaeology and cultural heritage is undertaken following the principles set out in chapter 7: EIA methodology. Topic-specific criteria have been developed for the value of the importance, setting and sensitivity of historic environment assets, as outlined in Table 13-9 and Table 13-10.

The value of the asset is combined with the magnitude of impact, supported by expert judgement to arrive at a consequence for each impact under consideration. Criteria for identifying the magnitude of impact on onshore assets are presented in Table 13-11. The determination of the consequence of any adverse effects is outlined in Table 13-12 with the significance of effect derived directly from the consequence ranking, as shown in Table 13-13, with residual effects identified subsequent to any additional secondary mitigation, if possible or required. The example criteria presented in the tables below are used to inform the assessment, but the tables and matrices are tools and not mechanical systems. Professional judgement is also required to input into the assessment, which may result in heritage values and significance of effect being moved higher or lower than the matrix result. This may also result in a significant material effect that does not reduce the heritage value of the asset being identified as potentially acceptable by statutory authorities. The reasoning is stated in the individual assessment wherever this is the case.

13.5.3.1 Effects on setting

"Setting can often be integral to a historic asset's cultural significance.....'Setting' is the way the surroundings of a historic asset or place contribute to how it is understood, appreciated and experienced. Monuments, buildings, gardens and settlements were almost always placed and orientated deliberately, normally with reference to the surrounding topography, resources, landscape and other structures. Over time, these relationships change, although aspects of earlier settings can be retained." (Managing Change in the Historic Environment: Setting. HES, 2020).

Based on the guidance provided by Managing Change in the Historic Environment: Setting (HES, 2020), a three-stage process was undertaken to assess the potential effect of the onshore substation on the setting of historic environment assets (assets shown on Figure 13.3):

- Stage 1: identify the historic environment assets that might be affected by the onshore Project:
  - Consultation was undertaken with THC HET and HES, and the following scheduled monuments were identified for setting assessment: ORCA 89 Benachie cairn (SM2400), ORCA 90 Achanarras Hill North hut circle (SM 2402) and ORCA 251 Achanarras cairn (SM 2401).
- Stage 2: define the setting of historic environment assets by establishing how the surroundings contribute to the ways in which the historic structure is understood, appreciated and experienced:
  - For the three scheduled monuments listed above, modern OS mapping and a site visit was used to define their setting.

- Stage 3: assess how the proposed development would affect upon that setting.

Table 13-9 Criteria for the value of the asset

VALUE OF ASSET	DEFINITION
High	• World Heritage Sites; • Scheduled Monuments and sites proposed for scheduling; • Category A Listed Buildings; • Inventoried Gardens and Designed Landscapes; • Interconnected groups of B-Listed buildings; • Outstanding Conservation Areas; • Historic Battlefields; • Undesignated archaeological sites, areas and buildings of national and international importance (identified in the HER) due to association, rarity, intrinsic value, loss of life and/or retaining archaeological, structural, architectural, decorative or other physical remains to the extent that it makes a significant contribution to our understanding or appreciation of the past; and • Geophysical anomaly which appears anthropogenic (atypical in its context); or there is identifiable cultural material; or it is in the area of a known archaeological site, or another contact / anomaly identified to be of high potential.
Medium	• Category B and Category C Listed Buildings; • Burial Grounds; • Protected heritage landscapes; • Conservation Areas; and • Undesignated archaeological sites, areas, buildings, of equivalent regional importance (identified in the HER), or of high local significance, due to association, rarity, intrinsic value, and/or retaining archaeological, structural, architectural, decorative or other physical remains to the extent that it makes a significant contribution to our understanding or appreciation of the past.
Low	• Cultural heritage assets the physical remains of which contribute little to our understanding or appreciation of the past; • Cultural heritage assets of local value or interest for education or cultural appreciation; • Undesignated archaeological sites, areas, buildings, of equivalent local importance (identified in the HER) due to limited intrinsic, contextual or associative characteristics, or that are still common; • Unlisted historic buildings and settlements with local characteristics; and • Geophysical anomaly which is likely to be a natural formation. It could also be a processing error of the geophysical data.
Negligible	• Sites of former archaeological features; • Unlisted buildings of little historic or architectural interest; • Sites or features the physical remains of which make a negligible contribution to our understanding or appreciation of the past; • Single findspots; and • Sites of little or no known heritage importance.

Table 13-10 Criteria for importance of setting and sensitivity to change

SENSITIVITY TO CHANGE	IMPORTANCE OF SETTING
High	A setting that makes a crucial / critical contribution to the understanding and/or appreciation of the siting and/or historical / archaeological / architectural context of an asset. (Examples of this include: dominant or prominent topographic locations; surroundings that are believed not to have changed / little changed from those when the asset was created).
Medium	A setting that makes a positive contribution to the understanding and/or appreciation of the siting and/or historical / archaeological / architectural context of an asset. (Examples of this include: surroundings that complement the siting and appearance of an asset, such as the presence of a feature of the rural past within a more recent farming landscape containing little or no urban or industrial development).
Low	A setting that makes little positive contribution to the understanding and/or appreciation of the siting and/or historical / archaeological / architectural context of an asset. (Examples of this include: surroundings that only partially complement the siting and appearance of an asset, such as the presence of a feature of the rural past within a partly urbanised or industrialised landscape).
Negligible	A setting that does not contribute positively to the understanding and/or appreciation of the siting and/or historical / archaeological / architectural context of an asset. (Examples of this include: immediate surroundings, such as commercial coniferous woodland or an industrial development, that are not relevant to the understanding of the context of the asset).

Table 13-11 Magnitude criteria

MAGNITUDE CRITERIA	DIRECT IMPACTS	INDIRECT (SETTING) IMPACTS
High	Works would result in the complete loss of the heritage asset, or the loss of an area, features or evidence fundamental to its historic character and integrity, which would result in the complete loss of physical integrity.	The removal of, or a fundamental and irreversible change to, the relationship between a heritage asset and its relevant setting. Major change that removes or prevents appreciation, understanding or experience of a heritage asset and its key characteristics, or permanent change to or removal of surroundings of a less sensitive heritage asset. A noticeable change to a key relationship between a heritage asset and a highly sensitive, valued or historically relevant setting over a wide area or an intensive change to a less sensitive or valued heritage asset or setting over a limited area.

MAGNITUDE CRITERIA	DIRECT IMPACTS	INDIRECT (SETTING) IMPACTS
Medium	Works would result in the loss of an important part of the heritage asset or some important features and evidence, but not areas or features fundamental to its historic character and integrity. The integrity of the heritage asset would be affected, but key physical relationships would not be lost.	Noticeable change to a non-key relationship between a heritage asset and its relevant setting. A heritage asset and setting that is tolerant of moderate levels of change. Small changes to the relationship between a heritage asset and its setting over a wide area or noticeable change over a limited area.
Low	Works would not affect the main features of the heritage asset. The historic integrity of the heritage asset would not be significantly affected.	Minor changes to the relationship between a heritage asset and its setting over a wide area or minor changes over a limited area. A heritage asset and setting that is considered tolerant of change.
Negligible	Works would be confined to a relatively small, peripheral and/or unimportant part of the asset. The integrity of the asset, or the quality of the surviving evidence would not be affected.	Changes to a setting that cannot be discerned or perceived in relation to the heritage asset or environment.
Unknown	Ground breaking works over features that have not been fully interpreted would reduce the chance of interpretation in the future. In the event of significant features this would constitute impact of high magnitude; for sites of lesser significance it is less problematical. Nevertheless, it remains an issue where features have not been or could not be interpreted.	Changes to a setting, where it is uncertain how these contribute to our understanding, appreciation or experience of the site because the feature or asset itself could not be or has not been understood or interpreted.
Positive	An enhancement to the baseline condition of the heritage asset.	An enhancement to the baseline condition of the asset.

Table 13-12 Consequence of adverse effects matrix

VALUE / SENSITIVITY OF ASSET	MAGNITUDE OF IMPACT				
	High	Medium	Low	Negligible	Positive
High	Major	Major	Moderate	Minor	Positive
Medium	Major	Moderate	Minor	Minor	Positive
Low	Moderate	Minor	Minor	Negligible	Positive
Negligible	Minor	Negligible	Negligible	Negligible	Positive
Uncertain	Uncertain/Major	Uncertain/Moderate	Uncertain/Minor	Uncertain/Negligible	Positive

Table 13-13 Assessment of significance of effect

EFFECT	DESCRIPTION	SIGNIFICANCE OF EFFECT
Positive	Positive – to be encouraged.	Positive
Major	Highly significant and requires immediate action. May be intolerable risk or significance.	Significant
Moderate	Significant – may require additional control measures and/or management where possible.	Significant
Minor	Not significant – however may require some management to ensure remains within acceptable levels.	Not significant
Negligible	Not significant.	Not significant

13.5.4 Embedded mitigation

As described in chapter 7: EIA methodology, certain measures have been adopted as part of the onshore Project development process in order to reduce the potential for impacts to the environment, as presented in Table 13-14. These have been accounted for in the assessment presented below. The requirement for additional mitigation measures (secondary mitigation) will be dependent on the significance of the effects on terrestrial archaeology and cultural heritage assets.

In accordance with the onshore PPP Application, the embedded mitigations listed below have been attributed to particular Development Zones within the onshore Project area, these are detailed in Table 13-14 and the Development Zones are shown on Figure 13-22.

