5. LANDSCAPE AND VISUAL APPRAISAL

5.1 Introduction

This chapter presents an appraisal of predicted landscape and visual impacts arising as a result of the proposed 132 kV wood pole overhead line (OHL) to connect the consented Stranoch Wind Farm and the consented Chirmorie Wind Farm to an existing substation at Mark Hill, located approximately 4 km north of Barrhill in South Ayrshire (see Figure 5.1). The aim of the Landscape and Visual Appraisal (LVA) is to assess the potential impacts of the proposed development on the landscape and visual resource of the site and surrounding area.

The assessment has been carried out by Ramboll's team of Chartered Landscape Architects and is accompanied by the following figures:

- Figure 5.1: Site Location and LVA Study Area;
- Figure 5.2: Zone of Theoretical Visibility (ZTV);
- Figure 5.3: Topography;
- Figure 5.4: NatureScot Landscape Character Types within Study Area;
- Figure 5.5: Landscape Designations and Classifications;
- Figure 5.6: Viewpoint Locations;
- Figure 5.7: Visual Receptors; and
- Figures 5.8 – 5.15: Viewpoint Baseline Photographs and Visualisations.

Figures are referenced in text where relevant.

5.2 Methodology

5.2.1 Scope of Appraisal

The Landscape and Visual Appraisal (LVA) considers impacts on:

- Landscape fabric, caused by changes to the physical form and constituents of the landscape;
- Landscape character, caused by changes to key characteristics and qualities of the landscape; and
- Visual amenity, caused by changes to the visual composition of views and the wider visual resource.

The LVA is based on a double 'H' wood pole overhead line carrying a single circuit (3 conductors) in a flat (horizontal) formation, assuming a typical pole height of 12.1 m (including insulators). In addition, the assessors have taken into account that the maximum vertical height of wood pole above ground ILA is 15.1 m and pole heights will vary in certain locations in order to accommodate topographic variation.

The proposed development is described in Chapter 2: Development Description

5.2.2 Consultation

Consultation was undertaken with South Ayrshire Council (SAC) and Dumfries and Galloway Council (DGC) by the Scottish Government's Energy Consents Unit as part of the EIA Screening Request process. Responses from both Councils agreed that EIA was not required.

In addition, SAC requested the inclusion of two LVA viewpoint (VP) locations:

- C72 in the vicinity of Council boundary, looking North West

- C72 north of Chirmorie Farm (midway between Chirmorie and farm track on the west side of the public road leading under the railway)

These two viewpoints have been included in the viewpoint assessment presented in Section 5.6.13 and are shown on Figure 5.6.

5.2.3 Preliminary Visual Analysis

A preliminary visual analysis was carried out to identify landscape and visual receptors which are predicted to have theoretical visibility of the proposed development based on the size, scale and alignment of the proposed development, based on the Zone of Theoretical Visibility (ZTV) presented in Figure 5.2.

5.3 Appraisal Methodology

The purpose of the LVA is to identify, predict and evaluate potential impacts associated with the proposed development. Wherever possible, identified impacts are quantified, however the nature of LVA requires interpretation by professional judgement. In order to provide a level of consistency to the assessment, the prediction of magnitude of impact and assessment of the residual landscape and visual impacts have been based on pre-defined criteria.

5.3.1 Guidelines

The LVA accords with guidance provided in:

- Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidance for Landscape and Visual Impact Assessment – Third Edition (GLVIA3);
- The Countryside Agency and Scottish Natural Heritage (2002) Landscape Character Assessment;
- Scottish Natural Heritage and the Countryside Agency (2002) Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity; and
- Landscape Institute (2019) Technical Guidance Note 06/2019: Visual Representation of Development Proposals[1]

5.3.2 Data

The LVA was informed by data gathered from the following sources:

- OS Terrain 5m;
- Ordnance Survey mapping (1:25,000; 1:50,000);
- Carol Anderson Landscape Associates. (July 2013) South Ayrshire Landscape Wind Energy Capacity Study: Appendix Report[2]. SAC;
- Dumfries and Galloway Council (June 2017) Landscape Wind Capacity Study and Appendix Report[2]. DGC;
- Field surveys in 2019;
- Commercially available aerial photography;
- Computer generated theoretical ZTV (bare ground); and
- Site photography.

[1] Institute, L., 2019. Visual Representation of Development Proposals. 1st ed. Landscape Institute.
[2] This report has been used insofar as the baseline description of the landscape, including the classification of landscape character types.

5.3.3 Measurements

Receptor distances from the proposed development are calculated on the basis of the nearest pole location. Where measurements are given between landscape character types, designated areas, routes or settlements etc, such measurements relate to the nearest part of such areas to the nearest part of the proposed development.

5.3.4 Study Area

Defining the study area takes into account the nature of the topography, the pattern of visibility shown by the ZTV, the presence of existing vegetation and the pattern of settlement and other visual receptors such as residents, workers and those engaging in recreation in the area surrounding the proposed development.

For this appraisal, the study area extends to 2 km from the proposed development (see Figure 5.1). The appraisal only considers those areas within the study area which have theoretical visibility of the proposed development.

5.3.5 Assumptions and Limitations to the Appraisal

This appraisal has assumed that the woodland and shelterbelts / roadside vegetation located in the study area would be retained. Any coniferous plantation woodland is anticipated to be on rotational felling cycle (unless otherwise known), and this is taken into consideration in the appraisal.

Access to private properties was not requested as part of the visual assessment of impacts. It is acknowledged the proposed development would be viewed from residential properties located within the study area. Representative views from nearest communities (such as Barrhill) and in areas where scattered residential properties are located have been taken to assess the impact of the change in view for residential receptors in respect of 'community amenity'. The LVA does not include an assessment of impact on private views from individual properties.

5.3.6 Appraisal Process

Baseline

Prior to site work being undertaken, a baseline study was carried out to gain an understanding of the character of the landscape in the immediate and wider area of the proposed development site, identify any areas designated for their landscape and scenic qualities, and to identify key visual receptors most likely to be affected by the proposed development.

The assessment of baseline conditions was undertaken with reference to existing landscape character assessment studies extant within the study area. These studies have been considered and verified on site, and for the purposes of the LVA of the proposed development, the findings have been adopted as defining the baseline landscape character.

The LVA also considers landscape and visual impacts on designated landscapes in the study area, as well as non-designated sensitive landscapes such as Gardens and Designed Landscapes (GDLs) or Wild Land Areas (WLA).

The receptors of visual amenity include the publicly accessible areas including outdoor recreational areas, settlements, roads and the public rights of way.

Visibility Mapping

To assist in evaluating potential landscape and visual impacts arising from the proposed development, ZTVs were generated to identify the potential extent of the proposed development's visibility over the study area.

The ZTV presents the area from which the proposed development may be visible. The ZTV is produced by computer modelling using ArcMap GIS software, and a 5 m digital terrain model (DTM) and was modelled based on the anticipated pole locations. Poles were modelled to reflect the varying heights of each pole.

The resulting ZTV is shown on Figure 5.2, overlaid on OS 1:50,000 mapping to provide an indication of where the proposed development would theoretically be seen from, and which receptors would therefore be affected by views of the works. It should be noted, that the ZTV findings are based on a bare ground terrain model which does not take account of the screening impact of vegetation or built development, nor does it include localised topographical variations or features in topography. This is considered important in respect of the LVA as the area in which the proposed development would be located has a high degree of forestry, tree cover, hedges and riparian vegetation, which serve to restrict intervisibility and potential views of the proposed development. Consequently, visibility would be considerably less than indicated in the ZTV.

Given the inherent limitations of the ZTV, it has only been used as a tool to inform the understanding of the general pattern of visibility of the proposed development. Site work was utilised to verify the findings of the ZTV, thereby gaining an understanding of where screening may be afforded, and where discrepancies are found, these are described in the text. Site work has therefore allowed the assessors develop an understanding of where the proposed development would be visible from.

Site Survey and Fieldwork

Field surveys and site photography were undertaken in October 2019 and October 2020 to identify specific landscape constraints, visual receptors and to verify / supplement data collected in the desk-based baseline appraisal.

All fieldwork was undertaken in late summer/ early autumn. Trees were beginning to lose their leaves however the majority were still in full leaf and therefore conditions were such that the landscape architect was able to determine where an effective level of screening is provided by trees in leaf. This was taken into account in the appraisal, and cognisance was taken of the reduced levels of screening in the winter months when the trees are not in leaf and consideration of this was taken account of in the impact assessment.

Landscape and Landscape Receptors

Landscape receptors include the different landscape character types or areas which may be affected by the proposed development, as well as landscape designations or classifications within the study area.

The ZTV indicates those areas of the landscape which have the potential to be affected (directly or indirectly) by the proposed development. Landscape receptors considered in this appraisal include:

- The landscape of the site;
- Landscape Character Types (LCTs) as they lie within the study area; and
- Designated and classified landscapes within the study area.

Viewpoints and Visual Receptors

Only those receptors with potential for visibility (as indicated by the ZTV) have been considered for inclusion in the visual impact appraisal. Baseline research and field work confirmed the actual visibility of the proposed development and identified those receptors who are likely to be affected by views of the proposed development. These receptors are:

- The settlement of Barrhill;
- Users of the Barrhill to the Martyrs Tomb core pathway (REF SA67)
- Users of the A714, the B7027 and the Gowlands Terrace /C72 road which runs south from Barrhill to Glenluce.
- Passengers travelling along the Glasgow South Western railway line
- Users of the walking route from Barrhill to New Luce (13 miles), follows existing road network

The visual appraisal is illustrated from eight viewpoints (VPs) which have been selected to present typical views from within the study area, illustrating the impacts on viewers from different directions and at different distances. These VPs are listed and described in Table 5.1 and shown on Figure 5.6 and are all publicly accessible. The purpose of the viewpoint appraisal is to ascertain the level of visual impact at specific locations and to help to inform the appraisal of the overall impact of the proposed development on visual amenity.

VP locations include those requested by SAC. In some instances, VPs have been microsited to ensure a worst-case representative view is presented.

Table 5.1: Viewpoint Locations		
VP Ref	**Name** **Approximate Coordinates (x,y)** ***Distance to Proposed Development***	**Description and Reason for Selection**
VP01 See Figure 5.8	VP 1: Core Path to Glenkitten Fell 218405, 572961 *973 m southeast*	Representative of local walkers and other recreation users, at the southern end of the proposed route, within the Water of Luce Valley. Located within the Plateau Moorland (17) LCT.
VP02 See Figure 5.9	VP 2: C72 near SAC border 220467, 575800 *700 m northwest*	A representative view from the C72 local road at the point where road users enter/ exit the SAC authority area. Located within the Plateau Moorlands with Forestry and Wind Farms LCT (18c).
VP03 See Figure 5.10	VP 3: C72 North of Chirmorie Farmhouse 220878, 577227 *500 m east*	Representative of views from the C72 local road prior to entering areas of forestry. Also representative of views in the area of Chirmorrie Farmhouse. Located within the Plateau Moorlands with Forestry and Wind Farms LCT (18c).
VP04 See Figure 5.11	VP 4: C72 south of Barrhill 222562, 581229 *350 m east*	Representative of the C72 local road and recreational users located at an elevated position within the study area. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Duisk River Valley. Located within the Intimate Pastoral Valley (13) LCT.
VP05 See Figure 5.12	VP 5: B7027 near Altercannoch 223974, 581541 *20 m north*	Representative of road users and of the eastern edge of Barrhill where residential properties extend along the B7027. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Duisk River Valley. Located within the Intimate Pastoral Valley (13) LCT.
VP06 See Figure 5.13	VP 6: East Barrhill 223737, 582007 *97 m east*	Representative of views from the local road, from residential properties and of the Duisk River valley landscape. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Duisk River Valley.

Table 5.1: Viewpoint Locations		
VP Ref	**Name** **Approximate Coordinates (x,y)** ***Distance to Proposed Development***	**Description and Reason for Selection**
		Located within the Intimate Pastoral Valley (13) LCT.
VP07 See Figure 5.14	VP 7: A714 224396, 581616 *800 m east*	A representative view from an elevated position within the study area, providing panoramic views from the A714. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Duisk River Valley. Located within the Intimate Pastoral Valley (13) LCT.
VP08 See Figure 5.15	VP 8: Barrhill North 223666, 583231 *636 m east*	A representative view from an elevated position within the study area, providing panoramic views from the forest track. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Duisk River Valley. Located within the Intimate Pastoral Valley (13) LCT.

Mitigation

Mitigation measures which have been developed to reduce, remedy or avoid the impacts arising as a result of the proposed development are presented in Tables 5.5 and 5.6 of this chapter.

Residual Effects

As identified in GLVIA3, effects are identified by establishing and describing the changes to the landscape and visual baseline resulting from the proposed development and the resulting effects on individual landscape or visual receptors. The assessment of effects is derived from a comparison of the sensitivity of receptors and the magnitude of impact anticipated as a result of the construction and operation of the proposed development, as indicated in Tables 5.6 and 5.7 below.

There is no requirement for a formal EIA to support this application. The appraisal has used the guidance provided by GLVIA3 Statement of Clarification 1/13 on the terminology to be used in non-EIA Landscape and Visual Appraisals:

"In carrying out appraisals, the same principles and process as LVIA may be applied but, in so doing, it is not required to establish whether the effects arising are or are not significant given that the exercise is not being undertaken for EIA purposes. The reason is that should a landscape professional apply LVIA principles and processes in carrying out an appraisal and then go on to determine that certain effects would be likely be significant, given the term 'significant' is enshrined in EIA Regulations, such a judgement could trigger the requirement for a formal EIA.

The emphasis on likely 'significant effects' in formal LVIA stresses the need for an approach that is proportional to the scale of the project that is being assessed and the nature of its likely effects. The same principle – focussing on a proportional approach – also applies to appraisals of landscape and visual impacts outside the formal requirements of EIA."

In line with current guidance contained within GLVIA3, the terms 'significant' and 'not significant' have not been used in this appraisal. The level of impact is assessed through a combination of two considerations – the sensitivity of the receptor (landscape or visual), and the magnitude of impact arising from the development of the proposals, as described above. The levels of impact have been set using the terms none, negligible, minor, moderate, or major in order to quantify the findings of the assessment. There is a gradual, indistinct transition between levels, and the given grade is based on many variables, weighed up by the application of professional judgement and experience, on a case by case basis. Each assessment varies depending on the location, the landscape and visual context and the type of development proposed.

Table 5.2: Indicative Relationship between Sensitivity of Receptor and Magnitude of Impact

Magnitude of Impact	**Sensitivity of Receptor to Impact**			
		High	**Medium**	**Low**
	High	Major	Major/ Moderate	Moderate
	Medium	Major/ Moderate	Moderate	Minor
	Low	Moderate	Minor	Minor/ Negligible
	Negligible	Minor	Minor/ Negligible	Negligible
	None	None	None	None

Illustrative Tools

In addition to the ZTV, figures have been produced to show the location of landscape designations, landscape character areas, VP Locations and Visual Receptors within the study area (see Figures 5.4 – 5.7).

Baseline photography and wirelines which show the proposed development have been prepared for all viewpoints.

Photomontages have been prepared for each VP by combining a wireline of the view of the proposed development with the photograph of the existing view and rendering the image using a model of the proposed development (see Figures 5.8 – 5.15).

It should be noted that, whilst photography is a valuable tool to assist in the visualisation process, it cannot be expected to replicate the actual view or predicted view which would be attained on the ground.

5.3.7 Undertaking the Appraisal

Nature of Impacts

Impacts can be adverse (resulting in the loss or erosion of key characteristics of the landscape and/or view) or beneficial (resulting in an enhancement of improvement to the baseline condition of the landscape and/or view). For the purposes of this assessment impacts are assumed to be adverse unless stated otherwise. It is important to note that mitigation can have an influence on both the degree and nature of impacts during the course of development, and with the maturation of some mitigation measures (e.g. tree/shrub planting which would gradually screen development and strengthen the character, structure and condition of the landscape, offering beneficial outcomes).

The assessment of residual impacts is set out in Tables 5.7 and 5.8 of the LVA. Proposed mitigation measure aimed at impact avoidance, reduction of impacts and/or replication of landscape and visual characteristics elements are outlines in Tables 5.5 and 5.6.

Landscape Sensitivity

The sensitivity of landscape receptors to impact arising from the type of development proposed is defined as high, medium and low and is based on professional interpretation of their value and susceptibility to the type of development proposed.

The value attached to landscape receptors (landscape character) is reflected by landscape designations and the level of importance which they signify. However, landscape designations are not the sole indicator of landscape value. The following factors are also important considerations in ascribing value:

- Landscape quality;
- Scenic quality;
- Rarity;
- Representativeness;
- Conservation interest;
- Recreation value;
- Perceptual aspects; and
- Cultural associations.

Susceptibility to impact concerns the ability of the landscape receptor to accommodate the proposed development without undue negative consequences for the maintenance of the baseline situation and/or the landscape planning policies and strategies.

The susceptibility of landscape character to impact is defined as high, medium or low based on an interpretation of a combination of parameters including:

- The scale and pattern of the landscape and its elements/features;
- The simplicity or complexity of the landscape;
- The nature of skylines;
- Landscape quality or condition;
- Existing land use;
- Visual enclosure/openness of views; and
- The scope for mitigation, which would be in character with the existing landscape.

Sensitivity of Visual Receptors

The sensitivity of visual receptors is defined as high, medium and low based on professional interpretation, combining judgements of their susceptibility to the type of impact or development proposed and the value attached to the particular views. Visual receptors are assessed in terms of both their susceptibility to impact in views and visual amenity and also the value attached to particular views.

The susceptibility of different visual receptors to impact in views and visual amenity is mainly a function of:

- The occupation or activity of people experiencing the view at particular locations; and
- The extent to which their attention or interest may therefore be focused on the views and the visual amenity they experience (and expect) at that particular location.

In relation to the occupation or activity of people experiencing the view at the viewpoint, visual susceptibility is defined as follows:

- High: Residents of dwellings; users of outdoor recreational facilities including strategic recreational footpaths, cycle routes or rights of way, whose attention is focused on the landscape; visitors to cultural/historic assets where views out from the location are key to the enjoyment and experience of the asset, important landscape features with physical, cultural or historic attributes; beauty spots or picnic areas. Travellers on key tourist routes where vehicles are likely to contain passengers who have a particular interest in views of the landscape.
- Medium: General road users, commuters and travellers not primarily focused on the landscape.
- Low: People engaged in outdoor sports or recreation (other than appreciation of the landscape), commercial buildings, and other locations where people's attention may be focused on their work or activity, rather than their surroundings.

5.3.8 Magnitude of Impact

Each of the landscape and visual impacts identified are evaluated in terms of their size or scale, the geographical extent of the area influenced, and their duration and reversibility.

The magnitude of impact arising from the proposed development in respect of landscape character is described as High, Medium, Low, Negligible or None based on the interpretation of a combination of largely quantifiable parameters, as follows:

- The distance of the receptor from the proposed development;
- The extent of existing landscape elements that will be altered/lost
- Adding of new ones;
- The proportion of the total extent of the landscape elements that this represents;
- The degree to which aesthetic or perceptual aspects of the landscape would be altered by removal of existing components or with the addition of new elements;
- The context in which the proposed development would be seen (i.e. similar land uses in the vicinity of the development);
- The geographic area over which the loss of landscape elements will be perceived;
- The alteration of the skyline/altering the vertical scale in relation to the existing landscape features;
- The duration of the impact; and
- The reversibility of the impact.

The criteria utilised in ascribing magnitude of impact in respect of visual amenity is as follows:

- The scale of impact in the view with respect to the loss or addition of features in the view and impacts in its composition, including the proportion of the view occupied by the proposed development;
- The degree of contrast or integration of any new features or impacts in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and textures;
- The nature of the view of the proposed development;
- The relative amount of time over which it will be experienced and whether views will be full, partial or glimpsed;
- The angle of view in relation to the main activity of the receptor;
- The distance of the viewpoint from the proposed development; and
- The extent of the area over which the impacts would be visible.

The magnitude of impact is categorised as follows:

- High: Total loss or considerable alteration to key elements, features or characteristics of the landscape character and/or composition of views. The development is highly prominent or even dominant and could become the defining characteristic of views and landscape character.
- Medium: Represents a notable alteration or loss of key elements, features or characteristics of the landscape character and/or composition of views. The development is prominent, but not dominant. In such circumstances the development may become 'a' defining characteristic of the view of landscape, but not 'the' defining characteristic.
- Low: Constitutes a partial loss to one or more key characteristics of the landscape or views. Localised impacts within an otherwise unaltered landscape or visual context.
- Negligible: Represents a barely discernible loss or alteration to one or more key elements, features or characteristics of the baseline conditions. The underlying landscape character or view composition would be essentially unimpacted.
- None: no discernible impact apparent.

5.3.9 Cumulative Impacts

The purpose of the cumulative impacts assessment is to establish the cumulative impact of the proposed development when considered in conjunction with similar consented or proposed[3] developments within the study area.

A search for other proposed developments of a similar size, scale and/or character to the proposed development was undertaken using the Council's online planning application search tool. All developments identified are consented or currently under construction and have been taken account of within the LVA baseline. No development currently at the planning stage were identified within the study area.

Therefore, no cumulative assessment has been carried out in this LVA.

5.4 Baseline Conditions

5.4.1 Landscape and Landscape Context

Location

The location of the proposed development is shown in Figure 5.1.

The proposed development is situated across the boundary of the South Ayrshire and Dumfries and Galloway authority areas. The alignment commences at the Mark Hill substation in South Ayrshire, and routes south towards the small settlement of Barrhill. The alignment crosses the A714, the Duisk River and B7027 to the south east of the settlement. The alignment then routes south-west across moorland and through Chirmorie Wind Farm (connecting into the Chirmorie Wind Farm substation), generally running parallel with the Glasgow south western railway line and the C72 road. The alignment the crosses the Glasgow South Western railway line and Cross Water of Luce, before continuing in a south-west direction, before turning west and connecting into the Stranoch Wind Farm substation.

The overall proposed alignment is 16 km, which uses a double 'H' wood pole overhead line carrying a 'trident' 132 kV overhead line (OHL).

Topography and Hydrological Features

Figure 5.3 illustrates the topography within the study area. The landscape of the study area is characterised by a broad, gently undulating areas of plateau moorland, intersected to the north by the narrow Duisk Valley. The wider landscape is formed by movement of the Southern Upland Fault (SUF) which runs from Girvan in the south west to Dunbar in the north east, across central and southern Scotland.

General topography patterns in South Ayrshire follow a south west – north east orientation, which lie parallel to the main fault. The Duisk River, which forms a key landscape feature within the study area, contradicts this trend and runs in a south east - north west direction. The Duisk River forms a narrow river valley which cuts through the elevated plateau moorland to the north and south of Barrhill. The valley is bounded to the north by the southern slopes of Craigcannochie Hill and Shentulloch Knowe, and to the south by the gently rising foothills of plateau moorland which rise to high points at Pinwherry Hill and Shiel Hill.

Other minor water features within the study area include the Muck Water in the north, which flows from the summit of Fell Hill to feed into the Duisk River. Steep slopes contain the valley as it descends into the Duisk Valley. A series of lochs are present to the north east of the study area

[3] i.e. subject to a registered planning application.

– Loch Farroch, Near Eyes Stanks and Mill Loch and are fed by minor burns which flow through the plateau moorland landscape.

South west of Barrhill, the Cross Water flows north east to the Duisk River from tributaries within Arecleoch forest. Further south, the Cross Water of Luce partially defines the Local Authority boundary flowing south to feed into the Water of Luce, which lies outwith the study area. Within the study area, these water courses create shallow valleys in the surrounding hillsides. Small meandering tributaries are common features across the moorland landscape and drainage features are also present, creating linear patterns across the moor.

Landcover

In the north of the study area, vegetation is comprised of semi improved grassland, surrounding shelter belts, located on lower slopes. Coniferous forestry plantations are present in the north west of the study area, forming dense block features within the landscape. In the north east, open moorland is the predominant landcover.

The vegetation cover within the central extent of the study area is comprised of shelterbelts and hedgerows along field boundaries, semi improved grassland within the lower valley slopes. Coniferous forestry plantations, which dominate the southern central section of the study area, forming part of rotational felling cycle.

To the south, as the alignment crosses the Glasgow South Western railway line and Cross Water of Luce watercourse, the vegetation is comprised of open moorland, with small sections of semi improved grassland, located along the banks of the Cross Water of Luce watercourse. Large areas of coniferous forestry plantations are located at Arecleoch Forest and Kilgallioch.

Land use

The land use within the study area comprises commercial forestry operations, with plantations predominately located within the central and northern section of the study area. Areas of open moorland to the north and south, used for rough grazing. Farming is also a key land use within the study area, with more intensive farming operations and improved pasture present to the north, and rough grazing with some areas of improved pasture in the south.

Operational and consented wind farm development is a characteristic of the landscape within the study area. The proposed alignment routes through Mark Hill Wind Farm, located in the north of the study area, approximately 2.8 km north from Barrhill. The route also passes through the consented Chirmorie and Stranoch Wind Farms, located within the southern extents of the study area.

Landscape Character Types

Figure 5.4 indicates the location and extent of the LCTs which are located within the study area. These are based on the findings of the following publications:

- South Ayrshire Council (2013) Landscape Wind Capacity Study and Appendix[4];
- Dumfries and Galloway Council (2017) Landscape Wind Capacity Study and Appendix[5]; and
- NatureScot (2020) Landscape Character Assessment: Landscape Character Types Map and Descriptions[6].

[4] South Ayrshire Council (August 2019) South Ayrshire Landscape Wind Capacity Study: https://www.south-ayrshire.gov.uk/planning/documents/south%20ayrshire%20landscape%20wind%20capacity%20study%20-%20final%20august%202018.pdf

[5] Dumfries and Galloway Council (June 2017) Dumfries and Galloway Local Development Plan Supplementary Guidance Part 1 Wind Energy Development: Development Management Considerations Appendix 'C' Wind Farm Landscape Capacity Study https://www.dumgal.gov.uk/media/18596/Dumfries-and-Galloway-Wind-Farm-Land-Capacity-Study-Appendix-C/pdf/Wind_Energy_Appendix_C_Landscape_June_2017.pdf

[6] https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

The South Ayrshire and Dumfries and Galloway Landscape Wind Capacity Study (LWCS) documents have been used in this assessment to describe the baseline landscape character, as they contain detailed LCT descriptions which are of relevance to the landscapes within the study area. These descriptions have been supplemented by the findings of the more recent NatureScot Landscape Character Types Map and Descriptions as it relates to each LCT. As they lie within the study area, the LCT boundaries of the Capacity Studies align with those shown in the NatureScot data. It should be noted that the sensitivity ratings provided in the LWCS relate to wind turbines and wind farm developments and are therefore considered of limited relevance to this assessment.

The LCTs classified by the LWCS which lie within the study area are:

- South Ayrshire LCT13 – Intimate Pastoral Valleys;
- South Ayrshire LCT18c – Plateau Moorland with Forestry and Wind Farms;
- Dumfries and Galloway LCT17 – Plateau Moorland; and
- Dumfries and Galloway LCT17a – Plateau Moorlands with Forest.

Of these, the proposed development would pass through LCTs 13, 17 and 18c. A description of the key characteristics of each LCT within the study area is presented in Table 5.3 below.

Table 5.3: Landscape Character Type Descriptions	
LCT ***Sensitivity to the type of development proposed***	**Description**
LCT13 - Intimate Pastoral Valley *High*	The Intimate Pastoral Valley landscape cut into the foothills and moorlands of the Ayrshire uplands. The Duisk River Valley is an example of this LCT. The Duisk River Valley is a broad valley of scale with steep slopes and a relatively flat but narrow bottom. The landscape increases in scale on the upper slopes, particularly at the transition with the Plateau moorland with Forest and Wind Farms LCT (18c). The landcover is dominated by the structure of broadleaved woodland, agricultural vegetation, with shelterbelts and riparian planting. This valley landscape is relatively narrow and strongly contained by adjacent upland character types. A number of prominent hills with rugged slopes and defined summits occur along the edge of the LCT, which contain the Stinchar and Girvan Valleys. The landform within the study area is comprised of broad terraces and gentler, smoother slopes, contained by the undulating, and often steep valley sides. The landcover within this LCT is well defined with hedges and diverse crops, and is subdivided by woodlands and narrow shelter belts, with coniferous forestry plantations becoming the dominant landcover within the central section of the study area. The valley landscape is well settled, with farms and small settlements located throughout the LCT. The settlement is dispersed along the valley, with the small village of Barrhill. Located within the central section of the study area. The existing character and condition of this landscape provides opportunities for accommodation of a development of the type proposed using elements that a characteristic of the existing landscape (e.g. landform and forest cover) and is of medium sensitivity.
LCT18c - Plateau Moorland with Forestry and Wind Farms *Medium - Low*	This LCT is extensive throughout the south eastern edge of south Ayrshire, on the boundary with Dumfries and Galloway administrative area. The landscape comprises a relatively low upland plateau which forms an even and generally indistinct edge to the smaller scale settled Intimate Pastoral Valley (13). The extensive area of the coniferous forestry plantations tends to 'flatten' and mask the underlying topography. The landcover comprises of a simple pattern of dense and fairly uniform coniferous plantations, areas of open moorland, small pockets of farmland and semi improved grassland, which all contrast within the this LCT. This LCT is sparsely settled and accommodates only a few minor public roads. There is windfarm development with the southern edge of the LCT, with Arecleoch and Mark Hill being the dominant features. Small clusters of properties are located to the south east of the landscape. The existing character and condition of this landscape provides opportunities for accommodation of a development of the type proposed using elements that a characteristic of the existing landscape (e.g. landform and forest cover) and is of medium sensitivity.

Table 5.3: Landscape Character Type Descriptions	
LCT ***Sensitivity to the type of development proposed***	**Description**
LCT17 – Plateau Moorland *Medium*	The Plateau Moorland (17) LCT occurs towards the north west of Dumfries and Galloway. The landform has a generally large scale due to its gently undulating topography; the scale reduces around the fringes of the moorland where the topography becomes more broken, with narrow valleys cutting into the plateau. This LCT presents a distinct upland edge to the south west above Loch Ryan. The landscape is comprised of a simple landcover of grass and heather moorland, with small fields and woodland fringes towards the outer edges, which form a transition with the adjacent lower ground and valleys. Coniferous forestry plantations covering the lower south west slopes above the Penwhirn Reservoir. The landscape is sparsely settled with small isolated farms located within the upper Main and Cross Water of Luce Valleys. The Penwhirn Reservoir and associated large buildings of the water treatment works are obvious man-made features within the landscape. This landscape is large scale, open and exposed and provides few opportunities for mitigation of the type of development proposed and consequently, has a high sensitivity.
LCT17a - Plateau Moorlands with Forest *Medium*	This LCT has an expansive scale due to the low-lying plateau landform, with extensive areas of coniferous forestry plantations reducing the scale on lower levels. The landform is comprised of a simple, gently undulating low lying plateau where open craggy features are distinctive within the subtle and sweeping topography. The existing character and condition of this landscape provides opportunities for accommodation of a development of the type proposed using elements that a characteristic of the existing landscape (e.g. landform and forest cover) and is of medium sensitivity. The landcover of the LCT, forms a simple pattern, dominated by dense and fairly uniform coniferous forestry plantations, with small pockets of farmland and the occasional loch. The LCT area is sparsely settled with isolated farms, small groups of cottages and the occasional estate house set within the adjacent valleys. There is a large network of tracks, largely contained by the coniferous forestry plantations, with the B7027 and narrow minor roads, which cross the area. The existing character and condition of this landscape provides opportunities for accommodation of a development of the type proposed using elements that a characteristic of the existing landscape (e.g. landform and forest cover) and is of medium sensitivity.

Landscape Designations

The location and geographical extent of landscape designations within the study area are shown on Figure 5.5.

The SAC SA falls across a large area of landscape, extending from Ayr, along the coast in a wide band, before extending inland at the mouth of the Water of Girvan, and following the southern side of the valley formed by this water body to Kirkmichael. The SA covers the full landscape south of this waterbody, defined in the east by the SAC boundary, and west to the coast. The SA omits a large part of the Galloway Forest Park, before extending along the Duisk River valley. The SA boundary lies along the northern edge of a large extent of forestry which lies between Barrhill and Arecleoch, Chirmorie, Stranoch and Killgallioch wind farms, excluding this area of commercial forestry and large-scale wind energy development. No citation is provided identifying the special qualities of the SA. The LDP Policy: Protecting the Landscape states:

We will consider proposals within or next to Scenic Areas (as defined on the LDP environment map) against the following conditions.

a) The significance of impacts and cumulative impacts on the environment, particularly landscape and visual effects as informed by the Ayrshire Landscape Character Assessment (SNH 1998)".

b) How far they would benefit the economy.

c) Whether they can be justified in a rural location.

As it lies within the study area, the character of the landscape within the SA is influenced by the land uses within it (wind farms, agriculture and forestry). The proposed development would be compatible with these existing land uses and it is considered that the landscape of the SA is able to accommodate the proposed development without undue consequence on the baseline landscape. The susceptibility to change as a result of an additional OHL is considered to be low.

The value of the SA, as a local designation, is considered to be high. Therefore, the sensitivity of the landscape within the South Ayrshire Scenic Area is considered to be medium.

There are no landscape classifications within the study area. The nearest WLA is the Merrick WLA, which is located approximately 13.2 km north east of the study area boundary at its closest point. Given this increased distance, and the nature of the development proposed (wood pole line no greater than 15.1 m in height) it is considered unlikely that the proposed development would be a discernible feature in views from the WLA. Therefore, it has not been considered in this appraisal.

No other designated landscapes are located within the study area.

5.4.2 Visual Amenity

Settlement

The main settlement within the study area is Barrhill, which is formed by a small cluster of semidetached, terraced cottages and detached double storey properties located along the A714. The properties lie on either side of the A714 and are generally oriented to face the road.

Elsewhere to the south west and north east of Barrhill, settlement comprises of a series of scattered properties and farmsteads on the upper slopes of the valley. The properties are well spaced, accessed by a local road network and frequently located within a complex of other farm buildings such as barns and sheds, the vegetations often demarcates the property boundaries.

The sensitivity of residential receptors is considered to be High, unless stated otherwise.

Transportation Routes

Due to the topography of the landscape within the study area, transportation routes generally follow the alignment of valley floors. This has resulted in transport routes which are contained by landform with corresponding containment and foreshortening or channelling of views.

A714

The A714 routes north west – south east through the central section of the study area and provides a key road link between Girvan and Wigtown. The roads pass through Barrhill, following the line of the Duisk Valley River, and in parts is heavily bordered by dense coniferous woodland vegetation which focuses the views within the road corridor which prevents high degree of views out across the wider landscape. In certain locations, such as where the road exits Barrhill to the east, some more open views across the Duisk Valley are available.

B7027

The B7027 runs between Barrhill and Challoch, in the central section of the study area. The road follows the alignment of the Duisk River Valley, running along the valley floor. The road is the main access for the residents of Barrhill and surrounding properties, it is bordered by a mix of scrubby vegetation, mature trees and coniferous forestry plantations, which varies the extent of views from the road.

Unclassified Roads

The Gowlands terrace/ C72 road connects Barrhill with Glen Luce. The road routes out of the Duisk Valley, north of Barrhill, past the Barrhill Railway Station. It then crosses through an area of plateau moorland and commercial forestry. As it exits the forestry, the road passes across plateau moorland landscape, running along the eastern edge of the consented Chirmorie and Stranoch Wind Farms. The road descends into the Cross Water of Luce and runs parallel with this water course in the southern extent of the study area. The C72 provides the only access to properties located within the southern extent of the study area. Views in the central section of the study area are contained by coniferous forestry vegetation, however within the southern section of the study area, views along the valley are open but are contained within the valley landscape.

The sensitivity of receptors on transport routes varies from medium in respect of general commuter road users who may be travelling alone and concentrating on the road rather than the adjoining landscape, and high in respect of tourists who are more likely to carry passengers, and who are likely to focus on the landscape.

Recreational Receptors

Recreational receptors are presented on Figure 5.5. Recreational activities within the study area are limited to walking trails which route through the landscape.

The Whithorn Way runs in a north-south direction. As it enters the study area in the west, it meanders through the Duisk River Valley, towards the small settlement of Barrhill. Then proceeding south through an area of open moorland. As the pathway routes south, it gains elevation before being incorporated into the Gowlands terrace/ C72 road, where it passes through the Cross Water of Luce valley landscape, contained within dense coniferous forestry plantations. The pathway continues south, through open moorland before exiting the study area in the south.

Within the central section of the study area, the Barrhill to Martyrs Tomb Core Path (REF SA67) runs from Barrhill to the south, for approximately 500 m. The path lies along the Cross Water watercourse, contained within riparian and mature woodland vegetation.

Recreational receptors found within the study area are considered to be of high sensitivity. It is anticipated that each person carrying out these activities has high value for the landscape within which they are passing through, and a high susceptibility to change as their attention and interest is focused on the views they experience as they pass through the landscape.

Representative Viewpoints

The location of the representative VPs are shown on Figure 5.6. Baseline views and photomontages are presented from each viewpoint in Figure 5.8 – 5.15. The following table presents a description of the existing view from each representative viewpoint.

Table 5.4: Representative Viewpoint Baseline View		
Viewpoint ***Distance to Development***	**Baseline View**	**Receptor Type and Sensitivity**
VP 1: Core Path to Glenkitten Fell 973 m southeast See Figure 5.8	The view extends northwest from the roadside towards rising plateau moorland which forms the horizon to the view. A drystone wall borders the road to the west, and is aligned with scrubby vegetation which provides some screening of the landscape in the foreground. The Glasgow South Western railway line cuts across the middle ground of the view, forming a horizontal line within the landscape. Turbines at Arecloch are visible across the skyline to the north west.	Road user: Medium Recreational: High
VP 2: C72 near SAC border 700 m northwest See Figure 5.9	The view from the SAC/ DGC administrative border extends north west across open plateau moorland. Commercial forestry is a feature across the hills which form the background to the view. Arecleoch Wind Farm forms a prominent element across the lower slopes of these hills and extends across a large proportion of the view.	Road user: Medium Workers: Low Recreational: High
VP 3: C72 North of Chirmorie Farmhouse 500 m east See Figure 5.10	The view extends across rolling moorland towards Arecleoch Forest, which forms the majority of the skyline to the east. The Galloway Hills are glimpsed to the north east. The dark swathe of forestry contrasts with the open moorland in the fore- and middle ground. Arecleoch Wind Farm visible to the south west extending above the skyline. Mark Hill Wind Farm forms a small feature in longer distance views to the north east. Forestry felling operations are visible in the middle ground of the view, and small retained areas of woodland are present within the moorland landscape. A post and wire fence and stone wall aligns the road to the west, screened largely by moorland vegetation. Communications distribution poles are visible alongside the road as it descends into a minor valley. Farm tracks, signage, fencing and gates are minor features within the central extent of the view.	Residential: High Road user: Medium
VP 4: C72 south of Barrhill 350 m east See Figure 5.11	The view extends from the C72 west, across an area of open moorland. It is an open view, however, is not expansive as the nature of the topography contains long distance views across the wider plateau moorland. Low hills covered in plantation forestry form the distant background to the view. Turbines at Arecleoch Wind Farm, the Glasgow South Western Railway and the control boxes/ communications tower at a railway underpass form notable man-made features within the landscape, clustered together within the north western extent of the view. Furthermore, a small section of existing OHL infrastructure traverses the landscape, with many of the OHLs being skylined.	Recreational: High Road user: Medium
VP 5: B7027 near Altercannoch	View is west from the single-track B7027 across rough pastureland of the gently rolling landscape looking up to the brow of a low hill. An existing 132 kV electrical distribution line crosses the landscape in a northeast – southwest direction, drawing the eye to the horizon. The existing line traverses an essentially open field to the southwest with	Residential: High Road user: Medium

Table 5.4: Representative Viewpoint Baseline View		
Viewpoint ***Distance to Development***	**Baseline View**	**Receptor Type and Sensitivity**
20 m north See Figure 5.12	very limited intervening landscape elements to offer, filtering/ screening. Furthermore, the existing line to the southwest is skylined with only a small section of the OHL being backclothed by existing mature vegetation. The remaining views from this location are enclosed/ filtered by the existing topography, mature roadside vegetation and woodland. It is a small-scale landscape with open views to the west, but enclosed on either side by large, mature roadside trees which frame the view.	
VP 6: East Barrhill 97 m east See Figure 5.13	The view from the A714 extends southeast over Duisk River valley and its associated floodplain. The river meanders through the landscape. Existing OHLs are visible along the river valley to the southwest, many of which are skylined, drawing the eye to the horizon. The floodplain south of the Duisk River dominates the foreground. Improved pasture is divided by a post and wire fences, with scrub and riparian vegetation creating a small-scale landscape.	Residential: High Recreational: High Road user: Medium
VP 7: A714 *800 m east* See Figure 5.14	The view extends southwest from the A714 across the small scale landscape of the valley of the Duisk River, whose course is marked by riparian woodland. Small fields are divided by hedgerows and shelterbelts. Scattered residential properties are visible amongst areas of woodland. It is an inhabited view. To the southwest of the view, existing 132 kV OHLs are visible along the river valley, most of which are backclothed by the surrounding vegetation.	Residential: High Road user: Medium
VP 8: Barrhill North *636 m east* See Figure 5.15	View extends southwest from an unnamed track located to the north of Barrhill. It is an elevated position above the village providing open and expansive views across the Duisk River valley to a forested skyline. The turbines of Kilgallioch Wind Farm are visible on the horizon. Throughout the view, existing OHLs are visible, albeit it backclothed by the surrounding vegetation, including woodland, coniferous forestry and grassland. It is an open view across the small scale valley landscape towards the more open and expansive plateau moorland in the distance.	Recreational: High Workers: Low

5.5 Potential Impacts and Mitigation

5.5.1 Construction Phase

Potential impacts during construction of the proposed development are detailed in Table 5.5 below, which also details the relevant receptor and mitigation or control measures, where appropriate.

Table 5.5: Potential Impacts on Landscape and Visual receptors during Construction and Relevant Mitigation/Control Measures

Potential Impact	Receptor	Mitigation/Control Measures Proposed
Site clearance; exavation of the ground for access track construction, pole base construction; placement of temporary construction compound; reinstatement works	Landscape fabric	• The proposed development will follow the alignment of existing tracks and forestry roads as far as practicable. The creation of new tracks across the landscape fabric will be minimised. • Reinstatement of the ground conditions following completion of construction activities in areas of temporary access, or earlier if possible, within the work programme. • Temporary stone tracks associated with the construction of the OHL poles will be removed upon completion of construction and any damage to the landscape fabric will be restored. • All working areas would be restricted as far as practicable to the specified areas and demarcated to prevent incursion of site plant onto non-construction areas. Physical exclusion zones (e.g. crowd barriers or Heras panels) where considered necessary (e.g. in any sensitive areas). Public access along roads and paths will be retained throughout the construction period.
Loss of mature vegetation within the proposed development site, and consequent construction of the poles.	Landscape character Visual amenity/ visual receptors	• The proposed alignment would route through approximately 4 km of forestry, it is estimated that 5.52 ha of existing forestry would need to be felled. • Additionally, approximately 2.43 ha of broadleaved woodland would require removal. • However, tree felling would be limited to only those necessary for the safe construction and operation of the grid connection. • The Applicant is committed to compensatory planting in accordance with Scottish Government Removal guidance.
Presence of construction activity (including movement)	Landscape character	• All construction equipment would be removed, and the landscape restored

Table 5.5: Potential Impacts on Landscape and Visual receptors during Construction and Relevant Mitigation/Control Measures		
Potential Impact	**Receptor**	**Mitigation/Control Measures Proposed**
and construction equipment such as excavators, tractors and scaffold tunnels	Visual amenity/ visual receptors	immediately following completion of the construction works. • Night lighting of construction sites/ compounds would be minimised within the requirements of health and safety, avoided wherever possible, and only in use at locations where activity is being carried out. Site working hours are restricted to daylight hours as preference. Where required, lighting to be inward towards the site activity and downward facing wherever possible. • Material storage/ stockpiles would be retained for the shortest duration practicable and would be sited to avoid visual intrusion to neighbouring receptor locations. • Where possible, laydown areas would be located in areas that are already disturbed or cleared of vegetation.

5.5.2 Operation Phase

Potential impacts during operation are detailed in Table 5.6 below, which also details the relevant receptor and mitigation or control measures, where appropriate.

Table 5.6: Potential Impacts during Operation and Relevant Mitigation/Control Measures		
Potential Impact	**Receptor**	**Mitigation/Control Measures Proposed**
Presence of new wood pole line (including conductor) within the landscape; presence of cleared wayleave	Landscape character Visual amenity/ receptors	• The height of the poles would typically be 12.1 m above the adjoining ground level (including steel work and insulators). Pole heights may be increased locally (up to a maximum height of 15.1 m) where required to safely cross features such as watercourses and access tracks. • Where possible, the proposed alignment has been routed to reduce its impact on the character of the landscape, and its prominence in views from the wider area.
Disturbance, movement and activity associated with maintenance activities	Landscape fabric Visual amenity/ receptors	• Where maintenance activities are required, they would be programmed to ensure that they are undertaken in a timely and localised manner. • Significant works to be notified to local residents and unplanned emergency works to be completed as quickly as possible to minimise unavoidable disruption. • All maintenance equipment would be removed, and any disturbed ground

Table 5.6: Potential Impacts during Operation and Relevant Mitigation/Control Measures		
Potential Impact	**Receptor**	**Mitigation/Control Measures Proposed**
		reinstated (if applicable) immediately following completion of the maintenance works.

5.6 Residual Impacts

The following section assesses the impacts arising from the development of the OHL section of the proposed development. Occasional maintenance activity may be required from time to time, however any impacts arising from these works would be short term and temporary and would be mitigated by the measures outlined in Table 5.6 above.

5.6.1 Impacts on Landscape Fabric

The proposed development would directly impact upon the landscape fabric in the areas in and round the pole foundations. Each pole excavation would disturb an area of approximately 3 m^2 and would be 2 m deep and would measure between 12.1 m and 15.1 m in height above ground, dependant on location and ground clearance requirements (see Chapter 2: Development Description).

To facilitate the construction and operation of the proposed OHL development, some areas of coniferous forestry would be removed, such as those to the north and south of Barrhill, with a total of 5.52 ha being impacted. Additionally, approximately 2.43 ha of broadleaf woodland would also be felled to facilitate construction. While the removal of this vegetation would directly impact on the fabric of the landscape, it would not detract from the contribution these areas of forestry or woodland make on the overall character of the landscape, nor the integrity of the areas themselves as landscape features. The ground disturbance occurred during the construction phase of the proposed development would be remediated upon completion of the works. It is considered that the magnitude of impact arising from the proposed development would be low, temporary and reversible (where not required for permanent works). The effect would be minor.

5.6.2 Impacts on Landscape Character

The proposed development would directly and indirectly impact upon the landscape of the following LCTs:

Directly

- South Ayrshire LCT13 – Intimate Pastoral Valleys;
- South Ayrshire LCT18c – Plateau Moorland with Forestry and Wind Farms; and
- Dumfries and Galloway LCT17 – Plateau Moorland;

Indirectly

- Dumfries and Galloway LCT17a – Plateau Moorlands with Forest.

5.6.3 Impacts on South Ayrshire LCT13 – Intimate Pastoral Valleys

Approximately 6 km of the proposed alignment routes through the Intimate Pastoral Valleys – South Ayrshire LCT, running in a north east – south west orientation. In the location where the proposed development passes through the LCT, the landscape is well tended and linear features such existing grid infrastructure, local roads, stone dyke walling and post and wire fencing contribute to the overall character of the managed landscape.

The proposed development would have limited impact on how the existing landscape of the LCT is perceived. Overall, the magnitude of impact caused by the proposed development would be

low, resulting in a minor residual effect. Furthermore, these effects would be localised in nature within the immediate area surrounding the OHL route. Further west, as the LCT extends north east and south west of the proposed development, effects would quickly reduce to none within a short distance from the proposed development.

5.6.4 Impacts on South Ayrshire LCT18c – Plateau Moorland and Forestry and Wind farms

Approximately 7.5 km of the proposed development routes through the Plateau Moorland and Forestry and Wind Farms LCT. The character of the plateau moorland landscape within this area is highly influenced by the presence of wind turbines, coniferous forestry plantations and associated infrastructure, including roads and tracks. The proposed development would be consistent within this established character. In some areas the proposed development would add to the overall assemblages of infrastructure, such as in and around the Duisk River valley, where phone lines and existing electricity OHLs are present.

The proposed development would not impact the way that the landscape is perceived by those who live, work or visit the area. Impacts would be localised, as the proposed development would integrate within the existing land uses and therefore the influence on the wider landscape character would be contained. In the area of the development, the magnitude of impact caused by the proposed development on the character of the Plateau Moorland and Forestry and Wind Farms LCT is considered to be Low-Medium, resulting in a Minor residual effect. Across the wider LCT, effects would quickly reduce to None as the influence of the development is restricted to the Duisk River Valley landscape.

5.6.5 Impacts on South Ayrshire LCT17 – Plateau Moorland

Approximately 2.5 km of the route of the proposed development is located within the Plateau Moorland LCT, in the southern extent of the study area. The overall character of the landscape is influenced by the presence of operational (and consented) wind farms, the meandering character of the Water of Luce and its gentle valley and existing rail and road links. Impacts arising from the proposed development on the character of the LCT would be limited to a localised extent of the Cross Water of Luce valley, within the vicinity of the proposed development. Impacts and effects would reduce quickly with distance due to the nature of the existing topography that surrounds the proposed development which would contain the influence of the proposed OHL on the overall character of the LCT.

The proposed development would not notably impact the way the landscape is perceived by those who experience it on a daily basis. Impacts would be localised within close proximity to the proposed development. Therefore, the magnitude of impact caused by the proposed development on the character of the Plateau Moorland – South Ayrshire LCT is considered to be low, resulting in a minor residual effect. Across the wider LCT, effects would quickly reduce to none as the influence of the proposed development is restricted to within the Cross Water of Luce Valley.

5.6.6 Impacts on South Ayrshire LCT17a – Plateau Moorland with Forest

This LCT is located in close proximity of the proposed development, with the closest point being 1 km southeast of the development. The LCT forms a small part of the overall study area and is limited to its southern most extent.

Indirect impacts upon the Plateau Moorland with Forestry – Dumfries and Gallows LCT would be confined to small isolated pockets adjoining the southernmost extent of the alignment as the route enters the Stranoch substation. The ZTV indicated the viewshed coincides with extensive areas of coniferous forestry cover which would screen a large proportion of moorland to the east. The influence of the proposed development would be contained across the wider landscape,

focussed in the shallow Cross Water valley which already has wood pole infrastructure present, albeit it within a small part of the landscape.

Based upon the preceding analysis, the magnitude of impact arising from the proposed development on the Plateau Moorland with Forestry – Dumfries and Galloway LCT would be Low-Medium in the immediate area surrounding the OHL, near Glenkitten Fell. The magnitude of impact will reduce to None in the wider extends of the LCT where theoretical visibility ceases, and forestry cover reduces the influence of the OHL across the wider LCT. Therefore, the residual effect on the character of the LCT would range from Minor in the local area in close proximity to the proposed development, to Negligible across the vast majority of the LCT.

5.6.7 Impacts on Landscape Designations

The proposed development would route through a section of landscape designated for its scenic qualities. The qualities of the South Ayrshire SA are not defined and therefore an assessment has been made on the quality of the landscape found within the study area which would be directly impacted by the proposed development.

The alignment comprised of wood 'trident' poles would be routed through a small section of the SA as it traverses the landscape to the east of Barrhill, which is already characterised by human activity and intervention including wind turbines, grid infrastructure and telephone lines, agriculture, transport and coniferous forestry.

The overall landscape is of a scale which has the capacity to absorb the type of development proposed, without adversely impacting on the overall experience of appreciation of the scenic qualities associated with the SA as it lies within the Duisk River Valley. Topography would contain the influence of the alignment across the wider area of the SA.

Due to the level of activity and man-made features within the immediate areas surrounding the proposed development, it is considered that the proposed development would not impact on the integrity of the landscape to the extent where its reason for designation is compromised. Therefore, the magnitude of impact arising from the construction and operation of the proposed development is considered Low. The residual effect is considered to be Minor.

5.6.8 Impacts on Visual Amenity Settlements

The proposed development would be heavily screened from the vast majority of properties within Barrhill due to intervening landscape elements such as the built environment, roadside and woodland vegetation, with exception to a small handful of properties to the south east along the B7027, where the alignment passes in close proximity. Where the proposed development is visible from a handful of properties along the B7027, it would largely appear in oblique views.

The magnitude of impact on views from within the settlement of Barrhill is considered to be Negligible/ None. The alignment would route north east – south west across the upper levels of the hills to the north east, through the Duisk River Valley before routing further south west into the Water of Luce Valley, introducing a new linear feature in small parts of the landscape. It would be screened in views from the village. The residual impact on views from Barrhill would be Negligible.

In views from scattered properties located to the east of Barrhill on the B7027, the proposed development would introduce a new feature into views which already contain infrastructure elements, such as telephone lines, and an existing distribution line. As the line passes through a field to the south of the B7027, it would pass close to a small number of properties which would have relatively close proximity views of the proposed development. However, these properties currently have similar views of an existing OHL which passes through this field. In order to facilitate the construction and operation of the proposed development, the existing OHL would be

undergrounded in this area. Therefore, the magnitude of impact would be Medium-Low for residential properties in the immediate vicinity of the proposed development along the B7027. The residual effect would be Moderate.

5.6.9 Impacts on Views from Transport Receptors

As the A714 crosses the Duisk River to the east of Barrhill and routes along the northern edge of the valley landscape, road users would have some views of the proposed development. Roadside vegetation screens open and clear views however intermittent views across the valley are present in some locations. The proposed development would be visible across the hillside to the northeast of the A714; as it crosses the A714; and as it passes across the valley floor to the southwest of the A714. However, it would not be a defining element within views from the road. The proposed development would be seen briefly in fleeting views, within the context of residential properties, farming activity and existing linear infrastructure.

Therefore, the magnitude of impact for users along the A714 is Negligible. The residual effect would be Minor.

The proposed development would be visible from a small section of the B7027 where the alignment crosses the road. It would be visible in fleeting views, backclothed by the valley sides and amongst scrubby riparian vegetation and trees and small areas of woodland which would filter and screen the proposed development. The proposed development would be viewed within the context of existing grid infrastructure, residential properties, roads and roadside vegetation.

The magnitude of impact for users along the B7027 would be Negligible. The effect would be Minor.

In views from the C72, a number of power lines and telephone lines are present within the landscape, particularly to the immediate south west of Barrhill. The proposed development would introduce another linear feature into the view from the roadside, particularly in the south western extent of the study area. The line would not be out of context with the existing view, nor would it form a defining element in views. Therefore, the magnitude of impact for users along the Gowland Terrace/ C72 road would Medium-Low, resulting in a Moderate-Minor effect.

5.6.10 Impacts on Views from Recreational Routes

For users along the Whithorn Way, the ZTV indicates the proposed development would be theoretically visible for large section along the route as it passes through Barrhill. However, in actual views, the proposed development would only appear as the route proceeds further south west of Barrhill due to intervening landscape elements such as topography, coniferous forestry and the built environment which would screen and filter views of the proposed development.

The route then continues south west, before being incorporated into the existing Gowlands Terrace/ C72 road, passing through the southern extent of the study area adjacent to the Cross Water of Luce. The view from the path extends across open moorland and the proposed development would be visible along this section of the path. However, the proposed development would lie low in the view backclothed by the surrounding landscape. The magnitude of impact would be medium-low, which would result in a localised moderate effect. Effects across the full path would be minor.

The REF SA67 Core pathway would experience theoretical views of the proposed development from the entire length of the route. In actual views, the core pathway is extensively screened by riparian and mature woodland vegetation. Therefore, the magnitude of impact and residual effect would be None.

5.6.11 Construction Impacts

As described above, there would be short-term landscape and visual impacts arising from the presence of plant equipment and activities on site during construction and operation. These impacts are explained in Tables 5.5 and 5.6 above and are summarised in Tables 5.7 and 5.8 below.

Table 5.7: Potential Residual Impacts on Landscape and Visual receptors during Construction

Residual Impact	**Description/ Magnitude of Impact** ***Residual Effect***
Site clearance; exavation of the ground for access track construction, pole base construction; placement of temporary construction compound; reinstatement works	Construction works would be located within an area of landscape already disturbed by forestry operation and existing transmission line infrastructure. All landscape disturbed for temporary construction activities (ie access) would be restored upon completion of construction. The magnitude of impact upon the landscape fabric is considered to be Low. *The residual effect would be Minor.*
Loss of mature vegetation within the proposed development site, and consequent construction of the poles.	Existing vegetation is comprised of coniferous tree species forming part of the rotational felling practice. Areas of vegetation would be removed to allow for access and construction of the proposed OHL poles. Following the completion of the construction works, the restoration of disturbed land would take time to re-establish to the original condition, although no tree species would be replanted due to the clearance requirements for the poles The magnitude of impact is considered Low. *The residual effect would be Minor.*
Presence of construction activity (including movement) and construction equipment such as excavators, tractors and scaffold tunnels	The presence of construction activity would for a certain period during the installation of the proposed OHL infrastructure. There would be a large concentration of machinery and construction equipment located along pole locations. The magnitude of impact is considered to be Medium-Low *The residual effect would be Moderate-Minor.* Upon the completion of the proposed OHL works, construction activities will cease, and the magnitude of impact would reduce to None once all of the machinery and equipment is removed off site.

5.6.12 Operational Impacts

Table 5.8: Potential Residual Impacts on Landscape and Visual receptors during Operation

Residual Impact	**Description/ Magnitude of Impact** ***Residual Effect***
Presence of new wood pole line (including conductors) within the landscape; presence of cleared wayleave	The current landscape is comprised of coniferous forestry and low-lying scrubby vegetation. The poles would form new features within the landscape; however, they would be seen in the context of existing grid and telephone infrastructure. Additionally, the influence of the proposed OHLs over the wider landscape, or presence in views would be restricted by the wider valley topographical form.

Table 5.8: Potential Residual Impacts on Landscape and Visual receptors during Operation	
Residual Impact	**Description/ Magnitude of Impact** ***Residual Effect***
	The magnitude of impact on the character of the landscape within the study area, and on views and visual amenity, is considered to be Low. *The residual effect would be Minor.*
Disturbance, movement and activity associated with maintenance activities	Where maintenance activities are required, they will be localised and filtered by existing intervening landscape elements such as forestry and woodland vegetation and the built environment. Maintenance activities would not be out of character with those currently experienced during commercial forestry activities. All maintenance equipment will be removed, and any disturbed ground will be reinstated immediately upon the completion of maintenance works. The maintenance of impact on views and visual amenity is considered to be Negligible. *The residual effect would Minor.*

5.6.13 Viewpoint Assessment

Table 5.9 below presents the viewpoint assessment for selected representative VPs. Baseline descriptions for each location are described in Table 5.4 and the reason for selection is explained in Table 5.1.

Table 5.9: Viewpoint Assessment		
Viewpoint **Distance to Development** **Sensitivity**	**Assessment** **Magnitude of Impact**	**Residual Effect**
VP 1: Core Path to Glenkitten Fell *973 m southeast* Road user – Medium Recreational – High See Figure 5.8	The proposed development would route along the summit of Maurs Cairn before running downhill along the western slope and disappearing from view. The proposed OHL would be skylined, however, it would be viewed in combination with operational wind turbines at Arecleoch which are currently visible across the skyline in the background. Additionally, turbines at Stranoch Wind Farm would form prominent, large structures within this view once constructed, and would reduce the overall presence of the proposed development in this view. The introduction of the proposed development would result in new linear infrastructure in views to the west of the C72. It would be seen in the context of existing (and consented) wind farm infrastructure. Furthermore, views of the OHL would be transient in nature and be experienced over a short period of time. Overall impacts on the experience of walking along the Core Path would be localised to a short section to the east of Maurs cairn. The magnitude of impact would be Low.	Road User: Minor Recreational: Moderate
VP 2: C72 near SAC border *700 m northwest* Road user – Medium Recreational – High See Figure 5.9	The OHL would be viewed as it crosses the landscape in the middle ground of the view, backclothed by moorland landscape which assists in reducing the visibility of the proposed development. The OHL would be viewed in the context of operational (Arecleoch) and consented wind turbines (Chirmorie). There would be no loss of existing features. The proposed development would add a new linear element within the view however it would not be out of context, scale of character within the existing elements of the landscape and would be readily absorbed by the landscape. For road users, views would be transient in nature and would be experienced of a short amount of time. Impacts of recreational users would be localised. The magnitude of impact would be Negligible.	Road user: Minor/ Negligible Recreational: Minor
VP 3: C72 North of Chirmorie Farmhouse *500 m east* Road user – Medium Recreational – High	The proposed development would be located within the middle ground of the view, seen in the context of wind turbines, farmed moorland and coniferous forestry plantations. The proposed development would be skylined in small section of the view, however where this occurs, it would be seen in combination with operational (and consented) wind turbines. The proposed development would introduce a new linear element into the landscape in views from the C72 and would contribute to the presence of infrastructure within the view. Due to the nature of views from the road, any impacts would be transitory and of short duration. Therefore, the magnitude of impact would be Low.	Road user: Minor Recreational: Moderate

Table 5.9: Viewpoint Assessment		
Viewpoint **Distance to Development** **Sensitivity**	**Assessment** **Magnitude of Impact**	**Residual Effect**
See Figure 5.10		
VP 4: C72 south of Barrhill *350 m east* Road user – Medium Recreational – High See Figure 5.11	The proposed development would be visible at distance in views to the north as it routes across farmland to the east of Mark Hill Wind Farm and descends into the River Duisk Valley. As it passes through the valley, it would be screened in views from this location by topography. The OHL would then become visible again as it exits the valley and routes across the plateau moorland landscape to the east of the view. As the OHL passes further to the south east, it would be skylined, and would sit in the foreground of turbines at Kilgallioch. The proposed development would represent a notable new feature in the view, although it would not be out of character within the existing baseline view which contains large scale wind turbines, forestry and other overhead distribution infrastructure. It would relate to the size and scale of existing infrastructure present within the view, albeit at closer proximity to the viewer. It would not be a dominant element within the view. The overall magnitude of impact would be Medium/ Low.	Road user: Minor/ Minor Recreational: Moderate
VP 5: B7027 near Altercannoch *20 m north* Residential Road user See Figure 5.12	The proposed devleopment would be located in close proximity views from the B7027 as it descends into the Disk River valley. The OHL would be visible as a new linear feature within the landscape and would replace an existing OHL line. It would form a prominent focal point in static views from residential properties in the area, partially screened by boundary vegetation. Properties already view across to existing OHL infrastructure. For road users, while the proposed development would form a notable new feature in views from the road, views would be brief and fleeting as the road user passes beneath the OHL and be seen within the context of existing OHL infrastructure which is located along the road. The magnitude of impact would be Medium for residential receptors and Low for road receptors.	Residential: Major/ Moderate Road user: Minor
VP 6: East Barrhill *97 m east* Residential - High	The proposed development would be skylined in the view to the north east as it crosses the hillside north of Barrhill and routes towards the A714. While prominent on the skyline, the proposed development would relate to the scale of existing features within the view such as street lights, vegetation and fence boundaries etc. As it crosses the A714 and	Residential: Moderate Road user: Minor

Table 5.9: Viewpoint Assessment		
Viewpoint **Distance to Development** **Sensitivity**	**Assessment** **Magnitude of Impact**	**Residual Effect**
Road user - Medium See Figure 5.13	extends across the Duisk River valley, the proposed development would be largely screened by existing vegetation associated wtih the river and field boundaries. Glimpsed views of conductors would be available. As the OHL exits the valley to the south west and climbs towards the plateau moorland landscape, it would become skylined in the background of the view, although would be filtered in views by intervening vegetation in the foreground. The proposed devleopment would increase the influence of linear infrastrcture within the view, and would marginally intesify the presence of this type of devleopment within the landscape. Due to the nature of views from the road, it is considered that impacts would be intermittent and of short duration. The magnitude of impact would be Low.	
VP 7: A714 224396, 581616 800 m east Road user - Medium See Figure 5.14	The proposed devleopment would cross the A714 in the middle ground of the view. As it crosses the road, it would be partially skylined. As it enters the River Duisk valley, the proposed development would be backclothed by topography and vegetation which is present within the valley landscape. The OHL would form a new linear element within glimpsed and fleeting views from the A714. It would form a discernible change in the view however this would change would be of a short duration as road users approach and then pass the alignment. The magnitude of impact would be Low.	Road user: Minor
VP 8: Barrhill North 223666, 583231 636 m east Recreational - High Road user - Medium Workers - Low See Figure 5.15	Given the elevated position of the viewpoint, the proposed development would be visible as its crosses the plateau moorland landscape, seen at distance, and backclothed by topography and a mosaic of vegetation including coniferous forestry, woodland and moorland. The landscape is characterised by operational wind turbines and existing OHL infrastructure, allowing the proposed development to integrate into the landscape, rather than contrast with it. The proposed development would form a barely discernible alteration to the baseline condition. The underlying landscape character would be unchanged. The magnitude of impact would be Negligible.	Recreational: Minor Road user: Minor/ Negligible Worker: Negligible

5.6.14 Summary

The landscape and visual impacts arising from the proposed development would be largely contained within the landscape of the Duisk River Valley and areas of plateau moorland landscape in the north and south of the study area.

No effects of greater than Minor are expected upon the landscape of the study area and on the character of the LCTs through which the alignment passes.

Effects on the landscape within the South Ayrshire Scenic Area would be localised, limited to the landscape within the Duisk River Valley, in the vicinity of the proposed development. Due to the influence of existing man-made features within the immediate area surrounding the proposed alignment, and the relatively contained influence of the alignment across the wider landscape, it is not considered the proposed development would impact on the integrity of the landscape where its reason for designation would be compromised.

In views from Barrhill, the proposed development would be largely screened by existing built development and vegetation. For scattered properties along the B7027 to the east of Barrhill, the proposed development would introduce a new linear element in oblique views, in some cases at close proximity. The proposed development would not directly contrast with the existing view as the size and scale of the developments comparable to similar element within the landscape, however its prominence would be exacerbated by its skylined position along the eastern valley edges. Undergrounding of the existing OHL which passes through the landscape in this area would reduce the potential for visual clutter.

In views from transport routes within the study area, views of the proposed development would be brief and fleeting. The development would be largely backclothed in many views, however where it is skylined such as on the C72 south of Barrhill, the OHL would be seen in combination with existing utility infrastructure and/ or wind turbines. Therefore, it is predicted the proposed development would not form a prominent feature within views from transportation routes.

From recreational routes within the study area, views of the proposed development would be experienced from short sections of Barrhill to Martyrs Tomb and Glen Kitten Core Path. The magnitude of the impact would be Low for both routes, as users would experience it from a small section of the route, due to the intervening landscape elements such as path side vegetation and woodland, both riparian and coniferous. Moreover, the proposed development would be viewed within the context of existing grid infrastructure and is not considered to be out of character within the existing wider landscape nor would it effect the enjoyment of the path within this small area. Therefore, the residual effect resulting from the proposed development would be Minor/ Negligible.

A viewpoint assessment has been undertaken from eight locations within the study area. These locations represent a range of receptors with views of the proposed development. The greatest effect would be experienced by residential receptors near the B7027 as the proposed development would be viewed at close proximity (Viewpoint 5). Overall, the magnitude of impact at each viewpoint ranged from Low to Negligible, resulting in effects of Moderate to Negligible.

5.6.15 Glossary and Abbreviations

Glossary	
Term	**Definition**
Analysis (Landscape)	The process of breaking the landscape into component parts to understand how it is made up.
Analysis (Visual)	The process of identifying the nature of visibility in an area, which is determined through topographic analysis.
Baseline	The landscape and visual character of the study area as it exists at the commencement of the assessment process – i.e. prior to the development proposal under consideration.
Classification	A process of sorting the landscape into different types using selected criteria, but without attaching relative values to the different types of landscape.
Classified Landscape	Includes non-designated valued landscapes such as Gardens and Designed landscape and Wild Land Areas.
Constraints Map	Map showing the location of important resources and receptors that may form constraints to development.
Countryside	The rural environment and its associated communities (including the coast).
Cumulative Effects	Effects arising from the additional changes to the landscape or visual character caused by development when seen in conjunction with other developments (associated with or sperate to it).
Digital Terrain Model (DTM)	Computer generated 3-dimension model based on aerial survey of ground surface (e.g. Ordinance Survey Profile data). Often utilised as a basis for visibility modelling over large areas.
Diversity	Where a variety of qualities or characteristics occur.
Effect	The result of an impact on a landscape or visual receptor
Element	A component part of the landscape (e.g. roads, hedgerows, woods).
Enhancement	Landscape or visual improvement through restoration, reconstruction or creation.
Geographic Information Systems	Computerised data base of geographical information that can easily be updated and manipulated.
Key Characteristics	The elements of the landscape and/or their inter relationship which form the defining components of the landscape.
Impact	The change arising for a landscape or visual receptor as a result of some form of alteration to the baseline.

Glossary	
Term	**Definition**
Indirect Impacts	Impacts on the environment, which are not a direct result of the development but are often produced away from it or as a result of a complex pathway. Sometimes referred to as secondary impacts.
Landcover	Combination of land use and vegetation that covers the land surface.
Landform	See Topography.
Landscape	Human perception of the land conditioned by knowledge and identity with a place.
Landscape Capacity	An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. The degree to which a particular landscape character type or area is capable of is able to accommodate change without unacceptable adverse effects on its character. Capacity is likely to vary according to the type and nature of the changes being proposed. The capacity of the landscape is derived from a combination of Landscape Character Sensitivity, Visual Sensitivity and Landscape Value.
Landscape Character	The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place in different areas of the landscape.
Landscape Character Type	A landscape type will have broadly similar patterns of geology, landform, soils, vegetation land use, settlement and field pattern discernible in maps and field survey records.
Landscape Fabric	Physical elements of the landscape or development site.
Landscape Factor	A circumstance or influence contributing to the impression of the landscape (e.g. scale, enclosure, elevation).
Landscape Feature	A prominent eye-catching element or landmark (e.g. church spire, wooded hilltop).
Landscape Impact	The change in the elements, characteristics, qualities and overall character of the landscape as a result of development.
Landscape Effect	The consequence of change in the elements, characteristics, qualities and overall character of the landscape as a result of development. These effects can be positive, neutral or negative.
Landscape Evaluation	The process of attaching value (non-monetary) to a particular landscape, usually by the application of previously agreed criteria, including consultation and third-party documents, for a particular purpose (for example, designation or in the context of an assessment).
Landscape Quality (or Condition)	Based on judgments about the physical state of the landscape and about its intactness. Also relates to the state of repair of individual features and elements which make up character in any one place.
Landscape Resource	The combination of elements that contribute to landscape context, character and value.

Glossary	
Term	**Definition**
Landscape Sensitivity (to a specific type of change)	The extent to which a landscape can accept change of a particular type and scale and is assessed in relation a particular type of development. Based on a combination of susceptibility and value.
Landscape Value	The relative value or importance attached to a landscape (often as a basis for designation or recognition), which expresses commonly held national or local perception of its quality, special qualities and/or scenic beauty, tranquillity or wildness and cultural associations.
Magnitude of landscape Impact	A measure of the amount of change to the landscape that would occur as a result of proposed development, generally based on the scale or degree of change to the landscape resource, the nature of the effect and its duration. This is based on a combination of largely quantifiable parameters, such as the distance to the proposed development, visible extent, degree of contrast with context, extent to which the development would be visible, and the duration of an impact.
Magnitude of Visual Impact	A measure of the amount of change to the visual context that would occur as a result of a proposed development. This is generally based on the scale of change to the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view that would be occupied by the proposed development; the degree of contrast or integration of any new features of changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale, mass, line, height, colour and texture; duration and nature of the change, whether temporary or permanent, transient or persistent, the angle of view in relation to the main activity of the receptor(s); distance of the viewpoint from the proposed development; and extent of the area over which the changes would be visible.
Methodology	The specific approach and techniques used for a given study.
Mitigation Measures	Measures including any process, activity or design process to avoid, reduce, remedy or compensate for adverse landscape and visual impacts of a development. Mitigation can also apply to the amelioration of existing adverse effects associated with existing developments/features in the landscape.
Perception (of Landscape):	The psychology of seeing and possibly attaching value or meaning to the landscape.
Receptor	Physical landscape resource, special interest or individual or group experiencing view liable to change as a result of the proposed development.
Receptor Location	Location occupied by identified receptors.
Residual Effects	Effect of development after mitigation proposals are taken into account.
Scoping	The process of identifying likely significant effects of a development on the environment – which may be carried out in a formal or informal way.
Significant Effect	An effect which is considered by the assessor to be "significant" in terms of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 which require the identification of significant effects.

Glossary	
Term	**Definition**
Transient View	A view which obtained momentarily, as part of a sequence of views, e.g. from a car travelling along a road.
Visual Amenity	Particular composition of landscape elements that contribute to a view, or views.
Visibility Analysis	The process of identifying theoretical (based on digital modelling) and/or actual predicted areas from where any given development may be seen.
Visual Effect	The consequence of change in the appearance of the landscape as a result of development, which may be beneficial or adverse.
Visualisation	Computer generated simulation or photomontage or other technique to illustrate how the proposed development would appear. Presented either as a wireline image (outline of the development) or as a photomontage which merges a rendered version of the development into a photograph of the view/landscape.
Zone of Theoretical Visibility (ZTV)	The area predicted to have views of a proposed development on the basis of a digital terrain model or digital surface model, which may/may not take account of landcover features.

Abbreviation	
Abbreviation	**Expanded Term**
LCT	Landscape Character Type
NSA	National Scenic Area
WLA	Wild Land Area
LVA	Landscape and Visual Appraisal
ha	Hectare
km	Kilometre
kV	Kilovolt
m	Meter
NSA	National Scenic Area
OHL	Overhead Line

Abbreviation	
Abbreviation	**Expanded Term**
SAC	South Ayrshire Council
SNH	Scottish Natural Heritage
WLA	Wild Land Area
GLVIA	Guidance for Landscape and Visual Impact Assessment
ZTV	Zone of Theoretical Visibility
GDL	Gardens and Designed Landscapes
N	North
NE	North East
SE	South East
S	South
SW	South West
W	West
NW	North West

6. CULTURAL HERITAGE APPRAISAL

6.1 Introduction

This chapter considers the likely impacts of the proposed development on Cultural Heritage (historic environment sites and features, archaeology and built heritage; hereafter referred to as 'heritage assets'). The chapter details the results of a desk-based assessment, and a walk-over field survey covering the Inner Study Area (Figures 6.1a-e) and provides an assessment of the potential impacts (direct impacts and impacts on the setting of heritage assets in the Outer Study Area).

The appraisal was undertaken by CFA Archaeology Ltd and conducted in accordance with the Chartered Institute for Archaeologists 'Code of Conduct' (2021[1]) and 'Standard and Guidance for Historic Environment Desk-based Assessment' (2017[2]), using information provided by Historic Environment Scotland (HES), South Ayrshire Council (SAC), West of Scotland Archaeology Service (WoSAS), cultural heritage advisors to SAC, and Dumfries and Galloway Council Archaeology Service (DGCAS). A description of the project proposals that form the basis of this appraisal is provided in Chapter 2: Development Description.

The objectives of the appraisal were to:

- Describe the cultural heritage baseline, including identifying archaeological potential of the proposed development area (Inner Study Area);
- Identify the potential construction (direct) impacts of the proposed development on heritage assets;
- Identify any indirect impacts (impacts on the settings of heritage assets on the Outer Study Area) resulting from the proposed development; and
- Identify any mitigation measures proposed to address likely impacts.

Impacts on landscape and visual amenity are addressed separately in Chapter 5: Landscape and Visual Appraisal.

The chapter is supported by:

- Technical Appendix 6.1: Cultural Heritage Assets: Inner Study Area
- Technical Appendix 6.2: Cultural Heritage Assets: Outer Study Area
- Figure 6.1a-e: Cultural Heritage: Inner Study Area
- Figure 6.2: Cultural Heritage: Outer Study Area
- Figures 6.3-6.8: Cultural Heritage Visualisations (Photomontages/Wirelines)

6.2 Methodology

6.2.1 Study Areas

Two zones have been employed for the cultural heritage appraisal:

- the Inner Study Area: the study area for consideration of potential direct impacts upon heritage assets comprising a 200 m corridor centred on the proposed 132 kV overhead line (OHL) and a 100 m corridor centred on the indicative access track routes. A gazetteer of heritage assets within the Inner Study Area is provided as Technical Appendix 6.1 and shown on Figures 6.1a-e; and

[1] Chartered Institute for Archaeologists (CIfA) (2014 revised 2021) 'Code of Conduct: professional ethics in archaeology'.
[2] Chartered Institute for Archaeologists (CIfA) (2014 updated 2017) 'Standard and Guidance for Historic Environment Desk-based Assessment'

- the Outer Study Area: the study area for consideration of impacts affecting the setting of heritage assets, employs a 2 km Bare-Earth Zone of Theoretical Visibility (ZTV) from the centre line of proposed 132 kV OHL. The 2 km study area is consistent with the ZTV study area employed by the Landscape and Visual Appraisal and has been agreed with HES, DGCAS and WoSAS (see details in Table 6.1). Details on the methodology and parameters used to generate the ZTV are provided in Chapter 5: Landscape and Visual Appraisal. The proposed development together with the bare-earth ZTV, and the locations of heritage assets within 2 km from which there could be theoretical views of the proposed development are shown on Figure 6.2 and a gazetteer of these heritage assets is provided as Technical Appendix 6.2, which also provides a tabulated assessment of the predicted impacts on their settings.

6.2.2 Consultation

Table 6.1 summarises the consultation responses received regarding cultural heritage interests and provides information on where and/or how they have been addressed in this appraisal. The following organisations made comment on cultural heritage interests: HES, SAC, DGCAS and WoSAS.

Full details on the consultation responses can be reviewed in Chapter 4: EIA Screening.

Table 6.1: Consultation Reponses			
Consultee and Date	**Consultation**	**Issue Raised**	**Response / Action Taken**
HES 06/03/2017	Stranoch Wind Farm Grid Connection - Routing Strategy Consultation Response	Content that significant impacts on their interests are unlikely and are content that the key potential constraints have been identified within the Routeing Strategy Consultation Document.	The assessment considered both potential direct impacts and impacts on setting on designated and non-designated heritage assets within the Inner and Outer Study Areas.
		Noted that there are a number of Scheduled Monuments and one Category A Listed Building, in the vicinity of the proposed development whose settings may potentially be affected by the proposed development and advised that these heritage assets should be taken into consideration during the detailed design process.	The identification of assets for assessment is based on analysis of the bare-earth ZTV. The potential impacts of the proposed development on the settings of designated heritage assets are assessed in Section 6.5.2.
		Welcomed that the potential impact on the setting of Cairn Kenny, chambered cairn (SM 1925) has been identified as a key consideration for the preferred route. Noted that, in light of the consented and operational wind farm development in the area, HES consider it unlikely that the impacts on the setting of the chambered cairn from the proposed OHL would be significant.	The potential impact of the proposed development on the setting of Cairn Kenny (SM 1925) is assessed in Section 6.5.2. and Technical Appendix 6.2.
		Welcome that a potential impact has been identified on the setting of Category A Listed Kildonan House (LB 1052). Stated that, in light of the intervening vegetation and scale of the proposed OHL supports, they are content that, should any significant impacts be identified, it would be possible to mitigate them through the detailed routing process.	The proposed OHL alignment has been routed so that it avoids the extent of Kildonian House Non-Inventory Designed Landscape (NIDL) (Figure 6.1a-b). The impact of the proposed development on the setting of Kildonan House is assessed in Section 6.5.2.
		Advised that the starting point for assessment of impacts on heritage assets should be HES's 'Managing Change in the Historic Environment' Guidance documents.	The assessment is carried out in accordance with the principals contained within the following documents: HES (2019[3]) 'Designation Policy and Selection Guidance'

[3] Historic Environment Scotland (HES) (2019) 'Designation Policy and Selection Guidance'.

Table 6.1: Consultation Reponses			
			HES (2016[4]) 'Managing Change in the Historic Environment: Setting' HES (2016[5]) 'Managing Change in the Historic Environment: Gardens and Designed Landscapes'.
HES 26/07/2017	Chirmorie Wind Farm Grid Connection - Routing Strategy Consultation Response	Noted that only a short section of OHL is proposed for the Chirmorie Wind Farm which would then join onto the proposed OHL route for the Stranoch Wind Farm and were content that this short section of OHL would not have significant impacts on assets within their remit in light of the consented and operational wind farms in the surrounding area.	Noted
HES 14/10/2019	Stranoch and Chirmorie Wind Farm Grid Connection – Post-Screening Consultation	Advised that HES were content with the 2 km study area.	The study areas used for the assessment are set out in Section 6.2.1.
		Requested that the following viewpoints should be provided as part of the assessment: • Cairn Kenny, chambered cairn (SM 1925): this viewpoint should cover a wide arc of view from Markdu cairn (SM 4861) to the south-east to Chirmorie Cairn hill to the north-east. • Markdhu, cairn (SM 4861): this viewpoint should include views towards Chirmorie Cairn hill • Kildonan House (LB 1052).	A list of cultural heritage visualisations included in the assessment is provided in Table 6.4.
		Requested that the impact on Kildonan House (LB 1052) should be assessed, including the impact on principal views to the house when moving along the entrance drive from west, south and east, and when viewing the garden elevation from the west.	The impact of the proposed development on the setting of Kildonan House is assessed in Section 6.5.2.
SAC 24/04/2017	Stranoch Wind Farm Grid Connection - Routing Strategy Consultation Response	Advised that part of the proposed route crosses areas that are rich in archaeological and heritage features and advised that advice should be requested from WoSAS.	Consultation was carried out with WoSAS (see response below). WoSAS provided a digital extract from the South Ayrshire Historic Environment Record (HER) for all assets within 2 km of the proposed development area.

[4] Historic Environment Scotland (HES) (2016) 'Managing Change in the Historic Environment: Setting'.

[5] Historic Environment Scotland (HES) (2016) 'Managing Change in the Historic Environment: Gardens and Designed Landscapes'.

Table 6.1: Consultation Reponses			
SAC 24/07/2017	Chirmorie Wind Farm Grid Connection - Routing Strategy Consultation Response	Requested that care should be taken to minimise any impact on any unrecorded archaeology that may exist within the proposed development area.	The archaeological potential for the Inner Study Area is assessed in Section 6.4.2. Mitigation to reduce or offset any potential impacts on buried archaeological remains within the proposed development area is provided in Section 6.6.3.
DGC 29/09/2019	Post Screening Consultation	Advised that the Council are content that the 2 km Outer Study Area is an appropriate study area for the proposed development.	The study areas used for the assessment are set out in Section 6.2.1.
		Advised that there are no assets beyond 2 km that the Council wish to include in the assessment.	The identification of assets for assessment is based on analysis of the bare-earth ZTV.
		Agreed with the choice of Cairn Kenny, chambered cairn (SM 1925) as a cultural heritage viewpoint and requested that a wireline be produced for Markdhu, cairn (SM 4861) given its close proximity to the proposed development.	The assessment is supported with visualisations (photomontages/wirelines) from those heritage assets considered to be potentially sensitive to the Development. A list of visualisations is provided in Table 6.4. Wirelines, produced for Markdu, cairn (SM 4861), are provided in Figure 6.4.
WoSAS 29/10/2019	Post Screening Consultation	Advised that they were content that the 2 km Outer Study Area is appropriate for the proposed development.	The study areas used for the assessment are set out in Section 6.2.1.
		Advised that there are no assets beyond 2 km that the Council wish to include in the assessment.	The identification of assets for assessment is based on analysis of the bare-earth ZTV.
		Advised that they were content with the choice of West Altercannoch Cairn (WoSAS 11562) as a cultural heritage viewpoint.	The assessment is supported with visualisations (photomontages/wirelines) from those heritage assets considered to be potentially sensitive to the proposed development. A list of visualisations is provided in Table 6.4. A wireline/ produced for West Altercannoch Cairn (WoSAS 11562)/ is provided in Figure 6.5.
		Requested that a walkover survey of the proposed development area be undertaken as part of the assessment.	A walkover survey of the proposed development area was undertaken between 30/09/2019 and 03/10/2029. Limitations were encountered in respect of the field survey between Poles 1 and 48 where land access was restricted during

Table 6.1: Consultation Reponses			
			the field survey period (see 'Limitations and Assumptions' section for further details).
		Advised that the proposed development ran close to the location of Knockmalloch enclosure (WoSAS 11546) and a former cairnfield (WoSAS 11537) immediately south of the enclosure. No surface remains of the cairnfield now survive, however, there is potential for buried remains to survive in the area. Advised that, given the close proximity of the proposed pole positions to the heritage assets, there was potential for construction works to result in a significant direct impact on the enclosure and former cairnfield.	The proposed grid connection route has been realigned to avoid Knockmalloch enclosure (WoSAS 11546) and the cairnfield (WoSAS 11537). The enclosure and former cairnfield now lie well away (c.500 m) from the proposed development and would not be affected by construction works.
		Requested that a photomontage be provided for Knockmalloch Enclosure (WoSAS 11546) as the route of the proposed development runs very close to the heritage asset.	The proposed grid connection route has been realigned to avoid Knockmalloch enclosure (WoSAS 11546). The grid connection route is located c.500 m east (Figure 6.2) of the enclosure. Intervening shelterbelts and woodland would largely screen views of the proposed development. A wireline is included in the assessment (Figure 6.8) to show the theoretical bare-earth visibility of the proposed development from the enclosure.

6.2.3 Desk Study

The following information sources were consulted for this appraisal:

- WoSAS and DGC Historic Environment Records (HER): provided up-to-date data for all assets within 2 km of the proposed development area;
- National Record of Historic Environment (NHRE) Scotland database (Canmore) (HES 2020[6]): for any information additional to that contained in the HERs;
- HES Spatial Data Warehouse (HES 2020[7]): provided up-to-date data on the locations and extents of Scheduled Monuments, Listed Buildings, Conservation Areas, Inventory Garden and Designed Landscapes and Inventory Historic Battlefields;
- Historic Land-Use Assessment Data for Scotland (HLAmap) (HES 2020[8]): for information on the historic land use character of the proposed development area and the surrounding area;
- Ordnance Survey maps (1st and 2nd Edition maps) and other historic maps held by the Map Library of the National Library of Scotland;
- Modern aerial photographic imagery available through GoogleEarth™ and Bing™.
- Relevant bibliographic references were consulted to provide background and historic information (including McGowan, 2009[9]; Suddaby, 2009[10]; Farrell, 2013[11]);
- The bare-earth ZTV map generated for the proposed development was utilised to identify those designated assets within the Outer Study Area that would have theoretical visibility of the proposed development.

6.2.4 Field Survey

A walk-over field survey was carried out within the Inner Study Area (a 200 m wide corridor centred on the proposed OHL alignment and within a 100 m wide corridor centred on the indicative access track routes). The field survey was undertaken between 30/09/2019 and 03/10/2019, and the 28/04/2021 with the following aims:

- Assess the baseline condition of the known heritage assets identified by the desk-based assessment;
- Identify any further features of cultural heritage interest not detected from the desk-based assessment that could be affected by the proposed development; and
- Identify areas with the potential to contain currently unrecorded buried archaeological remains.

All areas of improved arable/pasture fields and open rough grazing/moorland were surveyed in full and all cultural heritage assets that were identified through the desk-based assessment were visited. Sites identified by the desk-based assessment and located within areas of commercial forestry were visited where access was possible.

Field visits were undertaken to heritage assets in the Outer Study Area in October 2019 to assess their baseline settings.

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[6] HES (2020b) Historic Environment Scotland's National Record of Historic Environment (NRHE) database (Canmore), available at: http://pastmap.org.uk, accessed September 2020

[7] HES (2020) Historic Environment Scotland's Spatial Database Warehouse, available at http://portal.historicenvironment.scot/downloads, accessed September 2020

[8] HES (2020c) Historic Land-Use Assessment Data for Scotland (HLAmap), available at: http://hlamap.org.uk, accessed September 2020.

[9] McGowan, P (2009) Ayrshire Designed Landscape Survey: Final Report, Peter McGowan Associates.

[10] Suddaby, I (2009) Mark Hill Windfarm, Barrhill, South Ayrshire: Archaeological Recording of Parish Boundary, CFA Report No 1628.

[11] Farrell, S (2013) 'Colmonell, Blair Farm, Barrhill, Survey, DES, New Vol 14.

6.2.5 Appraisal of Potential Impacts

Cultural heritage assets are given weight through the designation process. Designation ensures that sites and places are recognised by law, through the planning system and other regulatory processes. The level of protection and how a site or place is managed varies depending on the type of designation and its laws and polices (HES, 2019[12]). Table 6.2 summarises the relative sensitivity of key cultural heritage assets (and their settings) relevant to the proposed development (excluding, in this case, World Heritage Sites and Marine resources as these are not affected by the proposed development).