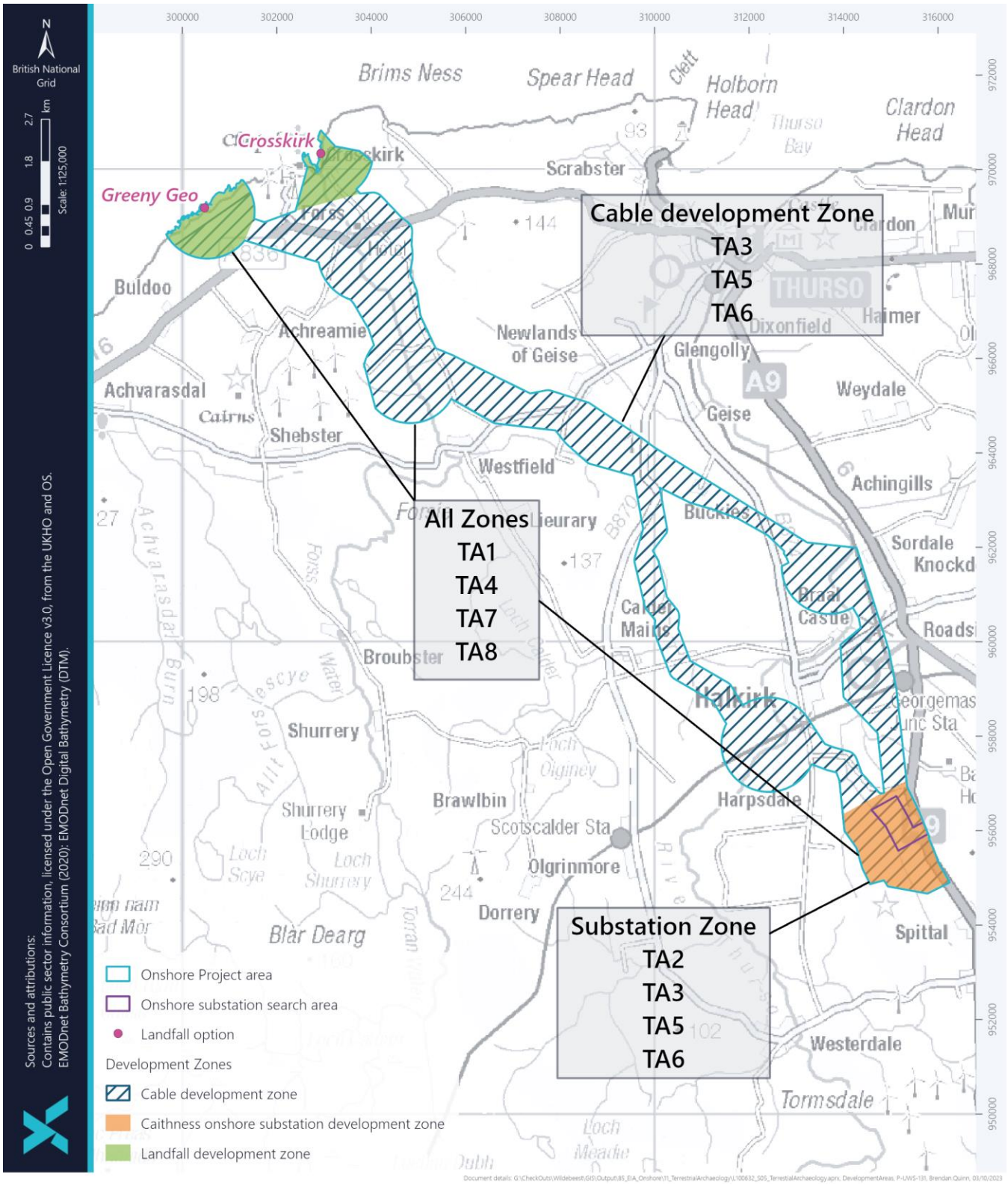

Figure 13-22 Development Zones for the onshore PPP Application

Table 13-14 Embedded mitigation measures relevant to terrestrial archaeology and cultural heritage

ID	MITIGATION MEASURE	TYPE	DESCRIPTION	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE
TA1	Avoidance of designated and medium and high value non-designated assets	Primary	The onshore substation location, cable routing and landfall, and installation activities such as access routes, laydown areas and compounds, will avoid all designated heritage assets. The onshore substation location, cable routing and landfall, and installation activities such as access routes, laydown areas and compounds, will avoid a number of non-designated assets of medium and high value that could be of schedulable quality. These assets include the following: ORCA 7, ORCA 8, ORCA 9, ORCA 27, ORCA 38, ORCA 39, ORCA 40, ORCA 41, ORCA 42, ORCA 43, ORCA 53, ORCA 67, ORCA 89, ORCA 90, ORCA 94, ORCA 95, ORCA 97, ORCA 101, ORCA 172, ORCA 175, ORCA 247, ORCA 251 and ORCA 265 (for further details see Figure 13-23 and Figure 13-24 (section 13.5.4.1)).	Established within design principles (secured through Construction Method Statements (CMSs)) and within the Archaeological Management Plan. The Archaeology Management Plan will be secured through a condition attached to the PPP.	All zones.
TA2	Onshore substation bunding	Primary	The onshore substation will include bunding with appropriate planting to reduce its visual impact in views from designated heritage assets. Further details of the design principles of the landscape screening and planting are provided in chapter 17: Landscape and visual.	Established within the design principles (secured through CMSs).	Substation zone.

ID	MITIGATION MEASURE	TYPE	DESCRIPTION	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE
TA3	Reinstatement of terrain and ground cover	Primary	Reinstatement of terrain and ground cover to avoid any impacts on the setting of heritage assets by the underground onshore export cables. Any reinstatement / ground cover to be used above underground export cables shall be technically appropriate, e.g. planting will not be appropriate in the cable corridor.	Established through design principles (secured through CMSs) and as outlined within Outline Management Plan (OMP) 1: Outline Construction Environmental Management Plan (CEMP), these measures will also be established within the Soil Resource Management Plan (SRMP) appended to the CEMP. The CEMP will be secured through a condition attached to the PPP. Additionally, these measures will also be established within the Habitat Management Plan (HMP) and SHPP. These plans will also be secured through conditions attached to the PPP.	Cable development zone and substation zone.
TA4	CEMP	Tertiary	The CEMP will outline how the onshore Project will ensure the suitable implementation and control of the mitigation measures during construction. An outline CEMP (OMP1: Outline CEMP) is provided alongside the Application for PPP.	As per OMP1: Outline CEMP, the final CEMP will be provided at post-consent. The CEMP will be secured through a condition attached to the PPP.	All zones.
TA5	Disturbance post-construction	Tertiary	Operations, maintenance and decommissioning activities will ensure no further disturbance outwith ground already disturbed during the construction stage and thus no further disturbance to heritage assets.	Established within the design principles (secured through CMSs).	Cable development zone and substation zone.

ID	MITIGATION MEASURE	TYPE	DESCRIPTION	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE
TA6	WSIs (including Protocols for Archaeological Discoveries (PAD))	Tertiary	The preparation of appropriate Written Schemes of Investigation (WSIs) which may include archaeological intrusive evaluations, watching briefs and excavations, and a PAD to avoid or mitigate accidental impacts and manage any accidental discoveries of archaeological interest. The Archaeological Management Plan will be underpinned by the WSI and PAD.	Established within design principles (secured through CMSs) and within the Archaeological Management Plan. The Archaeology Management Plan will be secured through a condition attached to the PPP.	Cable development zone and substation zone.
TA7	Archaeological Clerk of Works	Tertiary	An Archaeological Clerk of Works will be responsible for the implementation of the Archaeological Management Plan and monitoring of construction and watching briefs as required.	Established within design principles (secured through CMSs) and within the Archaeological Management Plan. The Archaeology Management Plan will be secured through a condition attached to the PPP.	All zones.
TA8	Decommissioning, Restoration and Aftercare Plan	Tertiary	A Decommissioning, Restoration and Aftercare Plan will be prepared for the onshore Project and agreed with THC prior to decommissioning works being undertaken. The plan will include any measures required to protect archaeological features during decommissioning which are likely to be similar to those proposed within the CEMP.	Established within the design principles (secured through CMSs) and the Decommissioning, Restoration and Aftercare Plan which will be secured through a condition attached to the PPP.	All zones.

13.5.4.1 Assets to be avoided

The assets detailed in 13.5.4.1 and shown in Figures 13-23 and 13-24 comprise scheduled monuments, listed buildings and a number of non-designated assets of medium and high value which were identified during the walkover survey that could be of schedulable quality. The onshore Project has committed to avoid any direct, physical impacts on these during construction activities.

Table 13-15 Historic environment assets that will be avoided during onshore construction activities

ORCA NO.	DESIGNATION	DESCRIPTION
7	Scheduled monument	Green Tullochs: Iron Age / early medieval cairn and cist
8	Scheduled monument	Green Tullochs: Iron Age broch and inhumation
9	Non-designated	Tulloch of Lybster: Iron Age broch
27	Listed building	Lybster Farm steading
38	Listed building	Forss House: country house
39	Listed building	West Mill, Forss: watermill
40	Listed building	East Mill, Forss: mill
41	Listed building	Miller's House, East Mill, Forss
42	Listed building	Bridge of Forss
43	Listed building	Tollhouse, Forss
53	Listed building	Old Bridge of Forss
67	Scheduled monument	Skinnet Chapel
89	Scheduled monument	Benachie: prehistoric cairn and stone circle
90	Scheduled monument	Achanarras Hill North: Bronze Age hut circle
94	Scheduled monument	The Shean, Achanarras: prehistoric / medieval cairn

ORCA NO.	DESIGNATION	DESCRIPTION
95	Non-designated	Achanarras Hill: Bronze Age hut circles
97	Non-designated	Achanarras Farm: Iron Age broch
101	Scheduled monument	St Magnus Hospital and chapel, Spittal
172	Non-designated	Oust Farm: possible prehistoric hut circle identified during walkover survey
175	Non-designated	Houstry: possible prehistoric hut circle identified during walkover survey
247	Non-designated	Stemster Hill: Iron Age broch
251	Scheduled monument	Achanarras: Neolithic cairn
265	Non-designated	Achanarras: possible prehistoric hut circle identified during walkover survey

13.5.4.2 Landscape screening and planting

A landscape screening strategy using bunding and planting around the proposed substation has been developed in consultation with HES and THC HET that will reduce visual impacts of the onshore substation on nearby scheduled monuments.

Landscape bunds will be the principal means of screening the onshore substation and in summary will have the following principles built into the design:

- Slopes will be varied, with an average slope of 1:6, and a recommended maximum slope of 1:4 to the outer faces;
- 'Internal' slopes adjacent to the development platform can be steeper and/or make use of retention;
- The bunds will have rounded and varied tops and toes, and their shape should respond to the existing landforms within the surrounding context where possible; and
- The maximum height of the landscape bunds will be determined by the requirement to screen the onshore substation from the surrounding visual receptors and for noise mitigation.

In addition to bunding, there will be the introduction of planting to reinforce the screening. Landscape planting is proposed to be native which will be used to soften views of the proposed bunds and to integrate the bunds into the wider landscape. The planting will be designed to enhance biodiversity within the onshore substation area and will include a mix of wildflower meadow, shrub planting and mixed native woodland (70% broadleaf and 30% coniferous trees). The assessment considers that planting will only be established and starting to mature at Year 15.

Further details of the screening and planting design principles are set out in chapter 17: Landscape and visual.