Table 6.2: Sensitivity of Heritage Assets

Sensitivity of Asset	Definition / Criteria
High	Assets valued at a national level, including: Scheduled Monuments Category A Listed Buildings Non-designated assets that meet the relevant criteria for designation
Medium	Assets valued at a regional level, including: Archaeological sites and areas that have a regional value Archaeological Sensitive Areas (ASA) (where these are identified in Local Authority records) Non-Inventory Designed Landscapes (NIDL) (where these are identified in Local Authority records) Category B Listed Buildings Conservation Areas
Low	Assets valued at a local level, including: Archaeological sites that have local heritage value Category C Listed Buildings Unlisted historic buildings and townscapes with local (vernacular) characteristics
Negligible	Assets of little or no intrinsic value, including: Artefact find-spots (where the artefacts are no longer in situ and where their provenance is uncertain) Poorly preserved examples of particular types of minor historic landscape features (e.g. quarries and gravel pits, dilapidated sheepfolds, etc)

Criteria for Assessing the Significance of Impacts

The magnitude of impact (adverse or beneficial) is assessed in the categories, high, medium, low and negligible and described in Table 6.3.

- Adverse effects are those that detract from or reduce cultural significance or special interest of heritage assets.
- Beneficial effects are those that preserve, enhance or better reveal the cultural significance or special interest of heritage assets.

Table 6.3: Magnitude of Impact

Contribution	Criteria	
	Adverse	Beneficial

[12] Historic Environment Scotland (HES) (2019) 'Designation Policy and Selection Guidance'.

Table 6.3: Magnitude of Impact		
High	Changes to the fabric or setting of a heritage asset resulting in the complete or near complete loss of the asset's cultural significance. Changes that substantially detract from how a heritage asset is understood, appreciated and experienced.	Preservation of a heritage asset in situ where it would otherwise be completely or almost completely lost. Changes that appreciably enhance the cultural significance of a heritage asset and how it is understood, appreciated and experienced.
Medium	Changes to those elements of the fabric or setting of a heritage asset that contribute to its cultural significance such that this quality is appreciably altered. Changes that appreciably detract from how a heritage asset is understood, appreciated and experienced.	Changes to important elements of a heritage asset's fabric or setting, resulting in its cultural significance being preserved (where this would otherwise be lost) or restored. Changes that improve the way in which the heritage asset is understood, appreciated and experienced.
Low	Changes to those elements of the fabric or setting of a heritage asset that contribute to its cultural significance such that this quality is slightly altered. Changes that slightly detract from how a heritage asset is understood, appreciated and experienced.	Changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed. Changes that result in a slight improvement in the way a heritage asset is understood, appreciated and experienced.
Negligible	Changes to fabric or setting of a heritage asset that leave its cultural significance unchanged and do not affect how it is understood, appreciated and experienced.	

6.3 Limitation and Assumptions

This appraisal has been completed using data derived from HES's Spatial Warehouse, the DGCAS HER and the WoSAS HER and other sources (historic maps, aerial photographs). It is assumed that, at the time of the acquisition of the data from HES and the HERs, the information provided was accurate and up to date.

6.4 Baseline Conditions

6.4.1 Heritage Assets within the Inner Study Area (Figures 6.1a-e, Technical Appendix 6.1)

In total, 48 heritage assets have been identified within the Inner Study Area.

Numbers in brackets in the following text, refer to asset numbers shown on Figures 6.1a-e. full descriptions and an assessment of their value/sensitivity are provided in Technical Appendix 6.1: Cultural Heritage Assets: Inner Study Area.

General Observations

There are no Scheduled Monuments or Listed Buildings within the Inner Study Area and the Inner Study Area does not cross any Conservation Areas (CAs), Inventory Gardens and Designed Landscapes (GDLs) or Inventory Historic Battlefields (HBs).

The southern end of the proposed development crosses the northern end of East Rhins Archaeologically Sensitive Area (ASA 001) (Figure 6.1e). The East Rhins ASA is an area that has been designated by DGC in recognition of its archaeological interest as a wider collection of important archaeological sites contained within a wide expanse of moorland and rough pasture grassland around the Main Water of Luce and Cross Water of Luce river system. The ASA is considered to be of value at the regional level and is assessed as being of medium sensitivity.

The Inner Study Area clips the eastern edge of one NIDL, Kildonan House NIDL (4). This designed landscape forms the setting for Category A Listed Kildonan House (LB 1052), which was constructed c.1930. The current house replaced an earlier building, which is shown as 'ruins' on Armstrong's map (1775[13]). Roy's Military Map of Scotland (1747-44[14]) records that the earlier house stood within a walled enclosure surrounded by woodland planting and this general layout, with woodland policies surrounding the current house, remains today. Field survey indicated that where the Inner Study Area clips the edge of the NIDL it intersects with an area of woodland and there are no formal garden features in the area. As the remains of an 18th century designed landscape the NIDL is considered to be of value at the regional level and is assessed as being of medium sensitivity.

Prehistoric Features

Five of the identified heritage assets are of prehistoric date. These include settlement and associated remains likely dating to the Bronze and Iron Age, including two hut circles and associated field systems (40 and 44) and several cairnfields (23 and 37-38). A possible early prehistoric cup-marked boulder (38a) was also noted located within cairnfield (38).

Field survey recorded the remains of two possible hut circles (40a and 44a) located close to Markdu and Mill Loch respectively:

- The first hut circle (40a) and a section of field bank (40b), which may be the remnants of a former enclosure, lie just outside the Markdu, hut circles and field system (SM 4848) Scheduled Monument just outside the Inner Study Area (Figures 6.1a-e) and which are most likely associated with that settlement. The hut circle (40a), defined by a low turf and stone bank, abuts the field bank (40b) and it is likely that the two structures are contemporary. The surviving section of field bank(40b) is crossed by a later farm track. Given the location of the possible hut circle and field bank, adjacent to the Scheduled Monument, and most likely a part of contemporary settlement, it is assessed that these associated features are of high sensitivity.
- The second hut circle (44a) survives immediately west of a woodland shelterbelt at the edge in an area of semi-improved pasture just east of Mill Loch. The hut circle survives as a circular enclosure defined by a low stone-and-turf wall. A short section of bank (44b) abuts the southern edge of the hut circle and at least eleven turf-covered clearance cairns (44c) are spread around the hut circle. No cairns or any other upstanding features were noted in the woodland shelterbelt and pre-forestry ploughing in this area is likely to have removed any remains that may have been present in that area. As generally well-preserved prehistoric remains, the hut circle and associated features are assessed as being of value at the regional level and of medium sensitivity.

Field survey in 2014 (Coriolis Energy, 2015[15]) recorded the presence of a small cairnfield (37) on the crest of Drumhastie, at the edge of the Inner Study Area. Two further cairnfields (23 and 38) were recorded during recent field survey for this assessment in areas of moorland south-west of Altercannoch (23) and at Drumkare (38). 'Cairnfield' is a generic name for groups of small heaps of stones, roughly rounded or oval in plan, often less than 5 m in diameter and numbering from several to many hundred in any one location. They are not characteristic of any one particular period, since stone clearance has been practised in Britain from the Neolithic to the present day. However, in this instance, the cairnfields survive in areas where other prehistoric settlement remains are recorded, including hut circles, burial cairns and field banks, and this suggests that

[13] Armstrong, A (1775) Anew map of Ayr Shire.
[14] Roy, W (1747-55) Military Map of Scotland.
[15] Coriolis Energy (2015) Chirmorie Wind Farm EIA: Chapter 10, Archaeology and Cultural Heritage.

the cairnfields are potentially of prehistoric date. Accordingly, the cairnfields are assessed as being of value at the regional level and of medium sensitivity.

Field survey recorded what may be a cup-marked boulder (38a) located at 218672, 575168 within cairnfield (38). The bedrock boulder had two large cup-marks (9 cm by 15 cm in diameter and 3 cm to 12 cm deep) cut into its upper surface. Cup-marked rocks general date from the early prehistoric period (Neolithic to the Early Bronze Age), but their purpose or function is not known. The cup-marked boulder is considered as being of value at the regional level and is assessed as being of medium sensitivity.

A cairnfield (39) comprising of at least 12 cairns, is recorded scattered across a terrace to the north of a sheepfold on the south-east flank of Maurs Cairn. The DGC HER records that, in addition to the cairns, the possible stone footings of small enclosures and probable shieling huts are also present. The cairnfield and structures may be associated with the Marklach, Field clearance cairns 850 NNE of (SM 4844) Scheduled Monument just outside the Inner Study Area (Figures 6.1a-e). Field survey found no visible evidence for any cairns or other archaeological remains within the Inner Study Area. All of the features recorded previously lie in an area of well-drained semi-improved ground below a steep escarpment to the south of, and outside, the Inner Study Area. As remain evidently associated with the adjacent Scheduled Monument (SM 4844) the cairnfield and associated remains are assessed as being of value at the national level and to be of high sensitivity.

Medieval or Later Land-Use Features

Four farmsteads within the Inner Study Area, Drumytuat (2), Balluskie (3), Altercannoch (15) and Markdu (41) are depicted on the Ordnance Survey 1st edition map (1856-57).

- Drumytuat (2) is depicted as comprising of an unroofed long building and an incomplete enclosure, indicating that the farmstead had been abandoned by this date. The farmstead is not shown on subsequent Ordnance Survey maps. Field survey recorded that a large pile of stone is present at the location of the former building and enclosure depicted on the 1st edition map. There were no obvious structures seen as surviving here and it appears that the stone is material that has been dumped during the upgrading of a farm access road that runs past the western side of the former farmstead.
- Balluskie (3) is shown as comprising an unroofed L-shaped building with an associated enclosure, annotated as 'Ruin'. By the time of the 1979 Ordnance Survey map, a four-compartment enclosure, annotated 'Sheep Dip', is depicted at the location of Balluskie farm, suggesting that the farmstead ruins had been incorporated into a later agrarian structure. Field survey recorded that the enclosure shown on the 1979 Ordnance Survey map still stands, with the well-preserved remains of a mortared sheep dip surviving towards its centre. There is no evidence for any of the buildings depicted on the 1st edition map and it is likely that these were demolished to make way for the later enclosure and sheep dip.
- The farmstead at Altercannoch (15) and Markdu (41) continue to be occupied today. Examination of the Ordnance Survey maps indicates that Altercannoch (15) farmstead appears to have been unmodified since the 1st edition map (1856), while the farmstead at Markdu (41) has not changed substantially from the layout shown on the 2nd edition map (1896).

Two additional buildings (5 and 10) are depicted on the Ordnance Survey 1st Edition map (1857) in the Inner Study Area:

- Building (5) is recorded as an unroofed structure, annotated as 'Ruin', on the 1st edition map and is not shown on subsequent maps. No remains of this building are visible on modern aerial photographs (GoogleEarth™) in what is now an improved pasture field.

- A building and associated enclosure (10) are depicted on the 1st edition map on the south bank of the Duisk River. By the time of the 2nd edition map (1894) the building is annotated 'Ebans' and depicted as partially unroofed. Field survey recorded the remains of the building and enclosure surviving as faint turf-covered banks located at the edge of an improved pasture field.

The surviving farmsteads (15 and 41) and upstanding remains of enclosure and sheep dip (3) and building/enclosure (10) form elements of the local historic landscape and are all considered to be of value at the local level and are assessed as being of low sensitivity. Where no upstanding remains now survive (2 and 5) the buildings are considered to be of little heritage value and of negligible sensitivity.

Field survey identified the scattered remains of former agricultural activity across the Inner Study Area, this included an area of rig and furrow cultivation remains (21), several enclosures (7, 22, 24, 32 and 34), two former fields (30), two field banks (43, and 46), two walls (9 and 45), two sheep shelters (35 and 36) and numerous clearance cairns/clearance spreads (8, 12-14, 16-20, 25, 42 and 48).

- A large area of relict rig and furrow cultivation remains (21) is visible on modern aerial photographs (GoogleEarth™) between Altercannoch West farm and the Barrhill to Chirmorie public road. Field survey recorded faint traces of the rig and furrow (21a) spread over an area c.500 m by c.500 on the south bank of Cross River. Fragments of rig were partially enclosed by the remnants of a field bank (21a) and a ditch (21b). As the remains of former medieval/post-medieval cultivation they are assessed as being of value at the local level and to be of low sensitivity.
- The earthwork remains of three small enclosures (7, 22 and 24) survive in areas of rough pasture to the south of Barrhill. In addition, two further enclosures (32 and 34) and two possible fields (30) are shown on the Ordnance Survey 1st edition map (1856) within the Inner Study Area. Of these only the poorly preserved remains of enclosure (34) survives, defined by a denuded boulder wall and a low-turf covered bank, overlying the faint outline of former rig and furrow cultivation remains (Coriolis Energy, 2015[16]). No remains of enclosure (32) nor the fields (30) were identified in what is now areas of felled forestry; it is likely that pre-afforestation ploughing and forestry activity has removed any trace of these. In addition, field survey for this assessment recorded the remains of three field banks (9, 43 and 46) and sections of drystone walls (45 and 47); these are likely to be remnants of previous field boundaries which now survive in varying degrees of preservation. The generally well-preserved remains of enclosures (7, 22 and 24), field bank (43) and wall (47) are all considered to be of value at the local level and of low sensitivity; where no upstanding remains now survive (30 and 32) or the remains are poorly preserved (9, 34, 45 and 46) these are assessed as being of little heritage value and to be of negligible sensitivity.
- Field survey recorded the presence of a number of clearance cairns/clearance spreads (8, 12-14, 16-20, 25 and 42), present in areas of rough pasture/moorland around Barrhill. The clearance cairns and spreads are likely remnants of stone cleared from pastureland during the medieval/post-medieval periods and as remnants of historic agrarian practices they are assessed as being of value at the local level and to be of low sensitivity. In addition, a large irregular clearance heap (48) was recorded in improved pasture to the north of Barrhill, abutting a stone wall; the large stones present within the heap suggests that this may be of recent date, and it is assessed as being of little heritage value and to be of negligible sensitivity.

[16] Coriolis Energy (2015) Chirmorie Wind Farm EIA: Chapter 10, Archaeology and Cultural Heritage.

Three gravel pits (26-28) and two quarries (29 and 33) are depicted within the Inner Study Area on the Ordnance Survey 1st Edition map (1856). All are shown adjacent to public roads and were likely used as a source of stone during road construction. Field survey identified all of the gravel pits/quarries and recorded one additional quarry (31) just west of the Barrhill to Chirmorie public road at the edge of commercial forestry. The quarries are minor historic features of relatively recent date and are of no intrinsic heritage value and are of negligible sensitivity.

Miscellaneous

The WoSAS HER and Canmore record that a parish boundary (1) survives between Comonell and Barr parishes. The course of the boundary is shown on the 1st edition map (1857-8) running from the Muck Water, just south of Bellamore Farm, to Loch Farroch. Field survey for this assessment recorded that the former parish boundary survives as an open ditch running past the western side of Mark Hill substation to 223738, 585902 where it becomes a tumbled drystone wall running south along the eastern side of a forestry plantation (Craigcannochie Hill forestry) before turning east to follow the course of an unnamed burn at 223838, 585596. The wall has already been breached for the construction of an existing OHL. As the generally well-preserved remains of a former parish boundary the remains are considered to be of value at the local level and are assessed as being of low sensitivity.

The WoSAS HER and Canmore hold records for a former golf course (11) at Altercannoch but provides no further information. There was no evidence for a golf course found during the field survey, the area in which the golf course is recorded is now improved farmland. During the field survey, a local farmer confirmed that there had been a golf course in the area, around 50 years ago, but that it had all been ploughed out since. The former golf course has no intrinsic archaeological value and is assessed as being of negligible sensitivity.

6.4.2 Archaeological Potential of the Inner Study Area

The proposed development runs south from the lower slopes of Garleffin Hill to Markdu; the Inner Study Area crossing areas of a mixture of improved pasture and rough pasture/moorland, from Garleffin Hill to Altercannoch, passing through an area of commercial forestry plantation at Knockshin (Arecleoch Forest), and crossing an area of undulating upland at Chirmorie/Markdu.

A large number of prehistoric settlement and funerary remains, including burial cairns, hut circles and cairnfields have been recorded within upland areas at Chirmorie/Markdu and this landscape has been designated as an Archaeologically Sensitive Area (East Rhinns ASA; ASA 001) by the Dumfries and Galloway Council in recognition of the well-preserved earthwork remains (dating from the Neolithic to the Bronze Age) surviving in this area.

The WoSAS HER database records additional prehistoric settlement and funerary remains within areas of pasture surrounding Barrhill (for example, Laggan Cairns (MPK 11527 & MPK 11534), White Cairn (MPK 11558) and West Altercannoch Cairn (MPK 11562) (Figure 6.2)) and field survey for this assessment has recorded a possible prehistoric cairnfield (22) on the northern banks of the Cross Water at Altercannoch.

Roy's 'Military Survey of Scotland' map (1747-55) shows settlement at 'Barrhill', 'Kildonan' and 'Altercannoch', surrounded by unenclosed rig and furrow cultivation indicating that the area around Barrhill has been settled since at least the 18th century and possibly earlier. Remnants of medieval/post-medieval agricultural activity, including relict rig and furrow remains, clearance cairns and enclosures have been recorded within the Inner Study Area; particularly around Altercannoch.

Examination of early Ordnance Survey maps (1856-7, 1909) indicates that much of the Inner Study Area was rough pasture/moorland during the latter part of the 19th century and this land use continues today.

Taking into account the present historic environment record within the Inner Study Area, and the historic and current landscape, it is considered that:

- there is a high to medium potential for hitherto undiscovered buried archaeological remains to survive where the Inner Study Area crosses upland rough pasture and moorland at Chirmorie/Markdu, where substantial earthwork remains of prehistoric settlement and funerary remains have been identified;
- a high to medium potential for buried remains to survive where the Inner Study Area crosses farmland to the east of Mill Loch, where earthwork remains of a prehistoric settlement have been identified;
- a medium to low potential for buried remains to survive within areas of pasture farmland around Barrhill and Altercannoch; where remains of field systems and farmsteads of medieval or post-medieval date survive; and,
- a low to negligible potential for archaeological remains where the Inner Study Area passes through an area of modern commercial forestry plantation (Arecleoch Forest). Ploughing and drainage works, as well as planting and subsequent tree root growth, and forestry harvesting activities are likely to have disturbed or destroyed the integrity of any surviving buried archaeological deposits that may be present.

6.4.3 Heritage Assets within the Outer Study Area (Figure 6.2; Technical Appendix 6.2)

Based on analysis of the bare-earth ZTV, there are 27 Scheduled Monuments, assets valued at the national level and of high sensitivity, within the Outer Study Area from which there is some degree of theoretical visibility of the proposed development. All of the Scheduled Monuments form part of East Rhins Archaeologically Sensitive Areas (ASA 001) (medium sensitivity) which is crossed by the proposed development.

In addition to the Scheduled Monuments, there are 15 non-designated heritage assets within the Outer Study Area that are listed in the HER as being of 'national significance' (high sensitivity). Of these, six (prehistoric burial cairns: WoSAS 11480, WoSAS 11527, WoSAS 11534, WoSAS 11535, WoSAS 11558 and WoSAS 11562) have settings where wider landscape views and intervisibility between them are potentially important aspects of their setting.

Within the Outer Study Area there is one Category A Listed building (high sensitivity), one Category B Listed Buildings (medium sensitivity), two Category C Listed Buildings (low sensitivity) from which there is a degree of predicted theoretical visibility. Category A Listed, Kildonan House (LB 1052) has a setting where wider landscape views are a potentially important aspect of its setting.

There are also three NIDL (medium sensitivity) from which there is a degree of predicted visibility of the proposed development. Evidence from Ordnance Survey maps and modern aerial photography (GoogleEarth™) indicates that two of these, Bellamore and Docherneil, are no longer appreciable on the ground. Kildonan NIDL forms the setting for Category A Listed Kildonan House (LB 1052).

The sensitivity of each of the heritage assets in the Outer Study Area is set out in Technical Appendix 6.2 and their locations and extents are shown on Figure 6.2.

6.5 Potential Impacts

6.5.1 Construction

Any ground-breaking/disturbance activities associated with construction of the proposed development have the potential to disturb or destroy features of cultural heritage interest. Other construction activities, such as vehicle movements, storage of construction materials and soil and

overburden storage, also have the potential to cause permanent and irreversible impacts on heritage assets.

The potential adverse, permanent and irreversible direct impacts identified would result primarily from possible ground disturbance associated with the erection of the OHL poles and construction of and upgrading of access tracks close to recorded heritage assets shown on Figure 6.1.

Assumption for potential construction impacts

For the purpose of this assessment potential for direct (construction) impacts has been based on the proposed OHL route and indicative pole positions and access track routes shown on Figures 6.1a-e.

It is considered that there is potential for direct impact on heritage assets in the following circumstances:

- Within 20 m of proposed wood pole locations, to take into account working areas around poles and vehicle movement at these locations;
- Along, and in close proximity to, indicative access track routes, including where the indicative access tracks run along the line of the proposed OHL; and
- Within proposed forestry felling areas (see Chapter 9: Forestry Appraisal for more information).

Micrositing

It is the intention that the proposed development would be subject to an Infrastructure Location Allowance (ILA) of 50 m in either direction along the proposed alignment, measured from each pole centre, and 25 m in any direction from each proposed pole centre in order to avoid environmental constraints or physical features as required (see Chapter 2: Development Description for details). Movement of infrastructure would, however, be dependent upon consideration of identified constraints and subject to advice from an Ecological Clerk of Works (ECoW). No micrositing of infrastructure would be undertaken where this could potentially affect cultural heritage interests without consultation with an appointed Archaeological Clerk of Works (ACoW), who would advise on the acceptability of any proposed realignments, and consultation with the Council Archaeologist to agree appropriate mitigation where there are potential impacts as a result.

Potential Direct (Construction) Impacts

Forty-eight heritage assets have been identified within the Inner Study Area and it is assessed that there is potential, in the absence of mitigation, for construction works to result in direct impacts on fifteen of these:

- The remains of a former parish boundary (1), of low sensitivity, lie close to (c.1 m) the proposed position of Pole 5 and is crossed by the indicative access track between Poles 5 and 6. Construction activities associated with the proposed development have the potential, in absence of mitigation, to disturb a short section of the boundary remains (surviving as a tumbled stone wall at this location) leading to a **low** magnitude direct adverse impact on the parish boundary as a whole. Mitigation measures are presented below to ensure that the parish boundary is avoided.
- A water tank (6), of low sensitivity, lies close to (c.7 m) the indicative access track route to Pole 47. Construction of the indicative access track route has the potential, without mitigation, to disturb the water tank and lead to a **high** magnitude direct adverse impact. Mitigation measures are presented below to ensure that the water tank is avoided.
- The poorly preserved remains of a field bank (9), of negligible sensitivity, lie within an area of proposed tree felling, to the south-west of Pole 51. Felling works has the potential, in the

absence of any mitigation, to disturb a short section of the field bank and lead to a **negligible** magnitude adverse impact on the remains, when considered as a whole. Given the poor condition and negligible sensitivity of the remains, no mitigation is recommended for this impact.

- An area of relict rig and furrow cultivation remains (21), of low sensitivity, is crossed by the proposed OHL route and the proposed positions of Poles 69-71 are located within the area of rig and furrow. Construction work associated with the proposed development have the potential, in absence of any mitigation, to disturb these remains and lead to a **low** magnitude adverse impact on the rig and furrow remains as a whole. Mitigation measures are presented below to ensure that any disturbance to the rig and furrow remains during construction work is kept to a minimum.
- The remains of a field bank (21a), of low sensitivity, lie close to (c.9m) the construction area for Pole 66. Construction activities associated with the proposed development have the potential, in absence of any mitigation, to disturb a small section of the field bank and lead to a **low** magnitude adverse impact on the bank as a whole. Mitigation measures are presented below to ensure that the field bank is avoided.
- The remains of a well-preserved enclosure (22), of low sensitivity, are crossed by the indicative access track route to Pole 74. Construction activities associated with the proposed development have the potential, in absence of mitigation, to disturb the remains and lead to a **medium** magnitude direct adverse impact on the enclosure. Mitigation measures are presented below to ensure that the enclosure is avoided.
- The remains of a cairnfield (23), of medium sensitivity, are crossed by the indicative access track route to Pole 74 and one of the cairns lies within the proposed construction area around Pole 74. Construction works for the proposed development, in absence of mitigation, would affect a small part of the cairnfield as a whole and lead to a **low** magnitude direct adverse impact. Mitigation measures are presented to ensure that any disturbance to the cairnfield during construction works is kept to a minimum.
- The poorly preserved remains of an enclosure and associated rig and furrow remains (34), of negligible sensitivity, are crossed by the indicative access track route between Poles 112 and 113. The proposed position for Pole 112 is located within the area of rig and furrow and the construction area around the angle pole at Pole 113 clips the southern edge of the enclosure. Construction work associated for the proposed development has the potential, in the absence of any mitigation, to disturb these remains and lead to a **medium** magnitude direct adverse impact on the enclosure and the rig and furrow remains. Given the poor condition and negligible sensitivity of the remains no mitigation is recommended for this impact.
- The well-preserved remains of a cairnfield (38), of medium sensitivity, are crossed by the indicative access track route between Poles 148 and 151 and the proposed positions for Poles 148 – 150 lie within the cairnfield. Construction works for the proposed development have the potential, in absence of any mitigation, to disturb these remains and lead to a **medium** magnitude direct adverse impact on the cairnfield as a whole. Mitigation measures are presented to ensure that any disturbance to the cairnfield during construction works is kept to a minimum.
- A cup-marked boulder (38a), of medium sensitivity, lies at the edge of the proposed construction area around Pole 149. Construction work for the proposed development has the potential, in absence of any mitigation, to disturb the cup marked boulder and lead to a **high** magnitude direct adverse impact. Mitigation measures are presented below to ensure that the cup-marked boulder is avoided.
- The remains of a field bank (40b), part of a group of remains that are evidently associated with a Scheduled Monument of high sensitivity, is crossed by the indicative access track to Pole 169. The field bank in its own right is of no more than low sensitivity and construction

of the indicative access track to Pole 169 has the potential, in absence of any mitigation, to disturb a short section of the field bank, leading to a **low** magnitude direct adverse impact on the bank as a whole. Mitigation measures are presented below to ensure that any disturbance to the field bank during construction works is kept to a minimum.

- The remains of a field bank (43) are crossed by the indicative access track route to Pole 16. Construction work for the proposed development has the potential, in absence of any mitigation, to disturb a short section of the field bank and lead to a **low** magnitude direct adverse impact. Mitigation measures are presented below to ensure that any disturbance to the field bank during construction works is kept to a minimum.
- The poorly preserved footings of a section of drystone wall (45) lie within 6 m of the indicative access track between Poles 20 and 21. Construction work for the indicative access track route has the potential, in absence of any mitigation, to disturb the northeast end of the wall and lead to a **low** magnitude direct adverse impact. Given the poor condition and negligible sensitivity of the wall remains, no mitigation is recommended for this impact.
- The poorly preserved remains of a stone and turf bank (46) are crossed by the indicative access track between Poles 21 and 22. Construction work for the indicative access track route has the potential, in absence of any mitigation, to disturb a short section of the wall and lead to a **low** magnitude direct adverse impact. Given the poor condition and negligible sensitivity of the wall remains, no mitigation is recommended for this impact.
- The remains of a drystone wall (47) are crossed by the indicative access track route between Poles 35 and 36. Construction work for the indicative access track route has the potential, in absence of any mitigation, to disturb a short section of the wall and lead to a **low** magnitude direct adverse impact. Mitigation measures are presented below to ensure that any disturbance to the field bank during construction works is kept to a minimum.

If proposed poles were to be relocated within the ILA, there are seven other heritage assets that could potentially fall within a 20 m working area around a possible revised pole position and be directly affected by construction operations. These are:

- Field bank (9) – 21 m to the southwest of Pole 51 could potentially be affected if Pole 51 is moved to the southwest. The possible impact is assessed as potentially being of **medium** magnitude on an asset of negligible sensitivity.
- Clearance cairn (14) - 21 m northeast of proposed Pole 61 could potentially be affected if Pole 61 is moved to the northeast. The possible impact is assessed as potentially being of **high** magnitude on an asset of low sensitivity.
- Clearance cairn (18) - 21 m southeast of the indicative access track route between Poles 62 and 63 could potentially be affected if Pole 62 and/or Pole 63 is moved to the southeast. The possible impact is assessed as potentially being of **high** magnitude on an asset of low sensitivity.
- Clearance cairn (25) – 36 m north northwest of Pole 82 could potentially be affected if Pole 82 is moved to the north northwest. The possible impact is assessed as potentially being of **high** magnitude on an asset of low sensitivity.
- Gravel pit (26) – 36 m southeast of Pole 82 could potentially be affected if Pole 82 is moved to the southeast. The possible impact is assessed as potentially being of **high** magnitude on an asset of negligible sensitivity.
- Quarry (33) – 35 m west northwest of Pole 107 could potentially be affected if Pole 107 is moved to the west northwest. The possible impact is assessed as potentially being of **high** magnitude on an asset of negligible sensitivity.

- Sheep shelter (35) – 34 m north of Pole 120, and 16 m from the indicative access track, could potentially be affected if Pole 120 is moved to the north. The possible impact is assessed as potentially being of **high** magnitude on an asset of negligible sensitivity.

Where required, mitigation to avoid, reduce or offset potential impacts arising from micrositing is set out in Section 6.6.

In addition to the impacts identified above, there is the possibility that any ground disturbing works in areas required for construction of the OHL connections could disturb or destroy hitherto unrecorded buried archaeological remains present in affected areas. It has been assessed that there is a high to medium potential of encountering buried remains where the Inner Study Area crosses moorland at Chirmorie/Markdu; a medium to low potential in areas of pastureland around Barrhill and Altercannoch and a low to negligible potential in areas of modern commercial forestry plantation. Mitigation is proposed below to address the possibility of discoveries of buried archaeological remains.

6.5.2 Operation

The proposed development could result in adverse impacts on the settings of cultural heritage assets within the Outer Study Area. Beyond 2 km, the proposed development would not be a dominant feature in the landscape and the impact on the settings of heritage assets would not be significant, with any potential impacts diminishing with distance from the proposed development. No heritage assets beyond 2 km have been identified by HES, WoSAS, or DGCAS as requiring consideration for potential impacts on their settings. Technical Appendix 6.2 contain tabulated assessments of the predicted impacts.

The assessment of operational impacts has been carried out with reference to the layout of the proposed development and locations of the heritage assets shown on Figure 6.2. The criteria detailed in Tables 6.2 and 6.3 have been used to assess the magnitude of the predicted impacts, which are set out in summary form in Technical Appendix 6.2. Those heritage assets, identified through consultation with HES, WoSAS and DGCAS as being potential sensitive to change resulting from the proposed development, are discussed in detail below, ordered from south to north along the proposed OHL alignment. The assessment is supported by visualisations (Figures 6.3-6.8) which are referenced in Technical Appendix 6.2 and throughout the following text where relevant.

A list of the visualisations (photomontages/wirelines) is provided in Table 6.4 for ease of reference.

Table 6.4: Cultural Heritage Visualisations Viewpoints

Figure no	Asset name	Asset no	Status	Visual type	Viewpoint no
6.3	Cairn Kenny, chambered cairn	SM 1925	Scheduled Monument	Photomontage	CH01
6.4	Markdu, cairn	SM 4861	Scheduled Monument	Wireline	CH02
6.5	West Altercannoch, cairn	WoSAS 11562	HER 'national significance' site	Photomontage	CH03
6.6	Martyr's Tomb, Barrhill	LB 1054	Category B Listed Building	Wireline	CH04
6.7	Kildonan House	LB 1052	Category A Listed Building	Wireline	CH05

Table 6.4: Cultural Heritage Visualisations Viewpoints					
6.8	Knockmalloch, enclosure	WoSAS 11546	HER 'national significance' site	Wireline	CH06

Cairn Kenny, Chambered Cairn (SM 1925) (Figures 6.3)

This well-preserved prehistoric chambered cairn stands on a small knoll on a north-east facing slope of High Murdonochee in open moorland/pasture. The main arc of view from the cairn is oriented to the north and east, with long views afforded to the Southern Uplands in the north-east. Rising ground, which lies to the southwest, south and south-east of the burial cairn, provides a relatively secluded setting and the cairn is not a prominent feature in the wider landscape. The cairn is, however, visible from the higher ground immediately to the south and when approaching its location from the north.

The cairn is one of a number of prehistoric assets, including prehistoric settlement remains and other burial cairns that survive within the moorland/pasture land overlooking the Cross Water of Luce valley and which collectively make up the East Rhins ASA (ASA 001). Another burial cairn, Markdu Cairn (SM 4861), stands around 400 m to the south-east and there is a degree of intervisibility between the two locations. The burial cairn stands just north of the consented Stranoch Wind Farm and the existing Arecleoch and Kilgallioch wind farms are visible in views to the north-west and south-east, forming part of the cairn's baseline setting.

The key aspects of the setting of the cairn are the upland moorland/pasture in which it lies and its relationship with Markdu Cairn (SM 4861). Due to its topographical position, the monument has a relatively localised setting.

The proposed development would pass the cairn's location on its east side, at its closest being 0.8 km away and running in a line from the north-east to the south-west (Figure 6.2). A photomontage showing the predicted visibility of the proposed development from the monument (Figure 6.3a) shows that the proposed development would be seen in the middle distant, largely backdropped by hills and seen against the background of the operational Killgallioch Wind Farm. The proposed development would pass through the consented Stranoch and Chirmorie wind farms and would be seen in the same context as these developments.

The proposed development would be seen as an additional visual element in a landscape already containing the existing Killgalioch Wind Farm. The presence of the proposed development within the wider landscape surrounding the burial cairn would not affect the relatively localised setting of the cairn and the intervisibility between the monument and Markdu Cairn (SM 4861) would not be interrupted by the proposed development.

Overall, it is considered that the presence of the proposed development in the wider landscape of the burial cairn would not appreciably affect the way in which the monument is understood, appreciated or experienced and the monument's cultural significance would not be appreciable diminished by the introduction of the proposed development into its setting. It is therefore assessed that the impact of the proposed development on the setting of the burial cairn would be of **low** magnitude.

Markdu, cairn (SM 4861) (Figures 6.4)

This prehistoric burial cairn, of late Neolithic or Bronze Age date, stands on a small knoll in open moorland/pasture between High Murdonachee and Corly Craig, on a slight north-east facing slope. The main arc of view from the cairn is oriented to the north and east, with long views afforded to the Southern Uplands in the north-east. Rising ground, which lies to the south-west, south and south-east of the burial cairn, provides a relatively secluded setting and the cairn is not a prominent feature in the wider landscape. The cairn is, however, visible from higher ground immediately to the south and when approaching its location from the north.

The cairn is one of a number of prehistoric assets, including prehistoric settlement remains and other burial cairns that survive within the upland moorland/pasture land overlooking the Cross Water of Luce valley and which collectively make up the East Rhins ASA (ASA 001). Another burial cairn, Cairn Kenny (SM 1925), stands around 400 m to the north-east and there is a degree of intervisibility between the two locations. The burial cairn stands just north of the consent Stranoch Wind Farm and the existing Arecleoch and Kilgallioch wind farms are visible in views to the north-west and south-east, forming part of the cairn's baseline setting.

The key aspects of the setting of the cairn are the upland moorland/pasture in which it lies and its relationship with Cairn Kenny (SM 1925). Due to its topographical position the cairn has a relatively localised setting.

The proposed development would pass the cairn's location on its east side, at its closest being 0.3 km away and running in a line from the north-east to the south-west (Figure 6.2). A wireline showing the predicted visibility of the proposed development from the cairn (Figure 6.4) shows that the proposed development would be seen in the middle distant and partly visible against the skyline. The proposed poles would be seen in the same arc of view as, and seen against the background of, the operational Killgallioch Wind Farm. The proposed development would also pass through the consented Stranoch and Chrimorie wind farms and would be seen in the same context as these developments.

The proposed development would be seen as an additional visual element in a landscape already containing the existing Killgallioch Wind Farm. The presence of the proposed development within the wider landscape surrounding the burial cairn would not affect the relatively localised setting of the cairn and the intervisibility between the monument and Cairn Kenny (SM 1925) would not be interrupted by the proposed development.

Overall, it is considered that the presence of the proposed development in the wider landscape of the burial cairn would not appreciably affect the way in which the monument is understood, appreciated or experienced and the monument's cultural significance would not be appreciable diminished by the introduction of the proposed development into its setting. It is therefore assessed that the impact of the proposed development on the setting of the burial cairn would be of **low** magnitude.

West Altercannoch Cairn (WoSAS 11562) (Figure 6.5)

The monument comprises the remains of a prehistoric burial cairn located in semi-improved farmland, around 300 m north-east of West Altercannoch farm. The cairn is situated on a low eminence near the confluence of the Cross Water and the Duisk River. Views are afforded in all directions from the cairn, overlooking surrounding farmland, although key views are to the north overlooking the Duisk River valley. The cairn is one of several prehistoric burial cairns in the landscape surrounding Barrhill (i.e. Laggan Cairns (WoSAS 11527 and WoSAS 11534) and White Cairn (WoSAS 11558)), although any visual relationship between these cairns is not evidence on the ground due to the presence of commercial forestry. The cairn, which is surmounted by a modern marker cairn, is not a prominent feature in the wider landscape.

The key aspects of the setting of the cairn are the farmland in which it lies, its relationship with the confluence between the Cross Water and the Duisk River, and key views overlooking the Duisk River valley.

The proposed development would pass the cairn's location on its south-east side, at its closest being 0.2 km away to the south and running in a line from the north to the south-west (Figure 6.2). A series of photomontages showing the predicted visibility of the proposed development from the cairn (Figure 6.5) shows that the proposed development would be seen running north to south-west across the Duisk River valley and would be visible in the near distant between the

cairn and West Altercannoch farm; visible together with an existing wood pole line where it passes closest to the monument.

The proposed development would be an evident new element in the landscape surrounding the cairn. However, given the permeable nature of the proposed development, it will still be possible to appreciate the farmland setting of the cairn, gain an understanding of the position of the monument in relation to the confluence of the Cross Water and the Duisk River, and the main views from the cairn overlooking the Duisk River valley.

Overall, it is considered that the presence of the proposed development in the wider landscape around the cairn would not appreciably detract from the way in which the burial cairn is understood, appreciated or experienced and the monument's cultural significance would not be appreciable diminished by the introduction of the proposed development into its setting. It is therefore assessed that the impact of the proposed development on the setting of the cairn would be of **low** magnitude.

Martyr's Tomb, Barrhill (LB 1054) (Figure 6.6)

This Category B Listed building is a 19th century inscribed monument erected in 1825 within a walled enclosure marking the graves of two Covenanters, John Murchie and Daniel Meiklewrick, who were shot and buried at this location in 1615. The tomb stands in a woodland clearing on the south bank of the Cross Water and is reached by an unmarked path approaching the tomb from the east. Surrounding woodland and a rise in topography to the east of the monument provides a secluded and sheltered setting for the tomb and the monument has a localised river setting.

The proposed development would pass the tomb's location on its east side, at its closest being 0.6 km away, crossing farmland in a line from the north-east to the south-west (Figure 6.2). A wireline showing the predicted bare-earth view from the tomb (Figure 6.6) shows that the proposed development would be just theoretically visible beyond the skyline in distant views and largely screened from view by intervening topography.

Overall, it is considered that the presence of the proposed development in the wider landscape to the south-east of the tomb would not affect the way in which it is understood, appreciated or experienced and the tomb's cultural significance would not be appreciably diminished by the introduction of the proposed development. It is therefore assessed that the impact of the proposed development on the setting of the enclosure would be of **negligible** magnitude.

Kildonan House (LB 1052/NIDL 53453) (Figure 6.7)

This Category A Listed Building is a 20th century country house, constructed ca. 1930 and reminiscent of the work of Sir Edward Lutyens. The house stands towards the centre of a small, NIDL surrounded by woodland policies and open parkland. The main elevations of the house are oriented towards the north-west and the south-east. The house is surrounded by woodland which provides a sheltered and secluded, private setting for the house within the designed landscape.

The house is approached from the west, along an approach drive that passes through Liglaw Wood, and from the east, along an approach drive that runs along the southern edge of Glen Wood/Waulk Mill Wood. Views to the house from the surrounding landscape are largely screened by surrounding woodland and by trees/woodland that edge the surrounding fields, and which are present along the banks of the River Duisk. Glimpses of the house, standing within woodland, can be gained in views from the south-east around Ansheen Church (LB 51617) on the north-western edge of Barrhill. Key views from within the designed landscape are concentrated along and overlooking the Duisk River valley to the north-west and the south-east.

The proposed development would pass Kildonan House and its designed landscape on the east side, at its closest being 1.4 km from the house and running in a line from the north to the south (Figure 6.2). A wireline (Figure 6.7), showing the predicted bare-earth view from the south-east elevation (main elevation) of the house, shows that visibility of the proposed development would be almost entirely screened by the intervening topography. Where proposed wood poles would potentially be theoretically visible, they would be seen in distant views and largely backdropped by surrounding hills (Figure 6.7). Views of the proposed development, whilst travelling along the western approach drive would be largely screened by the woodland through which the approach drive passes, although glimpses of the proposed wood polesmay be visible from the approach drive where it passes Kildonan House on the south side; from here the proposed poles would be seen only in distant views and backdropped by surrounding hills. Views of the house and gardens whilst approaching from the east would not be affected.

Overall, the presence of the proposed development in the wider landscape east of Kildonan House and its associated NIDL would not affect the way in which the house or its designed landscape are understood, appreciated or experienced and the cultural significance of the house and its designed landscape would not be appreciably diminished by the introduction of the proposed development. It is therefore assessed that the impact of the proposed development on the setting of Kildonan House and NIDL would be of **negligible** magnitude.

Knockmalloch, Enclosure (WoSAS 11546) (Figure 6.8)

This monument comprises the poorly preserved remains of a probable later prehistoric settlement surviving as a circular enclosure defined by a heavily robbed stone wall. The enclosure stands at the corner of an improved-pasture field on gently sloping south-west facing ground, adjacent to Mill Burn and immediately south of a woodland shelterbelt. Further shelterbelts edge the field in which the enclosure lies, to the east and south of the monument and provide a contained, localised setting for the enclosure. The enclosure would originally have overlooked the Duisk River to the south, but the surrounding shelterbelts now screen views in this direction and obscure that view.

The proposed development would pass the location of the enclosure on its east side, at its closest being 0.5 km away and running in a line from the north to the south-east (Figure 6.2). A wireline, showing the predicted theoretical visibility of the proposed development from the monument (Figure 6.8), shows that the proposed wood poles would be seen beyond the skyline largely screened by intervening topography. The ZTV and the wireline do not, however, take into account the screening provided by woodland shelterbelt plantations which would entirely screen views of the proposed development from the monument.

The presence of the proposed development in the wider landscape around the enclosure would not affect the way in which the monument is understood, appreciated or experienced and the monument's cultural significance would not be appreciably diminished by the introduction of the proposed development. It is therefore assessed that the impact of the proposed development on the setting of the enclosure would be of **negligible** magnitude.

6.6 Mitigation

The emphasis in Planning Advice Note (PAN) 2/2011: Planning and Archaeology (PAN2) is for the preservation of important remains in situ where practicable and by record where preservation is not possible. The mitigation measures presented below therefore take into account this planning guidance and provide various options for protection or recording and ensuring that, where practical, surviving assets are preserved intact to retain the present historic elements of the landscape.

All mitigation works presented in the following paragraphs would take place prior to, or, where appropriate, during, the construction of the proposed development. All works would be

conducted by a professional archaeological organisation, and the scope of works would be detailed in one or more Written Scheme(s) of Investigation (WSI) developed in consultation with (and subject to the agreement of) WoSAS on behalf of SAC or by DGCAS on behalf of DGC.

6.6.1 Embedded Mitigation

Design of the proposed development has taken into account issues raised through consultation (see Table 6.1) and the route has been designed so as to reduce likely construction and operational impacts; in particular the concerns expressed through consultation regarding Kildonan House (LB 1052) by HES (Table 6.1: 14/10/2020) and on Knockmalloch, Enclosure (WoSAS 11546), by WoSAS (Table 6.1: 29/10/2020) have been addressed.

6.6.2 Mitigation During Construction

Preservation in Situ / Marking-off

Final pole positions and associated infrastructure, which lie in close proximity to heritage assets, would be microsited, where possible, away from heritage assets in their vicinity.

The locations of construction working areas, ground-breaking works at pole locations, indicative access track routes, and compound/laydown areas, would be designed to avoid known heritage assets as far as this is reasonably practicable. Procedures would include the exclusion of heritage assets from working areas and the avoidance of assets when preparing detailed designs for access routes for construction areas.

Known archaeological sites and archaeological sensitive areas, would not be used for storage of materials or as parking areas for vehicles or machinery.

Surviving heritage assets that are within the ILA of the proposed development or indicative access track routes or within 20 m of a possible microsited pole position would be marked out for avoidance during the construction phase. The ILA limit is adopted to correspond with the micrositing allowance that would allow for flexibility to relocate poles, tracks or other infrastructure components as necessary to accommodate the range of potential environmental and engineering constraints. Formal agreement with landowners would be confirmed prior to any micrositing during construction.

Marking out would be achieved using high visibility fencing placed, wherever possible, a minimum of 5 m from the edge of the identified heritage assets and these markers would be retained for the duration of the construction phase. Assets for marking out would be identified on the ground by a qualified archaeologist (ACow) using the baseline information provided in Technical Appendix 6.1. Marking out of the assets would be undertaken by the appointed main contractor under the guidance of the retained archaeologist (ACoW). Such demarcation should be retained and maintained as required during the duration of construction works.

Heritage assets identified as requiring marking out are:

- Water tank (6);
- Field bank (21a);
- Enclosure (22);
- Cairnfields (23 and 38) (markers would be set from the edge of individual cairns within the cairnfields where these are in areas likely to be directly affected by construction work);
- Cup-marked boulder (38a);
- Clearance cairns (14, 18, 25); and
- Sheep shelter (35).

For other assets identified as being within the ILA, but which are of little or no heritage value and of negligible sensitivity, field bank (9), gravel pit (26), quarry (33) and enclosure (34), there are no requirements for any measures to ensure their preservation in situ.

There are no requirements to ensure preservation in situ of any of the other identified heritage assets within the Inner Study Area.

Protection of Features Crossed by Access Tracks

A working corridor would be defined for the routes of indicative access tracks where they cross cairnfields. This approach would limit the areas within which construction works would take place and ensure the preservation in situ of the majority of the individual components of the cairnfields as far as is practicable.

Disturbance to the former parish boundary (1), relict rig and furrow remains (21), relict field banks (40b), field banks (43), and a wall (47), which are crossed by indicative access tracks would be keep to a minimum. Where the indicative access track to Pole 169 crosses the remains of a field bank (40b) the access track would be routed so that it utilises an existing farm track that already breaches the field bank.

Temporary track mats would be employed, where possible, where access tracks pass through cairnfields (23 and 38) to avoid disturbance of any surviving buried remains.

Watching Briefs/Excavations

If required under the terms of a planning condition, the scope of any required archaeological watching brief(s) would be agreed through consultation with DGCAS and WoSAS in advance of development works commencing and would be set out in the Written Scheme of Investigation (WSI).

Watching briefs (and possibly excavation) are recommended for the following assets:

- Hut circle, field bank and cairn field (44a-c): watching brief between Poles 17-19 where the proposed development runs close to the prehistoric remains. To identify and record any surviving buried remains.
- Cairnfields (23 and 38): any cairns that cannot be avoided by the proposed development should be excavated to a strategy and standard accepted by DGCAS and WoSAS. This may require full excavation of individual cairns, or a sample selection of these.

If new, archaeologically significant discoveries are made during any watching briefs that are carried out, and it is not possible to preserve the discovered site or features in situ, provision would be made for the excavation, where necessary, of any archaeological remains encountered following further consultation with the relevant Council Archaeologist. The provision would include the consequent production of written report, on the findings, with post-excavation analysis and publication of the results of the works, where appropriate.

Construction Guidelines

Written guidelines would be issued for use by all construction contractors, outlining the need to avoid causing unnecessary damage to known heritage assets. The guidelines would set out arrangements for calling upon retained professional support in the event that buried archaeological remains of potential archaeological interest (such as building remains, human remains, artefacts, etc.) should be discovered in areas not subject to archaeological monitoring.

The guidelines would make clear the legal responsibilities placed upon those who disturb artefacts or human remains.

6.6.3 Mitigation During Operation

No mitigation measures are proposed in relation to the likely operational impacts of the proposed development.

6.7 Summary

A desk-based assessment and a walkover field survey have been carried out for the proposed development. The assessment has been informed by comments and information supplied by HES, SAC, WoSAS, cultural heritage advisors to SAC, and DGCAS.

Forty-eight cultural heritage assets have been identified within the Inner Study Area and potential direct impacts have been predicted on 15 of these arising from the construction of the proposed development. It is assessed that there would, in the absence of mitigation, be a high magnitude impact on two assets, a water tank (6) and cup-marked boulder (38a), and a medium magnitude impact on three assets, two enclosures (22 and 34) and a cairnfield (38). There are an additional seven heritage assets that lie within a 20 m working area radius of any pole position including where these may be subject to repositioning within the ILA, that could be affected by any deviation from the proposed layout. Mitigation measures are proposed to avoid, offset or reduce the potential loss of the archaeological resources that are likely to occur as a result of the construction of the proposed development.

Fifty heritage assets in the Outer Study Area are predicted to have visibility of one or more elements of the proposed development. It is assessed that there would be a low magnitude impact on the setting of twenty-one assets: thirteen Scheduled Monuments, one ASA and seven HER Nationally Significant Sites. All other impacts on the settings of heritage assets in the Outer Study Area are assessed as being of no more than negligible magnitude.

A summary of the likely impacts of the proposed development and proposed mitigation are provided below in Table 6.5.

Table 6.5: Summary of Impacts and Proposed Mitigation

Likely Impact	**Mitigation/Control Measure Proposed**
Construction	
Potential direct construction impact on remains of a parish boundary (1).	Keep disturbance to parish boundary to a minimum.
Potential direct construction impact on a water tank (6).	Mark-off asset during construction works.
Potential direct impact on the remains of a field bank (9).	None, the remains of the field bank are poorly preserved and considered to be of little heritage value.
Potential direct impacts on the remains of three clearance cairns (14, 18 and 25).	Mark-off asset during construction works.
Potential direct construction impact on an area of relict rig and furrow remains (21).	Keep disturbance of rig and furrow remains to a minimum. Use of temporary track mats for access where possible.
Potential direct construction impact on the remains of a field bank (21a).	Mark-off during construction works.
Potential direct impact on the remains of an enclosure (22).	Microsite route of indicative access track to avoid the enclosure remains. Mark-off during construction works.

Table 6.5: Summary of Impacts and Proposed Mitigation	
Potential direct impact on the remains of a cairnfields (23 and 38).	Mark-off upstanding remains during works. A working corridor would be defined for the route of the indicative access tracks, where they cross cairnfields. Temporary track mats, where possible, would be employed where access tracks pass through the cairnfields to avoid disturbance of buried remains. Microsite proposed development to avoid upstanding components of the cairnfields (individual cairns). Any areas where disturbance to components of the cairnfields is unavoidable should be recorded archaeologically prior to, or during, construction works as appropriate. Archaeological watching brief to be carried out during any ground works where the works pass through the extent of these assets.
Potential direct impact on a gravel pit (26).	None, as the asset is of minimal heritage value.
Potential direct impact on a quarry (33).	None, as the asset is of minimal heritage value.
Potential direct impact on the remains of an enclosure and rig and furrow cultivation (34).	None, the remains of the enclosure and rig and furrow cultivation are poorly preserved and considered to be of little heritage value.
Potential direct impact on sheep shelter (35).	Mark-off asset during construction works.
Potential direct impact on cup-marked boulder (38a).	Mark-off asset during construction works.
Potential direct impact on the remains of field bank (40b).	Route indicative access track along route of existing farm track where it breaches the field bank. Keep disturbance to the field bank to a minimum.
Potential direct impact on the remains of a field bank (43).	Keep disturbance to the field bank to a minimum.
Potential direct impact on wall (45).	None, the remains of the wall are poorly preserved and considered to be of little heritage value.
Potential direct impact on field bank (46)	None, the remains of the field bank are poorly preserved and considered to be of little heritage value.
Potential direct impact on wall (47)	Keep disturbance to the field bank to a minimum.
Operation	
Potential indirect impacts on the setting of 27 Scheduled Monuments.	No mitigation required.
Potential indirect impact on the setting of one Category A Listed Building.	No mitigation required.
Potential indirect impact on the setting of one Category B Listed Building.	No mitigation required
Potential indirect impacts on the setting of two Category C Listed Buildings.	No mitigation required

Table 6.5: Summary of Impacts and Proposed Mitigation	
Potential indirect impact on the setting of one ASA.	No mitigation required.
Potential indirect impacts on the setting of three NIDLs.	No mitigation required.
Potential indirect impacts on the setting of 15 HER 'national significance' sites.	No mitigation required.

TECHNICAL APPENDIX 6 - CULTURAL HERITAGE APPRAISAL

6.1: Cultural Heritage Assets: Inner Study Area
6.2: Cultural Heritage Assets: Outer Study Area

Appendix 6.1: Cultural Heritage Assets: Inner Study Area

This appendix provides details of the heritage assets recorded within the Inner Study Area identified through desk-based assessment and walkover survey, together with an assessment of their heritage sensitivity. This apprendix should be read in conjunction with Chapter 6: 'Baseline Conditions' section.

The following cultural heritage assets are organised from north to south along the proposed OHL alignment.

Appendix 6.1: Cultural Heritage Assets: Inner Study Area							
Asset no	**Asset name and type**	**HER no. / Canmore no.**	**Easting**	**Northing**	**Source**	**Asset description**	**Asset sensitivity**
1	Craigcannochie, boundary	WoSAS5990 & WoSAS62001 / 300611	223730	586001	HER, Canmore, Suddaby 2009[1], Historic maps	WoSAS HER and Canmore entries record that a parish boundary survives between Colmonell and Barr parishes. The boundary runs from Muck Water, just south of Bellamore Farm, up the unnamed stream to the south-east before turning south as far as 22385, 58555 before running south-east to Loch Farroch. The course of the boundary is shown on the Ordnance Survey 1st Edition map (Ayrshire, 1857, Sheet LXVII, six inches to one mile) and on the 2006 1:25,000 map. Archaeological investigations (2009) in the immediate area of the Mark Hill substation recorded that the parish boundary runs through a fire break in commercial woodland. From north to south, it consists of a drystone wall which follows the unnamed stream south-east up to 223726, 586284. An open linear ditch then runs south up to 223738, 585902, from which point a second drystone wall resumes the boundary. Both drystone walls are at most 1 m high and 0.6 m thick, in poor condition, with frequent collapse. The ditch links the alignment of the walls and is 1.5 m-2 m wide and is presently 0.5 m deep. Field survey identified the former parish boundary, which survives as an open ditch, 1.5 m – 2 m wide and 0.5 m	Low

[1] Suddaby, I (2009) Mark Hill Windfarm, Barrhill, South Ayrshire: Archaeological Recording of Parish Boundary, CFA Report No 1628.

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						deep, running past the western side of Mark Hill substation to 223738, 585902 where it becomes a tumbled drystone wall running south along the eastern side of a forestry plantation (Craigcannochie Hill forestry) before turning east to follow the course of an unnamed burn at 223838, 585596. The wall has been breached at approximately 223875, 585596 for the construction of an existing OHL pole line. Field survey found that the route of the parish boundary does not follow that shown in the HER but does follows that shown on the Ordnance Survey 1st Edition map.	
42	Clearance spread	-	223876	585563	Field survey	Field survey recorded an irregular shaped spread of field clearance stones, just south of an unnamed burn. The spread measures c. 9 m by 8 m and 0.4 m-0.5 m high with turf covered edges.	Low
43	Field bank	-	223897	585563	Field survey	Field survey identified the remains of a section of turf and stone field bank, running along the northern edge of a farm access track between 223881, 584628 and 223941, 584690. The bank measures 84 m long, c. 1 m wide and 0.5 m high.	Low
2	Drumytuat, Farmstead	WoSAS42438 / 170534	224120	584540	HER; Canmore; Historic maps	WoSAS HER entry records that a farmstead comprising one unroofed long building and one incomplete enclosure is depicted on the Ordnance Survey 1st edition map (Ayrshire, 1857, Sheet LXVII, six inches to one mile), but it is not shown on the 1979 Ordnance Survey 1:10000 map. Field survey recorded that a large pile of stone is present at the location of the former building and enclosure depicted on the 1st edition map. There are no obvious structures surviving and the stone appears to have been dumped during upgrading of a farm access road that runs past the western side of the former farmstead.	Low
44	Hut circle (possible);	-	223987	584470	Field survey	Field survey recorded a possible hut circle (44a), a section of field bank (44b) and at least 11 clearance cairns/heaps (44c).	Medium

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	Cairn field; Field bank					44a (223987, 584470), hut circle (possible), located adjacent to a woodland shelter belt. The hut circle survives as a circular enclosure, 6 m-7 m in diameter, defined by a low stone and turf wall measuring 0.3 m high and spread to 1.5 m wide. A gap in the southeast arc may have been a entrance. No internal features are visible. 44b (between 223988, 584463 and 223982, 584456), short section of poorly preserved field bank measuring c.9 m long, 0.1 m high and 0.5 m wide. It may have originally abutted the southern edge of the hut circle (44a). 44c: at least 11 turf-covered clearance cairns are spread around the hut circle (44a) to the west side of a woodland shelterbelt in an area of semi-improved pasture. The cairns vary in shape, some being irregular heaps of stone and others being circular in plan, and varying in size from 1.5 m – 4 m in diameter and 0.1 m to 0.3 m high. No cairns were noted within the woodland shelterbelt; pre-forestry ploughing in this area is likely to have removed any surviving remains that may be in that area.	
45	Wall	-	224138	584342	Field survey	Field survey recorded a section of tumbled wall aligned northeast to southwest within a semi-improved pasture field. The wall measures c. 50 m long running between 224157, 584362 and 224117, 584323. The northeast end of the wall only survives as a slight stone and turf bank (c.2 m wide and 0.3 m high) petering out at modern fence line, the southwest end is visible as the tumbled footings of a stone wall (c.1 m wide and 0.4 m-0.5 m high). It appears that the wall may have continued further southwest but much of it has recently been removed during excavation of a modern field drainage ditch.	Negligible
46	Field bank (possible)	-	224192	584284	Field survey	Field survey recorded a section of possible turf and stone field bank aligned west-northwest to east-southeast at the edge of a semi-improved pasture field. The field bank measures c.60 m long running between 224167, 584289	Negligible

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						and 224221, 584277. It is extremely poorly preserved and hard to distinguish, measuring 1 m wide and 0.1 m high. The west-northwest end peters out in an area of reeds.	
47	Wall	-	224369	583205	Field survey	Field survey recorded a drystone wall running northwest to southeast along the edge of a woodland plantation. The wall measures 1.2 m high (max) and 1 m wide at the base. The northwest end peters out at a small burn, while the southeast end continue outwith the study area.	Low
3	Balluskie Plantation, Farmstead, Enclosure, Sheep dip	WoSAS42433 & WoSAS17912 / 170539	224030	582990	HER; Canmore; Historic maps; Field survey	WoSAS HER entry records that a farmstead comprising one unroofed L-shaped building, which is annotated 'Ruin', and one enclosure is depicted on the Ordnance Survey 1st Edition map (Ayrshire, 1857, sheet LXVII, six inches to one mile). A four-compartment enclosure, which is annotated 'Sheep Dip', is shown on the 1979 Ordnance Survey 1st Edition map. Field survey recorded that the 1979 enclosure and sheep dip survive in generally good condition. The enclosure comprises of drystone walls (1.2 m high max) and is divided into at least three compartments. The sheep dip (which has mortared walls) still survives, towards the centre of the enclosure. There is no evidence for any of the buildings depicted on the 1st edition map and it is likely that these were demolished to make way for the later enclosure and sheep dip.	Low
48	Clearance heap	-	224191	582655	Field survey	Field survey recorded a large irregular heap of clearance stone abutting the northern side of a field wall. The clearance stone is spread across an area measuring 16 m long by 5 m wide and 1 m high (max). The large stones present within the clearance heap suggest that it may be of recent date, although it may overlie earlier clearance.	Negligible

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4	Kildonan Non-Inventory Designed Landscape	WoSAS53453	223012	583148	HER, Historic maps	WoSAS HER notes that the Ayrshire Designed Landscapes Survey (McGowan 2009[2]) records the remains of a former designed landscape associated with Kildonan House. A settlement is depicted on Blaeu's map (1652[3]) annotated 'Kildonne'. On Roy's map (1747-55[4]) an L-shaped house is depicted at Kildonnan, surrounded by a large enclosure. The same house is depicted on Armstrong's map (1775[5]) annotated 'Kildonan ruins'. The Ordnance Survey 1st Edition map (Ayrshire, 1856, Sheet LXVII.6, 25 inches to 1 mile) shows a T-shaped house standing within a small, designed landscape. The house is shown standing in a small area of open parkland overlooking a formal garden, immediately west of the house, and a wooden bridge is shown crossing the Mill Burn to the south-west of the house. Several blocks of woodland (Liglaw Wood, Wauk Mill Wood and Glen Wood) surround the house and its garden. The same house continues to be depicted on the 2nd Edition map (Ayrshire, 1894, Sheet LXVII.6, 25 inches to 1 mile), two additional rectangular buildings are shown to the north of the main house. The formal gardens shown on the 1st Edition are no longer depicted, having been replaced with new gardens to the north of the house and what appears to be potentially an associated glasshouse. A North Lodge and South Lodge are now depicted to the west and east of the house respectively and two driveways are shown approaching the main house, from the west and from the east. Kennels are depicted to the south-west of the house, and a nursery is shown to the south of the banks of the Duisk River. The house and its associated buildings/gardens continue to be surrounded by	Medium

[2] McGown, P (2009) Ayrshire Designed Landscapes Survey: Final Report, Peter McGowan Associates.
[3] Blaeu, J. (1654) Atlas of Scotland, Carricta meridionalis, [vulgo], The South part of Carrick.
[4] Roy, W (1747-55) Military Survey of Scotland.
[5] Armstrong, A (1775) A new map of Ayrshire.

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						blocks of woodland (Liglaw Wood, Glen Wood, Wauk Mill Wood and Craigknowe Plantation). The same layout is shown on the Ordnance Survey 1907 map. HES Listed Building Inventory[6] notes that the current Kildonan House dates to c.1930 and was designed by James Miller (architect). The house was completed with a theatre and indoor tennis court (Buildings at Risk Register[7]). The house was unoccupied in 2012 and continued to be disused in 2018.	
5	Barrhill, Building	WoSAS42432 / 170540	2224170	582500	HER, Canmore, Historic maps	WoSAS HER entry records that one unroofed building, annotated 'Ruin', is depicted on the Ordnance Survey 1st Edition map (Ayrshire, 1857, Sheet LXVII, 6 inches to 1 mile), but is not shown on the 1979 1:10,000 map. No remains of the building are visible on modern aerial photography (GoogleEarth™), in what is now an improved pasture field.	Negligible
6	Clearance cairns, Water tank	346816	222410	581743	Canmore	Canmore entry records that field survey in 2012 (Farrell, 2013[8]) recorded the presence of two clearance cairns at 224304 582115 and 224462 581815 and a water tank at 224410 581740. The water tank is not depicted on the 1st or 2nd Edition maps (Ayrshire, 1857, Sheet LXVII & Ayrshire, 1896, Sheet LXVII.SE, six inches to one mile). It is shown on the 1909 Ordnance Survey map (Ayrshire, 1909, Sheet LXVII.11, 25 inches to 1 mile) and continues to be depicted on the 2020 Ordnance Survey map at 224410 581743. The water tank was not visited during the field survey. Both of the clearance cairns previously recorded (see above) lie outwith the Inner Study Area (LoD).	Negligible

[6] http://portal.historicenvironment.scot/designation/LB1052
[7] (https://www.buildingsatrisk.org.uk/details/912369)
[8] Farrell, S (2013) Colmonell, Blair FARM, Barrhill, Survey, DES, New Vol 14.

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7	Enclosure (possible)	-	224050	581779	Field survey	Field survey recorded the remains of a small, roughly C-shaped, possible enclosure just south of the A714 public road in an area of woodland. The enclosure, which is defined by a tumbled stone wall (2 m wide and 1 m high), measures c.14 m long by 8 m wide.	Low
8	Clearance cairn and track	-	224038	581765	Field survey	Field survey recorded that a large moss-covered clearance cairn (8a), measuring c.11 m by 4.5 m and 1 m high, survives in an area of woodland just south of the A714 public road. A rough, grass-covered track (8b), measuring c.3 m wide, runs from the cairn to the west for c. 40 m before petering out at the A714.	Low
9	Field wall, boundary	-	224003	581648	Field survey	Field survey recorded the remains of a linear stone wall, surviving as a line of boulders (1 m wide and 0.5 m high). running along the northern bank of the Duisk River between 224073, 581547 and 223982, 581759.	Negligible
10	Building, enclosure	-	223935	581710	Historic maps, Field survey	A roofed building and associated enclosure are depicted on the Ordnance Survey 1st Edition map (Ayrshire, 1856, Sheet LXVII.10, 25 inches to 1 mile. By the time of the 2nd Edition map (Ayrshire, 1894, Sheet LXVII.10, 25 inches to 1 mile) the building is annotated 'Ebans' and depicted as partially unroofed. Field survey identified the remains of the building and its enclosure surviving as faint, turf-covered banks (0.4 m wide and 0.2 m high) at the edge of an improved pasture field on the south bank of the Duisk River. The building (9 m long by 6 m wide) is aligned north-west to south-east and the enclosure measures around 19 m by 14 m. The remnants of a hawthorn hedge run along the top of the enclosure bank. No internal features are visible.	Low
11	West Altercannoch, Golf Course (possible)	WoSAS11542 / 62545	223705	581495	HER, Canmore, Field survey	WoSAS HER and Canmore entries hold a record for a possible golf course at this location but provides no further information.	Negligible

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						Field survey found no trace of the former golf course in what is now improved farmland. A local farmer confirmed that there had been a golf course in the area, around 50 years ago, but it has been ploughed out.	
12	Clearance cairn	-	223492	581375	Field survey	Field survey recorded a partly turf-covered, linear clearance cairn measuring c. 7 m long by 2 m wide and 0.7 m high, in area of rough ground at the edge of an improved pasture field.	Low
13	Clearance cairn	-	223440	581361	Field survey	Field survey recorded a partly turf-covered sub-circular clearance cairn measuring c. 3 m in diameter and 1 m high, in area of rough ground at the edge of an improved pasture field.	Low
14	Clearance spread	-	223264	581257	Field survey	Field survey recorded a linear spread of clearance, measuring c. 12 m long by 3 m wide and 0.4 m high, at the edge of a pasture field and crossed by a modern post and wire fence.	Low
15	Altercannoch West, Farmstead	-	223464	581219	Historic maps, Aerial photographs	A U-shaped steading, annotated 'Altercannoch West', is depicted on the Ordnance Survey 1st Edition map (Ayrshire 1856, Sheet LXVII.14, 25 inches to 1 mile). The steading is visible on modern aerial photography (GoogleEarth™) and appears to have been unmodified from the layout shown on the Ordnance Survey 1st Edition map. Field survey found that the farmstead is currently occupied.	Low
16	Clearance spread	-	223348	581208	Field survey	Field survey recorded a partially turf-covered linear spread of clearance stone, measuring c. 14 m long by 4 m wide and 0.5 m high.	Low
17	Clearance spread	-	223224	581149	Field survey	Field survey recorded a partially turf-covered linear spread of clearance stone, measuring c. 8 m long by 2 m and 0.5 m high.	Low

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18	Clearance cairn	-	223161	581118	Field survey	Field survey recorded a partially turf-covered, sub-oval field clearance cairn, measuring c. 7 m long by 5 m wide and 0.5 m high.	Low
19	Clearance cairn	-	223169	581093	Field survey	Field survey recorded a partially turf-covered linear spread of clearance stones, measuring c. 9 m by 3 m and 0.5 m high.	Low
20	Clearance cairn	-	222953	581111	Field survey	Field survey recorded a partially turf-covered sub-circular clearance cairn, measuring c.4 m in diameter by 0.6 m high, at the edge of a pasture field.	Low
21	Rig and furrow, field bank, ditch	-	222706	580887	Aerial photographs, Field survey	A large area of relict rig and furrow cultivation is visible on modern aerial photography (GoogleEarth™), between the Altercannoch West farm and the Barrhill to Chirmorie road. Field survey recorded faint traces of rig and furrow cultivation spread over an area c. 500 m by 500 m. The rig measures c. 6m crest to crest and is 0.2m high. A short section of linear field bank (21a), c. 1 m wide and 0.3 m high, aligned north-east to south-west, runs for c. 130 m between 222915, 581083 to 222810, 581005, defining the north edge of the area of cultivation. The bank peters out at the north-east end in an area of moorland, while the south-west end terminates at a ditch (21b), c. 1 m wide and 0.5 m deep aligned north-west to south-east, between 222806, 581016 to 222828, 580954, marking the western edge of the area of cultivation.	Low
22	Enclosure	-	222176	580587	Field survey	Field survey recorded the remains of an irregularly shaped enclosure defined by a stone and turf bank measuring c. 2 m wide by 0.5 m high.	Low
23	Cairnfield	-	222176	580587	Field survey	Field survey recorded that at least 16 turf-covered clearance cairns are spread across a slightly raised ridge to the east of the Barrhill to Chirmorie public road, in an area of semi-improved pasture. The cairns are all circular in plan, ranging in size from 3 m-5 m in diameter and 0.2 m-0.5 m high.	Medium

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						Four of the cairns are located within an enclosure (22), while the rest were scattered across the ridge.	
24	Enclosure	-	221975	579218	Historic maps, Aerial photographs, Field survey	A roughly rectangular enclosure is depicted, just east of the Barrhill to Chirmorie road, on the Ordnance Survey 1st Edition map (Ayrshire, 1856, Sheet LXVII.14, 25 inches to 1 mile) and on the 2nd Edition map (Ayrshire, 1894, Sheet LXVII.SW, 6 inches to 1 mile). The enclosure is visible on modern aerial photography (GoogleEarth™), as a tumbled stone and turf bank. Field survey recorded the slight traces of a turf and stone bank (c. 1 m wide by 0.2 m high), defining a roughly rectangular enclosure (115 m by 68 m), in an area of semi-improved pasture. A possible entrance was visible at the north end of the enclosure.	Low
25	Clearance cairn	-	221927	579914	Field survey	Field survey recorded the remains of a probable turf-covered clearance cairn, measuring c. 4 m long by 2 m wide and 0.2 m high, located just west of the Barrhill to Chirmorie public road.	Low
26	Gravel pit	-	221986	579858	Historic maps, Aerial photographs, Field survey	A gravel pit is depicted, just west of the Barrhill to Chirmorie road, on the Ordnance Survey 1st Edition map (Ayrshire, 1856, Sheet LXVII.14, 25 inches to 1 mile) and on the 2nd Edition map (Ayrshire, 1894, Sheet LXVii.SW, 6 inches to 1 mile). The gravel pit is visible on modern aerial photography (GoogleEarth™). Field survey recorded that the gravel pit is approximately 30 m long by 28 m wide and 2 m deep and completely overgrown with rushes and tall grass.	Negligible
27	Gravel pit	-	221491	578991	Historic maps, Aerial photographs, Field survey	A gravel pit is depicted on the Ordnance Survey 1st Edition map (Ayrshire, 1856, Sheet LXVII.14, 25 inches to 1 mile), east of the Barrhill to Chirmorie road.	Negligible

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						The gravel pit is not visible on modern aerial photography (GoogleEarth™) in what is now an area of commercial forestry. Field survey found the gravel pit cut into a slight bank and overgrown with tall grass and trees. It measures approximately 12 m long by 8 m wide and 2 m deep.	
28	Gravel pit	-	221283	578592	Historic maps, Field survey	A gravel pit is depicted on the Ordnance Survey 1st Edition map (Ayrshire, 1856, Sheet LXVII.14, 25 inches to 1 mile), east of the Barrhill to Chrimorie road. Field survey found the gravel pit in an area of mature conifer plantation and covered in windblown trees which hampered recording of its size.	Negligible
29	Whinstone Quarry	-	221080	578270	Historic maps, Field survey	A 'whinstone quarry' is depicted on the Ordnance Survey 1st Edition map (Ayrshire, 1856, Sheet LXXXI.1, 25 inches to 1 mile) and on the 2nd Edition map (Ayrshire, 1894, Sheet LXXXI.NW, 6 inches to 1 mile). Field survey recorded evidence for modern quarrying along both sides of the Barrhill to Chirmorie public road and no remains of the earlier whinstone quarry was found	Negligible
30	Laggish Burn, Field system(s)	WoSAS17166 / 170493	221200	578100	HER, Canmore, Historic maps, Aerial photographs, Field survey	WoSAS HER and Canmore entries record that two fields, lying approximately 100 m apart, one either side of the Laggish Burn, are depicted on the Ordnance Survey 1st Edition map (Ayrshire, 1856, Sheet LXXXI.1, 25 inches to 1 mile) and on the Ordnance Survey 2nd Edition map (Ayrshire, 1894, Sheet LXXXI.NW, 6 inches to 1 mile). A small square enclosure is depicted within the larger enclosure, to the west of the Burn. There are no visible remains of the fields on modern aerial photography (GoogleEarth™), in what is now an area of commercial forestry. Field survey found no remains of the field system in what is now an area of felled forestry that has been restocked with	Negligible

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						hardwoods. It is likely that pre-afforestation ploughing removed any trace of the field system.	
31	Quarry	-	221000	578024	Field survey	Field survey recorded a small turf-covered quarry scoop in an area of felled forestry. It measures 20 m by 13 m and 2 m deep.	Negligible
32	Enclosure (possible)	-	220952	577956	Historic maps, Field survey	A possible enclosure is shown as pecked lines on the Ordnance Survey 1st Edition map (Ayrshire, 1856, Sheet LXXI.5, 25 inches to 1 mile) but is not shown on the 2nd Edition map (Ayrshire, 1894, Sheet LXXXI.NW, 6 inches to 1 mile). Field survey found no remains of the enclosure in what is now an area of felled forestry that has been restocked with hardwoods. It is likely that pre-afforestation ploughing removed any trace of the enclosure.	Negligible
33	Quarry	-	220779	577937	Historic maps, Field survey	A square quarry is depicted on the Ordnance Survey 1st Edition map (Ayrshire, LXXI.1, 25 inches to 1 mile) and on the Ordnance Survey 2nd Edition (Ayrshire, 1894, Sheet LXXXI.NW, 6 inches to 1 mile). Field survey found the quarry, measuring 12 m by 8 m and 1.5 m deep, in an area of felled forestry and covered in trees stumps.	Negligible
34	Enclosure	WoSAS17167 / 170494	220330	577630	HER, Canmore, Historic maps, Aerial photographs, Coriolis Energy 2015 (Site 6), Field survey	An enclosure, or field, is depicted on the Ordnance Survey 1st Edition map (Ayrshire, 1857, Sheet LXXI, 6 inches to 1 mile) near to 'Chirmorie' farm. The same enclosure (or field) is visible on aerial photographs from 1946, defined by a turf and stone bank enclosing an area of rig and furrow cultivation, with a smaller sub-rectangular area of improved ground on the eastern side. Previous field survey, for the Chirmorie Wind Farm (Coriolis Energy, 2015), found the enclosure to survive as a denuded boulder wall (0.6 m to 1.5 m wide by 0.3 m high) and traceable in places as only a low turf-covered bank. Poorly	Negligible

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						preserved rig and furrow cultivation, 2.5 m crest by crest and 0.2 m high, lies within the enclosure and extends beyond its eastern edge, corresponding with the area of improved ground visible on aerial photographs. Field survey found the enclosure as previously described.	
35	Sheep shelter	WoSAS67651	220064	577063	HER, Coriolis Energy 2015 (Site 31), Field survey	Previous field survey, for the Chirmorie Wind Farm (Coriolis Energy, 2015), identified the remains of an L-shaped drystone wall abutting a bedrock outcrop. The wall measures c. 1 m by 0.3 m high and defines an area 1.2 m by 1.5 m, with tumbled stone extending for a further 3 m along the side of the outcrop indicating a slightly larger structure. Field survey found the sheep shelter as previously described.	Negligible
36	Drumhastie Burn, Enclosure, sheepfold	WoSAS67645	219581	575887	HER, Coriolis Energy 2015 (Site 25), Field survey	Previous field survey, for the Chirmorie Wind Farm (Coriolis Energy, 2015), found a roughly P-shaped structure abutting a bedrock outcrop. The structure measures c. 12 m long by 3 m wide overall and comprises a section of crude drystone wall (8 m long by 1 m-0.4 m wide and up to 0.8 m high), attached to a D-shaped alignment of large boulders (4 m by 3 m) with an entrance on the north-west side. Field survey found the sheep shelter as previously described.	Negligible
37	Drumhastie, small cairns, cairnfield	WoSAS11286 / 61780	219235	575315	HER, Coriolis Energy 2015 (Site 20), Field survey	The Canmore database notes that the RCAHMS recorded the presence of a group of small cairns on the crest of Drumhastie in 1986. Previous field survey, for the Chirmorie Wind Farm (Coriolis, 2015), found a small group of seven low, stony circular and sub-circular mounds, measuring between 1.5 m and 2.5 m diameter and generally 0.2 m high but varying between 0.1 m and 0.3 m high.	Medium
38	Markdu, cairnfield, cup-	MDG1827 / 61779	218600	575150	HER, Canmore, Field survey	DGC HER and Canmore entries record that a group of at least twelve small cairns lie on the gently sloping south-east flank of Drumkare. Most of the cairns measure between 2 m	Medium

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	marked boulder (possible)					and 3 m in diameter, but one measures 5 m in diameter by 0.4 m high and there is also a robbed-out cairn about 6 m in diameter located at 218590, 575100. Field survey recorded ten clearance cairns spread over an area of rough pasture and moorland (15 0m by 120 m). All of the cairns are covered in turf, reeds and grass and are difficult to distinguish. They range in size from 2 m-6 m in diameter and 0.2 m-0.3 m high. What may be a cup-marked boulder (38a) was found at 218672, 575168; comprising two large cup-marks, 9 cm-15 cm in diameter and 3 cm-12 cm deep, cut in a bedrock boulder.	
39	Marklach, Shieling?, Cairn, Hut	MDG1873 / 61833	217771	573252	HER, Canmore, Field survey	DGC HER and Canmore entries record that there are at least 12 small cairns scattered over a terrace to the north of a sheepfold on the south-east flank of Maurs Cairn. The cairns range in size from 2 m to 4 m in diameter and the largest is 0.6 m high. Amongst the rock outcrops to the south-east of the groups of cairns, and to the north-east of the sheepfold, there are irregular heaps of cleared stones, small enclosures, and probable shieling huts. Field survey recorded that there were no visible of any upstanding heritage remains within the Inner Study Area (LoD) and all of those previously recorded lie in an area of well-drained semi-improved ground below a steep escarpment to the south of and outside of the Inner Study Area (LoD).	High
40	Markdu, Cultivation terraces, field system, hut circle(s)	MDG1916 & MDG1883/ 61876 & 61843	218520	573640	HER, Canmore, Field survey	DGC HER and Canmore entries record that a group of at least two, and probably four, hut circles lie within an extensive field system in moorland to the north-east of Markdu Farm. The field system extends over an area of at least 5 ha and comprises a series of large fields partly enclosed by thick stony banks and low scarps buried in the peat. Some of the fields have been encroached upon by ridged fields of relatively recent date. The hut-circles are	High

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						recorded at: 218520, 573670; 218590, 573750; 218510, 573760 and 218630, 573660. Two areas of cultivation terraces have also been recorded to the north of Markdu Farm. Field survey recorded the remains of a possible hut circle (40a) and a section of field bank (40b), within the Inner Study Area, immediately north-east of Markdu Farm. The other features recorded in the HER and Canmore entries lie outwith the Inner Study Area and were not surveyed. 40a (218500, 573605): The possible remains of a hut circle c. 7 m in diameter and defined by a low turf and stone bank (c. 1.5 m wide and 0.2 m high). The south-west arc of the hut circle abuts the bank of a possible enclosure, and it is likely that they are of contemporary date. 40b: The remains of a sinuous field bank, c. 2 m wide and 0.3 m high, possibly forming part of a former enclosure, is crossed by a later farm track.	
41	Markdu, Farmstead	-	223366	583209	Historic maps	A farmstead, annotated 'Markdow', comprising of four buildings and four enclosures is depicted on the Ordnance Survey 1st Edition map (Wigtownshire, 1849, Sheet 6, 6 inches to 1 mile). By the time of the 2nd Edition map (Wigtownshire, 1896, Sheet I.SE, 6 inches to 1 mile) only two buildings and seven enclosures are shown. Field Survey found that the layout of the farmstead has not changed appreciably from that shown on the Ordnance Survey 2nd Edition map. The farmstead is currently occupied.	Low

Technical Appendix 6.2: Cultural Heritage Assets: Outer Study Area

This technical appendix provides details of the heritage assets (designated assets and non-statutory register (NSR) assets) recorded within the Outer Study Area that have theoretical visibility or one or more elements of the proposed development, together with an assessment of their heritage sensitivity and of the magnitude of impact of the proposed development on their settings. This technical appendix should be read in conjunction with Chapter 6: 'Baseline Conditions' and 'Potential Impacts' sections. Those assets which have accompanying photomontages/wirelines and discussed in detail in Chapter 6: 'Potential Impacts' section are highlighted in blue.

Technical appendix 6.2: Cultural Heritage Assets: Outer Study Area							
Asset no	**Asset name**	**Status**	**Character and Setting**	**Sensitivity of Asset**	**No of poles visible (bare-earth ZTV)**	**Distance to nearest pole**	**Magnitude of Impact**
SM 1925	Cairn Kenny, chambered cairn	Scheduled Monument	Remains of prehistoric burial cairn in upland moorland/pasture on north-east facing slope above Cross Water of Luce valley. Principal arc of views from north to east, with distant views to southern uplands to north-east. Located just north of consented Stranoch Wind Farm. Views to the north-east take in the existing Arecleoch Wind Farm. Key aspects of setting are the surrounding moorland/pasture in which it lies and the Cross Water of Luce valley over which it looks. Relatively localised setting. Forms part of the East Rhins ASA (ASA 001).	High	37	0.8	Low (Proposed development visible in distant views, largely backdropped by hill slopes and existing Arecleoch Wind Farm; seen in same context as consented Stranoch and Chirmorie wind farms. Presence of proposed development in wider landscape will not significantly affect relatively localised setting of monument) ***Assessed in detail in Chapter 6: Potential Impacts, Section 6.5.2: Operation (Figures 6.3a-b).***
SM 4809	Maurs Cairn, hut circle and field clearance cairns 1000m WNW of	Scheduled Monument	Remains of later prehistoric settlement and field system in upland moorland/pasture on south-east facing slopes of Mid Hill above a watercourse and Cross Water of Luce. Views are in a wide north-east to south arc. Located within the consented Stranoch Wind Farm. Key aspects of setting are the surrounding moorland/pasture in which it lies and the Cross Water of Luce valley over which it looks Forms part of the East Rhins ASA (ASA 001).	High	60	0.2	Low (Proposed development seen in same context as consented Stranoch Wind Farm; largely backdropped by hillslopes and existing Arecleoch Wind Farm)
SM 4834	Marklach, hut circles and field system 1900m WNW of	Scheduled Monument	Remains of later prehistoric settlement and field system in upland moorland/pasture on north-west facing slopes of Drumanee adjacent to unnamed watercourse. Principal views are to north-west and south-east looking along the Main Water of Luce and Davenholme Burn valleys. Located within the consented Stranoch Wind Farm. Key aspects of setting are the surrounding moorland/pasture in which it lies and the views across the Main Water of Luce and Davenholme Burn valleys. Localised valley setting. Forms part of the East Rhins ASA (ASA 001).	High	5	0.9	Negligible (Proposed development visible in distant views and largely screened by intervening topography; seen in same context as consented Stranoch Wind Farm. Key views along and across Main Water of Luce and Davenholme Burn valleys would not be affected. Presence of proposed development in wider landscape will not significantly affect relatively localised setting of monument)
SM 4843	Markdhu, hut circle 730m NE of	Scheduled Monument	Remains of later prehistoric hut circle in upland moorland/pasture on south-east facing slope above Cross Water of Luce. Principal views are along and across Cross Water of Luce valley to the north-east, east and south. Located just east of the consented Stranoch Wind farm. Key aspects of setting are the surrounding moorland/pasture in which it lies and the Cross Water of Luce valley over which it looks. Localised valley setting. Forms part of the East Rhins ASA (ASA 001).	High	25	0.9	Low (Proposed development visible in distant views, seen in same context as the consented Stranoch Wind Farm. Key views along and across Cross Water of Luce would not be affected. Presence of proposed development in wider landscape will not significantly affect relatively localised setting of monument)
SM 4844	Marklach, Field clearance cairns 850 NNE of	Scheduled Monument	Remains of prehistoric field system in upland moorland/pasture on south-east facing slopes adjacent to an unnamed watercourse and above Cross Water of Luce. Principal views are in a north-east to south arc along and across valley. Located just east of the consented Stranoch Wind Farm.	High	13	0.3	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance)

Technical appendix 6.2: Cultural Heritage Assets: Outer Study Area							
Asset no	**Asset name**	**Status**	**Character and Setting**	**Sensitivity of Asset**	**No of poles visible (bare-earth ZTV)**	**Distance to nearest pole**	**Magnitude of Impact**
			Key aspects of the setting are its relationship to other similar surrounding cultivation and settlement remains (e.g. SM 4848 & SM 4900) visible nearby. Localised valley setting. Forms part of the East Rhinns ASA (ASA 001).				
SM 4847	Glenwhilly, hut circle and enclosure 1590m NW of	Scheduled Monument	Remains of later prehistoric settlement in upland moorland/pasture on south facing slopes adjacent to a watercourse and above Davenholme Burn. Views restricted by local topography to the south overlooking the Davenholme Burn valley. Located within the consented Stranoch Wind Farm Key aspects of the setting are the surrounding moorland/pasture in which it lies and the views along and across the Davenholme Burn valley. Localised valley setting. Forms part of the East Rhins ASA (ASA001).	High	10	1.6	Negligible (Views of proposed development largely screened by intervening topography. Key views across Davenholme Burn valley not affected)
SM 4848	Markdhu, hut circles and field system 100m NE of	Scheduled Monument	Remains of later prehistoric settlement and associated field system in upland moorland/pasture on south-east facing slopes above Cross Water of Luce. Principal views are along and across valley to north-east, east and south. Located just east of the consented Stranoch Wind Farm. Key aspects of the setting are the surrounding moorland/pasture in which it stands and the views along and across the Cross Water of Luce. Localised valley setting. Forms part of the East Rhins ASA (ASA 001).	High	14	0.7	Low (Proposed development visible in distant views and largely screened by intervening topography; seen in same context as consented Stranoch and Chirmorie wind farms. Key views along and across the Cross Water of Luce valley would not be affected. Presence of proposed development in wider landscape will not significantly affect relatively localised setting of monument)
SM 4851	Glenkitten, hut circle 800m E of	Scheduled Monument	Remains of later prehistoric hut circle on south-east facing slope of Glenkitten Fell, in upland moorland/pasture, immediately adjacent to forestry plantation. Principal views in southwards direction overlooking Tryock Burn valley. Key aspects of the setting are the surrounding moorland/pasture in which it lies and the views out over the Tryock Burn. Forms part of the East Rhins ASA (ASA 001).	High	13	2.0	Negligible (Views of proposed development largely screened by intervening forestry plantation)
SM 4858	Glenwhilly, burnt mound 1190m NW of	Scheduled Monument	Remains of burnt mound in upland moorland/pasture on south-west facing slope adjacent to a watercourse and above Davenholme Burn. Located within the consented Stranoch Wind Farm. Localised setting, adjacent to watercourse. Forms part of the East Rhins ASA (ASA 001).	High	4	1.4	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance)
SM 4859	Markdhu, burnt mound 1090m NNE of	Scheduled Monument	Remains of burnt mound in upland moorland/pasture on east facing slope above Cross Water of Luce. Located just north of the consented Stranoch Wind Farm. Localised setting, adjacent to watercourse. Forms part of the East Rhins ASA (ASA 001).	High	33	0.6	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance)
SM 4861	Markdhu, cairn 1450m NNW of	Scheduled Monument	Remains of prehistoric burial cairn with modern sheepfold overlying, in upland moorland/pasture on north-east facing slope above Cross Water of Luce valley. Principal arc of view is from north-east, with distant views to the southern uplands to north-east. Associated site of Cairn Kenny (SM 1925) to the north-west. Located just north of the consented Stranoch Wind Farm.	High	57	0.3	Low (Proposed development largely backdropped by hill slopes and existing Arecleoch Wind Farm; seen in same context as consented Stranoch and Chrimorie wind farms. Presence of proposed development in wider