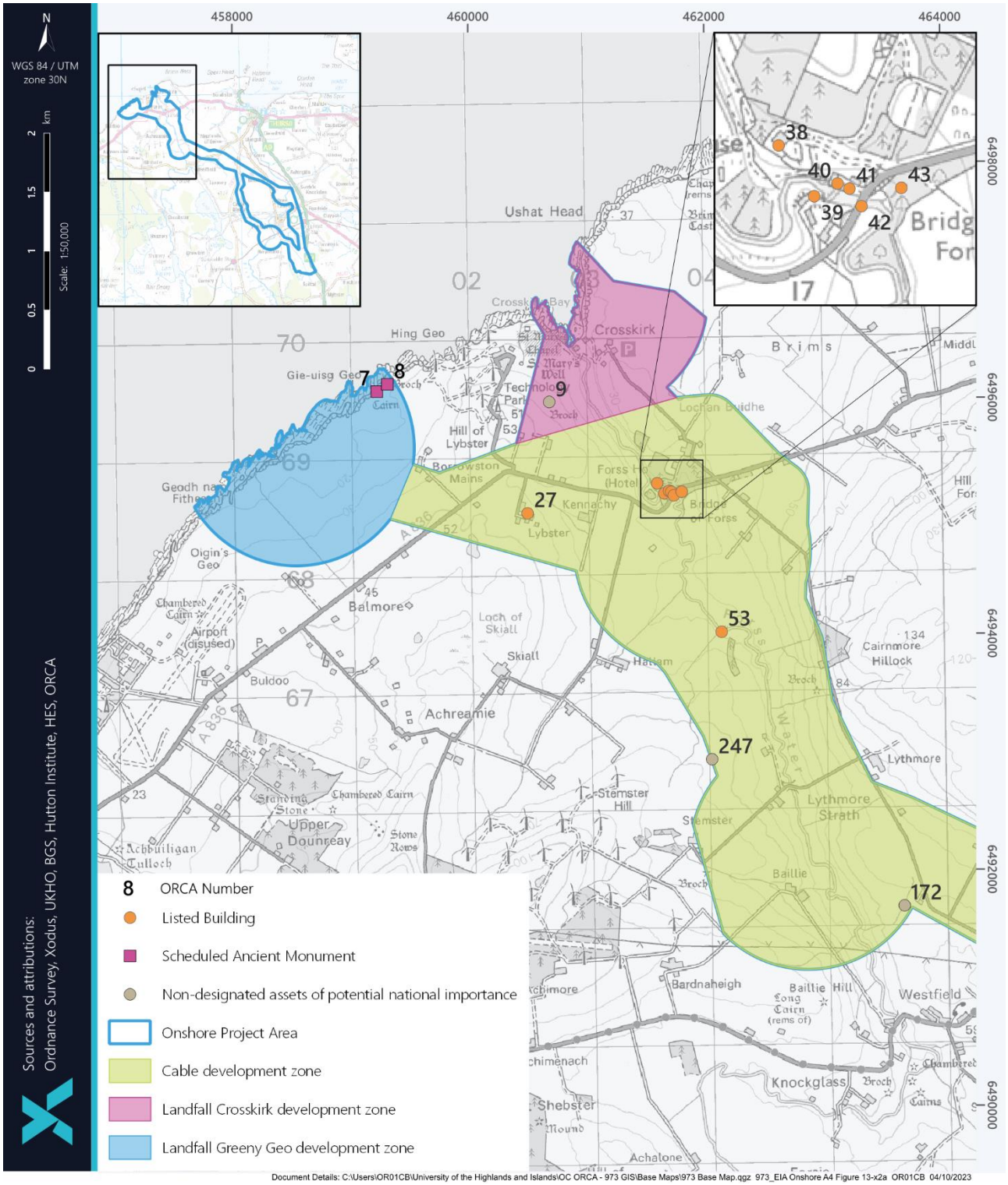

Figure 13-23 Historic environment assets that will be avoided by the onshore Project (north)

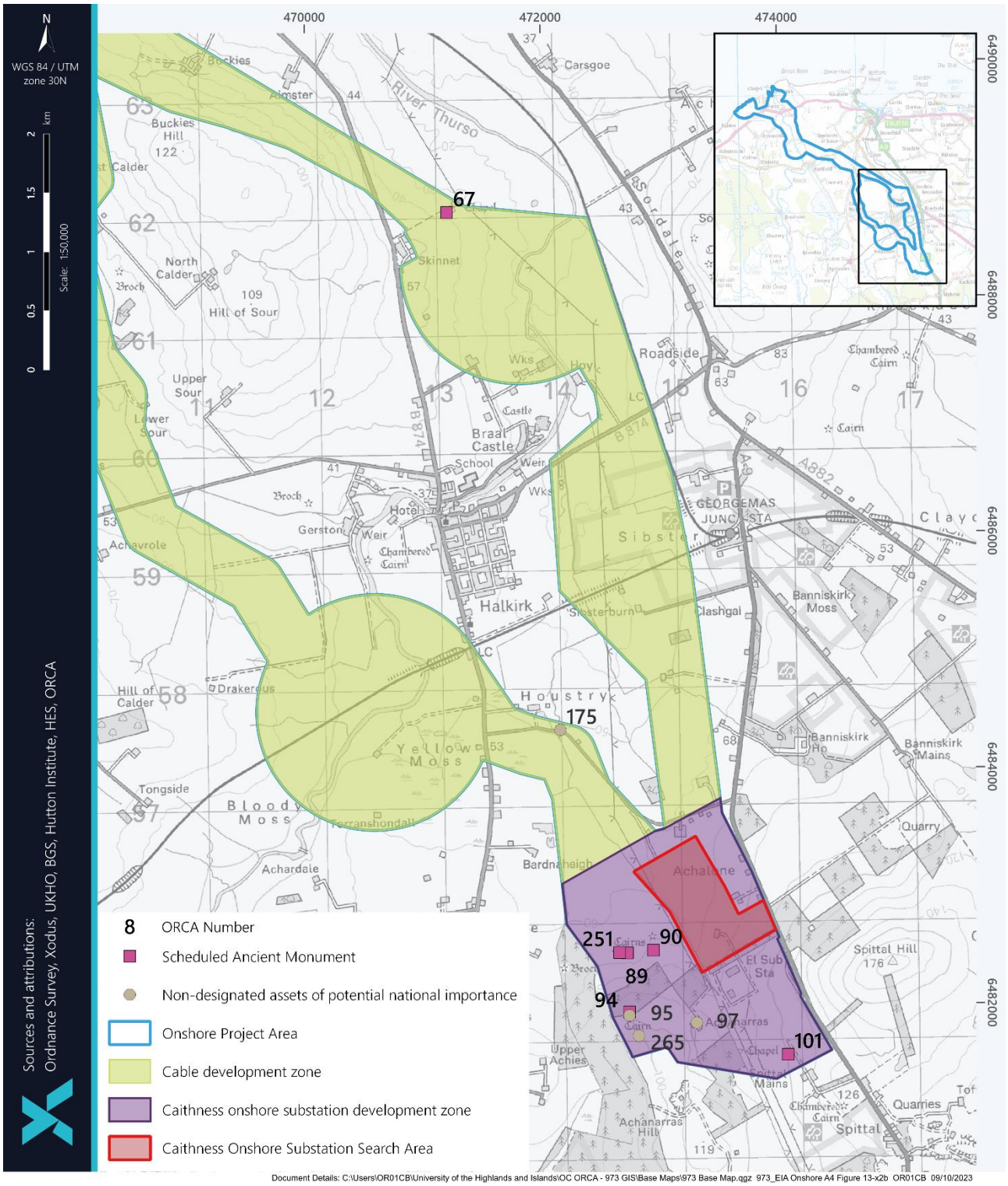

Figure 13-24 Historic environment assets that will be avoided by the onshore Project (south)

13.5.5 Worst case scenario

As detailed in chapter 7: EIA methodology, this assessment considers the worst case scenario for the onshore Project parameters which are predicted to result in the greatest environmental impact, known as the 'worst case scenario'. The worst case scenario represents, for any given asset and potential impact on that asset, the design option (or combination of options) that would result in the greatest potential for change.

Given that the worst case scenario is based on the design option (or combination of options) that represents the greatest potential for change, the development of any alternative options within the design parameters will give rise to no worse effects than those assessed in this impact assessment. Table 13-16 presents the worst case scenario for potential impacts on terrestrial archaeology and cultural heritage during construction, operation and maintenance, and decommissioning.

Table 13-16 Worst case scenario specific to terrestrial archaeology and cultural heritage asset impact assessment

POTENTIAL IMPACT	WORST CASE SCENARIO	JUSTIFICATION
Construction and decommissioning		
Loss of or damage to known and unknown onshore historic environment assets **Loss of or damage to unknown onshore historic environment assets** **Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest** **Temporary changes to the setting of historic environment assets**	Horizontal Directional Drilling (HDD) • A maximum of six (five plus one contingency) boreholes will be drilled via HDD from an entry point above Mean High Water Springs (MHWS); and • The borehole diameter will be indicatively 1,219 millimetres (mm) and the temporary HDD compound footprint will be 7,500 m^2. Onshore export cable corridor • A maximum of five onshore export cables buried to a depth of approximately 1 to 1.8 m and laid in a maximum of five trenches each up to 8 m wide at the top and 2 m wide at the bottom, with a working corridor of up to 100 m, from landfall to the onshore substation, a maximum of 33 km. The working corridor will be temporary and reinstated following completion of the cable lay; • Transition Joint Bay (TJB) where offshore export cables transit to onshore. The TJB would either be located wholly at a single location if one landfall is chosen or split over two landfall locations. The TJB dimensions up to 30 m x 6 m x 5 m; and • 288 Cable Joint Bays (CJBs), up to 30 m long x 3 m wide x 2.5 m deep. Onshore substation and construction compound • The onshore substation footprint (including landscaping and Sustainable Drainage Systems (SuDS) allowance) has a footprint of approximately 23.9 hectares (ha); and • The temporary construction compound footprint (including sites offices and carpark) is approximately 62,500 m^2.	The maximum footprint of onshore construction activities, and associated compounds.

POTENTIAL IMPACT	WORST CASE SCENARIO	JUSTIFICATION
	Access roads • Approximately 5 km in length of permanent access tracks will be required at the onshore substation, HDD and other maintenance points. 1.2 km are existing tracks, 2.21 km are existing tracks that require improvements and 1.67 km will be newly installed tracks. • Temporary access tracks (not including haul roads) up to 3,300 m in length at the landfall, the entry and exit points of the horizontal directional drilling (HDD) HDD points and the onshore substation. Lengths are indicative only; and • Where possible, local infrastructure including road networks, farmer tracks and utility access roads will be utilised to minimise the construction of new infrastructure. Temporary bridges/spanning structure will be considered for appropriate locations for haul roads. • At this stage all proposed access tracks are indicative and will be reviewed during Front End Engineering Design (FEED). Construction plant • Construction plant will include excavators, piling rigs, spoil removal vehicles, cranes for the assembly of structures and offloading of equipment, generators and compressors and may also include an on-site concrete batching unit.	
Operation and maintenance		
Loss of or damage to known and unknown onshore historic environment assets **Loss of or damage to unknown onshore historic environment assets** **Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest**	Maintenance • Routine activities on the underground cable system during the operational stage will be regular and ad-hoc visits to the manholes as required for inspection / maintenance purposes; and • Non-routine activities could include repair of damage to cables or replacement of failed cable joint, including recovering the cable / cable joint from its trench and making the necessary repairs, e.g. splicing in a new section, and reburial.	Potential for additional ground disturbance during maintenance activities.

POTENTIAL IMPACT	WORST CASE SCENARIO	JUSTIFICATION
Long-term changes to the setting of onshore historic environment assets that reduces their value	Onshore substation • The full size of development area (including substation screening and bunding) is approximately 239,200 m² (23.9 ha); • Size of onshore substation platform (250 m x 520 m) based on AIS substation design for 'worst case scenario' of largest footprint necessary; • Maximum of 12 substation buildings to allow flexibility; and • Maximum height of 13.5 m based on busbar height for the AIS scenario as this is considered to represent the 'worst case scenario', although a Gas Insulated Structure (GIS) design would require a building height of 14 m (but a smaller footprint).	Negative impacts on setting, where setting contributes to the value of a heritage assets, can reduce the overall asset value.

13.6 Assessment of potential effects

13.6.1 Potential effects during construction

13.6.1.1 Loss of or damage to known onshore historic environment assets

13.6.1.1.1 Scheduled monuments, listed buildings and non-designated assets

During construction, any activities that include ground-breaking works have the potential to result in the damage to or loss of the 328 known historic environment assets within the onshore Project area. The value of these assets ranges between negligible to high, and includes assets of uncertain value. In particular, there are scheduled monuments, listed buildings and non-designated assets of medium and high value that could be of schedulable quality. The embedded mitigation of avoidance of these assets, as listed in Table 13-15, is the primary embedded mitigation, therefore there is no potential for impact. There is also no impact for potential effect on the other known assets of medium, low, negligible or uncertain value.

Evaluation of significance

Taking the medium to high value of certain scheduled monuments, listed buildings and non-designated assets and no magnitude of impact, the overall effect on these assets during construction are considered **negligible** and **not significant** in EIA terms.