Technical appendix 6.2: Cultural Heritage Assets: Outer Study Area							
Asset no	**Asset name**	**Status**	**Character and Setting**	**Sensitivity of Asset**	**No of poles visible (bare-earth ZTV)**	**Distance to nearest pole**	**Magnitude of Impact**
			Key aspects of setting are the surrounding moorland in which its stands and the views along and across the Cross Water of Luce valley. Relatively localised setting. Forms part of the East Rhins ASA (ASA 001).				landscape will not significantly affect relatively localised setting of monument) ***Assessed in detail in Chapter 6: Potential Impacts, Section 6.5.2: Operation (Figures 6.4).***
SM 4865	Glenwhilly, hut circle and field clearance cairns 1500m NW of	Scheduled Monument	Remains of later prehistoric settlement and associated field system in upland moorland on south and south-east facing slopes adjacent to a watercourse and above Davenholme Burn. Located within the consented Stranoch Wind Farm. Key aspects of setting are the surrounding moorland in which it lies and the views along and across the Davenholme Burn. Localised valley setting. Forms part of the East Rhins ASA (ASA 001).	High	19	1.3	Low (Proposed development visible in distant views, seen in same context as consented Stranoch Wind Farm. Key views along and across Davenholme Burn valley would not be affected. Presence of proposed development in wider landscape will not significantly affect relatively localised setting of monument)
SM 4868	Glenwhilly, hut circles and field system 1300m NW of	Scheduled Monument	Remains of later prehistoric settlement and associated field in upland moorland/pasture on south facing slopes adjacent to a watercourse and above Davenholme Burn. Located within the consented Stranoch Wind Farm. Key aspects of setting are the surrounding moorland/pasture in which it lies and the views along and across the Davenholme Burn. Localised valley setting. Forms part of the East Rhins ASA (ASA 001).	High	8	1.2	Negligible (Views of proposed development largely screened by intervening topography)
SM 4869	Maurs Cairn, enclosure 1100m NNW of	Scheduled Monument	Remains of later prehistoric enclosure in upland moorland/pasture in elevated position on east/east south-east facing slope. Wide arc of view extending from north-east to south-east with distant views in these directions. Located within the consented Stranoch Wind Farm. Key aspects of setting are the surrounding moorland/pasture in which it lies and the views out across the Cross Water of Luce valley. Forms part of the East Rhins ASA (ASA 001).	High	100	0.9	Low (Proposed development visible in distant views, largely backdropped by hill slopes and existing Arecleoch Wind Farm; seen in same context as consented Stranoch and Chirmorie wind farms)
SM 4893	Markdhu, hut circles and field system 1250m NNE of	Scheduled Monument	Remains of later prehistoric settlement and field system in upland moorland/pasture on north-east/east facing slopes above Cross Water of Luce. Principal views are to north-east/east and south-east across and along Cross Water of Luce valley. Located just north-east of the consented Stranoch Wind Farm. Key aspects of setting are the surrounding moorland/pasture in which it lies and the views along and across the Cross Water of Luce valley. Localised valley setting. Forms part of the East Rhins ASA (ASA 001).	High	34	0.4	Low (Proposed development seen in same context as consented Stranoch Wind Farm. Presence of proposed development in wider landscape will not significantly affect relatively localised setting of monument)
SM 4900	Glenkitten, clearance cairns 250m NNW of	Scheduled Monument	Remains of prehistoric field system in rough pasture on lower south-west facing slopes above Cross Water of Luce. Remains adjacent to public road and railway. Localised setting. Forms part of the East Rhins ASA (ASA 001).	High	36	1.3	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance)
SM 4902	Glenkitten, farmstead	Scheduled Monument	Remains of pre-improvement farmstead in rough pasture on south-west facing slopes adjacent to a watercourse and above Cross Water of Luce. Key aspects of setting are surrounding farmland in which it lies and the Cross Water valley over which it looks. Localised setting. Forms part of East Rhins ASA (ASA 001).	High	10	1.5	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance)

Technical appendix 6.2: Cultural Heritage Assets: Outer Study Area							
Asset no	**Asset name**	**Status**	**Character and Setting**	**Sensitivity of Asset**	**No of poles visible (bare-earth ZTV)**	**Distance to nearest pole**	**Magnitude of Impact**
SM 4911	Markdhu, hut circle 1370m N of	Scheduled Monument	Remains of later prehistoric hut circle in upland moorland/pasture on north-east facing slope above unnamed watercourse and the Cross Water of Luce. Principal views are to north-east/east across Cross Water of Luce valley. Located just north-east of the consented Stranoch Wind Farm. Key aspects of setting are surrounding moorland in which it stands and the views across the Cross Water of Luce valley. Localised valley setting. Forms part of East Rhins ASA (ASA 001).	High	38	0.2	Low (Proposed development seen in same context as consented Stranoch and Chirmorie wind farms. Presence of proposed development in wider landscape will not significantly affect relatively localised setting of monument)
SM 4972	Dirniemow, burnt mound 900m NNE of	Scheduled Monument	Remains of burnt mound in rough pasture on gentle south-west facing banks of Tryock Burn and above Cross Water of Luce. Localised setting, adjacent to watercourse. Forms part of East Rhins ASA (ASA 001).	High	8	1.8	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance)
SM 4985	Marklach, cairn 470m N of	Scheduled Monument	Remains of prehistoric burial cairn in upland moorland/pasture on south-east facing slopes adjacent to a watercourse and above Cross Water of Luce. Principal views from cairn are in an arc from north-east to south, along and across the Cross Water of Luce valley. Located just east of the consented Stranoch Wind Farm. Key aspects of setting are the moorland/pasture in which it lies and the views across the Cross Water of Luce valley. Relatively localised valley setting. Forms part of East Rhins ASA (ASA 001).	High	7	0.6	Negligible (Views of proposed development largely screened by intervening topography. Presence of proposed development in wider landscape will not significantly affect relatively localised setting of monument)
SM 4986	Markdhu, cairn 450m ENE of	Scheduled Monument	Remains of prehistoric burial cairn in upland moorland/pasture on south-east facing banks above Cross Water of Luce, adjacent to railway. Principal views are in north-east to south arc along and across river valley. Located just east of the consented Stranoch Wind Farm. Key aspects of setting are the moorland/pasture in which it lies and the views across the Cross Water of Luce valley. Relatively localised valley setting. Forms part of East Rhins ASA (ASA 001).	High	8	1.1	Negligible (Views of proposed development largely screened by intervening topography. Key views across Cross Water of Luce valley not affected. Presence of proposed development in wider landscape will not significantly affect relatively localised setting of monument)
SM 5054	Marklach, hut circle and field clearance cairns 270m N of	Scheduled Monument	Remains of later prehistoric hut circle and associated field system in upland moorland/pasture on east facing slope above Cross Water of Luce. Principal views are in north-east to south arc along and across valley. Located just east of the consented Stranoch Wind Farm. Key aspects of setting are the moorland/pasture in which it lies and the views across Cross Water of Luce. Localised valley setting. Forms part of East Rhins ASA (ASA 001).	High	13	0.8	Low (Proposed development visible in distant views and largely screened by intervening topography; seen in same context as the consented Stranoch Wind Farm. Key views across Cross Water of Luce valley not affected. Presence of proposed development in wider landscape will not significantly affect localised setting of monument)
SM 5066	Markdhu, hut circle 1020m NE of	Scheduled Monument	Remains of later prehistoric hut circle in upland moorland/pasture on east facing slopes above Cross Water of Luce. Principal views are along and across valley to north, east and south. Located just north-east of the consented Stranoch Wind Farm. Key aspects of setting are the moorland/pasture in which it lies and the views across the Cross Water of Luce. Localised valley setting. Forms part of East Rhins ASA (ASA 001).	High	13	0.9	Low (Proposed development visible in distant views and largely screened by intervening topography; seen in same context as consented Stranoch and Chirmorie Wind Farms. Key views across Cross Water of Luce valley not affected)

Technical appendix 6.2: Cultural Heritage Assets: Outer Study Area							
Asset no	**Asset name**	**Status**	**Character and Setting**	**Sensitivity of Asset**	**No of poles visible (bare-earth ZTV)**	**Distance to nearest pole**	**Magnitude of Impact**
SM 6009	Miltonise, hut circle and cairns 800m NE of	Scheduled Monument	Remains of later prehistoric settlement and associated field system in upland moorland/pasture west facing slope above Cross Water of Luce. Principal views are along and across valley to north, west and south. Key aspects of setting are the moorland/pasture in which it lies and the views across Cross Water of Luce valley. Localised setting. Forms part of East Rhins ASA (ASA 001).	High	50	1.4	Low (Proposed development visible in distant views; seen in same context as the consented Stranoch Wind Farm. Presence of proposed development in wider landscape will not significantly affect localised setting of monument)
SM 6010	Miltonise, cairns 670m NNE of	Scheduled Monument	Remains of two prehistoric burial cairns in upland moorland/ pasture on east facing bank above Cross Water of Luce. Adjacent to railway line. Principal views are across valley to west, and along valley to north and south. Key aspects of setting are the moorland/pasture in which the cairns lie, the relationship between the two cairns and the views along and across Cross Water of Luce valley. Relatively localised valley setting. Forms part of the East Rhinns ASA (ASA 001).	High	17	1.3	Low (Proposed development visible in distant views and largely screened by intervening topography; seen in same context as consented Stranoch Wind farm. Relationship between the two cains will not be affected. Presence of proposed development in wider landscape will not significantly affect relatively localised setting of monument)
SM 6013	Miltonise, burnt mound 1430m NNE of	Scheduled Monument	Remains of burnt mound in rough pasture on west facing slopes above Cross Water of Luce adjacent to watercourse. Localised setting, adjacent to watercourse. Forms part of the East Rhinns ASA (ASA 001).	High	21	0.8	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance)
SM 6945	Marklach, burnt mound 300m W of	Scheduled Monument	Remains of prehistoric burnt mound in rough pasture on north-east facing slopes adjacent to a watercourse and above Cross Water of Luce. Located just east of the consented Stranoch Wind Farm. Localised setting, adjacent to watercourse. Forms part of the East Rhinns ASA (ASA 001).	High	18	1.1	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance)
LB 1052	Kildonan House	Category A Listed	Modern mansion, c.1930 by architect James Millar and reminiscent of work of Sir Edwin Lutens. The house stands towards the centre of a small, designed landscape (Non-Inventory Designed Landscapes (NIDL)) surrounded by woodland policies and open parkland (farmland). The main elevations of the house are aligned north-west and south-east. The house is surrounded by woodland which provides a relatively sheltered setting for the building within the designed landscape. The house is approached from the west, along an approach drive that passes through Liglaw Wood, and from the east, along an approach drive that runs along the southern edge of Glen Wood/Waulk Mill Wood. Views to the house from the surrounding landscape are largely screened by surrounding woodland policies and by trees/woodland that edge surrounding fields and are present along the banks of the River Duisk. Glimpses of the house, standing within woodland, can, however, be afforded in views from the south-east around Ansheen Church (LB 51617) on the north-western edge of Barrhill.	High	14	1.4	Negligible (Views of proposed development largely screened by intervening topography and surrounding woodland/shelterbelts) ***Assessed in detail in Chapter 6: Potential Impacts, Section 6.5.2: Operation (Figure 6.7)***
LB 1054	Martyr's Tomb Barrhill	Category B Listed	Monument erected in 1825 to John Murchie and Daniel Meiklewrick. The monument, which comprises a pedimented monument with stone walled	Medium	10	0.6	Negligible

Technical appendix 6.2: Cultural Heritage Assets: Outer Study Area							
Asset no	**Asset name**	**Status**	**Character and Setting**	**Sensitivity of Asset**	**No of poles visible (bare-earth ZTV)**	**Distance to nearest pole**	**Magnitude of Impact**
			enclosure, replaces an earlier monument fragments of which still survive to the side. The monument stands within a woodland clearing on the south bank of the Cross Water of Luce. Surrounding woodland and a rise in topography to the east provides a secluded and sheltered setting for the monument. Localised river setting.				(Visibility of proposed development largely screened by intervening topography and surrounding woodland) ***Assessed in detail in Chapter 6: Potential Impacts, Section 6.5.2: Operation (Figure 6.6)***
LB 19379	Marklach, Footbridge	Category C Listed	Late 19th century footbridge over Cross Water of Luce. Localised riverside setting.	Low	16	1.4	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance).
LB 51617	Barrhill, Former Arnsheen Church	Category C Listed	Scottish Baronial style former church, with clock tower. Standing at the north-west end of Barrhill village and next to former manse. No longer used for ecclesiastical purposes. Surrounded by trees and vegetation which provide a generally sheltered and secluded setting. Key aspects of setting are its historic relationship with Barrhill village and its associated manse.	Low	29	1.0	Negligible (Visibility of proposed development largely screened by intervening woodland and buildings)
ASA 001	East Rhins	ASA	ASA encompassing a large area of upland rough pasture grassland and moorland around the valleys and minor tributaries of several watercourses (including Cross Water of Luce). ASA contains extensive and well-preserved remains of multi-period archaeological assets from prehistoric period onwards. Many individual assets have localised settings focused on the valleys/watercourses in which they are situated.	Medium	135	0.0	Low (Proposed development seen in the same context as the consented Stranoch Wind Farm; would not appreciably affect the localised valley settings of the heritage assets within the ASA and it would still be possible to appreciate and understand the layout and relationship of these heritage assets and the setting of the ASA as a whole)
53512	Docherniel	NIDL	NIDL associated with Docherniel, recorded from map evidence and extent of NIDL not now appreciable on ground. Lies within improved pasture on south facing slopes above Muck Water. Localised valley setting.	Medium	1	1.3	Negligible (Proposed development largely screened by intervening topography. Extent of NIDL now not appreciable on ground)
53513	Bellamore	NIDL	NIDL associated with Bellamore, recorded from map evidence and extent of NIDL not now appreciable on ground. Lies within improved pasture on south facing slopes above Much Water. Localised valley setting.	Medium	2	0.7	Negligible (Proposed development largely screened by intervening topography. Extent of NIDL now not appreciable on ground)
53453	Kildonan	NIDL	NIDL associated with Kildonan House (Category A listed (LB 1052). Located on south-west facing slopes forming Duisk River valley. Encompasses mixed woodland plantation and improved pasture. Approaches to house from south-east and west. House has south-east facing aspect and is surrounded by trees. Relatively secluded, localised valley setting; although some open views from pastureland on northern edges of NIDL looking across NIDL to south-west. Some contribution to local landscape in views from public road to west within wider rural landscape.	Medium	109	0.1	Negligible (Views of proposed development largely screened by intervening topography and surrounding by woodland/shelterbelts)
MDG 1916	Markdhu, Cultivation terrace	HER (National)	Former (medieval/post-med) cultivation remains in rough pasture on south-easting facing slopes above Cross Water of Luce.	High	11	0.8	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance.)

Technical appendix 6.2: Cultural Heritage Assets: Outer Study Area							
Asset no	**Asset name**	**Status**	**Character and Setting**	**Sensitivity of Asset**	**No of poles visible (bare-earth ZTV)**	**Distance to nearest pole**	**Magnitude of Impact**
			Key aspects of the setting are the relationship to other similar surrounding cultivation and settlement remains (MDG 1917 & MDG 13814) visible nearby. Localised setting. Forms part of the East Rhins ASA (ASA 001).				
MDG 1917	Markdhu, Cultivation terrace	HER (National)	Former (medieval/post-med) cultivation remains in rough pasture on south-easting facing slopes above Cross Water of Luce. Key aspects of the setting are the relationship to other similar surrounding cultivation and settlement remains (MDG 1916 & MDG 13814) visible nearby. Localised setting. Forms part of the East Rhins ASA (ASA 001).	High	12	0.7	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance.)
MDG 13814	Minniebay, Buildings	HER (National)	Potential footings of building shown on 1st edition map surviving in rough pasture on south-east facing slopes above Cross Water of Luce. Key aspects of the setting are its relationship to the immediate farmland in which it is located and its association with surrounding former cultivation remains (MDG 1916 & MDG 1917). Localised setting. Forms part of the East Rhins ASA (ASA 001).	High	6	1.0	Negligible (Localised setting. Views out from asset not an important contributor to cultural significance.)
WoSAS 11480	White Cairn, Laggish	HER (National)	Poorly preserved remains of a prehistoric burial cairn on a south-east facing slope above Pollgowan Burn and within commercial forestry plantation. Closely surrounded by commercial forestry. Principal views from cairn would have been to south, overlooking the Pollogwan Burn. Other burial cairns in wider landscape, but presence of forestry means difficult to appreciate any visual relationships between these on the ground. Key aspect of setting is its relationship with the Pollgowan Burn valley to the south and association with other burial cairns in the surrounding landscape.	High	26	1.3	Negligible (Views of proposed development screened by surrounding forestry)
WoSAS 11491	High Altercannoch, Hut-circles; Buildings; Small-cairns; Barrow (possible)	HER (National)	Remains of later prehistoric hut circles, buildings, clearance cairns and a possible prehistoric barrow in rough pasture on south-east facing slopes above Pollgowan Burn. Key aspects of the setting are the views to the south across the Pollgowan Burn valley and its relationship to other similar surrounding cultivation and settlement remains (i.e. MDG 11492, MDG 11493 & MDG 11496). Localised setting.	High	93	2.0	Low (Proposed development visible in distant views. Principal views to south not affected. Localised setting within Pollgowan River valley)
WoSAS 11492	High Altercannoch, Hut circle (possible)	HER (National)	Remains of possible hut circle in rough pasture on south-facing slopes overlooking Pollgowan Burn. Large swathes of commercial forestry to east, south and south-west of monument. Key aspects of the setting are the views to the south across the Pollgowan Burn valley and its relationship to other similar surrounding cultivation and settlement remains (i.e. MDG 11491 & MDG 11493). Localised setting.	High	106	1.8	Low (Proposed development visible in distant views. Principal views to south not affected. Localised setting within Pollgowan River valley)
WoSAS 11493	High Altercannoch, Small Cairns	HER (National)	Remains of clearance cairns and rickles of cleared stone in rough pasture on the north-east flank of Eyes hill and close to remains of stone building. Key aspects of the setting are its relationship to other similar surrounding cultivation and settlement remains (i.e. MDG 11491 & MDG 11496) visible nearby. Localised setting.	High	106	1.8	Low (Views out from asset not an important contributor to cultural significance. Localised setting)
WoSAS 11527	Laggan, Cairn	HER (National)	Poorly preserved remains of prehistoric burial cairn on a low knoll within an area of felled commercial forestry. Principal views are to the south-east and east along the Feoch Burn valley. One of several burial cairns in surrounding	High	61	1.0	Low (Proposed development visible in distant views; key views along Feoch Burn valley not affected)

Technical appendix 6.2: Cultural Heritage Assets: Outer Study Area							
Asset no	**Asset name**	**Status**	**Character and Setting**	**Sensitivity of Asset**	**No of poles visible (bare-earth ZTV)**	**Distance to nearest pole**	**Magnitude of Impact**
			area, but presence of forestry means difficult to appreciate any visual inter-relationships on ground. Key aspect of setting is its relationship with the Feoch Burn valley to the south and association with other burial cairns in the surrounding landscape.				
WoSAS 11534	Laggan, Cairn	HER (National)	Remains of prehistoric burial cairn on the south-east tip of a low hillock within an area of felled commercial forestry and close to an unnamed watercourse. Principal views from to the north overlooking the Cammnock Burn. One of several burial cairns in surrounding area, but presence of forestry means difficult to appreciate any visual inter-relationships on ground. Key aspects of setting is its relationship with the Cammnock Burn valley and association with other burial cairns in the surrounding landscape.	High	61	1.7	Low (Proposed development visible in distant views; key views to Cammnock Burn not affected)
WoSAS 11535	Duisk Lodge, Cairn	HER (National)	The remains of a possible prehistoric cairn surviving as a low oval mound of stones in an improved pasture field on a slightly north facing slope and just south of the Duisk River. Would have originally overlooked the Duisk River to the north however woodland/trees that edge the field in which it lies, and along the riverbanks, now screen this views. Key aspect of the setting is its relationship with the Duisk River.	High	15	1.6	Negligible (Views of proposed development largely screened by surrounding woodland)
WoSAS 11540	High Altercannoch, Enclosure	HER (National)	Remains of a circular enclosure and possible associated building footings on a slightly north facing slope, in rough pasture 200m south-west of High Altercannoch farmhouse. Principal views concentrated to north overlooking the Duisk River valley. Woodland (High Altercannoch Wood) immediately to the west of monument screens views in that direction. Localised setting. Key aspects of setting are the pasture farmland in which the enclosure remains lie and the Duisk River valley over which it looks.	High	15	1.3	Negligible (Views of proposed development largely screened by intervening topography and woodland)
WoSAS 11546	Knockmalloch, Enclosure	HER (National)	Poorly preserved remains of probable later prehistoric settlement site in improved pasture on gently sloping south-west facing ground adjacent to Mill Burn. Woodland shelterbelt plantation screen views to south, east and north. Would have originally overlooked the Duisk River valley to the south, however surrounding shelterbelts and woodland now screen this view. Localised setting.	High	10	0.5	Negligible (Views of proposed development screened by intervening shelterbelts) ***Assessed in detail in Chapter 6: Potential Impacts, Section 6.5.2: Operation (Figure 6.8).***
WoSAS 11555	West Altercannoch, Farmstead	HER (National)	Remains of pre-improvement farmstead in semi-improved farmland/rural landscape on north-east facing slopes along Duisk River valley. Key aspect of setting is its relationship to the immediate farmland in which it stands. Localised setting.	High	54	0.2	Low (Views out from asset not an important contributor to cultural significance. Localised setting)
WoSAS 11558	White Cairn, Cairn	HER (National)	Remains of a prehistoric burial cairn on a rocky knoll at the edge of an improved pasture field. The cairn has been considerably robbed and a modern cairn has been built on the north side. Cairn surrounded by forestry plantation on its north, south and east sides, which screen views in these directions. Would have originally overlooked the Duisk River to the north however forestry plantation now screens this view. Localised setting.	High	57	1.8	Negligible (largely screened by intervening forestry planation and woodland shelterbelts)
WoSAS 11562	West Altercannoch, Cairn	HER (National)	Remains of prehistoric burial cairn in semi-improved farmland on slightly north-east facing slope c.300m north-east of West Altercannoch Farm. Principal views are concentrated to the north overlooking the Duisk River valley. One of several burial cairns in surrounding area, but presence of	High	52	0.2	Low (Proposed development visible in the near distant. However, given the permeable nature of the proposed development it will

Technical appendix 6.2: Cultural Heritage Assets: Outer Study Area							
Asset no	**Asset name**	**Status**	**Character and Setting**	**Sensitivity of Asset**	**No of poles visible (bare-earth ZTV)**	**Distance to nearest pole**	**Magnitude of Impact**
			forestry means difficult to appreciate any visual inter-relationships on ground. Key aspects of setting are the pastureland in which it stands and the views overlooking the Duisk River valley and association with other burial cairns in the surrounding landscape.				still be possible to appreciate the farmland setting of the monument) ***Assessed in detail in Chapter 6: Potential Impacts, Section 6.5.2: Operation (Figures 6.5a-f).***

7. ECOLOGY AND ORNITHOLOGY APPRAISAL

7.1 Introduction

This chapter identifies the potential impacts on ecological and ornithological features associated with the construction and operation of the proposed development as described in Chapter 2: Development Description. Where appropriate, it also provides details of mitigation measures to address these potential impacts. The specific objectives of the chapter are to:

- Describe the ecological and ornithological baselines;
- Identify the potential direct and indirect impacts on ecological and ornithological features; and
- Describe any mitigation or control measures proposed to address likely impacts.

This chapter is supported by the following appendices:

- Technical Appendix 7.1: Protected Species List;
- Technical Appendix 7.2: Ecology and Ornithology Survey Results; and
- Confidential Technical Appendix 7.3: Bowland Ecology Report.

This chapter is supported by the following figures:

- Figure 7.1: Ecological Constraints;
- Figure 7.2: Ornithological Constraints;
- Figure 7.3: Phase 1 Habitat Survey;
- Figure 7.4: Vantage Point Locations;
- Figure 7.5: Groundwater Dependent Terrestrial Ecosystems (GWDTEs);
- Figure 7.6: Target Notes;
- Figure 7.7: Flightlines; and
- Figure 7.8: Ornithology Notes.

Technical Appendices 7.1-7.3 and Figures 7.1 – 7.8 are referenced in the text, where relevant. Confidential Technical Appendix 7.3 should not be shared with members of the public as it contains information on the location of a badger *Meles meles* sett.

7.2 Methodology

7.2.1 Study Areas

For the desk study, an ecological study area comprising a 2 km-wide corridor centred on the proposed development was defined in order to enable data to be gathered to account for potential ecological links outwith the more focused site area, as shown on Figure 7.1. The ornithological desk study area was defined as a 10 km buffer centred on the proposed development in order to assess the connectivity of potential key ornithological species with the proposed development, as shown on Figure 7.2.

For the purposes of the ecological surveys, the site boundary was defined as an area centred on the proposed development and included a buffer of up to 250 m on either side of the proposed development, as shown on all ecology figures where relevant (e.g. Figure 7.3). This was considered to represent the area within which potential impacts on ecology or ornithology would be concentrated.

7.2.2 Desk Study

A desk study was undertaken to collect existing baseline data about the site and the surrounding area, such as the location of designated sites or other natural features of potential ecological or ornithological importance. The desk study areas considered the following data sources:

- NatureScot (NS) Sitelink[1];and
- Multi Agency Geographic Information for the Countryside (MAGIC)[2].

Data sources were searched for protected or notable species records. Examples of notable species include, but are not limited to, national or local Biodiversity Action Plan (BAP) species, restricted range species, species or species groups listed against local designated sites in the area (Local Nature Reserves, Sites of Importance for Nature Conservation, Sites of Nature Conservation Interest) or key species groups such as invertebrates or non-vascular plants. These species are not considered to have the same importance as those protected by legislation; however, their inclusion allows a more holistic approach and therefore a more robust assessment in line with the Applicant's responsibilities under Schedule 9 of the Electricity Act 1989[3]. This information was used to understand what the key species for the site might be, prior to field surveys. Supplementary information on the site and its surroundings was obtained from aerial images available from Google™ Earth Pro.

7.2.3 Field Surveys

Extended Phase 1 Habitat Survey

Surveys were completed in accordance with the methodology of an extended Phase 1 habitat survey[4] and were undertaken on the 14th and 15th of August 2019, the 3rd of October 2019, the 8th, 9th and 30th of June 2020, and the 7th, 8th, 21st and 23rd of July 2020. Surveys in 2019 were undertaken by Ramboll and involved the area to the south of the Duisk River. Surveys in 2020 were undertaken by Bowland Ecology and involved the area north of the Duisk River.

The surveys involved a site walkover with an assessment of key habitat, land use and ecological features, focusing on areas of natural interest that could be affected by the proposed development. These habitats were mapped using standard Phase 1 habitat survey methodology as described in the Handbook for Phase 1 Habitat Survey[5]. Target notes were used to record habitats and features of particular interest.

The site was inspected for signs of any invasive plant species subject to legal controls, such as giant hogweed *Heracleum mantegazzianum* or Japanese knotweed *Fallopia japonica*.

The site was assessed for the presence of GWDTEs, which are protected under the Water Framework Directive[6] due to their hydrological sensitivity and potential to be adversely impacted by development. This was assessed using targeted National Vegetation Classification (NVC)[7] surveys of wetlands and peatlands.

The survey included an assessment of the site's ability to support species protected by international and national legislation, particularly badger, otter *Lutra lutra*, water vole *Arvicola amphibius*, pine marten *Martes martes*, red squirrel *Sciurus vulgaris* and great crested newt *Triturus cristatus*. A full list of all protected species known to occur naturally in Scotland is

1 https://sitelink.nature.scot/home

2 http://magic.defra.gov.uk/MagicMap.aspx

3 http://www.legislation.gov.uk/ukpga/1989/29/schedule/9

4 Joint Nature Conservation Committee (JNCC) (2010) Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit. JNCC Peterborough.

5 *Ibid*.

6 https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf

7 Rodwell, J.S. (2009), National Vegetation Classification Users Handbook. Peterborough: JNCC.

provided in Technical Appendix 7.1. The location of bird nests, especially those of raptor species, was also recorded.

In addition, any notable species encountered during the course of the surveys were recorded, as defined in Section 1.2.2.

Bat Roost Potential

Trees present on the site were assessed for their potential to support roosting bats and categorised depending on the presence of features suitable to support bat roosts. The categories assigned were high, moderate, low and negligible potential for use by bats. Table 7.1 provides criteria for each of these categories[8]. The identified trees with bat roost potential (BRP) were inspected from the ground using binoculars.

Table 7.1: Bat Roost Potential Categories

Roost Potential	**Description**
High	A tree with one or more potential roost site(s) that is obviously suitable for use by larger numbers of bats on a regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
Moderate	A tree with one or more potential roost site(s) that could be used by bats due to its size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
Low	Trees of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with very limited roosting potential.
Negligible	Negligible potential for roosting and bats very unlikely to be present.

Great Crested Newt eDNA Test

Any pond within the site with a Habitat Suitability Index (HSI) of 0.5 or greater was sampled for great crested newt eDNA using testing kits from Surescreen Scientifics[9]. Two ponds were sampled on the 26th of April 2021. Pond samples were then analysed by Surescreen Scientifics for the presence of great crested newt eDNA, the presence of which would indicate a recent, historical or current presence of great crested newt in the pond.

Vantage Point Surveys

According to good practice guidance on assessing the impact of power lines on birds[10], the species most susceptible to OHL impacts include waterfowl, waders, raptors and game birds. As a result, breeding bird surveys for passerine birds were not considered necessary. Six vantage point (VP) surveys were selected to cover the original preferred route (see Chapter 3: Route Selection and Alternatives), as shown on Figure 7.4. The aim of the surveys was to provide data on birds and bird habitat sensitivity along the original preferred route. The survey approach followed NS (previously Scottish Natural Heritage (SNH)) guidance for assessing power line impacts[11] on birds. The focus was on bird species with higher levels of legal protection and/or those species of highest conservation status/concern both nationally and regionally. The following height bands were assigned to all flights related to the height of the proposed

8 Collins, J. (ed.) (2016), Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition.). London: The Bat Conservation Trust

9 https://www.surescreenscientifics.com/edna/gcn-edna/

10 http://www.snh.gov.uk/docs/A2047189.pdf

11 SNH (2016). Guidance: Assessment and Mitigation of Impacts of Power Lines and Guyed Meteorological Masts on Birds.

development and the configuration of the OHL, as discussed in Chapter 2: Development Description:

- A = 0-8 m;
- B = 8-17 m; and
- C = >17 m.

VP surveys were undertaken between November 2016 and September 2017. Each VP location was surveyed three times per month in November and December 2016 and then twice per month from January to September 2017 to provide a full year of survey data suitable for use in a collision risk assessment. Each VP location was watched for three hours per survey visit, with the surveys classed as either a dawn, day or dusk survey to provide optimal temporal coverage. Surveys were organised, wherever possible, to avoid surveying at the same time of day over sequential months. Flights were split into 15 second sections and each flight section assigned an estimated height to the nearest 5 m. Target species were hen harrier *Circus cyaneus* and goshawk *Accipiter gentilis*. Other species of conservation interest were also recorded, if seen.

Following consultation with John Gibson at NS on the 5th of October 2018, further surveys were not considered to be required to cover the preferred alignment, which occurs further east than the original preferred route. VP data collected from VP2, VP3 and VP4 were considered to provide enough flight information to inform the environmental appraisal.

7.2.4 Appraisal of Potential Impacts

A preliminary ecological appraisal[12] of the site was undertaken to assess its ecological value and to consider the likely impacts of the proposed development on the ecological and ornithological features, with the intention of identifying mitigation requirements. No assessment is made of the significance of potential impacts.

7.3 Baseline Conditions

7.3.1 Desk Study

Designated Sites

Figure 7.1 shows the sites designated for ecological interests (excluding the Galloway and Southern Ayrshire Biosphere Reserve[13], which occurs across the whole study area) and Figure 7.2 shows the sites designated for ornithological interests. Table 7.2 details the designated sites occurring within both the ecological and ornithological study areas and their connectivity with the proposed development.

Table 7.2: Designated Sites within Ecological and Ornithological Study Areas			
Site Name	**Qualifying Features**	**Distance from Proposed Development (at closest point)**	**Comments**

12 CIEEM (2018) Technical Guidance Series: Guidelines for Preliminary Ecological Appraisal. Second Edition. Chartered Institute of Ecology and Environmental Management, Winchester.

13 https://www.gsabiosphere.org.uk/#:~:text=The%20Galloway%20and%20Southern%20Ayrshire%20Biosphere%20boundary%20embraces,with%20everyone%20living%20and%20working%20in%20the%20area.

Table 7.2: Designated Sites within Ecological and Ornithological Study Areas			
Glen App and Galloway Moors Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI)	Breeding population of hen harrier (Annex 1 species[14]).	1.3 km to the west	Within connectivity distance[15] for foraging hen harrier, therefore hen harrier from the SPA have the potential to be impacted.
Feoch Meadows SSSI	Fen meadow, including marsh cinquefoil *Potentilla palustris* and bogbean *Menyanthes trifoliata*, and species-rich unimproved neutral grassland, including uncommon species such as spignel *Meum athamanticum*, field gentian *Gentianella campestris*, lesser butterfly-orchid *Platanthera bifolia* and small-white orchid *Pseudorchis albida*.	1.9 km to the east	Separated from the proposed development by hills and woodland, therefore impacts are considered to be unlikely.
Galloway Forest Park Important Bird Area (IBA)	Short-eared owl *Asio flammeus*, peregrine *Falco peregrinus* and black grouse *Lyrurus tetrix.*	5.9 km to the east	Proposed development is outwith the maximum connectivity distance of short-eared owl and black grouse. There may be some connectivity with foraging peregrine and peregrine moving between alternative nest sites.
Galloway and Southern Ayrshire Biosphere Reserve	World-class environment for people and nature.	Proposed development occurs within the biosphere	The biosphere is not a protected area but is accredited for demonstrating excellence in sustainable development rather than supporting specific protected species and/or habitats. As a result, the biosphere is not considered further in this report.

There are several areas of woodland identified as ancient woodland occurring within the ecological study area, primarily in the north around Barrhill, as shown on Figure 7.1. Native and ancient woodlands are important for biodiversity and nature conservation, providing habitat for species such as badger, red squirrel, pine marten and bat species. Ancient woodland is defined

14 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF
15 https://www.nature.scot/sites/default/files/2018-08/Assessing%20connectivity%20with%20special%20protection%20areas.pdf

as woodlands that have been continually wooded since 1750, and there is a strong presumption in Scottish Planning Policy against the removal of woodland on ancient woodland sites[16].

No ancient woodland is directly crossed by the proposed development. The closest area of ancient woodland occurs 196.6 m to the north-west of the proposed development at Ward of Cairnlea, as shown on Figure 7.1a. Direct or indirect impacts are considered unlikely as the closest area is separated from the proposed development by open habitat (marshy grassland) and scrub.

7.3.2 Field Surveys

This section provides a summary of habitats identified during the ecological walkover survey and any protected species recorded. A full description of habitat types, dominant plant species recorded, and target notes can be found in Technical Appendix 7.1 and Confidential Technical Appendix 7.3.

Habitats

Figure 7.3 shows the locations of the following habitat areas recorded and their proximity to the proposed development:

- Semi-natural broadleaved woodland;
- Broadleaved woodland plantation;
- Coniferous woodland plantation;
- Semi-natural mixed woodland;
- Mixed woodland plantation;
- Broadleaved parkland/scattered trees;
- Coniferous parkland/scattered trees;
- Recently felled broadleaved woodland;
- Recently felled coniferous woodland;
- Dense and scattered Scrub;
- Unimproved neutral grassland;
- Semi-improved neutral grassland;
- Improved grassland;
- Marshy grassland;
- Species-poor grassland;
- Continuous bracken;
- Tall ruderal;
- Blanket bog;
- Wet modified bog;
- Species-rich intact hedge;
- Species-poor intact hedge;
- Species-poor defunct hedge; and
- Bare ground and other habitat (hardstanding and gardens around buildings).

The site is dominated by woodland plantation, marshy grassland and wet modified bog. Areas of blanket bog occur south of Chirmorie, as shown by Figure 7.3e and Figure 7.3f. Blanket bog is listed on Annex 1 of the EC Habitats Directive[17] as an international priority habitat. It is also a priority habitat on the UK BAP. The proposed development passes through areas of semi-natural woodland to the south-east of Barrhill, as shown on Figure 7.3b and Figure 7.3c.

Six different NVC communities that are potential GWDTEs[18] were identified throughout the study area and are shown on Figure 7.5. Table 7.3 details the potential GWDTEs identified and their groundwater dependency from an ecological perspective. These communities are assessed in Technical Appendix 8.1: GWDTE Assessment to confirm whether they are groundwater dependent in terms of hydrology and hydrogeology. GWDTEs are sensitive to changes in hydrology and hydrogeology and are a priority under the EU Water Framework Directive[19].

16 hhttps://www.nature.scot/sites/default/files/2018-11/A%20guide%20to%20understanding%20the%20Scottish%20Ancient%20Woodland%20Inventory%20%28AWI%29.pdf
17 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF
18 https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf accessed 28th July 2017
19 http://ec.europa.eu/environment/water/water-framework/index_en.html

Table 7.3: Potential GWDTE NVC Community Type	
Vegetation Community	**Potential Groundwater Dependency**
M6 *Carex echinata-Sphagnum fallax/denticulatum* mire	High
M23 *Juncus effusus-Galium palustre* rush pasture	
M15 *Trichophorum cespitosum–Erica tetralix* wet heath	Moderate
M25 *Molinia caerulea-Potentilla erecta* mire	
MG9 *Holcus lanatus-Deschampsia cespitosa* grassland	
MG10 *Holcus lanatus - Juncus effusus* rush-pasture	

Japanese knotweed and rhododendron *Rhododendron ponticum* were recorded on of close to the site, as shown by Target Notes 2 and 7 on Figure 7.6b and Figure 7.6e.

Protected Species

A single badger sett was recorded 265 m from the proposed development. Due to this distance from the proposed development, no impacts are considered to be possible on the sett and it is not considered further in this assessment.

Red squirrels were sighted foraging in the woodland plantation to the east of Balluskie, as shown by TN53 on Figure 7.6b. No dreys were recorded.

An otter sighting was made along the Cross Water of Luce during VP surveys, as shown by Note 17 on Figure 7.8b. Otter spraints were recorded on Lily Burn, a tributary of the Duisk River, and the Duisk River, as shown by TN9 on Figure 7.6a, and by TN60 and TN70 on Figure 7.6b. Three possible holts were also recorded at TN70 but no signs of otter activity were noted. The possible holts occur 65.9 m from the proposed development.

Water vole droppings were recorded in wet modified bog to the south of Barrhill, as shown by Target Note 5 on Figure 7.6c. No burrows were recorded during the survey, although the watercourses crossed by the proposed development were noted to be suitable to support water vole.

Trees with bat roost potential were identified to the east of Knockytinnal and around Barrhill, as shown by BT2, BT3 and BT4 on Figure 7.6a and Target Notes 1, 3 and 4 on Figure 7.6b, respectively. One tree (Target Note 1) occurs 21.7 m from the proposed alignment, though 32.9 m from a proposed pole location, as shown on Figure 7.6b. All other trees with bat roost potential occur greater than 30 m from the proposed development and are unlikely to be disturbed or damaged.

Two ponds with good suitability and below average suitability to support great crested newt were recorded in the study area, as shown by TN19 and TN35 on Figure 7.6a, respectively. Mill Loch (TN19) occurs 340.5 m from the proposed development and the field pond (TN35) occurs 367.6 m from the proposed development. Both ponds were negative for great crested newt eDNA.

The peatland habitat in the south of the site was noted to be suitable to support reptiles such as common lizard *Zootoca vivipara*, although no sightings were recorded.

VP Surveys

<u>Raptors</u>

Flight activity data gathered during the 2016 and 2017 surveys identified hen harrier activity at all VP locations, with the exception of VP1, as shown on Figure 7.7n. Flights by individual females were recorded at VP2, VP3 and VP6. Flights by both male and female individuals were recorded at VP4 and VP5. A ringtail was also seen flying in Arecleoch Forest, as shown by Note 3 on Figure 7.8a. Goshawk were recorded at VP2 and VP3, as shown on Figure 7.7i. Peregrine were recorded at VP1 and VP6, as shown on Figure 7.7q. Buzzards *Buteo buteo* and ravens *Corvus corax* were commonly recorded at all VPs, as shown on Figure 7.7a and Figure 7.7t, respectively. Flights by sparrowhawk *Accipiter nisus* were recorded at VP1 and VP5, as shown on Figure 7.7u. Flights by kestrel *Falco tinnunculus* were recorded at VP2, VP3, VP5 and VP6, as shown on Figure 7.7o. A female kestrel also mobbed corvids over a small area of forestry at VP5, indicating a likely nest in the vicinity, as shown by Note 8 on Figure 7.8b.

Hen harrier and goshawk are Schedule 1 species[20]. These species are afforded additional protection from disturbance at, on or near an active nest.

Kestrel is an amber-listed species on the Birds of Conservation Concern (BoCC)[21]. The BoCC reviews the status of birds in the UK against a set of criteria and places them on the green, amber or red list, indicating an increasing level of conservation concern.

Waterfowl

Cormorant *Phalacrocorax carbo* was recorded at VP1 and VP6, as shown on Figure 7.7b. A single coot *Fulica atra* flight was recorded at VP1, as shown on Figure 7.7d. A single goosander *Mergus merganser* flight was recorded at VP1, as shown on Figure 7.7h. One skein of eight greylag geese *Anser anser* was recorded in August 2017 from VP6, as shown on Figure 7.7j. One mallard *Anas platyrhynchos* flight was recorded at VP6, as shown on Figure 7.7p and a mallard was heard calling in Arecleoch Forest, as shown by Note 12 on Figure 7.8b. Razorbill *Alca torda* were recorded at VP1, VP2, VP5 and VP6, as shown on Figure 7.7r. Red-breasted merganser *Mergus serrator* flights were recorded at VP2, VP3 and VP6, as shown on Figure 7.7s.

Greylag goose, mallard and razorbill are amber-listed species on the BoCC.

Waders

Curlew *Numenius arquata* flights were recorded at VP4 and VP5, as shown on Figure 7.7e. Five curlews were also recorded calling at VP5, as shown by Note 4 on Figure 7.8b. Golden plover *Pluvialis apricaria* were recorded at VP4, VP5 and VP6, as shown on Figure 7.7k. Grey heron *Ardea cinerea* were recorded at VP1, VP4, VP5 and VP6, as shown on Figure 7.7l. A single snipe *Gallinago gallinago* flight was recorded at VP2, as shown on Figure 7.7v. A snipe was also flushed on the walk in to VP4, as shown by Note 28 on Figure 7.8a. Woodcock *Scolopax rusticola* were recorded at VP3, as shown on Figure 7.7w and heard calling in Arecleoch Forest, as shown by Notes 14 on Figure 7.8a.

Curlew and woodcock are red-listed species and snipe is an amber-listed species on the BoCC.

Gulls

A single common gull *Larus canus* flight was recorded at VP1, as shown on Figure 7.7c. Great black-backed gull *L. marinus* were recorded at VP1 and VP5, as shown on Figure 7.7g. A single herring gull flight was recorded at VP4, as shown by Figure 7.7m.

Common gull and great black-backed gull are amber-listed species and herring gull is a red-listed species on the BoCC.

[20] www.legislation.gov.uk/ukpga/1981/69/schedule/1

[21] https://www.rspb.org.uk/globalassets/downloads/documents/birds-and-wildlife/birds-of-conservation-concern-4--the-population-status-of-birds-in-the-united-kingdom-channel-islands-and-the-isle-of-man.pdf

Other Schedule 1 Species[22]

Flocks of crossbill *Loxia curvirostra* were recorded in Arecleoch Forest, as shown by Notes 20, 25 and 27 on Figure 7.8a. Flocks of fieldfare *Turdus pilaris* were recorded throughout the winter season from VP1 and VP5, as shown on Figure 7.7f.

Other Birds of Conservation Concern[23]

A black grouse was heard lekking from VP4, as shown by Note 2 on Figure 7.8a. Black grouse is a red-listed species on the BoCC. The proposed development is located 1.5 km to the south-east of the lekking site at its closest point, which is outwith the disturbance distance for this species[24]. Oystercatcher *Haematopus ostralegus* were seen at VP6, as shown by Note 5 on Figure 7.8b, and are an amber-listed species on the BoCC. Starling *Sturnus vulgaris* were seen at VP5 and VP6 and are a red-listed species on the BoCC. A tawny owl *Strix aluco* was heard calling in Arecleoch Forest, as shown by Note 13 on Figure 7.8a, and is an amber-listed species on the BoCC. Whinchat *Saxicola rubetra* were seen at VP2 and are a red-listed species on the BoCC.

7.4 Potential Impacts and Mitigation

7.4.1 Construction

Potential impacts during construction are detailed in Table 7.4 below, which also details the relevant ecological or ornithological feature and mitigation or control measures, where appropriate.