For other known assets of medium, low, negligible or uncertain value, the overall effect during construction is also considered **negligible**, and therefore the overall effect is **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Negligible to High, Uncertain	No impact	Negligible

Impact significance - NOT SIGNIFICANT

13.6.1.1.2 Onshore substation construction

The construction of the onshore substation has the potential to result in the loss of five known heritage assets of low and negligible value:

- ORCA 85 - Achalone, an occupied farm building of low value;
- ORCA 234 - the remains of a post-medieval farmstead of low value;
- ORCA 235 - the remains of a post-medieval farm of low value;
- ORCA 131 - the conjectured site of a post-medieval well of negligible value; and
- ORCA 261 - a post-medieval clearance cairn of negligible value.

Impact on low value assets: ORCA 85, 234 and 235

The construction of the onshore substation would remove all of the low value assets (ORCA 85, 234 and 235), resulting in a **high** magnitude of impact.

Evaluation of significance

Taking the low value of assets ORCA 85, 234 and 235 and the high magnitude of impact, the overall effect on these assets during construction are considered **moderate** and **significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Low to negligible	High	Moderate

Impact significance – SIGNIFICANT

Additional secondary mitigation would be developed in consultation with THC HET for the low value assets to appropriately record them prior to construction (ORCA 85, 234 and 235) through the historic building recording process in accordance with standards set out in THC's Standards for Archaeological Work (THC, 2012b). The implementation of these secondary mitigation measures would result in a **low** residual magnitude of impact.

Evaluation of significance (with secondary mitigation)

Taking the low value of assets ORCA 85, 234 and 235 and the low magnitude of impact with secondary mitigation in place, the overall effect on these assets during construction are considered **minor** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Low	Low	Minor

Impact significance - NOT SIGNIFICANT

Impact on negligible value assets: ORCA 131 and 261

The construction of the onshore substation would remove the two negligible value assets (ORCA 131 and 261), resulting in a **high** magnitude of impact.

Evaluation of significance

Taking the negligible value of assets ORCA 131 and 261 and the high magnitude of impact, the overall effect on these assets during construction are considered **minor** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Negligible	High	Minor

Impact significance - NOT SIGNIFICANT

13.6.1.1.3 Permanent access track construction

Of the seven permanent access tracks proposed for construction, two have been identified as having the potential for damage to known historic environment assets, including the track at Crosskirk and the track at Kennachy as detailed below. However, it should be noted that all proposed permanent access tracks are still indicative. They will be reviewed during FEED and where possible sited to avoid direct impact to known historic environment assets.

Track at Crosskirk

The access track is located close to the shore at Crosskirk as shown in Figure 13-25, within an area of known archaeological remains relating to prehistoric settlement and post-medieval agricultural activity. The following historic environment assets have been identified as being affected by the construction of the access track:

- ORCA 19 - the site of a prehistoric (likely Bronze Age) hut circle Crosskirk, that has been assigned medium value;
- ORCA 20 - the remains of a building and kiln of likely post-medieval date, that has been assigned a low value;
- ORCA 24 - a rectangular grass-covered structure of uncertain date and uncertain value; and
- ORCA 184 - the remains of a limekiln of post-medieval date, that has been assigned a low value.

ORCA 19: prehistoric hut circle, Crosskirk – medium value

The access track is located approximately 12 m to the east of the hut circle (ORCA 19), and therefore it is unlikely that the asset would be removed by the track's construction. It is possible, however, that the hut circle and any associated remains could extend into the track's construction footprint and therefore be at risk of damage. Should avoidance of impacts not be possible, the magnitude of impact will potentially be **low to medium.**

Evaluation of significance

Taking the medium value of asset ORCA 19 and the low to medium magnitude of impact, the overall effect on this asset during construction is considered **minor to moderate** and **significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Medium	Low to Medium	Minor to Moderate

Impact significance - SIGNIFICANT

Figure 13-25 Historic environment assets at the indicative Crosskirk permanent access track

Should avoidance of the asset not be possible during construction, additional secondary mitigation of a geophysical survey and evaluation trenching to establish its nature, importance and extent will be required. The results of this would be used to formulate an appropriate mitigation strategy, if one is required based on the results, in consultation with THC HET. The implementation of this secondary mitigation would result in a **negligible** residual magnitude of impact.

Evaluation of significance (with secondary mitigation)

Taking the medium value of asset ORCA 19 and the negligible magnitude of impact with secondary mitigation in place, the overall effect on this asset during construction is considered **minor** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Medium	Negligible	Minor

Impact significance - NOT SIGNIFICANT

ORCA 20 and ORCA 184: post-medieval structures – low value

The access track is located immediately to the east of the post-medieval structures (ORCA 20 and 184) and it is possible they will be removed by construction activities. Should avoidance of impacts not be possible, the magnitude of impact will be **medium to high.**

Evaluation of significance

Taking the low value of assets ORCA 20 and 184 and the medium to high magnitude of impact, the overall effect on these assets during construction is considered **minor to moderate** and **significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Low	Medium to High	Minor to Moderate

Impact significance - SIGNIFICANT

Additional secondary mitigation would be developed in consultation with THC HET to appropriately record the assets through the historic building recording process in accordance with standards set out in THC's Standards for Archaeological Work (THC, 2012b). The implementation of this secondary mitigation would result in a **negligible** residual magnitude of impact.

Evaluation of significance (with secondary mitigation)

Taking the low value of assets ORCA 20 and 184 and the negligible magnitude of impact with secondary mitigation in place, the overall effect on these assets during construction is considered **negligible** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Low	Negligible	Negligible

Impact significance - NOT SIGNIFICANT

ORCA 24: structure of uncertain function and date – uncertain value

The rectangular grass-covered structure of uncertain date and uncertain value is located within the construction footprint of the access track and may be removed by construction activities. Should avoidance of impacts not be possible, the magnitude of impact will be **high.**

Evaluation of significance

Taking the uncertain value of asset ORCA 24 and the high magnitude of impact, the overall effect on this asset during construction is considered **negligible to major** and **significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Uncertain	High	Negligible to Major

Impact significance - SIGNIFICANT

Should avoidance of the asset not be possible, additional secondary mitigation of a geophysical survey and evaluation trenching to establish its nature, importance and extent will be required. The results of this would be used to formulate an appropriate mitigation strategy, if one is required based on the results, in consultation with THC HET. The implementation of this additional mitigation would result in a **negligible to low** residual magnitude of impact.

Evaluation of significance (with secondary mitigation)

Taking the uncertain value of asset ORCA 24 and the negligible to low magnitude of impact with secondary mitigation in place, the overall effect on this asset during construction is considered **negligible to minor** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Uncertain	Negligible to Low	Negligible to Minor

Impact significance - NOT SIGNIFICANT

Access track at Kennachy

The access track is located to the south of the A836 and the Forss House complex of farm steadings and mills (Figure 13-26). It is also located close to Forss Water within an area of improved agricultural land. However, it should be noted that all proposed permanent access tracks are still indicative. They will be reviewed during FEED and where possible sited to avoid direct impact to known historic environment assets.

There is a single known historic environment asset within the footprint of the access track:

- ORCA 168, the ruins of a post-medieval building, that has been assigned a low value.

The access track is located on the site of a post-medieval building, and it would be removed by construction. Should avoidance of impacts not be possible, the magnitude of impact will be **high.**

Evaluation of significance

Taking the low value of asset ORCA 168 and the high magnitude of impact, the overall effect on this asset during construction is considered **moderate** and **significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Low	High	Moderate

Impact significance - SIGNIFICANT

Additional secondary mitigation would be developed in consultation with THC HET to appropriately record the asset through the historic building recording process in accordance with standards set out in THC's Standards for Archaeological Work (THC, 2012b). The implementation of this additional mitigation would result in a **low** residual magnitude of impact.

Evaluation of significance (with secondary mitigation)

Taking the low value of asset ORCA 168 and the low magnitude of impact with secondary mitigation in place, the overall effect on this asset during construction is considered **minor** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Low	Low	Minor

Impact significance - NOT SIGNIFICANT

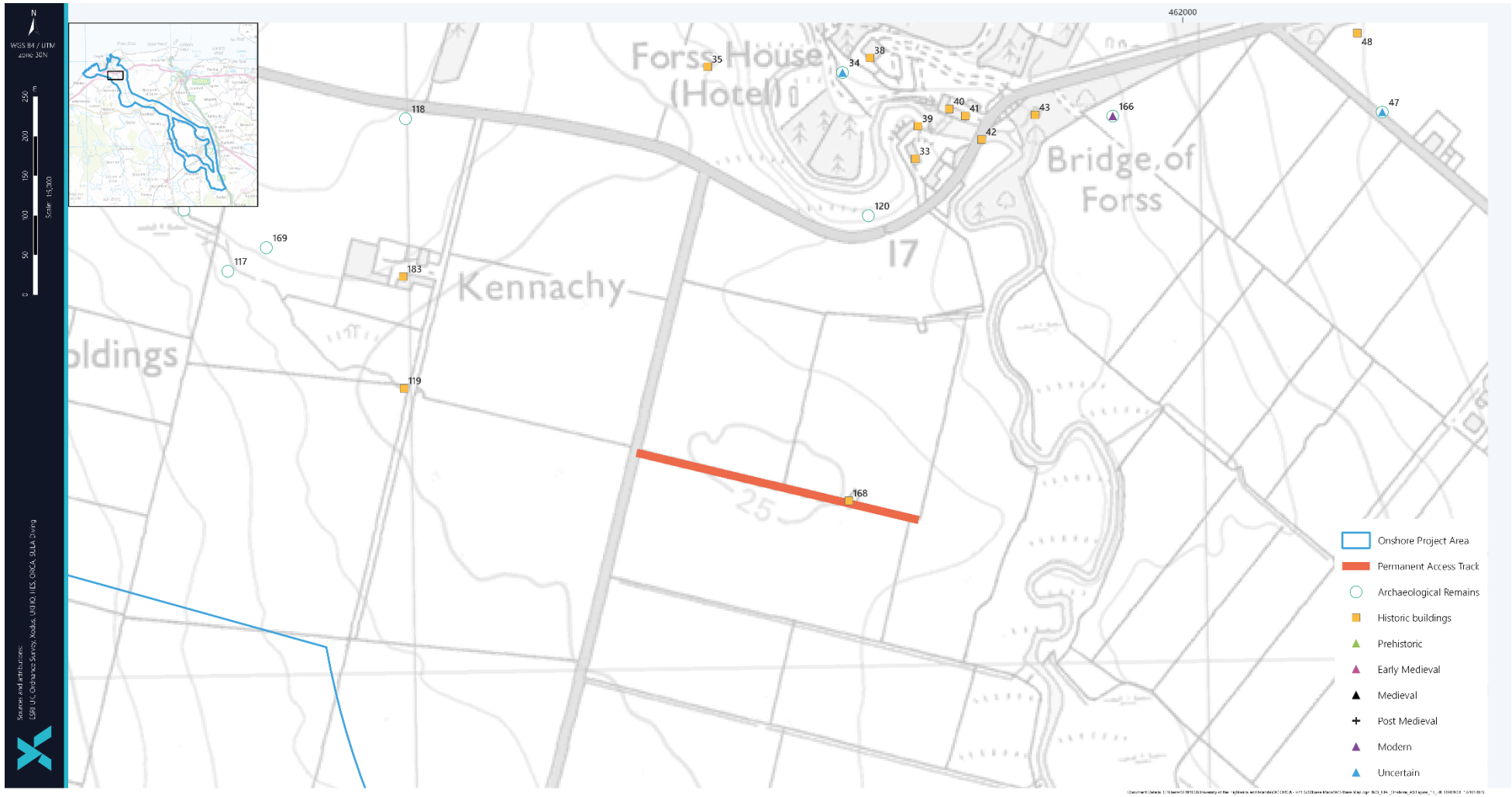

Figure 13-26 Historic environment assets at the indicative Kennachy permanent access track

13.6.1.2 Loss of or damage to unknown onshore historic environment assets

The risk of unknown heritage assets being present within the onshore Project area has been reduced because of the desk-based survey and walkover survey covering the onshore Project area. In addition, the archaeological watching briefs that have been undertaken have not identified any features or remains of archaeological interest, although areas with potential for palaeoenvironmental evidence have been identified where peat was encountered during watching briefs and on-site investigations (OWPL, 2023).

13.6.1.2.1 Areas of archaeological potential

Due to the survey work undertaken, the likelihood of the presence and impact on unknown archaeological remains within areas that have been subject to post-medieval and modern agricultural activity and improvement is negligible (as outlined in section 13.4.4.4.6 and shown on Figure 13-9 to Figure 13-11).

Within areas of peat and alluvial deposits, and areas of land that have not been extensively disturbed by agricultural or other development, there is a higher potential for the survival of unknown archaeological remains, particularly relating to prehistoric settlement and funerary activities, as well as for deposits of palaeoenvironmental interest. Within these areas the likelihood of the presence and impact on unknown historic environment assets is considered low to medium.

Where unknown archaeological remains, and deposits of palaeoenvironmental interest are encountered these could potentially range in value from **negligible to high**.

Evaluation of significance

Taking the negligible to high value of unknown assets and the negligible to medium magnitude of impact, the overall effect on these assets during construction is considered **negligible to moderate** and **significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Negligible to High	Negligible to medium	Negligible to Moderate
Impact significance - SIGNIFICANT		

Depending on the final design and construction methodologies employed across the onshore Project, the risk of potential significant impacts would be reduced by additional secondary mitigation of conducting geophysical surveys and evaluation trenching (both targeted on geophysical survey results and within apparent blank areas) over areas that will be subject to ground-breaking works to identify the nature, importance and extent of any archaeology.

The results of this additional secondary mitigation will then be used to formulate appropriate management or mitigation strategies in consultation with THC HET. The implementation of this additional mitigation would result in a negligible residual magnitude of impact.

Evaluation of significance (with secondary mitigation)

Taking the negligible to high value of unknown assets and the negligible magnitude of impact with secondary mitigation in place, the overall effect on this asset during construction is considered **negligible to minor** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Negligible to High	Negligible	Negligible to Minor

Impact significance - NOT SIGNIFICANT

13.6.1.3 Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest

Deposits of palaeoenvironmental interest are generally considered to have a moderate or high value. Three areas of peat have been identified within three site investigation trial pits in the onshore Project area (see Figure 13-9 to Figure 13-11), and there are also areas of alluvial deposits across the area as well. The remaining trial pits comprise snapshots rather than 100% coverage, so it is not possible to eliminate the risk of similar peat deposits being present. Deposits of geoarchaeological interest could be present within areas of peat and alluvium, close to rivers.

Site investigations within the area of the onshore substation did not encounter any peat or alluvium deposits, and it is considered that the likelihood and magnitude of impacts is **negligible**.

Evaluation of significance

Taking the moderate to high value of deposits of palaeoenvironmental or geoarchaeological interest and the negligible magnitude of impact, the overall effect on these interests during construction at the onshore substation is considered **negligible** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Moderate to High	Negligible	Negligible

Impact significance - NOT SIGNIFICANT

13.6.1.4 Temporary changes to the setting of scheduled monuments and listed buildings

The construction of the onshore Project could cause temporary changes on the setting of onshore historic environment assets, temporarily affecting the way in which the asset is understood, appreciated and experienced, and thus the significance of the asset, albeit temporary and where the asset derives significance from its setting.

Potential temporary changes on the setting of assets could be caused by the presence and movement of construction plant, spoil heaps, site compounds and associated infrastructure, temporary gantries and construction areas within

areas in proximity to scheduled monuments and listed buildings. Where this is the case, there could be temporary visual impacts on the assets of high value, the magnitude of the impacts could be **negligible to minor.**

Evaluation of significance

Taking the high value of assets and the negligible to minor magnitude of impact, the overall effect on the setting of scheduled monuments and listed buildings is considered **minor** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
High	Negligible to Minor	Minor

Impact significance - NOT SIGNIFICANT

Although the consequence is considered minor, the assets that could potentially be impacted are scheduled monuments, therefore additional specific requirements for the historic environment will be included within the Archaeology Management Plan which will be developed post-consent. Dependant on the final design of the onshore Project, mitigation measures could include screening of construction related activities and infrastructure from affected historic environment assets, as well as the provision of noise baffling, dust reduction measures where required; and ensuring that historic environment assets close to construction related activities and infrastructure are protected from accidental damage.

Evaluation of significance (with secondary mitigation)

Taking the high value of assets and the negligible magnitude of impact with secondary mitigation in place, the overall effect on the setting of scheduled monuments and listed buildings is considered **negligible** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
High	Negligible	Negligible

Impact significance - NOT SIGNIFICANT

13.6.2 Potential effects during operation and maintenance

13.6.2.1 Loss of or damage to known historic environment assets

It is not anticipated that there will be ground-breaking works (e.g. for cable repair) outwith that already disturbed during construction for any of the developments that overlap with the onshore Project, on historic environment assets of negligible to medium value. Therefore, there is no potential for impact.

Evaluation of significance

Taking the negligible to medium value of known historic environment assets and no magnitude of impact, the overall effect on these assets during operation and maintenance are considered **negligible** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Negligible to Medium	No impact	Negligible

Impact significance - NOT SIGNIFICANT

13.6.2.2 Loss of or damage to unknown historic environment assets

The risk of unknown historic environment assets being present in the onshore Project area has been much reduced because of the desk-based study, walkover survey and the watching briefs conducted within the onshore Project area. It is never possible to eliminate the risk entirely shown by the presence of archaeological features within areas of land that have not been disturbed by previous development, and the value of archaeological features could vary from negligible to high.

It is not anticipated that there will be ground-breaking works (e.g. for cable repair) outwith that already disturbed during construction for any of the developments that overlap with the onshore Project. Therefore, there is no potential for impact.

Evaluation of significance

Taking the negligible to high value of unknown historic environment assets and no magnitude of impact, the overall effect on these assets during operation and maintenance are considered **negligible** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Negligible to High	No impact	Negligible

Impact significance - NOT SIGNIFICANT

13.6.2.3 Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest

It is never possible to eliminate the risk of the presence of deposits of palaeoenvironmental interest entirely and the value of these could vary from moderate to high.

It is not anticipated that there will be ground-breaking works (e.g. for cable repair) outwith that already disturbed during construction of the onshore Project. In addition, with the embedded mitigation of the implementation of a PAD to avoid or mitigate accidental impacts and manage any accidental discoveries of archaeological interest means that the magnitude of impact is **negligible**.

Evaluation of significance

Taking the moderate to high value of deposits of palaeoenvironmental or geoarchaeological interest and the negligible magnitude of impact, the overall effect on these interests during operation and maintenance is considered **minor** and **not significant** in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
Moderate to High	Negligible	Minor

Impact significance - NOT SIGNIFICANT

13.6.2.4 Long term changes to the setting of onshore historic environment assets that reduces their value

There is a possibility that the onshore Project could have long-term effects on the setting of an onshore historic environment asset, affecting the way in which the asset is understood, appreciated, and experienced, and thus the significance of the asset. There may also be cumulative effects on the setting with other developments (section 13.7).

As assessment of the potential impact from the substation element of the onshore Project has been undertaken on three scheduled monuments that were identified as requiring assessment in consultation with HES and THC HET. The assets comprise two prehistoric (likely Neolithic) cairns (ORCA 89 and 251) and a prehistoric hut circle (ORCA 90), and their locations are shown on Figure 13-3. Given their proximity to each other, and intervisibility, these assets have been considered as a group for the purposes of the setting impact assessment. None of the monuments survives above ground to an extent where they are clearly visible, however they are located within open heathland, and retain visual and temporal links with each other.

13.6.2.4.1 Description of modern setting

The group of scheduled monuments lies at around 65 m Ordnance Datum (OD) within open, heathland on the lower northern slopes of Achlachan Hill, and surrounded to the north, east and west by Bloody Moss, Yellow Moss and Houstry, with clear views towards Spittal Hill beyond the A9 to the east.

There is modern development to the south-east in the form of the SHET-L Spittal substation with associated overhead pylons and the A9 road; open views to the north and the modern woodland plantation at Achlachan Moss (founded in the late 1990s) dominates views to the west and south (see Figure 13-27) taken from ORCA 251 looking south-west.

The position of the monuments within heathland preserves part of the principal element of their original setting which remained largely open until the late 1990s when the Achlachan plantation was founded, and today retains unimpeded views to the north (see Figure 13-28) from Achlachan Moss forest looking north towards Halkirk over the monument location.

The monument group is located within an open area of unimproved heathland, and their setting, would have allowed for 360-degree views of the surrounding landscape, and there would have been views between the two contemporary Neolithic monuments (ORCA 89 and 251) as well as views to The Shean (ORCA 94) to the south and

a likely cairn to the east (ORCA 91). The Bronze Age hut circle (ORCA 90) would have had views to other settlement sites in the surrounding area, such as the nearby hut circle sites at Achlure (ORCA 88), Achanarras Hill (ORCA 95) and close to The Shean (ORCA 94). The sites are therefore located within an area of prehistoric activity that is also within a more recent farming landscape with the existing SHET-L Spittal substation and associated overhead pylons running parallel to the A9.

Figure 13-27 View south-west towards Achlachan Moss forest, taken from ORCA 251

Figure 13-28 View north towards Halkirk, overlooking ORCA 89, 90 and 251. Photo taken from Achlachan Moss forest

13.6.2.4.2 Contribution of setting to the value of the asset

Views from within, and into, the assets are available from the north and west, and from the perimeters of the Achlachan forest. The immediate setting of the assets includes visual links between the monument group, although visual links between other assets of contemporary dates (including The Shean to the south) have been obscured by modern woodland plantations. The surrounding unimproved heathland therefore provides an important contribution to the setting of the monuments as it preserves an element of their original setting, particularly in views to the north-east, north and north-west, albeit one that has been partially degraded by modern development.

As all three scheduled monuments have a high heritage value and a medium contribution of setting, the group of monuments have a medium sensitivity to change.

13.6.2.4.3 The effect of the onshore Project on the value of the asset

The onshore substation will be located below the scheduled monument group, and views between the assets, and the open views to the north-west, north and north-east will not be affected. With embedded mitigation in place through the provision of planting and bunding, the substation will blend into the surrounding landscape to the east, with no effect on the key intervisibility between the monuments or views towards the north and east. It should be noted that until the planting reaches maturity at Year 15 (as outlined in section 13.5.4.2), the onshore substation will be visible from the monument group (see Onshore EIA Report, SS16: LVIA – Viewpoint assessment and Onshore EIA Report, SS19: Terrestrial archaeology onshore setting supporting visualisations), and there will therefore be a temporary impact on the views from the monuments to the east.