[22] www.legislation.gov.uk/ukpga/1981/69/schedule/1

[23] https://www.rspb.org.uk/globalassets/downloads/documents/birds-and-wildlife/birds-of-conservation-concern-4--the-population-status-of-birds-in-the-united-kingdom-channel-islands-and-the-isle-of-man.pdf

[24] https://www.nature.scot/sites/default/files/2018-05/A%20Review%20of%20Disturbance%20Distances%20in%20Selected%20Bird%20Species%20-%20Natural%20Research%20Ltd%20-%202007.pdf

Table 7.4: Potential Impacts on Ecology and Ornithology during Construction and Relevant Mitigation/Control Measures		
Potential Impact	**Feature**	**Mitigation/Control Measures Proposed**
Vegetation clearance (including tree felling) and habitat loss and/or modification from temporary access track construction, temporary construction areas around each pole location, temporary site compounds, maintenance of a resiliance corridor around the proposed alignment where it crosses through woodland, and excavation and burying of the proposed underground cable.	Sensitive and notable habitats (semi-natural broadleaved woodland, broadleaved woodland plantation, coniferous woodland plantation, scattered broadleaved trees, scattered scrub and species-rich hedgerows). Wetland habitats that are potential GWDTEs and peatland habitats, such as wet modified bog and blanket bog, are considered separately below.	• Existing, or temporary, access tracks would be used as much as possible. The locations of site compounds are not provided in this report but construction would avoid all known environmental constraints or would have relevant mitigation in place if they cannot be avoided. The construction of the Chirmorie and Stranoch substations are not considered in this report as these have already been consented following separate Environmental Appraisals; • Reinstatement of habitats as soon as possible following construction activities in areas of temporary access and construction; • Avoidance of the removal of species-rich hedgerow habitat, as shown on Figure 7.3b and Figure 7.3c; • Avoidance of tree felling, where possible, particularly in areas of broadleaved woodland. Minimal tree felling is considered to be required for the proposed development and is discussed in more detail in Chapter 9: Forestry. Where tree felling is required, the area removed would be replaced to ensure no net loss. The planting and management of tree species would be undertaken in consultation with landowners; and • An opportunity for enhancement of the habitats for amphibians, reptiles and invertebrates exists whereby stones and/or wooden material, such as brash from felling, greater than 150 mm would be gathered into piles to form artificial refugia. Where agreement can be reached with landowners and following assessment by the project Ecological Clerk of Works (ECoW), provision of areas of insect refugia to be considered from some felled trees (Small areas of log stacks). The majority of felled trees will be removed from site. Three habitat piles would be placed in sunny locations away from areas of construction and fence lines, such as close to the field pond and Mill Loch in the north of the site.
Disturbance/loss of Annex 1 habitats[25] from temporary access track construction, temporary site compounds, and temporary	Blanket bog and wet modified bog.	• Avoidance of blanket bog and wet modified bog, where possible. If not possible, floating access tracks/bog mats and low ground-pressure vehicles would be used to cross these habitats. Pre-construction surveys would be conducted to detect the habitats previously mentioned and allow the contractor to plan for avoidance;

[25] http://archive.jncc.gov.uk/default.aspx?page=1379

Table 7.4: Potential Impacts on Ecology and Ornithology during Construction and Relevant Mitigation/Control Measures		
construction areas around each pole location.		• Peat probing surveys to inform the micro-siting of woodpole locations and identify areas of deeper peat to be avoided, where possible. However, if this is not possible, suitable peatland restoration would be undertaken and a Peatland Habitat Management Plan would be produced; • If peat is encountered during excavations, the excavated peat materials would be temporarily stored prior to being reinstated. The temporary storage of such excavated peat would seek to minimise disturbance of deposits by minimising haul distance between temporary peat storage sites and re-use areas. In general, it would be a priority to avoid a single site dedicated to temporary peat storage. A progressive construction method that recycles peat through excavation and timely re-instatement in a continuous process would be adopted for all peat excavation. Excavated peat would be stored on geo-textile matting, which acts as a protective barrier to the underlying soils and vegetation. The geo-textile would be designed to prevent ingress of groundwater and erosion and de-stabilisation of the base of the stored peat. Peat would be stored to a maximum depth of 1 m, with the peat turves stored separately from underlying peat. The peat turves or vegetation layer would be stored in a single layer and a system of watering the stored peat and turves/vegetation would be in place to ensure that the peat remains damp; • Immediate reinstatement of blanket bog and wet modified bog following construction activities to retain hydrological connectivity and hydrological connectivity to be disturbed as little as possible during construction; and • It is not anticipated that there would be a need for peat disposal as all excavated material would be backfilled.
Disturbance/loss of GWDTEs from temporary access track construction, temporary site compounds, and temporary construction areas around each pole location.	GWDTEs (M6 *Carex echinata-Sphagnum recurvum/auriculatum* mire, M15 *Scirpus cespitosus-Erica tetralix* wet health, M23 *Juncus effusus-Galium palustre* rush pasture, M25 *Molinia caerulea-Potentilla erecta* mire, MG9 *Holcus lanatus-Deschampsia cespitosa* grassland and MG10 *Holcus lanatus-Juncus effusus* rush-pasture).	• A floating track construction would be used. The track design would use measures, such as a porous granular rock fill blanket, non-alkaline porous layer and perforated pipes, to maintain the flow connectivity across the tracks. Pre-construction surveys would be conducted to detect the habitats previously mentioned and allow the contractor to plan for avoidance; • Reinstatement of habitats as soon as possible following construction activities to retain hydrological connectivity and hydrological connectivity to be disturbed as little as possible during construction; • Clean runoff (i.e. non-silty surface water flow, including that which has not passed over any disturbed construction areas) would be kept separate from potentially

Table 7.4: Potential Impacts on Ecology and Ornithology during Construction and Relevant Mitigation/Control Measures		
		contaminated water as far as possible. Where required, interceptor ditches and other drainage measures would be installed to safeguard clean runoff from disturbed areas. All interceptor ditches and other drainage measures would be removed on completion; • Incorporation of highly and moderately GWDTEs within the Construction Environmental Management Plan (CEMP); and • Minimising the extent of construction work within wetland habitat.
Disturbance from lighting, noise and excavations	Habitats (semi-natural broadleaved woodland, broadleaved woodland plantation, coniferous woodland plantation, scattered broadleaved trees, scattered scrub and species-rich hedgerows), red squirrel, otter, bat species, great crested newt and breeding birds	• The CEMP would include measures to protect ecological and ornithological features. The ECoW and/or a suitably qualified ecologist would input into the CEMP to ensure appropriate mitigation measures are in place, and to reduce any disturbance effects; • The ECoW would have the power to stop works; • Avoidance of damage, pruning or felling of the bat roost potential tree shown by Target Note 1[26] on Figure 7.6b. Disturbance of this tree is considered to be unlikely as the nearest excavation would be greater than 30 m away. Care would be taken with any lighting in the vicinity of the tree and would avoid shining light directly on the tree itself or any potential commuting corridor, as assessed by the project ECoW; • Undertake pre-construction surveys for red squirrel, otter, badger, water vole and other protected species no later than eight months prior to construction. If the results indicate the presence of any protected species, an assessment of the impacts of the proposed development on the species would be completed and appropriate mitigation measures identified (if required), such as micro-siting of woodpoles and access tracks. For example, if tree felling is necessary, mature trees would be surveyed by a licensed bat surveyor to ensure no bats are roosting in the trees. At the same time, trees to be felled would be checked for the presence of red squirrel dreys. If bats are found to be roosting in the trees, felling would only occur under an NS licence with a licensed bat surveyor present. Similarly, if a red squirrel drey is found to be present, felling would only occur under an NS licence. Any species protection plans would be agreed with NS;

[26] Labelled as number 1 on Figure 7.6b, not TN1 or TG1 on Figure 7.6a

Table 7.4: Potential Impacts on Ecology and Ornithology during Construction and Relevant Mitigation/Control Measures		
		• Camera trap monitoring of the otter holts under an NS licence during pre-construction survey to confirm breeding status, though it is considered unlikely that the holts are used for breeding due to the lack of field signs. Should breeding be confirmed at any of the holts, monitoring via camera trap under licence for signs of disturbance would continue during construction, with further protective measures implemented by the EcoW, where required. If the holts are not used for breeding, which is considered to be likely, no further measures would be required as the holt is greater than 30 m from the proposed development[27]; and • The CEMP would include measures to protect ecological features, which would involve covering excavations and providing ramps in excavations to allow any trapped species to escape. These measures would be implemented at the end of each work day. A suitably qualified ECoW would input into the CEMP to ensure appropriate mitigation measures are in place, and to reduce any disturbance impacts. Working hours would avoid dawn and dusk to minimise disturbance to protected species, such as bats. Working in the vicinity of the otter holts would avoid work during the hours of darkness and within two hours after sunrise and two hours before sunset, which could be reduced to one hour between November and February, inclusive[28].
Destruction of bird nests	Breeding birds	• Ground or vegetation clearance works would be undertaken outwith the main bird nesting season (March–September, inclusive), if possible. If this is not possible, a suitably experienced ecologist would survey the proposed development prior to construction, particularly vegetation clearance and tree felling, to determine if nesting birds are present, espcially Schedule 1 species such as crossbill, hen harrier and goshawk, which are afforded further protection from disturbance in comparison to other bird species. If nesting birds are found, a suitable buffer zone would be implemented around the nest, with no work in this zone until the young have fledged or the nest is no longer in use, as confirmed by a suitably qualified ECoW. The size of the buffer zone would be determined by the species of nesting bird recorded.

[27] https://www.nature.scot/sites/default/files/2020-06/Species%20Planning%20Advice%20-%20otter.pdf

[28] https://www.nature.scot/sites/default/files/2020-06/Species%20Planning%20Advice%20-%20otter.pdf

Table 7.4: Potential Impacts on Ecology and Ornithology during Construction and Relevant Mitigation/Control Measures		
Pollution e.g. oil spill, siltation of watercourses, or dust.	Habitats, particularly running water and standing water.	• Access would use existing tracks and watercourse crossings as far as possible. Where required, temporary track mats and bog mats would be used to cross areas of soft ground. Bog mats would be used to cross minor watercourses without damage to bank integrity and temporary bridging solutions would also be used, where possible; • Where pole installation is required within 30 m of a watercourse, silt traps or other mitigation would be put in place and outlined in the CEMP, with nearby watercourses checked during periods of high rainfall during construction activities. Ground excavation work would temporarily stop during periods of high rainfall, where a risk to surface water quality is identified; • Wood pole line dewatering should be avoided where possible but in the unlikely event that it is required, the preference would be to discharge to vegetation in a manner that prevents silted water entering watercourses; • Spill kits would be located and maintained at all oil storage and refuelling locations and on all site vehicles. Refuelling in the field would be minimised to avoid spills; • The construction areas around individual poles would be designed to avoid soil stripping, storage and other construction activity with the potential to cause pollution within 10 m of sensitive watercourses or waterbodies; • Good practice guidance[29][30] would be followed when working close to watercourses; and • The CEMP would include standard pollution prevention guidelines, such as silt traps, during the construction phase to ensure that no water or air-borne pollutants reach ecological features.

[29] https://www.sepa.org.uk/media/150997/wat_sg_29.pdf

[30] http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/

7.4.2 Operation

Potential impacts during operation are detailed in Table 7.5 below, which also details the relevant ecological or ornithological feature and mitigation or control measures, where appropriate.

Table 7.5: Potential Impacts on Ecology and Ornithology during Operation and Relevant Mitigation/Control Measures

Potential Impact	Feature	Mitigation/Control Measures Proposed
Disturbance and displacement due to maintenance activities.	Red squirrel, otter, bat species and breeding birds.	• No mitigation is proposed as disturbance is considered unlikely or would be at a very low level, with maintenance activities using existing roads and access tracks. Any security lighting would be motion activated; and • If any vegetation clearance is required, breeding bird and protected species surveys would be undertaken prior to the commencement of works, where appropriate. If the results indicate the presence of any protected species, an assessment of the impacts on the species would be completed and appropriate mitigation measures identified, if required.
Pollution e.g. oil spill from vehicles accessing proposed development for maintenance activities.	Habitats	• Oil spill kits carried in vehicles, particularly when working in sensitive habitats such as blanket bog, wet modified bog, GWDTEs and close to running water or standing water.
Collision of bird species with OHL.	Raptors (including foraging hen harrier from Glen App and Galloway Moors SPA and SSSI, peregrine from Galloway Forest Park IBA foraging and moving between nest sites, and goshawk), waterfowl (greylag geese, mallard and razorbill), waders (curlew, woodcock and oystercatcher) and gulls (common gull, great black-backed gull and herring gull).	• NS guidance for power lines advises against the use of mathematical collision risk models and instead suggests the use of mitigation to reduce potential collision impacts where flight activity levels are high enough to cause potential conflicts[31]. The flight activity levels observed within the study area are low and it is considered that the potential for impacts is similarly low. Raptors are not considered to be highly vulnerable to collision risk[32]. Waders can be vulnerable to collision risk when exhibiting flocking behaviour but this does not occur during the breeding season when birds are more solitary or are recorded in small family groups. In addition, the proposed development would consist of a wood pole line with the configuration of wires arranged in one horizontal plane, therefore presenting only a very narrow band within which a collision would be possible. The three wires are arranged in a narrow configuration so that the collision zone for birds not approaching the line in

[31] SNH (2016) Assessment and Mitigation of Impacts of Power Lines and Guyed Meteorological Masts on Birds, Version 1.
[32] https://www.nature.scot/sites/default/files/2018-09/Wind%20farm%20impacts%20on%20birds%20-%20Use%20of%20Avoidance%20Rates%20in%20the%20SNH%20Wind%20Farm%20Collision%20Risk%20Model.pdf

Table 7.5: Potential Impacts on Ecology and Ornithology during Operation and Relevant Mitigation/Control Measures		
		horizontal flight is similarly narrow. The likelihood of a collision is, therefore, deemed to be very low and is not considered to require mitigation or control measures.

7.5 Residual Effects

The majority of habitats would be reinstated following completion of construction of the proposed development, resulting in an adverse effect for the short- to medium-term, approximately three to five years for grassland habitats and five to 10 years for other habitats (excluding woodland), until the habitats have re-established. As a result, no significant long-term residual effects are predicted. A residual adverse effect is anticipated for the long-term (approximately 10 to 20 years) until woodland has re-established, though woodland planting would offset the loss of trees felled during construction.

Implementation of the proposed CEMP would avoid likely adverse effects from pollution events and disturbance of habitats, with no residual effects.

Following the implementation of mitigation such as the use of floating tracks/bog mats, NS licensing, eDNA testing and a pre-construction protected species survey, no residual effects are predicted on red squirrel, otter, bat species, great crested newt or breeding birds.

7.6 Summary

The appraisal of the proposed development has identified potential impacts on habitats (particularly woodland, blanket bog and wet modified bog), GWDTEs, red squirrel, otter, bat species and breeding birds. Proposed mitigation includes habitat reinstatement, the avoidance of sensitive habitats, woodland offset planting, a CEMP to include measures to protect ecological and ornithological features and a suitably qualified ECoW to input into the CEMP to ensure appropriate mitigation measures are in place. Proposed mitigation also includes a pre-construction protected species survey and surveys for nesting birds if work in the breeding bird season cannot be avoided.

Following the implementation of mitigation, no long-term residual effects are predicted except for a long-term adverse effect on woodland until offset planting has established or areas of felled woodland have re-established.

Table 7.6: Summary of Impacts and Proposed Mitigation	
Likely Impact	**Mitigation/Control Measure Proposed**
Construction	
Habitat loss and modification, including disturbance and pollution.	• Reinstatement of habitats as soon as possible following construction activities in areas of temporary access and construction; • Avoidance of the removal of species-rich hedgerow and tree felling, where possible. Where tree felling is required, the area removed would be replaced to ensure no net loss and, ideally, a net gain through additional planting of native tree species, such as silver birch, rowan, elder and oak; • Habitat enhancement for amphibians, reptiles and invertebrates through the creation of three artificial refugia; • Avoidance of blanket bog, wet modified bog and GWDTEs, where possible. If not possible, floating access tracks/bog

Table 7.6: Summary of Impacts and Proposed Mitigation	
	mats and low ground-pressure vehicles would be used to cross these habitats; • Peat probing surveys to identify areas of deeper peat to be avoided, where possible; • Correct storage of excavated peat; • Immediate reinstatement of blanket bog, wet modified bog and GWDTEs following construction activities; • Clean runoff (i.e. non-silty surface water flow, including that which has not passed over any disturbed construction areas) would be kept separate from potentially contaminated water as far as possible. Where required, interceptor ditches and other drainage measures would be installed to safeguard clean runoff from disturbed areas; • Incorporation of highly and moderately GWDTEs within the CEMP; • Where pole installation is required within 30 m of a watercourse, silt traps or other mitigation would be put in place and outlined in the CEMP, with nearby watercourses checked during periods of high rainfall during construction activities. Ground excavation work would temporarily stop work during periods of high rainfall, where a risk to surface water quality is identified; • Spill kits would be located and maintained at all oil storage and refuelling locations and on all site vehicles; • The construction areas around individual poles would be designed to avoid soil stripping, storage and other construction activity with the potential to cause pollution within 10 m of sensitive watercourses or waterbodies; • Good practice guidance[33][34] would be followed when working close to watercourses; and • The CEMP would include standard pollution prevention guidelines, such as silt traps, during the construction phase to ensure that no water or air-borne pollutants reach ecological features.
Disturbance of protected species	• The CEMP would include measures to protect ecological and ornithological features. ECoW and/or a suitably qualified ecologist would input into the CEMP to ensure appropriate mitigation measures are in place, and to reduce any disturbance effects; • Avoidance of damage, pruning or felling of the bat roost potential tree within 30 m of the proposed development. Care would be taken with any lighting in the vicinity of the tree and would avoid shining light directly on the tree itself; • Pre-construction surveys for red squirrel, otter, badger, water vole and other protected species no later than eight months prior to construction. If tree felling is necessary, mature trees would be surveyed by a licensed bat surveyor to ensure no bats are roosting in the trees. At the same time, trees to be felled would be checked for the presence of red squirrel dreys;

[33] https://www.sepa.org.uk/media/150997/wat_sg_29.pdf

[34] http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/

Table 7.6: Summary of Impacts and Proposed Mitigation	
	• Camera trap monitoring of the otter holts under an NS licence would also occur during pre-construction surveys to confirm breeding status prior to construction; and • The CEMP would include measures to protect ecological features, which would involve covering excavations and providing ramps in excavations to allow any trapped species to escape. Working hours would avoid dawn and dusk to minimise disturbance to protected species, such as bat species. Working in the vicinity of the otter holts would avoid work during the hours of darkness and within two hours after sunrise and two hours before sunset, which can be reduced to one hour between November and February, inclusive[35].
Destruction of bird nests	• Ground or vegetation clearance works would be undertaken outwith the main bird nesting season (March–September, inclusive), if possible.
Operation	
Disturbance and displacement of protected species	• Any security lighting would be motion activated; and • If any vegetation clearance is required, breeding bird and protected species surveys would be undertaken prior to the commencement of works, where appropriate. If the results indicate the presence of any protected species, an assessment of the impacts on the species would be completed and appropriate mitigation measures identified, if required.
Pollution of habitats	• Oil spill kits carried in vehicles, particularly when working in sensitive habitats such as blanket bog, wet modified bog, GWDTEs and close to running water or standing water.
Collision of bird species with OHL	• None required.

[35] https://www.nature.scot/sites/default/files/2020-06/Species%20Planning%20Advice%20-%20otter.pdf

TECHNICAL APPENDIX 7 - ECOLOGY AND ORNITHOLOGY APPRAISAL

7.1: Protected Species List
7.2: Ecology and Ornithology Survey Results

Protected species known to occur naturally in Scotland & their protection

Taxon	Current taxon name	Common name	Legislation giving protection	Schedule or Annex listing
Reptile	Vipera berus	Adder	WCA 1981	Schedule 5 [1, 4]
Fish	Alosa alosa	Allis shad	HR 1994	Schedule 3
Fish	Alosa alosa	Allis shad	WCA 1981	Schedule 5 [1,2,3a]
Vascular Plant	Lychnis alpina	Alpine catchfly	WCA 1981	Schedule 8
Moss	Mielichhoferia mielichhoferi	Alpine copper-moss	WCA 1981	Schedule 8
Vascular Plant	Erigeron borealis	Alpine fleabane	WCA 1981	Schedule 8
Vascular Plant	Gentiana nivalis	Alpine gentian	WCA 1981	Schedule 8
Lichen	Pertusaria bryontha	Alpine moss-pertusaria	WCA 1981	Schedule 8
Vascular Plant	Arabis alpina	Alpine rock-cress	WCA 1981	Schedule 8
Vascular Plant	Cicerbita alpina	Alpine sow-thistle	WCA 1981	Schedule 8
Lichen	Alectoria ochroleuca	Alpine sulphur-tresses	WCA 1981	Schedule 8
Vascular Plant	Woodsia alpina	Alpine woodsia	WCA 1981	Schedule 8
Lichen	Nephroma arcticum	Arctic kidney-lichen	WCA 1981	Schedule 8
Fish	Salmo salar (only in fresh water)	Atlantic salmon	HR 1994	Schedule 3
Crustacean	Austropotamobius pallipes	Atlantic stream (white-clawed) crayfish	WCA 1981	Schedule 5 [2, 4]
Bird	Recurvirostra avosetta	Avocet	WCA 1981	Schedule 1 (Part I)
Mammal	Meles meles	Badger	PBA 1992	not applicable
Mammal	Meles meles	Badger	WCA 1981	Schedule 6
Moss	Sphagnum balticum	Baltic bog-moss	WCA 1981	Schedule 8
Fish	Barbus barbus	Barbel	HR 1994	Schedule 3
Bird	Tyto alba	Barn owl	WCA 1981	Schedule 1 (Part I)
Bird	Tyto alba	Barn owl	WCA 1981	Schedule 3 (Part I)
Fish	Cetorhinus maximus	Basking shark	WCA 1981	Schedule 5
Mammal	Plecotus auritus	Bat - Brown long-eared	HR 1994	Schedule 2: European protected species
Mammal	Pipistrellus pipistrellus	Bat - Common pipistrelle	HR 1994	Schedule 2: European protected species
Mammal	Myotis daubentonii	Bat - Daubenton's	HR 1994	Schedule 2: European protected species
Mammal	Nyctalus leisleri	Bat - Leisler's	HR 1994	Schedule 2: European protected species
Mammal	Pipistrellus nathusii	Bat - Nathsius' pipistrelle	HR 1994	Schedule 2: European protected species
Mammal	Myotis nattereri	Bat - Natterer's	HR 1994	Schedule 2: European protected species
Mammal	Nyctalus noctula	Bat - Noctule	HR 1994	Schedule 2: European protected species
Mammal	Pipistrellus pygmaeus	Bat - Soprano pipistrelle	HR 1994	Schedule 2: European protected species
Mammal	Myotis mystacinus	Bat - Whiskered	HR 1994	Schedule 2: European protected species
Mammal	Vespertilionidae spp	Bats - All typical species	HR 1994	Schedule 2: European protected species
Mammal	Erignathus barbatus	Bearded seal	HR 1994	Schedule 3
Bird	Panurus biarmicus	Bearded tit	WCA 1981	Schedule 1 (Part I)
Bird	Cygnus columbianus	Bewick's swan	WCA 1981	Schedule 1 (Part I)
Bird	Botaurus stellaris	Bittern	WCA 1981	Schedule 1 (Part I)
Bird	Phoenicurus ochruros	Black redstart	WCA 1981	Schedule 1 (Part I)
Bird	Turdus merula	Blackbird	WCA 1981	Schedule 3 (Part I)
Bird	Podiceps nigricollis	Black-necked grebe	WCA 1981	Schedule 1 (Part I)

Bird	Limosa limosa	Black-tailed godwit	WCA 1981	Schedule 1 (Part I)
Bird	Gavia arctica	Black-throated diver	WCA 1981	Schedule 1 (Part I)
Moss	Saelania glaucescens	Blue dew-moss	WCA 1981	Schedule 8
Vascular Plant	Phyllodoce caerulea	Blue heath	WCA 1981	Schedule 8
Vascular Plant	Hyacinthoides non-scripta	Bluebell	WCA 1981	Schedule 8 [4]
Bird	Luscinia svecica	Bluethroat	WCA 1981	Schedule 1 (Part I)
Moss	Orthotrichum obtusifolium	Blunt-leaved bristle-moss	WCA 1981	Schedule 8
Moss	Grimmia unicolor	Blunt-leaved grimmia	WCA 1981	Schedule 8
Bird	Fringilla montifringilla	Brambling	WCA 1981	Schedule 1 (Part I)
Bird	Fringilla montifringilla	Brambling	WCA 1981	Schedule 3 (Part I)
Moss	Cyclodictyon laetevirens	Bright-green cave-moss	WCA 1981	Schedule 8
Bird	Pyrrhula pyrrhula	Bullfinch	WCA 1981	Schedule 3 (Part I)
Lichen	Fuscopannaria ignobilis	Caledonian pannaria	WCA 1981	Schedule 8
Bird	Branta canadensis	Canada goose	WCA 1981	Schedule 2
Bird	Tetrao urogallus	Capercaillie	WCA 1981	Schedule 1 (Part I)
Mammal	Tursiops truncatus	Cetacean - Bottlenose dolphin	HR 1994	Schedule 2: European protected species
Mammal	Cetacea	Cetacean - Dolphins, porpoises and whales - All species	HR 1994	Schedule 2: European protected species
Mammal	Phocoena phocoena	Cetacean - Harbour or Common porpoise	HR 1994	Schedule 2: European protected species
Bird	Fringilla coelebs	Chaffinch	WCA 1981	Schedule 3 (Part I)
Butterfly	Carterocephalus palaemon	Chequered skipper	WCA 1981	Schedule 5 [4]
Bird	Pyrrhocorax pyrrhocorax	Chough	WCA 1981	Schedule 1 (Part I)
Lichen	Lecanactis hemisphaerica	Churchyard lecanactis	WCA 1981	Schedule 8
Lichen	Heterodermia propagulifera	Collaroid rosette-lichen	WCA 1981	Schedule 8
Amphibian	Rana temporaria	Common frog	WCA 1981	Schedule 5 [4]
Bird	Melanitta nigra	Common scoter	WCA 1981	Schedule 1 (Part I)
Mammal	Phoca vitulina	Common seal	HR 1994	Schedule 3
Bird	Gallinago gallinago	Common snipe	WCA 1981	Schedule 2
Bird	Gallinago gallinago	Common snipe	WCA 1981	Schedule 3 (Part III)
Amphibian	Bufo bufo	Common toad	WCA 1981	Schedule 5 [4]
Bird	Fulica atra	Coot	WCA 1981	Schedule 2
Bird	Fulica atra	Coot	WCA 1981	Schedule 3 (Part III)
Bird	Crex crex	Corncrake	WCA 1981	Schedule 1 (Part I)
Bird	Parus cristatus	Crested tit	WCA 1981	Schedule 1 (Part I)
Bird	Loxia spp	Crossbills (all species)	WCA 1981	Schedule 1 (Part I)
Bird	Sylvia undata	Dartford warbler	WCA 1981	Schedule 1 (Part I)
Vascular Plant	Diapensia lapponica	Diapensia	WCA 1981	Schedule 8
Vascular Plant	Cystopteris dickieana	Dickie's bladder fern	WCA 1981	Schedule 8
Bird	Charadrius morinellus	Dotterel	WCA 1981	Schedule 1 (Part I)
Vascular Plant	Saxifraga cernua	Drooping saxifrage	WCA 1981	Schedule 8
Butterfly	Hamearis lucina	Duke of Burgundy fritillary	WCA 1981	Schedule 5 [4]
Vascular Plant	Gentianella uliginosa	Dune gentian	WCA 1981	Schedule 8
Bird	Prunella modularis	Dunnock	WCA 1981	Schedule 3 (Part I)
Vascular Plant	Eleocharis parvula	Dwarf spike-rush	WCA 1981	Schedule 8
Lichen	Peltigera lepidophora	Ear-lobed dog-lichen	WCA 1981	Schedule 8
Lichen	Gyalecta ulmi	Elm gyalecta	WCA 1981	Schedule 8
Mollusc	Atrina fragilis	Fan mussel	WCA 1981	Schedule 5 [1, 2, 4, 5]
Vascular Plant	Melampyrum arvense	Field cow-wheat	WCA 1981	Schedule 8
Bird	Turdus pilaris	Fieldfare	WCA 1981	Schedule 1 (Part I)
Bird	Regulus ignicapillus	Firecrest	WCA 1981	Schedule 1 (Part I)
Lichen	Bryoria furcellata	Forked hair-lichen	WCA 1981	Schedule 8
Stonewort	Lamprothamnium papulosum	Foxtail stonewort	WCA 1981	Schedule 8
Mollusc	Margaritifera margaritifera	Freshwater pearl mussel	WCA 1981	Schedule 5
Bird	Anas strepera	Gadwall	WCA 1981	Schedule 2

Bird	Anas querquedula	Garganey	WCA 1981	Schedule 1 (Part I)
Lichen	Catolechia wahlenbergii	Goblin lights	WCA 1981	Schedule 8
Bird	Aquila chrysaetos	Golden eagle	WCA 1981	Schedule 1 (Part I)
Bird	Aquila chrysaetos	Golden eagle	WCA 1981	Schedule 1A
Bird	Aquila chrysaetos	Golden eagle	WCA 1981	Schedule A1
Bird	Aquila chrysaetos	Golden eagle	WCA 1981	Schedule 4
Lichen	Teloschistes flavicans	Golden hair-lichen	WCA 1981	Schedule 8
Bird	Oriolus oriolus	Golden oriole	WCA 1981	Schedule 1 (Part I)
Bird	Pluvialis apricaria	Golden plover	WCA 1981	Schedule 2
Bird	Pluvialis apricaria	Golden plover	WCA 1981	Schedule 3 (Part III)
Bird	Bucephala clangula	Goldeneye	WCA 1981	Schedule 1 (Part II)
Bird	Bucephala clangula	Goldeneye	WCA 1981	Schedule 2
Bird	Carduelis carduelis	Goldfinch	WCA 1981	Schedule 3 (Part I)
Bird	Accipter gentilis	Goshawk	WCA 1981	Schedule 1 (Part I)
Bird	Accipter gentilis	Goshawk	WCA 1981	Schedule 4
Vascular Plant	Lythrum hyssopifolia	Grass-poly	WCA 1981	Schedule 8
Fish	Thymallus thymallus	Grayling	HR 1994	Schedule 3
Amphibian	Triturus cristatus	Great crested newt	HR 1994	Schedule 2: European protected species
Bird	Gavia immer	Great Northern diver	WCA 1981	Schedule 1 (Part I)
Vascular Plant	Rhinanthus angustifolius	Greater yellow-rattle	WCA 1981	Schedule 8
Bird	Tringa ochropus	Green sandpiper	WCA 1981	Schedule 1 (Part I)
Moss	Buxbaumia viridis	Green shield-moss	WCA 1981	Schedule 8
Reptile	Chelonia mydas	Green turtle	HR 1994	Schedule 2: European protected species
Bird	Carduelis chloris	Greenfinch	WCA 1981	Schedule 3 (Part I)
Bird	Tringa nebularia	Greenshank	WCA 1981	Schedule 1 (Part I)
Mammal	Halichoerus grypus	Grey seal	HR 1994	Schedule 3
Bird	Anser anser	Greylag goose	WCA 1981	Schedule 1 (Part I in Outer Hebrides, Caithness & Sutherland and Wester Ross only)
Bird	Anser anser	Greylag goose	WCA 1981	Schedule 1 (Part II in Outer Hebrides, Caithness & Sutherland and Wester Ross only)
Bird	Anser anser	Greylag goose	WCA 1981	Schedule 2
Bird	Falco rusticolus	Gyr falcon	WCA 1981	Schedule 1 (Part I)
Mammal	Phoca groenlandica (otherwise known as Pagophilus groenlandicus)	Harp seal	HR 1994	Schedule 3
Bird	Circus spp	Harriers (all species)	WCA 1981	Schedule 1 (Part I)
Reptile	Eretmochelys imbricata	Hawksbill turtle	HR 1994	Schedule 2: European protected species
Mammal	Erinaceus europaeus	Hedgehog	WCA 1981	Schedule 6
Bird	Circus cyaneus	Hen harrier	WCA 1981	Schedule 1 (Part I)
Bird	Circus cyaneus	Hen harrier	WCA 1981	Schedule 1A
Bird	Falco subbuteo	Hobby	WCA 1981	Schedule 1 (Part I)
Bird	Pernis apivorus	Honey buzzard	WCA 1981	Schedule 1 (Part I)
Bird	Pernis apivorus	Honey buzzard	WCA 1981	Schedule 4
Mammal	Cystophora cristata	Hooded seal	HR 1994	Schedule 3
Bird	Upupa epops	Hoopoe	WCA 1981	Schedule 1 (Part I)
Bird	Corvus monedula	Jackdaw	WCA 1981	Schedule 3 (Part I)
Bird	Garrulus glandarius	Jay	WCA 1981	Schedule 3 (Part I)
Reptile	Lepidochelys kempii	Kemp's ridley turtle	HR 1994	Schedule 2: European protected species
Vascular Plant	Trichomanes speciosum	Killarney fern	HR 1994	Schedule 4: European protected species

Bird	Alcedo atthis	Kingfisher	WCA 1981	Schedule 1 (Part I)
Bird	Calcarius lapponicus	Lapland bunting	WCA 1981	Schedule 1 (Part I)
Vascular Plant	Dactylorhiza traunsteineroides ssp lapponica	Lapland marsh-orchid	WCA 1981	Schedule 8
Butterfly	Coenonympha tullia	Large heath	WCA 1981	Schedule 5 [4]
Moss	Scorpidium turgescens	Large yellow feather-moss	WCA 1981	Schedule 8
Bird	Oceanodroma leucorhoa	Leach's petrel	WCA 1981	Schedule 1 (Part I)
Reptile	Dermochelys coriacea	Leatherback turtle	HR 1994	Schedule 2: European protected species
Liverwort	Adelanthus lindenbergianus	Lindenberg's leafy liverwort	WCA 1981	Schedule 8
Bird	Carduelis cannabina	Linnet	WCA 1981	Schedule 3 (Part I)
Bird	Larus minutus	Little gull	WCA 1981	Schedule 1 (Part I)
Bird	Charadrius dubius	Little ringed plover	WCA 1981	Schedule 1 (Part I)
Bird	Sterna albifrons	Little tern	WCA 1981	Schedule 1 (Part I)
Reptile	Caretta caretta	Loggerhead turtle	HR 1994	Schedule 2: European protected species
Moss	Anomodon longifolius	Long-leaved anomodon	WCA 1981	Schedule 8
Moss	Bryum neodamense	Long-leaved thread-moss	WCA 1981	Schedule 8
Bird	Clangula hyemalis	Long-tailed duck	WCA 1981	Schedule 1 (Part I)
Bird	Pica pica	Magpie	WCA 1981	Schedule 3 (Part I)
Bird	Anas platyrynchos	Mallard	WCA 1981	Schedule 2
Bird	Anas platyrynchos	Mallard	WCA 1981	Schedule 3 (Part III)
Liverwort	Jamesoniella undulifolia	Marsh earwort	WCA 1981	Schedule 8
Butterfly	Euphydryas aurinia	Marsh fritillary	WCA 1981	Schedule 5
Bird	Circus aeruginosus	Marsh harrier	WCA 1981	Schedule 1 (Part I)
Bird	Circus aeruginosus	Marsh harrier	WCA 1981	Schedule 4
Annelid worm	Hirudo medicinalis	Medicinal leech	WCA 1981	Schedule 5
Bird	Larus melanocephalus	Mediterranean gull	WCA 1981	Schedule 1 (Part I)
Bird	Falco columbarius	Merlin	WCA 1981	Schedule 1 (Part I)
Bird	Falco columbarius	Merlin	WCA 1981	Schedule 4
Bird	Circus pygargus	Montagu's harrier	WCA 1981	Schedule 1 (Part I)
Bird	Circus pygargus	Montagu's harrier	WCA 1981	Schedule 4
Bird	Gallinula chloropus	Moorhen	WCA 1981	Schedule 2
Mammal	Lepus timidus	Mountain hare	HR 1994	Schedule 3
Butterfly	Erebia epiphron	Mountain ringlet	WCA 1981	Schedule 5 [4]
Amphibian	Bufo calamita	Natterjack toad	HR 1994	Schedule 2: European protected species
Liverwort	Leiocolea rutheana	Norfolk flapwort	WCA 1981	Schedule 8
Butterfly	Aricia artaxerxes	Northern brown argus	WCA 1981	Schedule 5 [4]
Mollusc	Thyasira gouldi	Northern hatchet-shell	WCA 1981	Schedule 5
Vascular Plant	Hieracium northroense	Northroe hawkweed	WCA 1981	Schedule 8
Vascular Plant	Arenaria norvegica	Norwegian sandwort	WCA 1981	Schedule 8
Fungi	Piptoporus quercinus	Oak polypore	WCA 1981	Schedule 8
Vascular Plant	Woodsia ilvensis	Oblong woodsia	WCA 1981	Schedule 8
Lichen	Parmentaria chilensis	Oil-stain parmentaria	WCA 1981	Schedule 8
Lichen	Caloplaca luteoalba	Orange-fruited elm-lichen	WCA 1981	Schedule 8
Bird	Pandion haliaetus	Osprey	WCA 1981	Schedule 1 (Part I)
Bird	Pandion haliaetus	Osprey	WCA 1981	Schedule 4
Mammal	Lutra lutra	Otter	HR 1994	Schedule 2: European protected species
Amphibian	Triturus helveticus	Palmate newt	WCA 1981	Schedule 5 [4]
Butterfly	Boloria euphrosyne	Pearl-bordered fritillary	WCA 1981	Schedule 5 [4]
Bird	Falco perigrinus	Peregrine falcon	WCA 1981	Schedule 1 (Part I)
Bird	Falco perigrinus	Peregrine falcon	WCA 1981	Schedule 4
Liverwort	Petalophyllum ralfsii	Petalwort	WCA 1981	Schedule 8

Vascular Plant	Crassula aquatica	Pigmyweed	WCA 1981	Schedule 8
Mammal	Martes martes	Pine marten	HR 1994	Schedule 3
Mammal	Martes martes	Pine marten	WCA 1981	Schedule 5
Bird	Anser brachyrhynchus	Pink-footed goose	WCA 1981	Schedule 2
Bird	Anas acuta	Pintail	WCA 1981	Schedule 1 (Part II)
Bird	Anas acuta	Pintail	WCA 1981	Schedule 2
Bird	Anas acuta	Pintail	WCA 1981	Schedule 3 (Part III)
Bird	Aythya ferina	Pochard	WCA 1981	Schedule 2
Bird	Aythya ferina	Pochard	WCA 1981	Schedule 3 (Part III)
Liverwort	Gymnomitrion apiculatum	Pointed frostwort	WCA 1981	Schedule 8
Moss	Hygrohypnum polare	Polar feather-moss	WCA 1981	Schedule 8
Mammal	Mustela putorius (otherwise known as Putorius putorius)	Polecat	HR 1994	Schedule 3
Vascular Plant	Homogyne alpina	Purple colts-foot	WCA 1981	Schedule 8
Bird	Ardea purpurea	Purple heron	WCA 1981	Schedule 1 (Part I)
Bird	Calidris maritima	Purple sandpiper	WCA 1981	Schedule 1 (Part I)
Bird	Coturnix coturnix	Quail	WCA 1981	Schedule 1 (Part I)
Lichen	Pseudocyphellaria lacerata	Ragged pseudocyphellaria	WCA 1981	Schedule 8
Bird	Milvus milvus	Red kite	WCA 1981	Schedule 1 (Part I)
Bird	Milvus milvus	Red kite	WCA 1981	Schedule 1A
Mammal	Sciurus vulgaris	Red squirrel	WCA 1981	Schedule 5
Mammal	Sciurus vulgaris	Red squirrel	WCA 1981	Schedule 6
Bird	Lanius collurio	Red-backed shrike	WCA 1981	Schedule 1 (Part I)
Bird	Phalaropus lobatus	Red-necked phalarope	WCA 1981	Schedule 1 (Part I)
Bird	Carduelis flammea	Redpoll	WCA 1981	Schedule 3 (Part I)
Bird	Gavia stellata	Red-throated diver	WCA 1981	Schedule 1 (Part I)
Bird	Turdus iliacus	Redwing	WCA 1981	Schedule 1 (Part I)
Bird	Emberiza schoeniclus	Reed bunting	WCA 1981	Schedule 3 (Part I)
Mammal	Phoca hispida (otherwise known as Pusa hispida)	Ringed seal	HR 1994	Schedule 3
Lichen	Collema dichotomum	River jelly-lichen	WCA 1981	Schedule 8
Fish	Lampetra fluviatilis	River lamprey	HR 1994	Schedule 3
Vascular Plant	Potentilla rupestris	Rock cinquefoil	WCA 1981	Schedule 8
Bird	Sterna dougallii	Roseate tern	WCA 1981	Schedule 1 (Part I)
Bird	Carpodacus erythrinus	Rosefinch	WCA 1981	Schedule 1 (Part I)
Vascular Plant	Althaea hirsuta	Rough marsh-mallow	WCA 1981	Schedule 8
Bird	Philomachus pugnax	Ruff	WCA 1981	Schedule 1 (Part I)
Lichen	Psora rubiformis	Rusty alpine spora	WCA 1981	Schedule 8
Bird	Aythya marila	Scaup	WCA 1981	Schedule 1 (Part I)
Moss	Bryum schleicheri	Schleicher's thread-moss	WCA 1981	Schedule 8
Bird	Serinus serinus	Serin	WCA 1981	Schedule 1 (Part I)
Vascular Plant	Hieracium zetlandicum	Shetland hawkweed	WCA 1981	Schedule 8
Bird	Eremophila alpestris	Shore lark	WCA 1981	Schedule 1 (Part I)
Bird	Anas clypeata	Shoveler	WCA 1981	Schedule 2
Bird	Anas clypeata	Shoveler	WCA 1981	Schedule 3 (Part III)
Mammal	Sorex spp	Shrews (all species)	WCA 1981	Schedule 6
Bird	Carduelis spinus	Siskin	WCA 1981	Schedule 3 (Part I)
Bird	Podiceps auritus	Slavonian grebe	WCA 1981	Schedule 1 (Part I)
Moss	Hamatocaulis (Drepanocladus) vernicosus	Slender green feather-moss	WCA 1981	Schedule 8
Vascular Plant	Najas flexilis	Slender naiad	HR 1994	Schedule 4: European protected species
Reptile	Anguis fragilis	Slow worm	WCA 1981	Schedule 5 [1, 4]
Vascular Plant	Alyssum alyssoides	Small Alison	WCA 1981	Schedule 8
Butterfly	Cupido minimus	Small blue	WCA 1981	Schedule 5 [4]
Vascular Plant	Pulicaria vulgaris	Small fleabane	WCA 1981	Schedule 8

Vascular Plant	Ononis reclinata	Small restharrow	WCA 1981	Schedule 8
Amphibian	Triturus vulgaris	Smooth newt	WCA 1981	Schedule 5 [4]
Bird	Plectrophenax nivalis	Snow bunting	WCA 1981	Schedule 1 (Part I)
Lichen	Caloplaca nivalis	Snow caloplaca	WCA 1981	Schedule 8
Bird	Nyctea scandiaca	Snowy owl	WCA 1981	Schedule 1 (Part I)
Bird	Turdus philomelos	Song thrush	WCA 1981	Schedule 3 (Part I)
Bird	Platalea leucorodia	Spoonbill	WCA 1981	Schedule 1 (Part I)
Bird	Porzana porzana	Spotted crake	WCA 1981	Schedule 1 (Part I)
Bird	Sturnus vulgaris	Starling	WCA 1981	Schedule 3 (Part I)
Vascular Plant	Chenopodium vulvaria	Stinking goosefoot	WCA 1981	Schedule 8
Fish	Acipenser sturio	Sturgeon	HR 1994	Schedule 2: European protected species
Crustacean	Triops cancriformis	Tadpole shrimp/Apus	WCA 1981	Schedule 5
Lichen	Lecanora achariana	Tarn lecanora	WCA 1981	Schedule 8
Bird	Anas crecca	Teal	WCA 1981	Schedule 2
Bird	Anas crecca	Teal	WCA 1981	Schedule 3 (Part III)
Bird	Calidris temminckii	Temminck's stint	WCA 1981	Schedule 1 (Part I)
Lichen	Catapyrenium psoromoides	Tree catapyrenium	WCA 1981	Schedule 8
Bird	Aythya fuligula	Tufted duck	WCA 1981	Schedule 2
Bird	Aythya fuligula	Tufted duck	WCA 1981	Schedule 3 (Part III)
Vascular Plant	Saxifraga cespitosa	Tufted saxifrage	WCA 1981	Schedule 8
Liverwort	Geocalyx graveolens	Turpswort	WCA 1981	Schedule 8
Fish	Alosa fallax	Twaite shad	HR 1994	Schedule 3
Fish	Alosa fallax	Twaite shad	WCA 1981	Schedule 5 [3a]
Bird	Carduelis flavirostris	Twite	WCA 1981	Schedule 3 (Part I)
Lichen	Cladonia trassii	Upright mountain-cladonia	WCA 1981	Schedule 8
Moss	Hypnum vaucheri	Vaucher's feather-moss	WCA 1981	Schedule 8
Bird	Melanitta fusca	Velvet scoter	WCA 1981	Schedule 1 (Part I)
Fish	Coregonus albula	Vendace	HR 1994	Schedule 3
Fish	Coregonus albula	Vendace	WCA 1981	Schedule 5
Reptile	Zootoca vivipara	Viviparous lizard	WCA 1981	Schedule 5 [1, 4]
Mammal	Arvicola terrestris	Water vole	WCA 1981	Schedule 5 [3]
Vascular Plant	Hieracium attenuatifolium	Weak-leaved hawkweed	WCA 1981	Schedule 8
Bird	Numenius phaeopus	Whimbrel	WCA 1981	Schedule 1 (Part I)
Bird	Gavia adamsii	White-billed diver	WCA 1981	Schedule 1 (Part I)
Fish	Coregonus lavaretus	Whitefish	HR 1994	Schedule 3
Fish	Coregonus lavaretus	Whitefish	WCA 1981	Schedule 5
Bird	Anser albifrons	White-fronted goose	WCA 1981	Schedule 2
Bird	Haliaeetus albicilla	White-tailed eagle	WCA 1981	Schedule 1 (Part I)
Bird	Haliaeetus albicilla	White-tailed eagle	WCA 1981	Schedule 1A
Bird	Haliaeetus albicilla	White-tailed eagle	WCA 1981	Schedule 4
Bird	Haliaeetus albicilla	White-tailed eagle	WCA 1981	Schedule A1
Bird	Cygnus cygnus	Whooper swan	WCA 1981	Schedule 1 (Part I)
Vascular Plant	Polygonatum verticillatum	Whorled Solomon's-seal	WCA 1981	Schedule 8
Bird	Anas penelope	Wigeon	WCA 1981	Schedule 2
Bird	Anas penelope	Wigeon	WCA 1981	Schedule 3 (Part III)
Mammal	Felis silvestris	Wildcat	HR 1994	Schedule 2: European protected species
Bird	Tringa glareola	Wood sandpiper	WCA 1981	Schedule 1 (Part I)
Bird	Scolopax rusticola	Woodcock	WCA 1981	Schedule 2
Bird	Scolopax rusticola	Woodcock	WCA 1981	Schedule 3 (Part III)
Bird	Columba palumbus	Woodpigeon	WCA 1981	Schedule 3 (Part II)
Bird	Jynx torquilla	Wryneck	WCA 1981	Schedule 1 (Part I)
Vascular Plant	Saxifraga hirculus	Yellow marsh saxifrage	HR 1994	Schedule 4: European protected species
Bird	Emberiza citrinella	Yellowhammer	WCA 1981	Schedule 3 (Part I)

Vascular Plant	Epipactis youngiana	Young's helleborine	WCA 1981	Schedule 8

Key

WCA 1981	Wildlife & Countryside Act 1981 (as amended in Scotland)	
	Schedule 1 (Part I)	Birds protected by special penalities
	Schedule 1 (Part II)	Birds protected by special penalities during the closed season
	Schedule 1A	Birds that may not be intentionally or recklessly harassed at any time
	Schedule A1	Birds whose habitually used nests may not be intentionally or recklessly taken, damaged, destroyed or otherwise interfered with when not in use
	Schedule 2	Birds which may be killed or taken outside the closed season
	Schedule 3 (Part I)	Birds which may be sold at all times if ringed and kept in captivity
	Schedule 3 (Part II)	Birds that may be sold dead at all times
	Schedule 3 (Part III)	Birds that may be sold dead from 1 September to 28 February
	Schedule 4	Birds that must be registered and ringed if kept in captivity
	Schedule 5	Protected animals
	Schedule 6	Animals protected from prohibited methods of capture
	Schedule 8	Protected plants
HR 1994	Habitats Regulations 1994 (as amended in Scotland)	
PBA 1992	Protection of Badgers Act 1992	

[1] Protected against intentional killing and injuring

[2] Protected against intentional or reckless taking

[3] Protected against intentional or reckless damage to, destruction of, obstruction of access to any structure or place used for shelter or protection and disturbance to animal whilst occupying such structures

[3a] Protected against intentional or reckless damage to, destruction of, obstruction of access to any structure or place used for shelter or protection

[4] Protected against selling, offering or advertising for sale, possessing or transporting for the purpose of sale

[5] Protected against possession or control (live or dead animal, part or derivative)

[#] Protected in England & Wales only (a species believed to have been introduced to Scotland)

TECHNICAL APPENDIX 7.2: ECOLOGY AND ORNITHOLOGY SURVEY RESULTS

1.1 Detailed Field Survey Results

1.1.1 Habitats

The habitats and dominant species recorded throughout the field survey area are shown on Figure 7.3. The following habitats and dominant species were recorded to the south of the Duisk River. Full details of the habitats and species recorded to the north of the Duisk River are included in Confidential Technical Appendix 7.3.

Semi-natural Broadleaved Woodland A1.1.1

This habitat type occurs in small areas around Barrhill, as shown on Figure 7.3c. The proposed development intersects this habitat type to the north of the A714 road south-east of Barrhill. Dominant species are ash *Fraxinus excelsior*, rowan *Sorbus aucuparia*, silver birch *Betula pendula* and willow *Salix sp*. Sycamore *Acer pseudoplatanus* is abundant, with occasional Scots pine *Pinus sylvestris* and rhododendron *Rhododendron ponticum*. Larch *Larix sp.* occurs rarely.

Coniferous Woodland Plantation A1.2.2

This habitat type occurs in Arecleoch Forest, as shown on Figure 7.3c and Figure 7.3d, where the proposed development runs through it. The dominant species is Sitka spruce *Picea sitchensis*, with rare silver birch and willow *Salix sp*.

Semi-natural Mixed Woodland A1.3.1

A single, small area of this habitat type occurs to the south of Barrhill, as shown on Figure 7.3c. The dominant species are ash and larch *Larix sp*.

Scrub – Scattered A2.2

A single area of this habitat type occurs to the south of Ward of Cairnlea around Cross Water, as shown on Figure 7.3c. The dominant species is gorse *Ulex europaeus*, with abundant soft rush *Juncus effusus*, and frequent purple moor-grass *Molinia caerulea*, bog myrtle *Myrica gale*, bracken *Pteridium aquilinum* and willow *Salix sp*.

Broadleaved Parkland/Scattered Trees A3.1

Lines of trees occur around houses and roads to the south of Barrhill, which are crossed by the proposed development, as shown on Figure 7.3c. Dominant species are ash, sycamore and beech *Fagus sylvatica*, with frequent willow *Salix sp.*, wych elm *Ulmus glabra*, hawthorn *Crataegus monogyna*, male fern *Dryopteris filix-mas* and common nettle *Urtica dioica*.

Coniferous Parkland/Scattered Trees A3.2

This habitat type occurs around the road through Arecleoch Forest, which the proposed development runs through, as shown on Figure 7.3c and Figure 7.3d. Dominant species are Sitka spruce, with occasional willow *Salix sp.* over blanket bog dominated by purple moor-grass, with abundant cross-leaved heath *Erica tetralix*.

Recently Felled Coniferous Woodland A4.2

Areas of this habitat type occur along the road through Arecleoch Forest, as shown by Figure 7.3c and Figure 7.3d.

Semi-improved Neutral Grassland B2.2

Several areas of this habitat type occur to the south of Barrhill and are crossed by the proposed development, as shown on Figure 7.3c. Dominant species are cock's-foot *Dactylis glomerata* and

Yorkshire fog *Holcus lanatus,* with abundant creeping thistle *Cirsium arvense* and perennial ryegrass *Lolium perenne*. Docks and sorrels *Rumex sp.*, common nettle, timothy *Phleum pratense*, marsh thistle *Cirsium palustre*, soft rush and common bent *Agrostis capillaris* occur frequently. Occasional species are chickweed *Stellaria media* and creeping buttercup *Ranunculus repens*.

Improved Grassland B4

This habitat type occurs in fields crossed by the proposed development to the south of Barrhill, as shown on Figure 7.3c. This habitat is heavily grazed by sheep in most areas. The dominant species are perennial ryegrass, crested dog's-tail *Cynosurus cristatus*, with abundant creeping thistle. Soft rush, and docks and sorrels *Rumex sp.* are frequent, with occasional Yorkshire fog.

Marshy Grassland B5

This is the most dominant habitat type crossed by the proposed development and occurs throughout the site, as shown on Figure 7.3. Dominant species are soft rush, sharp-flowered rush *Juncus acutiflorus*, willowherbs *Epilobium sp.*, creeping buttercup, Yorkshire fog and tufted hair-grass *Deschampsia cespitosa.* Abundant species are meadowsweet *Filipendula ulmaria,* Yorkshire fog and purple moor-grass, with rare bog myrtle*.*

Bracken – Continuous C1.1

A single, small area of bracken occurs to the north of Arecleoch Forest, which is skirted by the proposed development, as shown on Figure 7.3c.

Other Tall Herb and Fern –Ruderal C3.1

A single, small area occurs to the south of Barrhill, as shown by Figure 7.3c. Dominant species are Yorkshire fog, and docks and sorrels *Rumex sp.*, with abundant creeping thistle.

Blanket Sphagnum Bog E1.6.1

This habitat type is the second most dominant, occurring to the south of Chirmorie where it is crossed by the proposed development, as shown on Figure 7.3e and Figure 7.3f. Dominant species are common heather *Calluna vulgaris*, deergrass *Trichophorum cespitosum* and purple moor-grass. Cross-leaved heath, wavy hair-grass *Deschampsia flexuosa* and bog mosses are abundant, primarily red bog-moss *Sphagnum capillifolium*, blunt-leaved bog-moss *S. palustre* and feathery bog-moss *S. cuspidatum* in wetter areas. Frequent species are bilberry *Vaccinium myrtillus* and hare's-tail cotton grass *Eriophorum vaginatum*, with occasional bog asphodel *Narthecium ossifragum*.

Wet Modified Bog E1.7

This habitat is the third most dominant crossed by the proposed development and occurs to the south of Barrhill and south of Chirmorie, as shown on Figure 7.3c, Figure 7.3d and Figure 7.3e. The dominant species is purple moor-grass, with abundant wavy-hair grass, soft rush and sharp-flowered rush. Frequent species are cross-leaved heath, deergrass, bilberry, common bent, Yorkshire fog and bog myrtle, with occasional spruce *Picea sp.* and common heather. Silver birch and bog-mosses *Sphagnum sp.* occur rarely*.*

Defunct Hedge - Species-poor J2.2.2

A line of defunct hedge occurs along the road south of Barrhill and is crossed by the proposed development, as shown on Figure 7.3c. The dominant species is hawthorn, with occasional brambles *Rubus fruticosus*.

Other Habitat J5

This habitat type comprises hardstanding and garden areas around buildings to the south of Barrhill, as shown on Figure 7.3c.

1.1.2 National Vegetation Classification (NVC)

Information on the NVC habitats to the north of the Duisk River is provided in Confidential Technical Appendix 7.3. Seventeen habitats were surveyed to NVC level to the south of the Duisk River to assess their potential to be Groundwater Dependent Terrestrial Ecosystems (GWDTEs). The first group of quadrats was surveyed in a grassy area of blanket bog at grid reference NX 18251 75012. The following species were recorded:

- Purple moor-grass;
- Wavy hair-grass;
- Common heather;
- Cross-leaved heath;
- Bilberry;
- Common cottongrass *Eriophorum angustifolium*;
- Hare's-tail cottongrass *E. vaginatum*;
- Bog asphodel;
- Deergrass;
- Red bog-moss;
- Feathery bog-moss;
- Blunt-leaved bog-moss; and
- Round-leaved sundew *Drosera rotundifolia*.

This species list indicates that the area is an M19a *Calluna vulgaris-Eriophorum vaginatum* blanket mire with an *Erica tetralix* sub-community. This is not a GWDTE.

The second group of quadrats was surveyed in blanket bog with bog-moss *Sphagnum sp.* bog pool at grid reference NX 17943 74535. The following species were recorded:

- Purple moor-grass;
- Soft rush;
- Common heather;
- Cross-leaved heath;
- Tormentil *Potentilla erecta*;
- Wavy hair-grass;
- Bilberry;
- Flat-topped bog-moss *Sphagnum fallax*;
- Feathery bog-moss; and
- Red bog-moss.

This species list indicates that the area is an H9e *Calluna vulgaris-Deschampsia flexuosa* heath with *Molinia caerulea* sub-community. This is not a GWDTE.

The third group of quadrats was surveyed in marshy grassland by the Cross Water of Luce at grid reference NX 18876 75315. The following species were recorded:

- Soft rush;
- Sharp-flowered rush;
- Jointed rush *Juncus articulatus*;
- Tufted hair-grass;
- Creeping bent *Agrostis stolonifera*;
- Common sorrel *Rumex acetosa*;

- Marsh bedstraw *Galium palustre*;
- Sweet vernal grass *Anthoxanthum odoratum*;
- Purple moor-grass;
- Yorkshire fog; and
- Flat-topped bog-moss.

This species list indicates that the area is an M23b: *Juncus effusus/acutiflorus-Galium palustre* rush pasture, with *Juncus effusus* sub-community. This is a highly GWDTE.

The fourth group of quadrats was surveyed in marshy grassland beside a burn at grid reference NX 23929 81419. The following species were recorded:

- Soft rush;
- Sharp-flowered rush;
- Creeping buttercup;
- Meadowsweet;
- Meadow vetchling *Lathyrus pratensis*;
- Great willowherb *Epilobium hirsutum*;
- Creeping thistle;
- Yorkshire fog;
- Lesser stitchwort *Stellaria graminea*;
- Cock's-foot;
- Common nettle;
- Common hogweed *Heracleum sphondylium*;
- Common knapweed *Centaurea nigra*;
- Sneezewort *Achillea ptarmica*; and
- Broad-leaved dock *Rumex obtusifolius*.

This species list indicates that the area is an OV26a *Epilobium hirsutum* open habitat community, with *Juncus effusus* sub-community. This is not a GWDTE.

The fifth group of quadrats was surveyed in marshy grassland with bog-moss *Sphagnum sp*. and purple moor-grass surrounded by improved grassland at grid reference NX 23517 81399. The following species were recorded:

- Soft rush;
- Sharp-flowered rush;
- Purple moor-grass;
- Tormentil;
- Sorrel *Rumex sp.*;
- Yorkshire fog;
- Marsh thistle;
- Meadowsweet;
- Heath bedstraw *Galium saxatile*;
- Marsh violet *Viola palustris*;
- Glittering wood-moss *Hylocomium splendens*;
- Common haircap *Polytrichum commune*;
- Papillose bog-moss *Sphagnum papillosum*;
- Blunt-leaved bog-moss; and

- Red-stemmed feather-moss *Pleurozium schreberi*.

This species list indicates that the area is an M25 *Molinia caerulea-Potentilla erecta* mire. This is a moderately GWDTE.

The sixth group of quadrats was surveyed in marshy grassland at grid reference NX 23366 81298. The following species were recorded:

- Soft rush;
- Sharp-flowered rush;
- Common bird's-foot-trefoil *Lotus corniculatus*;
- Yorkshire fog;
- Common bent;
- Marsh woundwort *Stachys palustris*;
- Marsh willowherb *Epilobium palustre*;
- Marsh thistle;
- Sorrel *Rumex sp.*;
- Marsh pennywort *Hydrocotyle vulgaris*; and
- Creeping buttercup.

This species list indicates that the area is an MG10a *Holcus lanatus-Juncus effusus* rush pasture, with typical sub-community. This is a moderately GWDTE.

The seventh group of quadrats was surveyed in marshy grassland beside the railway line at grid reference NX 18976 75497. The following species were recorded:

- Purple moor-grass;
- Sharp-flowered rush;
- Soft rush;
- Yorkshire fog;
- Marsh violet;
- Heath wood-rush *Luzula multiflora*;
- Tormentil;
- Heath bedstraw;
- Glittering wood-moss;
- Blunt-leaved bog-moss;
- Flat-topped bog-moss;
- Common haircap; and
- Broad-buckler fern *Dryopteris dilatata*.

This species list indicates that the area is an M6d *Carex echinata-Sphagnum recurvum/auriculatum* mire, with *Juncus acutiflorus* sub-community. This is a highly GWDTE.

The eighth group of quadrats was surveyed in wet modified bog around marshy grassland at grid reference NX 19032 75511. The following species were recorded:

- Purple moor-grass;
- Cross-leaved heath;
- Wavy hair-grass;
- Bilberry;
- Tormentil;

- Heath bedstraw;
- Star sedge *Carex echinata*;
- Common haircap;
- Red bog-moss; and
- Red-stemmed feather-moss.

This species list indicates that the area is an M15d *Scirpus cespitosus-Erica tetralix* wet heath, with *Vaccinium myrtillus* sub-community. This is a moderately GWDTE.

The ninth group of quadrats was surveyed in blanket bog at grid reference NX 19221 75620. The following species were recorded:

- Purple moor-grass;
- Wavy hair-grass;
- Common heather;
- Cross-leaved heath;
- Bilberry;
- Cranberry *Vaccinium oxycoccus*;
- Cottongrass *Eriophorum sp.*;
- Bog asphodel;
- Deergrass;
- Red bog-moss;
- Papillose bog-moss;
- Red-stemmed feather-moss; and
- Round-leaved sundew.

This species list indicates that the area is an M19 *Calluna vulgaris-Eriophorum vaginatum* blanket mire. This is not a GWDTE.

The tenth group of quadrats was surveyed in marshy grassland at grid reference NX 19944 77244. The following species were recorded:

- Purple moor-grass;
- Sharp-flowered rush;
- Soft rush;
- Wavy hair-grass;
- Marsh violet;
- Yorkshire fog;
- Heath wood-rush;
- Heath bedstraw;
- Tormentil;
- Broad-buckler fern;
- Blunt-leaved bog-moss;
- Flat-topped bog-moss;
- Common haircap; and
- Red-stemmed feather-moss.

This species list indicates that the area is an M6d *Carex echinata-Sphagnum recurvum/auriculatum* mire, with *Juncus acutiflorus* sub-community. This is a highly GWDTE.

The eleventh group of quadrats was surveyed in wet modified bog at grid reference NX 22051 79849. The following species were recorded:

- Soft rush;
- Sharp-flowered rush;
- Purple moor-grass;
- Tormentil;
- Deergrass;
- Common knapweed;
- Yorkshire fog;
- Common thistle;
- Marsh pennywort;
- Round-leaved sundew;
- Cranberry;
- Willowherb *Epilobium sp.*;
- Cross-leaved heath;
- Bell heather *Erica cinerea*; and
- Bog asphodel.

This species list indicates that the area is an M25 *Molinia caerulea-Potentilla erecta* mire. This is a moderately GWDTE.

The twelfth group of quadrats was surveyed in blanket bog at grid reference NX 16637 73972. The following species were recorded:

- Purple moor-grass;
- Wavy hair-grass;
- Common heather;
- Cross-leaved heath;
- Bilberry;
- Common cottongrass;
- Hare's-tail cottongrass;
- Bog asphodel;
- Red bog-moss; and
- Feathery bog-moss.

This species list indicates that the area is an M19a *Calluna vulgaris-Eriophorum vaginatum* blanket mire, with *Erica tetralix* sub-community. This is not a GWDTE.

The thirteenth group of quadrats was surveyed in blanket bog between scattered trees at grid reference NX 22011 79654. The following species were recorded:

- Purple moor-grass;
- Common heather;
- Cross-leaved heath;
- Hare's-tail cottongrass;
- Bog asphodel;
- Bog myrtle;
- Tormentil;

- Deergrass;
- Crowberry *Empetrum nigrum*;
- Sitka spruce;
- Sedge *Carex sp.*;
- Common haircap;
- Red-stemmed feather-moss;
- Magellanic bog-moss *Sphagnum magellanicum*;
- Blunt-leaved bog-moss;
- Flat-topped bog-moss;
- Papillose bog-moss;
- Red bog-moss; and
- Feathery bog-moss.

This species list indicates that the area is an M17c *Scirpus cespitosus-Eriophorum vaginatum* blanket mire, with a *Juncus squarrosus-Rhytidiadelphus* sub-community. This is not a GWDTE.

The fourteenth group of quadrats was surveyed in marshy grassland beside a road in the north of Arecleoch Forest at grid reference NX 22036 79543. The following species were recorded:

- Purple moor-grass;
- Sharp-flowered rush;
- Soft rush;
- Deergrass;
- Cross-leaved heath;
- Yorkshire fog;
- Common hogweed;
- Sneezewort;
- Bog asphodel;
- Bog myrtle;
- Tormentil;
- Spear thistle *Cirsium vulgare*;
- Ribwort plantain *Plantago lanceolata*;
- Buttercup *Ranunculus sp.*;
- Common mouse-ear *Cerastium fontanum*;
- Violet *Viola sp.*;
- Dock *Rumex sp.*;
- Marsh bedstraw;
- Goat willow *Salix caprea*;
- Yellow sedge *Carex demissa*;
- Common haircap;
- Glittering wood-moss;
- Springy turf-moss *Rhytidiadelphus squarrosus*;
- Red-stemmed feather-moss;
- Blunt-leaved bog-moss; and
- Flat-topped bog-moss.

This species list indicates that the area is an M23a *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, with a *Juncus acutiflorus* sub-community. This is a highly GWDTE.

The fifteenth group of quadrats was surveyed in marshy grassland at grid reference NX 21448 78956. The following species were recorded:

- Purple moor-grass;
- Soft rush;
- Sharp-flowered rush;
- Yorkshire fog;
- Tormentil;
- Wild angelica *Angelica sylvestris*;
- Dock *Rumex sp.*;
- Marsh bedstraw;
- Common haircap;
- Glittering wood-moss;
- Springy turf-moss; and
- Red-stemmed feather-moss.

This species list indicates that the area is an M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture. This is a highly GWDTE.

The sixteenth group of quadrats was surveyed in a purple moor-grass dominated area at grid reference NX 21394 78917. The following species were recorded:

- Purple moor-grass;
- Dock *Rumex sp.*;
- Wild angelica;
- Fern *Dryopteris sp.*;
- Red-stemmed feather-moss;
- Glittering wood-moss;
- Springy turf-moss;
- Heath bedstraw; and
- Deergrass.

This species list indicates that the area is an M25 *Molinia caerulea-Potentilla erecta* mire. This is a moderately GWDTE.

The seventeenth group of quadrats was surveyed in marshy grassland within felled woodland at grid reference NX 21159 78380. The following species were recorded:

- Purple moor-grass;
- Soft rush;
- Sharp-flowered rush;
- Common heather;
- Bilberry;
- Yorkshire fog;
- Tormentil;
- Chickweed;
- Spear thistle;

- Buttercup *Ranunculus sp.*;
- Fern *Dryopteris sp.*;
- Rosebay willowherb *Chamerion angustifolium*;
- Common haircap;
- Springy turf-moss;
- Glittering wood-moss;
- Grey willow *Salix cinerea*;
- Alder *Alnus glutinosa*;
- Dock *Rumex sp.*; and
- Heath bedstraw.

This species list indicates that the area is an M6c *Carex echinata-Sphagnum recurvum/auriculatum* mire, with a *Juncus effusus* sub-community. This is a highly GWDTE.

1.1.3 Ecological Target Notes

Target notes recorded during the Phase 1 habitat survey of the area south of the Duisk River are detailed in Table 7.1.1. Target notes recorded during the Phase 1 habitat survey of the area north of the Duisk River are detailed in Confidential Technical Appendix 7.3. All target notes are shown on Figure 7.6.

Table 7.1.1: Ecological Target Notes

Target Note Number	Grid Reference	Comment
1	NX 23976 81531	Mature beech with moderate bat roost potential.
2	NX 23999 81521	Rhododendron.
3	NX 23953 81472	Horse chestnut *Aesculus hippocastanum* with high bat roost potential.
4	NX 23746 81496	Beech with moderate bat roost potential.
5	NX 22066 80338	Water vole *Arvicola amphibius* dropping.
6	N/A	Meadow brown butterflies *Maniola jurtina* throughout site.
7	NX 19253 74357	Japanese knotweed *Fallopia japonica.*
8	NX 21431 78932	Female palmate newt *Lissotriton helveticus*.

1.1.4 Vantage Point (VP) Surveys

Tables 7.1.2 and 7.1.3 provide the flight and weather data gathered during the VP surveys, respectively.

Flight Details

Table 7.1.2 provides flight data from VP surveys.

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	2	70	45		2017-09-15 8:31	Nadine	1	Dawn
BZ	1	40	60	Mobbed by RO	2017-09-15 9:04	Nadine	1	Dawn
RN	1	80	30		2017-09-15 9:13	Nadine	1	Dawn
RN	1	20	60		2017-09-15 9:14	Nadine	1	Dawn
BZ	1	10	15		2017-09-15 9:40	Nadine	1	Dawn
BZ	1	10	45		2017-09-15 9:58	Nadine	1	Dawn
BZ	1	20	30		2017-09-15 10:00	Nadine	1	Dawn
BZ	1	30	120		2017-09-15 10:08	Nadine	1	Dawn
CO	1	30	45		2017-09-15 10:33	Nadine	1	Dawn
BZ	1	40	30		2017-09-15 10:40	Nadine	1	Dawn
K	1	5	15		2017-09-15 9:35	Espen	2	Dawn
GO	6	10	30		2017-09-15 9:06	Espen	2	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
K	1	25	45		2017-09-15 9:47	Espen	2	Dawn
RA	1	20	30		2017-09-15 8:48	Espen	2	Dawn
K	1	5	5	Hunting from the conifers	2017-09-15 10:18	Espen	2	Dawn
K	1	15	60	Hunting	2017-09-15 10:27	Espen	2	Dawn
K	1	5	15		2017-09-15 9:35	Espen	2	Dawn
GO	6	10	30		2017-09-15 9:06	Espen	2	Dawn
K	1	25	45		2017-09-15 9:47	Espen	2	Dawn
RA	1	20	30		2017-09-15 8:48	Espen	2	Dawn
K	1	5	5	Hunting from the conifers	2017-09-15 10:18	Espen	2	Dawn
K	1	15	60	Hunting	2017-09-15 10:27	Espen	2	Dawn
BZ	1	50	45		2017-09-14 13:53	Espen	1	Day
RA	1	55	15		2017-09-14 13:54	Espen	1	Day

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RA	1	50	15		2017-09-14 13:54	Espen	1	Day
BZ	1	50	45		2017-09-14 13:53	Espen	1	Day
RA	1	55	15		2017-09-14 13:54	Espen	1	Day
RA	1	50	15		2017-09-14 13:54	Espen	1	Day
SH	1	40	45	Mobbed BZ	2017-09-14 15:06	Nadine	3	Day
BZ	1	40	60	Mobbed by SH	2017-09-14 15:07	Nadine	3	Day
K	1	10	15		2017-09-14 15:16	Nadine	3	Day
RN	5	30	60		2017-09-14 15:31	Nadine	3	Day
K	1	15	180	Hunting	2017-09-14 15:32	Nadine	3	Day
K	1	40	90		2017-09-14 15:39	Nadine	3	Day
K	1	10	15		2017-09-14 16:04	Nadine	3	Day
RN	1	70	30	From DO at VP2	2017-09-14 16:22	Nadine	3	Day

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	10	45		2017-09-14 13:44	Nadine	3	Day
BZ	1	5	30		2017-09-14 14:34	Nadine	3	Day
RN	1	100	60		2017-09-14 15:00	Nadine	3	Day
HH	1	5	30	Female/juvenile	2017-09-14 10:02	Nadine	4	Dawn
BZ	1	80	90		2017-09-14 10:03	Nadine	4	Dawn
BZ	1	10	30	Hunting	2017-09-14 10:28	Nadine	4	Dawn
BZ	1	40	60		2017-09-14 10:36	Nadine	4	Dawn
BZ	1	100	60		2017-09-14 11:11	Nadine	4	Dawn
RN	4	50	90		2017-09-14 11:50	Nadine	4	Dawn
HH	1	5	30	Male	2017-09-14 12:26	Nadine	4	Dawn
HH	1	5	60	Female/juvenile	2017-09-14 12:26	Nadine	4	Dawn
BZ	1	10	30		2017-09-14 12:29	Nadine	4	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RA	2	10	30		2017-09-14 9:46	Espen	5	Dawn
RA	1	10	15		2017-09-14 9:47	Espen	5	Dawn
RA	2	10	30		2017-09-14 9:46	Espen	5	Dawn
RA	1	10	15		2017-09-14 9:47	Espen	5	Dawn
K	1	10	15		2017-09-13 13:51	Nadine	6	Day
K	1	10	45		2017-09-13 14:19	Nadine	6	Day
K	1	10	30		2017-09-13 14:40	Nadine	6	Day
GP	70	50	120		2017-09-13 16:36	Nadine	6	Day
GP	70	15	60		2017-09-13 16:49	Nadine	6	Day
RN	2	40	120		2017-08-18 8:21	Danny	4	Dawn
BZ	1	5	15		2017-08-18 8:24	Danny	4	Dawn
BZ	1	5	30		2017-08-18 8:30	Danny	4	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	20	45		2017-08-18 9:49	Danny	4	Dawn
BZ	1	2	45		2017-08-18 9:50	Danny	4	Dawn
BZ	1	15	1800		2017-08-18 10:12	Danny	4	Dawn
K	3	20	330	3 K in stramash with 1 MG. Lots of calling and chasing. Reason not identified.	2017-08-18 7:58	Espen	5	Dawn
K	3	20	330	3 K in stramash with 1 MG. Lots of calling and chasing. Reason not identified.	2017-08-18 7:58	Espen	5	Dawn
K	3	20	330	3 K in stramash with 1 MG. Lots of calling and chasing. Reason not identified.	2017-08-18 7:58	Espen	5	Dawn
K	1	10	15	Female	2017-08-18 8:42	Nadine	6	Dawn
K	2	10	180	Mobbed by corvids	2017-08-18 8:52	Nadine	6	Dawn
K	1	5	15	One K. broke away to sit in bush before	2017-08-18 8:53	Nadine	6	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
				returned to where other K. being mobbed				
GJ	8	30	45		2017-08-18 9:21	Nadine	6	Dawn
RN	1	40	45		2017-08-17 13:58	Espen	4	Day
HG	1	25	75	1st winter plumage	2017-08-17 14:25	Espen	4	Day
RN	1	40	45		2017-08-17 13:58	Espen	4	Day
HG	1	25	75	1st winter plumage	2017-08-17 14:25	Espen	4	Day
RN	1	40	45		2017-08-17 13:58	Espen	4	Day
HG	1	25	75	1st winter plumage	2017-08-17 14:25	Espen	4	Day
RN	1	20	45		2017-08-17 14:49	Danny	6	Day
RN	2	10	30		2017-08-17 13:34	Nadine	5	Day
BZ	1	20	30		2017-08-17 13:55	Nadine	5	Day
RN	5	80	60		2017-08-17 14:10	Nadine	5	Day

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	10	120		2017-08-17 14:11	Nadine	5	Day
RN	2	70	30		2017-08-17 14:58	Nadine	5	Day
BZ	1	30	45		2017-08-17 14:59	Nadine	5	Day
BZ	1	30	30		2017-08-17 15:30	Nadine	5	Day
K	1	15	45		2017-08-17 16:18	Nadine	5	Day
BZ	1	60	60		2017-08-17 9:49	Nadine	1	Dawn
BZ	1	30	30		2017-08-17 9:50	Nadine	1	Dawn
BZ	2	40	180		2017-08-17 9:54	Nadine	1	Dawn
SH	1	70	30		2017-08-17 9:55	Nadine	1	Dawn
BZ	1	60	60		2017-08-17 10:27	Nadine	1	Dawn
RN	2	80	60		2017-08-17 10:31	Nadine	1	Dawn
BZ	1	80	90		2017-08-17 10:37	Nadine	1	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	1	30	15		2017-08-17 11:51	Nadine	1	Dawn
BZ	1	20	30		2017-08-17 11:55	Nadine	1	Dawn
BZ	1	50	120		2017-08-17 11:55	Nadine	1	Dawn
BZ	2	40	120		2017-08-17 12:00	Nadine	1	Dawn
BZ	2	40	90		2017-08-17 12:15	Nadine	1	Dawn
BZ	1	30	75		2017-08-17 9:23	Danny	3	Dawn
BZ	1	30	450		2017-08-17 10:32	Danny	3	Dawn
GI	1	20	60		2017-08-17 10:50	Danny	3	Dawn
RN	2	25	210		2017-08-17 10:54	Danny	3	Dawn
RN	1	30	90		2017-08-17 11:12	Danny	3	Dawn
BZ	1	30	105		2017-08-17 12:20	Danny	3	Dawn
GI	1	30	45	Passed on by DO at VP 3. Discussion with DO of views led	2017-08-17 10:58	Espen	2	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
				us to believe it was a non-adult bird displaying characteristics of being a 2-year male				
GI	1	30	45	Passed on by DO at VP 3. Discussion with DO of views led us to believe it was a non-adult bird displaying characteristics of being a 2-year male	2017-08-17 10:58	Espen	2	Dawn
GI	1	30	45	Passed on by DO at VP 3. Discussion with DO of views led us to believe it was a non-adult bird displaying characteristics of being a 2-year male	2017-08-17 10:58	Espen	2	Dawn
RN	1	15	30		2017-08-16 16:45	Nadine	3	Dusk
H.	1	25	30		2017-07-14 8:21	Danny	1	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	2	30	30		2017-07-14 10:19	Espen	2	Dawn
RN	1	10	30		2017-07-14 10:26	Espen	2	Dawn
BZ	1	25	15		2017-07-13 14:39	Nadine	1	Day
BZ	1	20	30		2017-07-13 16:00	Nadine	1	Day
RN	1	30	120		2017-07-13 15:26	Danny	2	Day
RN	1	30	45		2017-07-13 15:34	Espen	3	Day
BZ	1	30	75		2017-07-13 10:22	Nadine	5	Dawn
HH	1	40	45	Female	2017-07-13 12:30	Nadine	5	Dawn
HH	1	5	30	Male, hunting. Caught small mammal, possibly vole	2017-07-13 12:37	Nadine	5	Dawn
PE	1	10	15		2017-07-13 10:49	Espen	6	Dawn
BZ	1	10	60		2017-07-13 10:55	Espen	6	Dawn
PE	1	10	45	Carrying prey	2017-07-13 11:02	Espen	6	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	3	25	75		2017-07-13 12:06	Espen	6	Dawn
H.	1	10	60		2017-07-13 11:39	Danny	4	Dawn
HH	1	5	120	Male	2017-07-13 12:29	Danny	4	Dawn
HH	1	5	210	As previous flight, male	2017-07-13 12:35	Danny	4	Dawn
HH	1	5	45	Same bird	2017-07-13 12:39	Danny	4	Dawn
SH	1	40	30		2017-06-16 10:37	Nadine	5	Dawn
CA	1	20	60		2017-06-16 9:16	Nadine	6	Dawn
BZ	2	15	15		2017-06-15 15:39	Nadine	1	Dusk
BZ	1	30	45		2017-06-15 15:40	Nadine	1	Dusk
RN	4	20	30		2017-06-15 16:26	Nadine	1	Dusk
BZ	1	40	75		2017-06-15 17:46	Nadine	1	Dusk
BZ	1	40	150		2017-06-15 16:37	Danny	3	Dusk

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	10	30		2017-06-15 11:53	Danny	6	Day
BZ	2	30	30		2017-06-14 11:03	Nadine	3	Day
BZ	2	30	45		2017-06-14 11:14	Nadine	3	Day
RN	1	40	30		2017-06-14 12:19	Nadine	3	Day
BZ	1	5	15		2017-06-14 12:22	Nadine	3	Day
RN	1	30	30		2017-06-14 13:16	Nadine	3	Day
BZ	1	1	15		2017-06-14 13:37	Nadine	3	Day
BZ	1	15	15		2017-06-14 11:26	Danny	2	Day
BZ	1	50	135		2017-06-14 11:44	Danny	2	Day
RN	2	25	120		2017-06-14 11:55	Danny	2	Day
RN	1	25	75		2017-06-14 11:56	Danny	2	Day
BZ	1	25	90		2017-06-14 12:26	Danny	2	Day

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	1	25	90		2017-06-14 12:29	Danny	2	Day
BZ	1	30	105		2017-06-14 12:30	Danny	2	Day
BZ	1	25	300		2017-06-14 12:37	Danny	2	Day
BZ	1	25	90		2017-06-14 12:48	Danny	2	Day
RN	1	20	30		2017-06-14 13:11	Danny	2	Day
BZ	1	30	45		2017-06-14 13:12	Danny	2	Day
RN	2	25	150		2017-06-14 13:16	Danny	2	Day
RN	1	15	45		2017-06-14 13:16	Danny	2	Day
BZ	1	25	270		2017-06-14 13:19	Danny	2	Day
BZ	1	15	105		2017-05-11 12:54	Danny	3	Day
BZ	1	25	180		2017-05-11 14:22	Danny	3	Day
BZ	1	10	30	Perched in tree	2017-05-11 8:29	Nadine	4	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	1	40	30		2017-05-11 8:49	Nadine	4	Dawn
RN	1	5	30		2017-05-11 9:40	Nadine	4	Dawn
RA	2	10	15		2017-04-12 17:51	Ramboll	6	Dusk
RA	1	5	15		2017-04-12 17:51	Ramboll	6	Dusk
RA	1	5	30		2017-04-12 18:05	Ramboll	6	Dusk
H	1	10	60		2017-04-12 18:52	Ramboll	6	Dusk
RN	1	60	30		2017-04-12 16:48	Nadine	5	Dusk
RN	1	10	15		2017-04-12 16:49	Nadine	5	Dusk
RN	2	20	15		2017-04-12 18:19	Nadine	5	Dusk
SH	1	40	30		2017-04-12 18:33	Nadine	5	Dusk
BZ	1	70	90		2017-04-12 18:48	Nadine	5	Dusk
RN	1	15	45		2017-04-12 18:15	Danny	4	Dusk

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	50	165		2017-04-12 14:03	Danny	4	Day
CU	1	5	30	Calling	2017-04-12 12:48	Ramboll	5	Day
CU	1	10	15		2017-04-12 13:13	Ramboll	5	Day
RA	4	20	45	Calling	2017-04-12 13:14	Ramboll	5	Day
RA	2	20	15		2017-04-12 14:46	Ramboll	5	Day
RN	1	10	30	Mobbed by two C.	2017-04-12 13:28	Nadine	6	Day
RN	1	10	15		2017-04-12 13:37	Nadine	6	Day
H.	1	5	15	Landed back by river	2017-04-12 14:35	Nadine	6	Day
RN	1	5	15	Dropped behind railway embankment	2017-04-12 15:03	Nadine	6	Day
HH	1	50	15	Female/Juvenile	2017-04-11 11:51	Nadine	2	Day
SH	1	40	15	Chasing WP	2017-04-11 12:47	Nadine	2	Day
SH	1	80	120		2017-04-11 11:16	Danny	3	Day

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	15	15		2017-04-10 15:57	Danny	1	Dusk
BZ	1	35	150		2017-04-10 16:11	Danny	1	Dusk
PE	1	5	30		2017-04-10 16:14	Danny	1	Dusk
GD	1	10	30		2017-04-10 16:25	Danny	1	Dusk
BZ	1	35	360		2017-04-10 16:45	Danny	1	Dusk
BZ	2	15	150		2017-04-10 16:47	Danny	1	Dusk
RN	2	70	165		2017-04-10 16:59	Danny	1	Dusk
BZ	1	10	30		2017-04-10 18:08	Danny	1	Dusk
BZ	1	70	30		2017-04-10 15:45	Nadine	3	Dusk
BZ	1	80	120		2017-04-10 16:32	Nadine	3	Dusk
BZ	1	70	240		2017-04-10 16:51	Nadine	3	Dusk
BZ	1	70	120		2017-04-10 17:25	Nadine	3	Dusk

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	1	70	30		2017-03-17 9:14	Nadine	1	Dawn
BZ	1	10	15		2017-03-17 9:25	Nadine	1	Dawn
RN	2	40	60		2017-03-17 9:25	Nadine	1	Dawn
RN	1	30	30		2017-03-17 9:26	Nadine	1	Dawn
RN	2	10	75		2017-03-17 9:19	Danny	2	Dawn
RN	2	20	15		2017-03-17 9:25	Adam	3	Dawn
RN	2	20	15		2017-03-17 9:25	Adam	3	Dawn
RN	1	30	15		2017-03-16 12:18	Nadine	2	Day
HH	1	15	60	Following EB up the road in the car	2017-03-16 14:28	Nadine	2	Day
BZ	1	25	15		2017-03-16 12:12	Adam	1	Day
BZ	1	25	15		2017-03-16 12:12	Adam	1	Day
CU	1	50	180		2017-03-16 9:09	Danny	5	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	6	5	150		2017-03-16 9:15	Danny	5	Dawn
RN	3	20	15		2017-03-16 8:50	Adam	4	Dawn
RN	1	10	15		2017-03-16 9:41	Adam	4	Dawn
RN	3	20	15		2017-03-16 8:50	Adam	4	Dawn
RN	1	10	15		2017-03-16 9:41	Adam	4	Dawn
BZ	1	10	30		2017-03-15 16:28	Nadine	4	Dusk
HH	1	1	60	Hunting male	2017-03-15 17:33	Nadine	4	Dusk
RN	2	10	15		2017-03-15 14:50	Adam	5	Dusk
RN	1	15	15		2017-03-15 14:51	Adam	5	Dusk
RN	2	10	15		2017-03-15 14:50	Adam	5	Dusk
RN	1	15	15		2017-03-15 14:51	Adam	5	Dusk
MA	4	20	30		2017-02-17 9:22	Nadine	5	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
PE	1	20	105		2017-02-17 10:36	Danny	6	Dawn
RN	2	10	15		2017-02-17 8:13	Adam	4	Dawn
RN	1	5	30		2017-02-17 8:14	Adam	4	Dawn
RN	1	5	15	Calling	2017-02-17 9:32	Adam	4	Dawn
RN	2	10	15		2017-02-17 9:41	Adam	4	Dawn
RN	2	10	15		2017-02-17 8:13	Adam	4	Dawn
RN	1	5	30		2017-02-17 8:14	Adam	4	Dawn
RN	1	5	15	Calling	2017-02-17 9:32	Adam	4	Dawn
RN	2	10	15		2017-02-17 9:41	Adam	4	Dawn
RN	1	25	15		2017-02-16 13:53	Adam	6	Dusk
SG	40	5	5		2017-02-16 14:26	Adam	6	Dusk
RN	2	5	15		2017-02-16 14:43	Adam	6	Dusk

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
SG	40	20	15		2017-02-16 14:44	Adam	6	Dusk
RN	1	25	15		2017-02-16 13:53	Adam	6	Dusk
SG	40	5	5		2017-02-16 14:26	Adam	6	Dusk
RN	2	5	15		2017-02-16 14:43	Adam	6	Dusk
SG	40	20	15		2017-02-16 14:44	Adam	6	Dusk
BZ	1	40	30		2017-02-16 14:21	Nadine	5	Dusk
RN	1	30	30		2017-02-16 15:57	Nadine	5	Dusk
RN	2	35	45		2017-02-16 14:27	Danny	4	Dusk
RN	1	20	120		2017-02-16 15:48	Danny	4	Dusk
BZ	1	20	15		2017-02-16 11:24	Nadine	1	Day
BZ	1	15	15		2017-02-16 11:45	Nadine	1	Day
RN	4	100	180		2017-02-16 11:53	Nadine	1	Day

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	20	60		2017-02-16 12:00	Nadine	1	Day
RN	1	100	90		2017-02-16 12:02	Nadine	1	Day
RN	1	70	45		2017-02-16 12:05	Nadine	1	Day
RN	2	90	120		2017-02-16 12:06	Nadine	1	Day
BZ	3	30	60		2017-02-16 12:11	Nadine	1	Day
RN	1	55	15		2017-02-16 10:28	Adam	3	Day
RN	1	55	15		2017-02-16 10:28	Adam	3	Day
RN	1	20	105		2017-02-16 10:09	Danny	2	Day
BZ	1	40	30		2017-02-16 9:50	Nadine	1	Day
BZ	2	40	60		2017-02-16 9:51	Nadine	1	Day
GB	1	60	30		2017-02-16 9:52	Nadine	1	Day
SH	1	50	30		2017-02-16 9:56	Nadine	1	Day

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	50	90		2017-02-16 9:57	Nadine	1	Day
H.	1	20	30		2017-02-16 10:06	Nadine	1	Day
BZ	2	40	120		2017-02-16 10:08	Nadine	1	Day
RN	1	50	120		2017-02-16 10:22	Nadine	1	Day
SH	2	40	60		2017-02-16 10:23	Nadine	1	Day
BZ	1	10	30	Mobbed by C.	2017-02-16 10:41	Nadine	1	Day
BZ	1	40	120		2017-02-16 11:11	Nadine	1	Day
BZ	1	50	60		2017-02-16 11:12	Nadine	1	Day
RN	1	15	15		2017-02-15 16:45	Nadine	3	Dusk
SH	1	20	30		2017-02-15 17:39	Nadine	3	Dusk
WK	1	10	15		2017-02-15 18:06	Nadine	3	Dusk
WK	1	10	15		2017-02-15 18:17	Nadine	3	Dusk