Evaluation of significance

Taking the high value of the three historic environment assets (Achlure (ORCA 88), Achanarras Hill (ORCA 95) and close to The Shean (ORCA 94)) and the low magnitude of impact this would be considered a moderate effect. However, professional judgement indicates that the resulting significance of effect is minor since the effect will be temporary and does not impact the integrity of the setting of the monument group, the heritage value of the assets, or the understanding, appreciation or experience of the assets. It is therefore considered not significant in EIA terms.

VALUE	MAGNITUDE OF IMPACTS	CONSEQUENCE
High	Low	Minor

Impact significance – NOT SIGNIFICANT

13.6.3 Potential effects during decommissioning

In the absence of detailed information regarding decommissioning works, the impacts during the decommissioning of the onshore Project are considered analogous with, or likely less than, those of the construction stage.

Decommissioning operations will be based on strategies that minimise the environmental impact and maximise efforts to recycle materials where possible and will be developed in consultation with the local authorities. The preference

will be to remove infrastructure where possible, however the impact of removal will be assessed against environmental impacts. Whilst the detail of the decommissioning strategy is yet to be established, this assessment is based on the decommissioning strategy proposed in Table 5-7 of chapter 5: Project description, which is as close to full removal as possible, whilst recognising that this is subject to assessments and consultation closer to the time of decommissioning. It is expected that decommissioning follows a reverse order of the installation activities with some infrastructure potentially left *in situ*, therefore lessening the impact on the land as there is no requirement for intrusive works. As the landscape bunds and proposed planting will be mature at the time of decommissioning, it is expected these will be retained.

For the onshore export cables, the impacts would be localised to the areas where cables are pulled and removed, and/or all aspects of the substation would be dismantled and removed, both resulting in very localised impacts that are broadly comparable with those identified for the construction stage.

Throughout the operational and construction stages, new and forthcoming legislation and policies would be acknowledged and adhered to, supporting, and guiding the decommissioning process. A Decommissioning Restoration and Aftercare Plan will be prepared prior to decommissioning which will include a financial guarantee to secure decommissioning and site restoration. Decommissioning will be undertaken in accordance with applicable guidance at the relevant time. As per the embedded mitigation measures the Project will seek to maximise recycling where possible of components which are recovered to ensure sustainable decommissioning. As such, it would be expected that any potential impact would not be significant.

The overall impact on terrestrial archaeology and cultural heritage during decommissioning is therefore considered to be, at worst, minor and not significant in EIA terms, in line with the impacts assessed for the construction stage.

13.6.4 Summary of potential effects

A summary of the outcomes of the assessment of potential effects from the construction, operation and maintenance and decommissioning of the onshore Project is provided in Table 13-17.

Table 13-17 Summary of potential effects

POTENTIAL EFFECT	ASSET	VALUE OF ASSET	MAGNITUDE OF IMPACTS	CONSEQUENCE (SIGNIFICANCE OF EFFECT)	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT)
Construction and decommissioning[4]						
Impact on scheduled monuments, listed buildings and non-designated assets of medium and high value	ORCA 7, 8, 9, 27, 38, 39, 40, 41, 42, 43, 53, 67, 89, 90, 94, 95, 97, 101, 172, 175, 247, 251, 265	Negligible to High, Uncertain	No impact	Negligible (not significant)	None required above embedded mitigation measures.	Negligible (not significant)
Impact of substation construction on known historic environment assets of low value	ORCA 85, 234, 235	Low	High	Moderate (significant)	Historic building recording in accordance with THC's standards for archaeological work.	Minor (not significant)
Impact of substation construction on known historic environment assets of negligible value	ORCA 131, 261	Negligible	High	Minor (not significant)	None required above embedded mitigation measures.	Minor (not significant)

[4] In the absence of detailed information regarding decommissioning works, and unless otherwise stated, the impacts during decommissioning of the onshore Project are considered analogous with, or likely less than, those of the construction stage.

POTENTIAL EFFECT	ASSET	VALUE OF ASSET	MAGNITUDE OF IMPACTS	CONSEQUENCE (SIGNIFICANCE OF EFFECT)	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT)
Impact of permanent access track construction at Crosskirk (indicative) on known historic environment asset of medium value	ORCA 19	Medium	Low to Medium	Minor to Moderate (significant)	Phased programme of archaeological evaluation and mitigation in accordance with THC's standards for archaeological work.	Minor (not significant)
Impact of permanent access track construction at Crosskirk (indicative) on known historic environment assets of low value	ORCA 20, 184	Low	Medium to High	Minor to Moderate (significant)	Historic building recording in accordance with THC's standards for archaeological work.	Negligible (not significant)
Impact of permanent access track construction at Crosskirk (indicative) on known historic environment asset of uncertain value	ORCA 24	Uncertain	High	Negligible to Major (significant)	Phased programme of archaeological evaluation and mitigation in accordance with THC's standards for archaeological work.	Negligible to Minor (not significant)
Impact of permanent access track construction at Kennachy (indicative) on known historic environment asset of low value	ORCA 168	Low	High	Moderate (significant)	Historic building recording in accordance with THC's standards for archaeological work.	Minor (not significant)

POTENTIAL EFFECT	ASSET	VALUE OF ASSET	MAGNITUDE OF IMPACTS	CONSEQUENCE (SIGNIFICANCE OF EFFECT)	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT)
Loss of or damage to unknown historic environment assets	Unknown archaeological remains	Negligible to High	Negligible to Medium	Negligible to Moderate (significant)	Phased programme of archaeological evaluation and mitigation in accordance with THC's standards for archaeological work.	Negligible to Minor (not significant)
Loss of or damage to deposits of palaeoenvironmental and geoarchaeological interest at the substation	Palaeoenvironmental or geoarchaeological interests	Moderate to High	Negligible	Negligible (not significant)	None required above embedded mitigation measures.	Negligible (not significant)
Temporary changes to the setting of onshore historic environment assets that reduces their value	Scheduled monuments and listed buildings	High	Negligible to Minor	Minor (not significant)	Inclusion within Archaeology Management Plan which will be developed post-consent and detail specific measures to reduce temporary impacts on historic environment assets.	Negligible (not significant)
Operation and maintenance						
Loss of or damage to known historic environment assets	Known historic environment assets	Negligible to Medium	No impact	Negligible (not significant)	None required above embedded mitigation measures.	Negligible (not significant)

POTENTIAL EFFECT	ASSET	VALUE OF ASSET	MAGNITUDE OF IMPACTS	CONSEQUENCE (SIGNIFICANCE OF EFFECT)	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT)
Loss of or damage to unknown historic environment assets	Unknown historic environment assets	Negligible to High	No impact	Negligible (not significant)	None required above embedded mitigation measures.	Negligible (not significant)
Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest	Palaeoenvironmental or geoarchaeological interests	Moderate to High	Negligible	Minor (not significant)	None required above embedded mitigation measures.	Minor (not significant)
Long-term changes to the setting of onshore historic environment assets that reduces their value	Benachie cairn and stone circle (ORCA 89), Achanarras Hill North hut circle (ORCA 90) & Achanarras cairn (ORCA 251)	High	Low	Minor (not significant)	None required above embedded mitigation measures.	Minor (not significant)

13.7 Assessment of cumulative effects

13.7.1 Introduction

Potential impacts from the onshore Project have the potential to interact with those from other developments, plans and activities, resulting in cumulative impacts on terrestrial archaeology and cultural heritage assets. The approach to the cumulative effects assessment is described in chapter 7: EIA methodology (see Figure 7-4), detailing the developments considered in relation to the onshore Project area. A summary of the approach is provided below.

The list of relevant developments for inclusion within the cumulative effects assessment is outlined in Table 13-18. This has been informed by a screening exercise, undertaken to identify relevant developments for consideration within the cumulative effects assessments for each topic-specific chapter, based on defined Zones of Influence (ZoI), for which, the following ZoIs have been derived for the terrestrial archaeology and cultural heritage cumulative assessment:

- Direct impacts on historic environment assets:
  - Developments within the onshore Project area.
- In-direct impacts and setting impacts on historic environment assets:
  - Onshore windfarm developments within 10 km of the onshore substation search area; and
  - Large scale developments excluding windfarms e.g. transmission infrastructure sites, within 5 km of the onshore substation search area.

No direct cumulative impacts associated with Forss have been identified, and any cumulative setting impacts associated with Forss and designated historic environment assets in the coastal areas of the proposed development have been considered in the Offshore assessment.

Table 13-18 List of developments considered for the terrestrial archaeology and cultural heritage cumulative impact assessment

LOCATION	DEVELOPMENT TYPE	DEVELOPMENT NAME	DISTANCE FROM ONSHORE PROJECT AREA (KM)	DISTANCE FROM ONSHORE SUBSTATION SEARCH AREA (KM)	STATUS	CONFIDENCE[5]
Corsback, Caithness	Onshore windfarm	Corsback Hill Windfarm (22/00790/SCO)	6.2	7.6	Pre-application (scoping)	Low

[5] *Confidence ratings have been applied to each cumulative development where: 'Low' = pre-application or application, 'Medium' = consented and 'High' = under construction or operational.*

LOCATION	DEVELOPMENT TYPE	DEVELOPMENT NAME	DISTANCE FROM ONSHORE PROJECT AREA (KM)	DISTANCE FROM ONSHORE SUBSTATION SEARCH AREA (KM)	STATUS	CONFIDENCE[5]
Mybster, Caithness	Onshore windfarm	Loch Toftingall Windfarm (19/02384/SCOP)	3.28	4.37	Pre-application (scoping)	Low
Westerdale, Caithness	Onshore windfarm	Tormsdale Windfarm (19/03045/SCOP)	4.75	5.54	Pre-application (scoping)	Low
West Watten, Caithness	Onshore windfarm	Watten windfarm (22/02644/SCOP)	5	6.1	Pre-application (scoping)	Low
Spittal, Caithness	Transmission infrastructure – substation plant	Electricity Supply Board (ESB) Asset Development Synchronous Compensator (20/05118/FUL)	0	0	Application	Low
Spittal, Caithness	Transmission infrastructure - cables	High Voltage underground Spittal Synchronous Compensator Grid Connection (22/00016/FUL)	0	0.24	Consented	Medium

The methodology for direct and indirect cumulative effects on onshore historic environment assets is the same as the process outlined in section 13.5, identifying if there may be a greater magnitude of impact and consequence derived from the combination of the overall impact of a series of developments. In terms of assessing cumulative impacts on the setting of onshore historic environment assets, cumulative impacts are derived from the combination of the overall impact of a series of developments or from the combination of different environmental impacts.

A cumulative impact on setting may result from different developments within a single view, or as seen when looking from different directions from a single viewpoint, or the sequential viewing of multiple developments when moving through the setting of one or more cultural heritage assets. The significance of cumulative effects has been assessed based on the value of the historic environment asset and its setting, and the magnitude of impacts expected to occur within the setting. The magnitude of impacts is based on:

- The scale of change to the setting;

- Proximity of the onshore Project to other developments;
- Whether the developments integrate or contrast within the existing landscape; and
- Whether the onshore Project appears as an extension to another development or introduces a new aspect of the view.

The magnitude of cumulative impact on the setting of a historic environment assets is assessed using the criteria set out in Table 13-19.

Table 13-19 Magnitude of cumulative impact on the setting of a historic environment asset criteria

MAGNITUDE OF IMPACT	CRITERIA
High	Onshore Project is the last in a number of developments that finally results in a complete loss of asset, or physical evidence fundamental to the historic character and integrity of the site, which would result in the complete loss of physical integrity. Onshore Project would be visually prominent and visible along with other prominent developments within the setting / landscape. Onshore Project removes last or key link between asset and original setting and removes integrity of setting. Onshore Project and additional developments visible in multiple directions creating a feeling of being surrounded, removing a sense of place.
Medium	Onshore Project is the last in a number of developments that finally results in the loss of an important part of the site or some important features and evidence, but not areas or features fundamental to its historic character and integrity. The integrity of the site would be affected, but key physical relationships would not be lost. Onshore Project would add to the successive or simultaneous visibility of other developments making them seem larger and more spread out within the landscape setting. Onshore Project interrupts but does not sever links between asset and setting, retaining the integrity of setting. Developments would be visible in two directions within the onshore Project in one of these views.
Low	Onshore Project along with other developments would not affect the main features of the asset. The historic integrity of the asset would not be significantly affected. Onshore Project will not add to the successive visibility with other developments. Onshore Project does not interrupt links between asset and setting, with no effect on the integrity of setting. Developments would be visible in only one direction within the onshore Project in this view.
Negligible	Onshore Project along with other developments would be confined to a relatively small, peripheral and/or unimportant part of the asset. The integrity of the asset, or the quality of the surviving evidence would not be affected. Onshore Project is the only one in the setting, thus no cumulative effect (although there may still be significant direct or indirect effects).

MAGNITUDE OF IMPACT	CRITERIA
Unknown	Onshore Project along with other developments affecting features that have not been fully interpreted would reduce the chance of interpretation in the future, with consequences of uncertain significance. Changes to a setting, where it is uncertain how these contribute to our understanding, appreciation of experience of the asset because it could not or has not been understood or appreciated.
Positive	An enhancement to the baseline condition of the asset. Changes to a setting that improves the relationship with the asset.

The following impacts have been taken forward for the cumulative assessment:

- Construction and decommissioning:
  - Loss of or damage to known historic environment assets;
  - Loss of or damage to unknown historic environment assets; and
  - Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest.
- Operation and maintenance:
  - Loss of or damage to known historic environment assets;
  - Loss of or damage to unknown historic environment assets;
  - Loss of or damage to deposits of palaeoenvironmental interest; and
  - Long-term changes to the setting of historic environment assets that reduces their value.

13.7.2 Cumulative construction and decommissioning effects

13.7.2.1 Loss of or damage to known historic environment assets

The ESB asset development synchronous compensator (hereafter referred to as the Spittal synchronous compensator) and the high voltage underground Spittal compensator grid connection overlap with the boundary of the onshore Project, however as there are no known historic environment assets recorded within their footprint they do not have the potential to result in cumulative damage to or loss of the known historic environment assets within the onshore Project area. Therefore, there is no potential for cumulative impacts on known historic environment assets.

Taking the negligible to high value of these assets and no magnitude of impact, the overall cumulative effect is negligible and not significant in EIA terms.

13.7.2.2 Loss of or damage to unknown historic environment assets

The Spittal synchronous compensator and the high voltage underground Spittal compensator grid connection overlap with the onshore Project area and construction works have the potential to result in cumulative damage to or loss of unknown historic assets, which may range from negligible to high value, within the onshore Project area.

The risk of unknown historic environment assets being present in the onshore Project area has been much reduced because of the desk-based, walkover surveys conducted, and the watching brief conducted within the onshore Project area. The area of the Spittal synchronous compensator is identified by THC HET as an area of archaeological potential (THC, 2021). The Environmental Report for the Spittal synchronous compensator (ESB Asset Development (UK) Ltd, 2020) noted that due to the unobtrusive nature of the groundworks associated with the development, it was unlikely that it would disturb any previously unknown archaeological remains.

Due to this, the likelihood of cumulative impact is considered low. In addition, the embedded mitigation of the implementation of a PAD to avoid or mitigate accidental impacts and manage any accidental discoveries of archaeological interest means that the magnitude of cumulative impact from construction activities is low.

Taking the negligible to high value of these assets and low magnitude of impact, the overall cumulative effect is minor and not significant in EIA terms.

13.7.2.3 Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest

The Spittal synchronous compensator and the high voltage underground Spittal compensator grid connection overlap with the onshore Project area, however they do not have the potential to result in cumulative damage to or loss of deposits of palaeoenvironmental or geoarchaeological interest, which range from moderate to high value, as groundworks associated with their construction will not require significant ground disturbance (ESB Asset Development (UK) Ltd, 2020).

Taking the moderate to high value of palaeoenvironmental or geoarchaeological interests and no magnitude of impact, the overall cumulative effect is negligible and not significant in EIA terms.

13.7.3 Cumulative operation and maintenance effects

13.7.3.1 Loss of or damage to known historic environment assets

Cumulative effects with other developments at or adjacent to the Spittal synchronous compensator and the high voltage underground Spittal compensator grid connection during operations and maintenance works do not have the potential to result in cumulative damage to or loss of known historic environment assets, which range from negligible to high value, within the onshore Project boundary.

Taking the negligible to high value on known historic environment assets and no magnitude of impact, the overall cumulative effect is negligible and not significant in EIA terms.

13.7.3.2 Loss of or damage to unknown historic environment assets

Cumulative effects with other developments at or adjacent to the Spittal synchronous compensator and the high voltage underground Spittal compensator grid connection during operations and maintenance works have the potential to result in cumulative damage to or loss of unknown historic environment assets within the onshore Project boundary.

The risk of unknown historic environment assets being present in the onshore Project area has been much reduced because of the desk-based study, walkover survey and the watching briefs conducted within the onshore Project area. It is never possible to eliminate the risk entirely shown by the presence of archaeological features within areas of land that have not been disturbed by previous development, and the value of archaeological features could vary from negligible to high value.

It is not anticipated that there will be ground-breaking works (e.g. for cable repair) outwith that already disturbed during construction for any of the developments that overlap with the onshore Project area. In addition, the implementation of a PAD to avoid or mitigate accidental impacts and manage any accidental discoveries of archaeological interest means that the magnitude of impact is negligible.

Taking the negligible to high value on unknown historic environment assets and negligible magnitude of impact, the overall cumulative effect is minor and not significant in EIA terms.

13.7.3.3 Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest

Cumulative effects with other developments at or adjacent to the Spittal synchronous compensator and the high voltage underground Spittal compensator grid connection during operations and maintenance works have the potential to result in cumulative damage to deposits of palaeoenvironmental interest within the onshore Project boundary.

It is never possible to eliminate the risk of the presence of deposits of palaeoenvironmental entirely and the value of these could vary from moderate to high value.

It is not anticipated that there will be ground-breaking works (e.g. for cable repair) outwith that already disturbed during construction for any of the developments that overlap with the onshore Project area. In addition, the implementation of a PAD to avoid or mitigate accidental impacts and manage any accidental discoveries of archaeological interest means that the magnitude of impact is negligible.

Taking the moderate to high value of palaeoenvironmental or geoarchaeological interests and negligible magnitude of impact, the overall cumulative effect is minor and not significant in EIA terms.

13.7.3.4 Long-term changes to the setting of historic environment assets that reduces their value

In combination with other developments (see Table 13-18) there is a possibility that the onshore substation could have cumulative long-term effects on the setting of an onshore historic environment asset, affecting the way in which it is understood, appreciated and experienced, and thus the value of the asset can be reduced. The other elements of the onshore Project would in the majority be underground, and where overground would be small-scale (and limited to infrastructure at ground level e.g., manhole covers) in nature. These elements of the onshore Project have therefore not been considered in this part of the assessment.

The onshore substation is located at the southern end of the onshore Project area, in close proximity to three scheduled monuments (ORCA 89, 90 and 251) two of which are likely Neolithic cairns and ritual sites and one which is a Bronze Age hut circle. The onshore substation is located approximately 6 km to the west of the proposed Corsback Hill windfarm, and it is possible that the four proposed Wind Turbine Generators (WTGs) associated with this development could also be seen from the identified scheduled monuments, so it has been included in this assessment.

The Spittal synchronous compensator and the high voltage underground Spittal compensator grid connection would be screened from the scheduled monuments by existing woodland and topography, and the Loch Toftinghall, Tormsdale and Watten windfarms would not be visible from the scheduled monuments or onshore substation and have therefore not been considered in the assessment.

The setting description of the scheduled monuments, Benachie cairn and stone circle (ORCA 89), Achanarras Hill North hut circle (ORCA 90) & Achanarras cairn (ORCA 251), is provided in section 13.6.2.4. Given their proximity to each other, and to the onshore substation, the scheduled monuments have been considered as a group.

All three scheduled monuments have a high heritage value and a high contribution of setting, with a high sensitivity to change in terms of the key views from the assets to the open landscape to the north-west, north, north-east and east. The onshore substation will be partially visible to the east until the mitigation planting around the substation has established, and the WTGs of the Corsback Hill windfarm may potentially be partially visible in the background to the east, albeit at a distance of 6 km, and would likely be screened from view by the bunding with associated planting on the western, eastern and northern edges of the substation.

Taking the high value of the three scheduled monuments and negligible magnitude of impact, the overall cumulative effect is **minor** and **not significant** in EIA terms. However, professional judgement indicates that the resulting consequence and significance of cumulative effect is **negligible** since the effect does not impact the integrity of the setting, the heritage value of the scheduled monuments, or the understanding, appreciation of experience of them, and is therefore **not significant** in EIA terms.

13.7.4 Cumulative decommissioning effects

As there is limited information on the decommissioning of the onshore Project and that of other developments, at present, a thorough assessment of decommissioning cumulative effects has not been undertaken. Nonetheless, it is expected that the cumulative effects are likely to be less than or equal to the construction stage, given the decommissioning will be a largely a reverse process to that of construction. Furthermore, decommissioning of multiple other developments are not expected to occur at the same time as the decommissioning stage of the onshore Project. The removal of the onshore Project would reverse any setting impacts, and the bunding and planting that would remain would be an established and visually non-intrusive element of the landscape. Therefore, no adverse cumulative effects on the setting of historic environment assets have been identified.

A Decommissioning, Restoration and Aftercare Plan will be developed and approved pre-construction to address the principal decommissioning measures for the onshore Project and will be written in accordance with applicable guidance. The Decommissioning, Restoration and Aftercare Plan will detail the environmental management, and

schedule for decommissioning and will be reviewed and updated throughout the lifetime of the onshore Project to account for changing best practices.

13.7.5 Summary of cumulative effects

A summary of the outcomes of the assessment of cumulative effects for the construction, operation and maintenance and decommissioning stages of the onshore Project is provided in Table 13-20.

Table 13-20 Summary of assessment of cumulative effects

POTENTIAL IMPACT	ASSET	VALUE OF ASSET	MAGNITUDE OF IMPACT	CONSEQUENCE (SIGNIFICANCE OF EFFECT)	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT)
Construction and decommissioning[6]						
Loss of or damage to known historic assets	Designated and non-designated historic environment assets	Negligible to High	No impact	Negligible (not significant)	None required above embedded mitigation measures.	Negligible (not significant)
Loss of or damage to unknown historic assets	Unknown historic environment assets	Negligible to High	Low	Minor (not significant)	None required above embedded mitigation measures.	Minor (not significant)
Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest	Potential deposits of palaeoenvironmental or geoarchaeological interest	Moderate to High	No impact	Negligible (not significant)	None required above embedded mitigation measures.	Negligible (not significant)

[6] *In the absence of detailed information regarding decommissioning works, and unless otherwise stated, the impacts during decommissioning of the onshore Project are considered analogous with, or likely less than, those of the construction stage.*

POTENTIAL IMPACT	ASSET	VALUE OF ASSET	MAGNITUDE OF IMPACT	CONSEQUENCE (SIGNIFICANCE OF EFFECT)	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT)
Operation and maintenance						
Loss of or damage to known historic assets	Designated and non-designated historic environment assets	Negligible to High	No impact	Negligible (not significant)	None required above embedded mitigation measures.	Negligible (not significant)
Loss of or damage to unknown historic assets	Unknown historic environment assets	Negligible to High	Negligible	Minor (not significant)	None required above embedded mitigation measures.	Minor (not significant)
Loss of or damage to deposits of palaeoenvironmental or geoarchaeological interest	Potential deposits of palaeoenvironmental or geoarchaeological interest	Moderate to High	Negligible	Minor (not significant)	None required above embedded mitigation measures.	Minor (not significant)
Long-term changes to the setting of historic environment assets that reduces their value	Benachie cairn and stone circle (ORCA 89), Achanarras Hill North hut circle (ORCA 90) & Achanarras cairn (ORCA 251)	High	Negligible	Negligible (not significant)	None required above embedded mitigation measures.	Negligible (not significant)

13.8 Inter-related effects

Inter-related effects are the potential effects of multiple impacts, affecting one asset or a group of assets. Inter-related effects include interactions between the impacts of the different stages of the onshore Project (i.e. interaction of impacts across construction, operation and maintenance and decommissioning), as well as the interaction between impacts on an asset within an onshore Project stage.

This chapter has assessed impacts that are relevant to terrestrial archaeology and cultural heritage assets during construction, operation and maintenance, and decommissioning stages of the onshore Project. Therefore, it is considered that the assessment and conclusions provide a complete and robust assessment of potential impacts relevant to terrestrial archaeology and cultural heritage assets.

13.9 Whole Project assessment

The offshore Project is summarised in chapter 5: Project description and a summary of the effects of the offshore Project is provided in chapter 18: Offshore EIA summary. The offshore aspects of the Project have been considered in relation to the impacts assessed in section 13.6. Considering the entirely terrestrial and extremely localised nature of impacts upon terrestrial archaeology and cultural heritage there is no potential for whole project impacts on the assets identified within this chapter, including those with the marine environment.

13.10 Transboundary effects

There is no potential for transboundary impacts upon terrestrial archaeology and cultural heritage assets due to construction, operation and maintenance and decommissioning of the onshore Project. The potential impacts are localised and will not affect other European Economic Area (EEA) states. Therefore, transboundary effects for terrestrial archaeology and cultural heritage do not need to be considered further.

13.11 Summary of mitigation and monitoring

Secondary mitigation has been proposed to reduce significant effects on historic environment assets that would be wholly or partially removed by the onshore Project. The mitigation comprises the undertaking of historic building recording in relation to historic buildings that would be affected by the onshore Project and phased archaeological evaluation and mitigation in accordance with THC's standards (THC, 2012b) for archaeological work for archaeological remains affected by the onshore Project. This mitigation will be established within design principles and within the Archaeological Management Plan. The Archaeology Management Plan will be secured through a condition attached to the PPP.

This will ensure: *(i) direct impacts on the scheduled monument are avoided; (ii) significant adverse impacts on the integrity of the setting of a scheduled monument area avoided*, and therefore demonstrating compliance with policy 7 in NPF4.

Any monitoring requirements during construction will be detailed in the onshore Written WSI which will underpin the Archaeology Management Plan and will be developed post-consent and agreed in advance with THC HET.

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13.13 Abbreviations

ACRONYM	DEFINITION
AD	Anno Domini
BC	Before Christ
BCE	Before Common Era
BGS	British Geological Survey
CaSPlan	Caithness and Sutherland Local Development Plan
CE	Common Era
CEMP	Construction Environment Management Plan
CIfA	Chartered Institute for Archaeologists
CJB	Cable Joint Bay
CMS	Construction Method Statement
DBA	Desk Based Assessment
EEA	European Economic Area
EIA	Environmental Impact Assessment
ha	Hectares
HDD	Horizontal Directional Drilling
HEPS	Historic Environment Policy Statement for Scotland
HER	Historic Environment Record
HES	Historic Environment Scotland

ACRONYM	DEFINITION
HighARF	Highland Archaeological Research Framework
HLA	Historic Landuse Assessment
HMP	Habitat Management Plan
HwLDP	Highland-wide Local Development Plan
HVAC	High Voltage Alternating Current
IPCC	Intergovernmental Panel on Climate Change
km	Kilometres
LVIA	Landscape and Visual Impact Assessment
m	Metres
MD-LOT	Marine Directorate - Licensing Operations Team
MHWS	Mean High Water Spring
mm	Millimetres
MS-LOT	Marine Scotland - Licensing Operations Team
NPF3 / NPF4	National Planning Framework 3 / National Planning Framework 4
NRHE	National Record of the Historic Environment
NRTE	Naval Reactor Test Establishment
OD	Ordnance Datum
OIC	Orkney Islands Council
OP	Outline plan

ACRONYM	DEFINITION
ORCA	Orkney Research Centre for Archaeology
OS	Ordnance Survey
OWPL	Offshore Wind Power Limited
PAD	Protocol for Archaeological Discoveries
PMP	Peat Management Plan
PPP	Planning Permission in Principle
RAF	Royal Air Force
RLB	Red Line Boundary
SAS	Society of Antiquaries of Scotland
ScARF	Scottish Archaeological Research Framework
SHET-L	Scottish Hydro Electric Transmission plc
SNH	Scottish Natural Heritage (now NatureScot)
SPP	Scottish Planning Policy
SS	Supporting study
SRMP	Soil Resource Management Plan
SuDS	Sustainable Drainage Systems
THC	The Highland Council
THC HET	The Highland Council Historic Environment Team
TJB	Transition Joint Bay

ACRONYM	DEFINITION
UHI	University of the Highlands and Islands
UK	United Kingdom
USB	Universal Serial Bus
WSI	Written Scheme of Investigation
WTG	Wind Turbine Generator
ZOI	Zone of Influence

13.14 Glossary

TERM	DEFINITION
Atlantic Scotland	The northern and western parts of mainland Scotland, the Orkney Islands, the Shetland islands and the Western Isles.
Broch	An Iron Age drystone hollow-walled structure found throughout Atlantic Scotland.
Bronze Age	A period that began approximately 4,500 years ago with the first evidence of copper tools and ended around 2,800 years ago. People continued to build tombs and large stone monuments, and also altered pre-existing Neolithic monuments (often adding burials) and also built hill forts and hut circles/roundhouses.
Cairn	A hand-made pile (or stack) of stones raised for a purpose, usually as a marker or as a burial mound.
Chalcolithic	A period at the start of the Bronze Age, approximately 4,500 years ago, that is marked by the appearance of a range of novelties from the Continent, including amongst others, objects of copper and gold, the Beaker pottery tradition, a funerary tradition featuring individual internment in simple graves or cist-like structures.
Chalybeate spring	Also known as ferruginous waters, these are mineral spring waters containing salts of iron.
Cist	A small stone or timber-built box used to hold the bodies of the dead. Usually contains either a body or ashes.
Devensian Till	Unsorted and unstratified drift, generally deposited directly by and underneath a glacier without subsequent reworking by water from the glacier. It consists of a mix of clay, sand, gravel, and boulders varying widely in size and shape.
Diamicton	A type of siliciclastic sediment and sedimentary rock, sometimes referred to as boulder clay.
Droving	Drovers (those droving or driving livestock) accompanied their livestock either on foot or horseback travelling substantial distances across Scotland, and into England. Scotland is crossed by numerous drove roads that were used for this trade, many of which are now no more than tracks, and some lost altogether.
Early medieval	The period lasted from around AD300 to 1093 and was a time of radical change. The period saw the rise and fall of the Picts, the introduction of Christianity, the expansion of Gaelic and the onset of Viking invasions.
Ecclesiastical	Relating to the Christian church or its clergy.

TERM	DEFINITION
Ephemeral	Lasting for a very short time, the concept of things being transitory, existing only briefly.
Forse Till Member	Diamicton, sandy, silty and clayey, typically dark grey and grey-brown, often weathered and mottled in the upper parts to orange, brown and yellow, cobble and boulder sized-clasts include flagstones, Jurassic and Lower Cretaceous mudstones, siltstone, sandstones and shell fragments.
Funerary	Relating to the treatment and commemoration of the dead.
Ice Age	See 'Pleistocene epoch'.
Iron Age	Following the Bronze Age, the Iron Age began approximately 2,800 years ago (when iron tools first came into use) and ended around 1,600 years ago. At this time, we stop seeing obvious cairns/tombs/cists and start to see new types of house and fort construction which were designed to show their status.
Limestone	A sedimentary rock mainly composed of calcium carbonate, usually in the form of calcite or aragonite.
Medieval	The foundations of modern Scotland were laid in the medieval period starting in 1093 until the start of the 1500s. This was when burghs and parishes, Scots law and Scots coinage, charters and government administration came into being.
Megalithic	Relating to or denoting prehistoric monuments made of or containing large stones.
Mesolithic	Following the Palaeolithic, the Mesolithic period ran from approximately 9,000 to 4,300 years ago. During this period humans spread and reached the far north of Scotland.
Modern	The period from 1901 until the present day.
Neolithic	Following the Neolithic, the Neolithic ran from approximately 6,000 to 4,000 years ago. The period heralded major changes for the local populations, where a reliance on hunting and food gathering took second place to husbandry and cultivation, and seasonal hunting camps were replaced with settlements that were more permanent. The Neolithic is best known for the emergence of constructed monumentality.
Palaeoenvironmental	The organic remains of plants, animals and sediments which are studied in order to examine past environments and human interaction with past environments.
Palaeolithic	A period dating between 16,600 and 13,500 years ago. This period saw the appearance of anatomically modern humans in Britain and is characterised by tool kits largely manufactured on blade blanks and containing projectile points. Often sub-divided into an earlier phase 'Early Upper Palaeolithic' and a later phase 'Later Upper Palaeolithic'.

TERM	DEFINITION
Picts	A group of people who lived north of the Forth-Clyde isthmus in the pre-Viking early medieval period. Where they lived and details of their culture can be inferred from early medieval texts and Pictish stones.
Pleistocene epoch	Often referred to colloquially as the Ice Age, this is the geological epoch that lasted from approximately 2.58 million to 11,700 years ago, spanning the Earth's most recent period of repeated glaciations.
Post-Medieval	Starting in the 16th century AD, this period encompasses the Protestant Reformation, the civil wars of the 17th century, the Union of Parliament in 1707, Jacobite risings, growing involvement in international trade including links to slavery, agricultural improvements and landscape transformation in the 18th and 19th centuries, clearances, crofting formation, urban growth, large-scale industrial projects, railway construction and shipping.
Prehistoric	A term that encompasses the Palaeolithic, Mesolithic, Neolithic, Bronze Age and Iron Age and early medieval periods.
Sandstone	A sedimentary rock composed on sand-sized grains of mineral, rock, or organic material.
Siltstone	A sedimentary rock that is composed mostly of silt.
Souterrain	An underground chamber or passage.
Trysts	An 18th century Scottish cattle market, the best-known example being the Falkirk Tryst which attracted drovers from across Scotland and northern England.