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	2	50	15		2017-01-20 10:43	Adam	1	Dawn
RN	1	50	15		2017-01-20 10:51	Adam	1	Dawn
RN	1	50	30		2017-01-20 11:15	Adam	1	Dawn
RN	2	50	15		2017-01-20 10:43	Adam	1	Dawn
RN	1	50	15		2017-01-20 10:51	Adam	1	Dawn
RN	1	50	30		2017-01-20 11:15	Adam	1	Dawn
HH	1	10	15	Female/juvenile	2017-01-20 10:15	Nadine	3	Dawn
K.	1	10	15		2017-01-19 14:33	Nadine	2	Dusk
HH	1	5	30	Female/juvenile	2017-01-19 14:47	Nadine	2	Dusk
SN	2	10	30	Flushed by HH	2017-01-19 14:50	Nadine	2	Dusk
BZ	1	40	210		2017-01-19 13:21	Danny	1	Dusk
BZ	1	15	90		2017-01-19 13:39	Danny	1	Dusk

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
H.	1	1	15		2017-01-19 14:15	Danny	1	Dusk
BZ	1	1	15		2017-01-19 15:06	Danny	1	Dusk
BZ	1	15	30		2017-01-19 9:25	Nadine	6	Dawn
BZ	1	5	15	Mobbed by C.	2017-01-19 9:29	Nadine	6	Dawn
HH	1	20	15	Male	2017-01-19 10:06	Nadine	6	Dawn
RN	1	40	45		2017-01-19 10:29	Nadine	6	Dawn
BZ	1	30	30		2017-01-19 10:38	Nadine	6	Dawn
SG	30	10	30		2017-01-19 8:53	Adam	5	Dawn
SG	12	15	15		2017-01-19 8:54	Adam	5	Dawn
RN	1	5	15		2017-01-19 8:54	Adam	5	Dawn
FF	1	20	15		2017-01-19 8:56	Adam	5	Dawn
RN	1	5	15		2017-01-19 8:56	Adam	5	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
FF	35	15	15		2017-01-19 9:01	Adam	5	Dawn
SG	16	20	15		2017-01-19 9:26	Adam	5	Dawn
RN	1	5	15		2017-01-19 10:57	Adam	5	Dawn
RN	1	5	30		2017-01-19 10:28	Adam	5	Dawn
FF	20	20	15		2017-01-19 10:12	Adam	5	Dawn
SG	30	10	30		2017-01-19 8:53	Adam	5	Dawn
SG	12	15	15		2017-01-19 8:54	Adam	5	Dawn
RN	1	5	15		2017-01-19 8:54	Adam	5	Dawn
FF	1	20	15		2017-01-19 8:56	Adam	5	Dawn
RN	1	5	15		2017-01-19 8:56	Adam	5	Dawn
FF	35	15	15		2017-01-19 9:01	Adam	5	Dawn
SG	16	20	15		2017-01-19 9:26	Adam	5	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	1	5	15		2017-01-19 10:57	Adam	5	Dawn
RN	1	5	30		2017-01-19 10:28	Adam	5	Dawn
FF	20	20	15		2017-01-19 10:12	Adam	5	Dawn
RN	1	15	240		2017-01-19 9:57	Danny	4	Dawn
RN	1	15	150		2017-01-19 9:58	Danny	4	Dawn
RN	1	70	300		2017-01-19 10:54	Danny	4	Dawn
MA	2	35	15		2017-01-18 14:17	Adam	6	Dusk
SG	150	15	45		2017-01-18 15:00	Adam	6	Dusk
RN	1	5	15		2017-01-18 15:03	Adam	6	Dusk
RN	1	5	15		2017-01-18 16:03	Adam	6	Dusk
SG	30	60	30		2017-01-18 16:29	Adam	6	Dusk
MA	2	35	15		2017-01-18 14:17	Adam	6	Dusk

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
SG	150	15	45		2017-01-18 15:00	Adam	6	Dusk
RN	1	5	15		2017-01-18 15:03	Adam	6	Dusk
RN	1	5	15		2017-01-18 16:03	Adam	6	Dusk
SG	30	60	30		2017-01-18 16:29	Adam	6	Dusk
RN	1	20	45		2017-01-18 13:56	Nadine	4	Dusk
RN	1	90	90		2017-01-18 15:44	Nadine	4	Dusk
HH	1	5	30	Male	2017-01-18 15:34	Danny	5	Dusk
RN	2	5	90		2016-12-16 9:06	Nadine	4	Dawn
RN	1	10	60		2016-12-16 12:01	Nadine	4	Dawn
SN	2	5	30		2016-12-16 12:01	Nadine	4	Dawn
GP	2	30	15		2016-12-16 8:52	Adam	5	Dawn
FF	7	30	30		2016-12-16 9:00	Adam	5	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
MG	2	35	15		2016-12-16 9:01	Adam	5	Dawn
FF	18	35	15		2016-12-16 9:02	Adam	5	Dawn
GP	2	20	30		2016-12-16 9:32	Adam	5	Dawn
RN	1	20	15		2016-12-16 9:35	Adam	5	Dawn
RN	1	20	30		2016-12-16 11:04	Adam	5	Dawn
RN	1	20	30		2016-12-16 11:04	Adam	5	Dawn
BZ	1	10	30		2016-12-16 8:59	Danny	6	Dawn
RN	1	20	75		2016-12-16 10:59	Danny	6	Dawn
H.	1	5	30		2016-12-16 11:22	Danny	6	Dawn
BZ	1	15	15		2016-12-15 12:55	Adam	1	Dusk
RN	1	30	30		2016-12-15 13:23	Adam	1	Dusk
FF	10	30	30		2016-12-15 15:26	Adam	1	Dusk

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RM	2	40	120		2016-12-15 14:14	Danny	3	Dusk
RM	2	40	30	Passed to DO at VP 3	2016-12-15 14:17	Nadine	2	Dusk
BZ	1	10	30		2016-12-15 15:24	Nadine	2	Dusk
RN	2	40	90		2016-12-15 9:02	Danny	5	Dawn
H.	1	5	45		2016-12-15 11:44	Danny	5	Dawn
BZ	1	10	15		2016-12-15 9:00	Nadine	6	Dawn
RM	1	20	30		2016-12-15 9:11	Nadine	6	Dawn
BZ	1	10	240		2016-12-15 10:14	Nadine	6	Dawn
BZ	1	15	15		2016-12-15 10:43	Nadine	6	Dawn
BZ	1	30	120		2016-12-15 10:44	Nadine	6	Dawn
RN	2	20	45		2016-12-15 11:29	Nadine	6	Dawn
RN	2	15	30		2016-12-15 11:29	Nadine	6	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	1	30	15		2016-12-15 9:13	Adam	4	Dawn
GP	3	30	30		2016-12-15 10:49	Adam	4	Dawn
H.	1	15	60		2016-12-14 9:10	Danny	1	Dawn
CA	1	90	150		2016-12-14 9:58	Danny	1	Dawn
CA	1	70	75		2016-12-14 10:15	Danny	1	Dawn
RN	1	40	30		2016-12-14 9:53	Adam	3	Dawn
RN	2	20	60		2016-12-14 9:47	Nadine	2	Dawn
RN	1	20	30		2016-12-14 9:51	Nadine	2	Dawn
CM	40	40	60		2016-12-13 13:15	Nadine	1	Dusk
H.	1	5	15		2016-12-13 13:16	Nadine	1	Dusk
BZ	1	25	30		2016-12-13 13:25	Nadine	1	Dusk
BZ	1	5	15	Perched in tree	2016-12-13 14:25	Nadine	1	Dusk

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	30	30		2016-12-13 14:52	Nadine	1	Dusk
BZ	1	20	60		2016-12-13 15:05	Nadine	1	Dusk
BZ	1	70	60		2016-12-13 15:41	Nadine	1	Dusk
BZ	1	15	15		2016-12-13 15:48	Nadine	1	Dusk
RN	2	30	30		2016-12-13 12:55	Adam	3	Dusk
RN	2	10	15		2016-12-13 13:02	Adam	3	Dusk
RN	1	20	30		2016-12-13 13:02	Adam	3	Dusk
RN	1	25	15		2016-12-13 14:01	Adam	3	Dusk
RN	2	20	30		2016-12-13 14:44	Adam	3	Dusk
RN	1	25	75		2016-12-13 13:55	Ramboll	2	Dusk
SH	1	50	15		2016-12-01 8:57	Nadine	1	Dawn
BZ	1	40	90		2016-12-01 9:07	Nadine	1	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	60	90		2016-12-01 9:09	Nadine	1	Dawn
BZ	1	20	15		2016-12-01 9:31	Nadine	1	Dawn
RN	1	20	15		2016-12-01 9:45	Nadine	1	Dawn
BZ	1	10	15		2016-12-01 10:46	Nadine	1	Dawn
RN	2	15	45		2016-12-01 11:00	Nadine	1	Dawn
RN	2	10	30	Calling	2016-12-01 11:07	Danny	2	Dawn
RN	1	20	45	Calling	2016-12-01 11:10	Danny	2	Dawn
HH	1	10	15	Female	2016-12-01 9:26	Adam	3	Dawn
HH	1	10	15	Female	2016-12-01 9:26	Adam	3	Dawn
GP	15	10	15		2016-11-30 13:43	Nadine	5	Day
GB	1	40	60		2016-11-30 12:45	Nadine	5	Day
GP	19	30	120		2016-11-30 14:06	Nadine	5	Day

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	1	50	15		2016-11-30 14:48	Nadine	5	Day
RN	2	10	30		2016-11-30 12:50	Adam	6	Day
RN	1	15	30		2016-11-30 13:03	Adam	6	Day
RN	1	30	30		2016-11-30 13:33	Adam	6	Day
RN	1	5	15		2016-11-30 15:15	Adam	6	Day
RN	2	10	30		2016-11-30 12:50	Adam	6	Day
RN	1	15	30		2016-11-30 13:03	Adam	6	Day
RN	1	30	30		2016-11-30 13:33	Adam	6	Day
RN	1	5	15		2016-11-30 15:15	Adam	6	Day
BZ	1	5	15	Perched in tree	2016-11-30 10:45	Nadine	3	Dawn
RN	2	15	15		2016-11-30 11:06	Nadine	3	Dawn
RN	1	15	30		2016-11-30 11:11	Nadine	3	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	1	5	15	Perched in tree	2016-11-30 11:11	Nadine	3	Dawn
BZ	1	5	15		2016-11-30 8:59	Danny	1	Dawn
BZ	1	30	105		2016-11-30 8:59	Danny	1	Dawn
BZ	1	25	45		2016-11-30 9:13	Danny	1	Dawn
H.	1	10	90		2016-11-30 10:52	Danny	1	Dawn
BZ	1	25	120	Mobbed by crows	2016-11-30 11:00	Danny	1	Dawn
H.	1	5	30		2016-11-30 11:13	Danny	1	Dawn
RN	1	60	30		2016-11-30 9:31	Adam	2	Dawn
RN	1	60	30		2016-11-30 9:31	Adam	2	Dawn
RN	1	15	60		2016-11-29 13:19	Danny	3	Dusk
HH	1	35	330	Ringtail	2016-11-29 13:43	Danny	3	Dusk
RN	1	70	180	Calling	2016-11-29 14:52	Danny	3	Dusk

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	1	15	60	Calling	2016-11-29 14:54	Danny	3	Dusk
RN	1	10	15		2016-11-29 13:19	Nadine	2	Day
RN	1	50	90		2016-11-29 13:21	Nadine	2	Day
HH	1	5	30	Hunting ringtail	2016-11-29 13:40	Nadine	2	Day
RN	1	70	30	Passed to DO	2016-11-29 14:53	Nadine	2	Day
RN	1	90	60		2016-11-29 15:04	Nadine	2	Day
WC	1	10	15		2016-11-29 15:28	Nadine	2	Day
BZ	1	25	15		2016-11-29 13:43	Adam	1	Day
H.	1	10	15		2016-11-29 14:14	Adam	1	Day
H.	1	5	15		2016-11-29 14:15	Adam	1	Day
H.	1	10	15		2016-11-29 14:38	Adam	1	Day
H.	1	5	15		2016-11-29 14:39	Adam	1	Day

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
BZ	1	25	15		2016-11-29 13:43	Adam	1	Day
H.	1	10	15		2016-11-29 14:14	Adam	1	Day
H.	1	5	15		2016-11-29 14:15	Adam	1	Day
H.	1	10	15		2016-11-29 14:38	Adam	1	Day
H.	1	5	15		2016-11-29 14:39	Adam	1	Day
HH	1	10	15		2016-11-29 8:54	Adam	4	Dawn
CU	7	5	15		2016-11-29 8:55	Adam	4	Dawn
RN	1	40	15		2016-11-29 9:29	Adam	4	Dawn
RN	1	40	15		2016-11-29 9:30	Adam	4	Dawn
HH	1	10	15		2016-11-29 8:54	Adam	4	Dawn
CU	7	5	15		2016-11-29 8:55	Adam	4	Dawn
RN	1	40	15		2016-11-29 9:29	Adam	4	Dawn

Table 7.1.2: Flight Data								
Species	**Number**	**Height (m)**	**Time at Height (s)**	**Notes**	**Date and Time**	**Surveyor**	**VP Number**	**VP Type**
RN	1	40	15		2016-11-29 9:30	Adam	4	Dawn
BZ	1	5	15		2016-11-29 10:25	Danny	5	Dawn
GP	17	20	90		2016-11-29 8:51	Nadine	6	Dawn
BZ	1	5	30		2016-11-29 9:27	Nadine	6	Dawn
RN	1	10	15		2016-11-29 10:11	Nadine	6	Dawn
HH	1	60	15	Male	2016-11-28 15:55	Nadine	4	Dusk
BZ	1	20	30		2016-11-28 13:17	Elizabeth	5	Day
RN	1	10	45		2016-11-28 15:09	Danny	6	Dusk
H.	10	5	30		2016-11-28 15:09	Danny	6	Dusk
BZ	1	10	30		2016-11-28 13:12	Elizabeth	5	Day

Weather Details

Table 7.1.3 provides details of weather conditions during VP surveys.

Table 7.1.3: Weather Conditions

VP ID	Date and Time	Wind Speed	Wind Direction	Precipitation	Precipitation Type	Temp (°C)	Cloud Cover (%)	Cloud Base (m)	Visibility (km)
1	2017-09-15 9:05	0	0	0		9	40	500	2
1	2017-09-15 10:01	2	SW	0		13	50	500	2
1	2017-09-15 11:01	4	NE	0		13	40	500	2
2	2017-09-15 8:40	1	W	0		8	30	500	2
2	2017-09-15 9:40	2	NW	0		8	70	500	2
2	2017-09-15 10:40	3	NW	0		8	50	500	2
2	2017-09-15 8:40	1	W	0		8	30	500	2
2	2017-09-15 9:40	2	NW	0		8	70	500	2
2	2017-09-15 10:40	3	NW	0		8	50	500	2
1	2017-09-14 14:39	2	SE	0		8	40	500	2
1	2017-09-14 15:41	2	SE	0		8	80	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
1	2017-09-14 16:40	2	SE	0		9	80	500	2
1	2017-09-14 14:39	2	SE	0		8	40	500	2
1	2017-09-14 15:41	2	SE	0		8	80	500	2
1	2017-09-14 16:40	2	SE	0		9	80	500	2
3	2017-09-14 15:30	5	W	0		11	70	500	2
3	2017-09-14 16:24	5	W	0		11	50	500	2
3	2017-09-14 14:33	6	W	2	Rain	13	50	500	2
4	2017-09-14 10:56	5	W	0		10	60	500	2
4	2017-09-14 11:51	5	W	0		10	80	500	2
4	2017-09-14 12:53	5	W	0		10	80	500	2
5	2017-09-14 10:42	4	N	1	Rain	7	90	500	2
5	2017-09-14 11:39	3	N	1	Rain	8	90	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
5	2017-09-14 12:37	4	N		Rain	9	50	500	2
5	2017-09-14 10:42	4	N	1	Rain	7	90	500	2
5	2017-09-14 11:39	3	N	1	Rain	8	90	500	2
5	2017-09-14 12:37	4	N		Rain	9	50	500	2
6	2017-09-13 14:42	4	SW	5	Rain	10	80	500	2
6	2017-09-13 15:51	5	W	0		13	30	500	2
6	2017-09-13 16:50	5	W	0		11	50	500	2
5	2017-09-13 14:42	10	S	5	Rain	7	100	500	2
5	2017-09-13 15:49	5	S	3	Rain	8	80	500	2
5	2017-09-13 16:40	4	S	2	Rain	6	90	500	2
5	2017-09-13 14:42	10	S	5	Rain	7	100	500	2
5	2017-09-13 15:49	5	S	3	Rain	8	80	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
5	2017-09-13 16:40	4	S	2	Rain	6	90	500	2
4	2017-08-18 9:20	5	SW	0		12	80	400	2
4	2017-08-18 10:13	5	SW	4	Rain	12	90	300	2
4	2017-08-18 10:47	5	SW	4	Rain	12	90	300	2
5	2017-08-18 8:52	4	SW	0		11	80	500	2
5	2017-08-18 9:49	5	SW	0		11	90	300	2
5	2017-08-18 10:50	4	SW	2	Rain	10	100	300	2
5	2017-08-18 8:52	4	SW	0		11	80	500	2
5	2017-08-18 9:49	5	SW	0		11	90	300	2
5	2017-08-18 10:50	4	SW	2	Rain	10	100	300	2
5	2017-08-18 8:52	4	SW	0		11	80	500	2
5	2017-08-18 9:49	5	SW	0		11	90	300	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
5	2017-08-18 10:50	4	SW	2	Rain	10	100	300	2
6	2017-08-18 8:39	4	SW	0		14	70	500	2
6	2017-08-18 9:21	5	SW	0		14	80	500	2
6	2017-08-18 10:12	4	SW	2	Rain	14	90	500	2
1	2017-08-17 18:50	3	E	4	Rain	14	100	300	1
1	2017-08-17 18:50	3	E	4	Rain	13	100	300	2
1	2017-08-17 18:51	3	E	1	Rain	13	100	300	2
1	2017-08-17 18:50	3	E	4	Rain	14	100	300	1
1	2017-08-17 18:50	3	E	4	Rain	13	100	300	2
1	2017-08-17 18:51	3	E	1	Rain	13	100	300	2
1	2017-08-17 18:50	3	E	4	Rain	14	100	300	1
1	2017-08-17 18:50	3	E	4	Rain	13	100	300	2

Table 7.1.3: Weather Conditions

VP ID	Date and Time	Wind Speed	Wind Direction	Precipitation	Precipitation Type	Temp (°C)	Cloud Cover (%)	Cloud Base (m)	Visibility (km)
1	2017-08-17 18:51	3	E	1	Rain	13	100	300	2
4	2017-08-17 14:47	4	SW	0		15	80	500	2
4	2017-08-17 18:47	5	SW	0		14	70	500	2
4	2017-08-17 18:48	4	SW	0		14	80		2
4	2017-08-17 14:47	4	SW	0		15	80	500	2
4	2017-08-17 18:47	5	SW	0		14	70	500	2
4	2017-08-17 18:48	4	SW	0		14	80		2
4	2017-08-17 14:47	4	SW	0		15	80	500	2
4	2017-08-17 18:47	5	SW	0		14	70	500	2
4	2017-08-17 18:48	4	SW	0		14	80		2
6	2017-08-17 14:24	5	S	0		14	90	400	2
6	2017-08-17 15:20	5	S	0		14	90	400	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
6	2017-08-17 16:20	5	S	0		16	30	400	2
5	2017-08-17 14:13	4	SW	0		16	40	500	2
5	2017-08-17 15:21	4	SW	0		15	80	500	2
5	2017-08-17 16:18	3	SW	0		14	80	500	2
1	2017-08-17 10:28	3	SW	0		17	50	500	2
1	2017-08-17 11:32	4	SW	0		17	40	500	2
1	2017-08-17 12:26	4	SW	0		17	60	500	2
2	2017-08-17 10:30	4	SW	0		15	80	500	2
2	2017-08-17 11:20	4	SW	3	Rain	15	60	500	2
2	2017-08-17 12:08	5	SW	0		15	70	500	2
2	2017-08-17 10:19	4	SW	0		16	60	500	2
2	2017-08-17 11:17	5	SW	0		15	50	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
2	2017-08-17 12:14	5	SW	1	Rain	15	60	500	2
2	2017-08-17 10:19	4	SW	0		16	60	500	2
2	2017-08-17 11:17	5	SW	0		15	50	500	2
2	2017-08-17 12:14	5	SW	1	Rain	15	60	500	2
2	2017-08-17 10:19	4	SW	0		16	60	500	2
2	2017-08-17 11:17	5	SW	0		15	50	500	2
2	2017-08-17 12:14	5	SW	1	Rain	15	60	500	2
3	2017-08-16 17:51	6	SW	2	Rain	14	100	100	2
3	2017-08-16 18:54	6	SW	3	Rain	14	100	50	1
3	2017-08-16 19:37	5	SW	3	Rain	14	100	50	1
2	2017-08-16 17:59	6	SW	0		12	100	300	2
2	2017-08-16 18:46	6	SW	3	Rain	12	100	300	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
2	2017-08-16 19:37	6	SW	4	Rain	12	100	300	2
1	2017-07-14 9:06	2	W	0		12	100	400	2
1	2017-07-14 10:10	2	W	5	Rain	12	100	300	2
1	2017-07-14 11:07	3	W	0	Rain	12	0	300	2
2	2017-07-14 9:06	4	W	0		10	100	300	2
2	2017-07-14 10:10	3	W	2	Rain	10	100	200	2
2	2017-07-14 11:04	4	W	2	Rain	10	80	400	2
3	2017-07-14 9:00	2	E	1	Rain	8	100	500	2
3	2017-07-14 10:00	2	E	1	Rain	7	100	500	2
3	2017-07-14 11:00	1	E	2	Rain	9	80	500	2
1	2017-07-13 14:50	1	NE	1	Rain	9	100	500	2
1	2017-07-13 15:40	2	NE	1	Rain	9	100	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
1	2017-07-13 16:49	2	NE	0		10	40	500	2
2	2017-07-13 14:47	3	SW	0		15	100	500	2
2	2017-07-13 15:47	3	SW	0		15	95	500	2
2	2017-07-13 16:46	3	SW	0		15	60	500	2
2	2017-07-13 14:40	4	SW	1	Rain	11	100	500	2
2	2017-07-13 15:35	5	SW	0		12	90	500	2
2	2017-07-13 16:32	5	SW	0		15	80	500	2
5	2017-07-13 11:10	3	W	0		9	100	500	2
5	2017-07-13 12:12	2	W	0		9	90	500	2
5	2017-07-13 13:14	3	W	0		8	100	500	2
6	2017-07-13 11:04	3	SW	0		15	30	500	2
6	2017-07-13 12:03	3	SW	0		15	90	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
6	2017-07-13 12:58	4	SW	0		13	100	500	2
4	2017-07-13 11:16	3	SW	0		17	90	500	2
4	2017-07-13 12:07	3	SW	0		17	100	500	2
4	2017-07-13 13:00	4	SW	0		17	100	500	2
6	2017-07-12 19:01	2	SW	0		18	10	500	2
6	2017-07-12 20:07	2	SW	0		15	20	500	2
6	2017-07-12 20:51	1	SW	0		15	80	500	2
5	2017-07-12 18:55	3	SW	0		16	20	500	2
5	2017-07-12 20:09	3	SW	0		15	40	500	2
5	2017-07-12 20:47	2	SW	0		15	60	500	2
4	2017-07-12 18:45	3	SW	0		10	10	500	2
4	2017-07-12 19:42	4	SW	0		10	20	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
4	2017-07-12 20:43	2	SW	0		9	10	500	2
4	2017-06-16 9:30	2	SW	5	Rain	12	100	200	2
4	2017-06-16 10:30	2	SW	5	Rain	12	100	200	2
4	2017-06-16 11:30	2	SW	3	Rain	12	100	300	2
5	2017-06-16 9:33	2	S	3	Rain	13	100	100	2
5	2017-06-16 10:18	2	S			13	100	300	2
5	2017-06-16 11:20	2	S	2	Rain	13	100	300	2
6	2017-06-16 9:20	1	SE	1	Rain	10	100	500	2
6	2017-06-16 10:20	1	SE	1	Rain	10	100	500	2
6	2017-06-16 11:20	2	SE	2	Rain	10	100	400	2
1	2017-06-15 16:05	2	S	3	Rain	16	90	500	2
1	2017-06-15 17:05	3	S	6	Rain	13	100	300	1

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
1	2017-06-15 20:02	1	S	3	Rain	13	80	500	2
4	2017-06-15 12:15	6	S	0		15	80	500	2
4	2017-06-15 13:15	5	S	0		15	80	500	2
4	2017-06-15 14:15	5	S	4	Rain	15	90	500	2
2	2017-06-15 15:55	3	SW	6	Rain	9	100	500	2
2	2017-06-15 16:55	3	SW	7	Rain	9	100	500	2
2	2017-06-15 18:08	2	SW	4	Rain	9	100	500	2
3	2017-06-15 16:32	3	SW	6	Rain	14	100	200	1
3	2017-06-15 17:02	3	SW	7	Rain	14	100	200	1
3	2017-06-15 17:59	3	SW	7	Rain	14	90	200	1
6	2017-06-15 12:26	2	S	0		14	60	500	2
6	2017-06-15 13:19	3	S	4	Rain	14	80	300	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
6	2017-06-15 14:22	3	S	2	Rain	14	90	400	2
5	2017-06-15 12:15	3	SW	0		10	90	500	2
5	2017-06-15 13:15	2	SW	6	Rain	10	100	500	2
5	2017-06-15 14:17	2	SW	0		10	100	500	2
3	2017-06-14 14:19	5	S	0		13	90	500	2
3	2017-06-14 14:19	5	S	2	Rain	12	90	500	2
3	2017-06-14 14:20	6	S	0		12	90	500	2
1	2017-06-14 12:10	3	SW	0		10	100	500	2
1	2017-06-14 13:14	3	SW			9	100	500	2
1	2017-06-14 14:10	4	SW	0		10	100	500	2
2	2017-06-14 12:23	4	S	0		14	100	500	2
2	2017-06-14 13:11	4	S	0		14	100	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
2	2017-06-14 14:04	4	S	0		14	95	500	2
2	2017-05-12 9:34	0	SE	4	Rain	12	100	500	2
2	2017-05-12 9:57	1	E	0		12	100	500	2
2	2017-05-12 11:04	2	E	0		12	100	500	2
1	2017-05-12 9:08	0	0	2	Rain	11	90	500	2
1	2017-05-12 10:07	0	0	0		11	90	500	2
1	2017-05-12 11:00	1	SE	0		11	90	500	2
2	2017-05-11 13:30	3	SE	0		15	60	500	2
2	2017-05-11 14:22	3	SE	0		18	40	500	2
2	2017-05-11 15:21	3	SE	0		18	60	500	2
2	2017-05-11 13:25	5	SE	0		14	30	500	2
2	2017-05-11 14:23	4	SE	0		14	30	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
2	2017-05-11 15:20	4	SE	0		14	30	500	2
4	2017-05-11 8:50	2	E	0		11	5	500	2
4	2017-05-11 9:56	4	E	0		10	10	500	2
4	2017-05-11 10:53	4	SE	0		10	20	500	2
6	2017-05-11 8:56	2	E	0		12	10	500	2
6	2017-05-11 9:56	2	SE	0		12	10	500	2
6	2017-05-11 10:51	2	SE	0		12	20	500	2
5	2017-05-10 15:53	3	NW	0		14	85	500	2
5	2017-05-10 16:51	2	NW	0		14	90	500	2
5	2017-05-10 17:52	2	NW	0		14	40	500	2
6	2017-05-10 16:14	3	NW	0		16	60	500	2
6	2017-05-10 16:46	2	NW	0		14	70	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
6	2017-05-10 17:39	2	SW	0		12	60	500	2
6	2017-04-12 17:00	5	NW	2	Rain	7	100	500	2
6	2017-04-12 18:00	5	NW	5	Rain	6	100	500	2
6	2017-04-12 18:59	3	NW	1	Rain	8	100	500	2
5	2017-04-12 16:49	5	NW	4	Rain showers	8	60	500	2
5	2017-04-12 17:49	5	NW	4	Rain showers	7	60	500	2
5	2017-04-12 18:48	5	W	4	Rain showers	6	60	500	2
4	2017-04-12 17:36	5	W	5	Rain	10	60	400	2
4	2017-04-12 18:14	5	W	5	Rain	10	50	400	2
4	2017-04-12 14:04	7	W	5	Rain	10	60	300	2
4	2017-04-12 15:34	7	W	5	Rain	10	60	300	2
4	2017-04-12 16:05	5	W	5	Rain	10	60	400	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
5	2017-04-12 13:45	5	NW	2	Rain	6	100	500	2
5	2017-04-12 14:42	4	NW	3	Rain	7	100	500	2
5	2017-04-12 15:44	5	NW	2	Rain	6	100	500	2
6	2017-04-12 13:39	5	NW	4	Rain	7	60	500	2
6	2017-04-12 14:36	6	NW			9	50	500	2
6	2017-04-12 15:38	6	W	4	Rain	8	70	500	2
1	2017-04-11 12:30	1	SE	0		8	100	500	2
1	2017-04-11 13:30	2	SE	0		8	100	500	2
1	2017-04-11 14:30	2	SE	0		8	100	500	2
2	2017-04-11 12:36	4	NW	0		8	90	500	2
2	2017-04-11 13:18	5	NW	0		7	90	500	2
2	2017-04-11 14:16	5	NW	0		8	90	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
2	2017-04-11 12:24	3	SW	0		9	95	400	2
2	2017-04-11 13:23	3	SW	0		10	95	400	2
2	2017-04-11 14:09	2	SW	0		14	80	400	2
1	2017-04-10 16:59	3	SW	0		13	90	500	2
1	2017-04-10 17:45	2	SW	0		13	100	500	2
1	2017-04-10 18:42	2	SW	0		13	100	500	2
2	2017-04-10 16:35	5	W	0		7	80	500	2
2	2017-04-10 17:35	5	SW	0		6	80	500	2
2	2017-04-10 18:35	5	W	1	Rain	6	100	500	2
3	2017-04-10 16:34	5	NW	0		11	70	500	2
3	2017-04-10 17:32	5	NW	0		9	80	500	2
3	2017-04-10 18:28	4	NW	0		7	90	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
1	2017-03-17 8:02	5	SW	4	Rain	8	100	500	2
1	2017-03-17 9:04	5	SW	5	Rain	8	100	500	2
1	2017-03-17 9:45	4	SW	4	Rain	8	100	500	2
2	2017-03-17 7:50	3	SW	4	Rain	7	100	400	2
2	2017-03-17 9:00	2	SW	5	Rain	7	100	400	2
2	2017-03-17 9:42	3	SW	5	Rain	7	100	400	2
3	2017-03-17 7:50	3	SE	6	Rain	7	100	200	1
3	2017-03-17 8:54	5	SE	6	Rain	6	100	200	1
3	2017-03-17 9:30	2	SW	6	Rain	6	100	400	2
3	2017-03-17 7:50	3	SE	6	Rain	7	100	200	1
3	2017-03-17 8:54	5	SE	6	Rain	6	100	200	1
3	2017-03-17 9:30	2	SW	6	Rain	6	100	400	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
2	2017-03-16 12:35	5	SW	6	Rain	8	100	500	2
2	2017-03-16 13:28	5	SW	6	Rain	7	100	500	2
2	2017-03-16 14:28	5	SW	4	Rain	8	90	500	2
2	2017-03-16 12:36	2	SW	6	Rain	8	100	300	2
2	2017-03-16 13:28	2	SW	6	Rain	8	100	300	2
2	2017-03-16 14:30	2	SW	4	Rain	8	80	400	2
1	2017-03-16 12:48	1	W	5	Rain	1	100	100	0
1	2017-03-16 13:46	2	W	5	Rain	8	100	300	1
1	2017-03-16 14:09	1	W	1	Rain	7	100	300	1
1	2017-03-16 12:48	1	W	5	Rain	1	100	100	0
1	2017-03-16 13:46	2	W	5	Rain	8	100	300	1
1	2017-03-16 14:09	1	W	1	Rain	7	100	300	1

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
6	2017-03-16 8:47	5	SW	0		8	90	500	2
6	2017-03-16 9:52	5	SW	2	Rain	9	100	500	2
6	2017-03-16 10:47	4	SW	2	Rain	9	100	500	2
5	2017-03-16 8:52	3	SW	1	Rain	8	98	400	2
5	2017-03-16 9:56	4	SW	4	Rain	8	100	400	2
5	2017-03-16 10:43	4	SW	5	Rain	8	100	300	2
4	2017-03-16 8:47	3	SW	1	Rain	7	100	500	2
4	2017-03-16 9:40	4	SW	2	Rain	6	100	500	2
4	2017-03-16 10:40	3	SW	4	Rain	6	100	200	1
4	2017-03-16 8:47	3	SW	1	Rain	7	100	500	2
4	2017-03-16 9:40	4	SW	2	Rain	6	100	500	2
4	2017-03-16 10:40	3	SW	4	Rain	6	100	200	1

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
4	2017-03-15 15:39	5	S	2	Rain	9	100	500	2
4	2017-03-15 16:38	4	S	3	Rain	9	100	500	2
4	2017-03-15 17:34	4	S	2	Rain	8	100	500	2
5	2017-03-15 15:44	1	S	1	Rain	8	100	400	2
5	2017-03-15 16:39	2	S	1	Rain	8	100	400	2
5	2017-03-15 17:44	1	S	1	Rain	7	100	400	2
5	2017-03-15 15:44	1	S	1	Rain	8	100	400	2
5	2017-03-15 16:39	2	S	1	Rain	8	100	400	2
5	2017-03-15 17:44	1	S	1	Rain	7	100	400	2
6	2017-03-15 15:42	4	S	1	Rain	9	100	400	2
6	2017-03-15 16:52	2	S	1	Rain	9	100	400	2
6	2017-03-15 17:35	1	S	0		9	100	400	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
5	2017-02-17 8:55	1	SE	1	Fog	8	100	100	0
5	2017-02-17 9:58	2	SE	1	Fog	8	100	100	2
5	2017-02-17 10:43	3	SE	1	Fog	7	100	100	0
6	2017-02-17 8:53	1	W	3	Rain	7	100	100	0
6	2017-02-17 9:51	2	W	0		7	100	200	2
6	2017-02-17 10:47	3	W	0		9	100	300	2
4	2017-02-17 9:10	2	W	2	Rain	8	100	100	0
4	2017-02-17 10:00	2	W	2	Rain	8	100	100	0
4	2017-02-17 10:59	2	E	2	Rain	7	100	100	0
4	2017-02-17 9:10	2	W	2	Rain	8	100	100	0
4	2017-02-17 10:00	2	W	2	Rain	8	100	100	0
4	2017-02-17 10:59	2	E	2	Rain	7	100	100	0

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
6	2017-02-16 14:15	2	SW	1	Rain	9	70	500	2
6	2017-02-16 15:14	2	W	4	Rain	9	100	500	2
6	2017-02-16 16:19	1	W	2	Rain	8	100	400	2
6	2017-02-16 14:15	2	SW	1	Rain	9	70	500	2
6	2017-02-16 15:14	2	W	4	Rain	9	100	500	2
6	2017-02-16 16:19	1	W	2	Rain	8	100	400	2
5	2017-02-16 14:20	5	SW	2	Rain	9	70	500	2
5	2017-02-16 15:13	5	SW	2	Rain	9	90	500	2
5	2017-02-16 15:58	3	SW	4	Rain	9	100	100	2
4	2017-02-16 14:24	5	W	2	Rain	8	80	300	2
4	2017-02-16 14:24	5	W	0	Rain	8	0	300	2
4	2017-02-16 15:17	5	W	4	Rain	8	90	300	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
4	2017-02-16 16:08	3	W	5	Rain	8	100	300	1
1	2017-02-16 11:25	3	SW	0		8	50	500	2
1	2017-02-16 12:24	4	SW	0		8	90	500	2
3	2017-02-16 10:20	2	E	0		10	80	500	2
3	2017-02-16 11:20	2	E	0		11	100	500	2
3	2017-02-16 12:20	2	E	0		10	90	500	2
3	2017-02-16 10:20	2	E	0		10	80	500	2
3	2017-02-16 11:20	2	E	0		11	100	500	2
3	2017-02-16 12:20	2	E	0		10	90	500	2
2	2017-02-16 10:10	4	W	0		8	80	400	2
2	2017-02-16 11:06	4	W	0		8	40	400	2
2	2017-02-16 12:14	5	W	0		8	70	400	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
1	2017-02-16 10:43	3	SW	0		8	30	500	2
3	2017-02-15 16:39	4	SW	2	Rain	7	100	300	2
3	2017-02-15 17:40	5	SW	2	Rain	8	100	100	2
3	2017-02-15 18:25	5	SW	2	Rain	6	100	100	1
2	2017-02-15 16:30	3	SW	1	Rain	9	100	400	2
2	2017-02-15 17:30	2	SW	2	Rain	8	100	400	2
2	2017-02-15 18:30	1	SW	1	Rain	7	100	500	2
2	2017-02-15 16:30	3	SW	1	Rain	9	100	400	2
2	2017-02-15 17:30	2	SW	2	Rain	8	100	400	2
2	2017-02-15 18:30	1	SW	1	Rain	7	100	500	2
1	2017-02-15 16:42	1	SW	3	Rain	8	100	300	2
1	2017-02-15 17:35	1	SW	2	Rain	8	100	300	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
1	2017-02-15 18:25	1	SW	1	Rain	8	100	300	1
1	2017-01-20 9:50	1	SE	0		6	100	400	2
1	2017-01-20 10:51	1	SE	1	Rain	6	100	500	2
1	2017-01-20 11:49	1	SE	1	Rain	6	100	400	2
1	2017-01-20 9:50	1	SE	0		6	100	400	2
1	2017-01-20 10:51	1	SE	1	Rain	6	100	500	2
1	2017-01-20 11:49	1	SE	1	Rain	6	100	400	2
3	2017-01-20 10:07	2	SW	1	Rain	5	100	100	1
3	2017-01-20 10:43	2	SW	1	Rain	5	100	100	1
3	2017-01-20 11:37	2	SW	3	Rain	5	100	100	0
2	2017-01-20 9:51	0	N/A	0		6	100	200	1
2	2017-01-20 10:44	0	N/A	3	Rain	6	100	200	1

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
2	2017-01-20 11:40	0	N/A	2	Rain	6	100	300	2
3	2017-01-19 13:25	1	NE	1	Rain	7	100	400	2
3	2017-01-19 14:25	1	NE			6	100	400	2
3	2017-01-19 15:31	1	NE	0		6	100	500	2
3	2017-01-19 13:25	1	NE	1	Rain	7	100	400	2
3	2017-01-19 14:25	1	NE			6	100	400	2
3	2017-01-19 15:31	1	NE	0		6	100	500	2
2	2017-01-19 13:22	1	NW	2	Rain	6	100	500	2
2	2017-01-19 14:22	2	W	2	Rain	5	100	500	2
2	2017-01-19 15:24	1	W	2	Rain	5	100	500	2
1	2017-01-19 13:30	1	SW	0		6	100	400	2
1	2017-01-19 14:30	1	SW	0		6	100	400	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
1	2017-01-19 15:23	1	SW	0		6	100	400	2
6	2017-01-19 9:45	0	0	0		6	100	500	2
6	2017-01-19 10:52	1	SW	2	Rain	6	100	500	2
6	2017-01-19 11:52	1	SW	2	Rain	6	100	500	2
5	2017-01-19 9:50	1	NE	0		8	100	500	2
5	2017-01-19 10:50	1	NE	0		8	100	500	2
5	2017-01-19 11:50	1	NE	1	Rain	7	100	500	2
5	2017-01-19 9:50	1	NE	0		8	100	500	2
5	2017-01-19 10:50	1	NE	0		8	100	500	2
5	2017-01-19 11:50	1	NE	1	Rain	7	100	500	2
4	2017-01-19 9:42	1	SW	0		7	100	400	2
4	2017-01-19 10:55	1	SW	0		7	100	400	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
4	2017-01-19 11:27	1	SW	2	Rain	7	100	400	2
6	2017-01-18 14:35	1	SW	0		7	90	500	2
6	2017-01-18 15:35	1	SW	0		7	100		2
6	2017-01-18 16:38	1	SW	0		8	100	500	2
6	2017-01-18 14:35	1	SW	0		7	90	500	2
6	2017-01-18 15:35	1	SW	0		7	100		2
6	2017-01-18 16:38	1	SW	0		8	100	500	2
4	2017-01-18 14:35	2	SW	0		7	100	500	2
4	2017-01-18 15:43	2	SW	0		7	100	500	2
4	2017-01-18 16:27	2	SW	0		7	100	500	2
5	2017-01-18 14:33	1	SW	0		6	100	400	2
5	2017-01-18 15:30	1	SW	0		6	100	400	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
5	2017-01-18 16:28	1	SW	0		6	100	400	2
4	2016-12-16 10:02	4	NE	4	Rain	8	100	100	1
4	2016-12-16 10:55	4	NE	4	Rain	9	100	100	1
4	2016-12-16 12:01	4	NE	4	Rain	9	100	100	1
5	2016-12-16 9:52	3	SW	7	Rain	6	100	200	1
5	2016-12-16 10:50	3	SW	7	Rain	6	100	200	1
5	2016-12-16 11:49	3	NW	7	Rain	6	100	200	1
6	2016-12-16 10:05	2	SE	6	Rain	9	100	300	1
6	2016-12-16 10:59	2	SE	6	Rain	9	100	300	2
6	2016-12-16 11:23	2	SE	6	Rain	9	100	300	1
1	2016-12-15 13:32	1	W	2	Rain	9	100	400	2
1	2016-12-15 14:30	3	W	1	Rain	8	100	500	1

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
1	2016-12-15 15:29	2	W	1	Rain	8	100	400	1
3	2016-12-15 13:27	4	S	5	Rain	9	100	300	2
3	2016-12-15 14:30	5	SW	5	Rain	8	100	300	2
3	2016-12-15 15:25	5	SW	0		8	100	300	2
2	2016-12-15 13:28	4	SW	4	Rain	10	100	200	1
2	2016-12-15 14:19	5	SW	2	Rain	10	90	100	2
2	2016-12-15 15:19	5	SW	0		9	100	100	2
5	2016-12-15 9:46	6	S	5	Rain	9	100	300	1
5	2016-12-15 10:48	5	S	5	Rain	9	100	400	2
5	2016-12-15 10:52	5	S	8	Sleet	9	0	400	1
5	2016-12-15 11:45	2	S	5	Rain	9	100	300	2
6	2016-12-15 9:46	5	SW	3	Rain	8	100	100	1

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
6	2016-12-15 10:45	5	SW	3	Rain	9	100	200	2
6	2016-12-15 11:43	4	SW	4	Rain	10	100	200	2
4	2016-12-15 9:50	7	NW	7	Rain	5	100	100	1
4	2016-12-15 10:50	7	NW	4		6	100	300	2
4	2016-12-15 11:49	6	NW	3	Rain	6	100	300	1
5	2016-12-14 13:49	3	SW	4	Rain	10	100	100	2
5	2016-12-14 14:31	3	N	5	Rain	10	100	100	2
5	2016-12-14 15:42	3	N	4	Rain	9	100	300	2
6	2016-12-14 13:44	2	SW	7	Rain	8	100	400	2
6	2016-12-14 14:44	3	W	7	Rain	7	100	400	2
6	2016-12-14 15:40	2	W	7	Rain	7	90	500	1
4	2016-12-14 13:43	2	W	6	Rain	10	100	300	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
4	2016-12-14 15:28	3	W	6	Rain	10	100	300	2
4	2016-12-14 15:29	3	W	10	Rain	10	100	300	2
1	2016-12-14 9:58	1	SW	1	Rain	8	100	500	2
1	2016-12-14 10:49	1	SW	2	Rain	8	100	400	2
1	2016-12-14 11:48	2	SW	6	Rain	9	100	200	2
2	2016-12-14 9:42	4	E	2	Rain	6	100	500	2
2	2016-12-14 10:40	2	E	2	Rain	5	100	500	2
2	2016-12-14 11:40	3	E	5	Rain	6	100	300	0
3	2016-12-14 9:35	5	SW	2	Rain	10	100	200	2
3	2016-12-14 10:40	5	SW	0		10	100	200	2
3	2016-12-14 11:40	5	SW	4	Rain	10	100	200	2
1	2016-12-13 14:11	2	SW	2	Rain	9	90	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
1	2016-12-13 14:55	4	SW	0		8	100	500	2
1	2016-12-13 15:56	4	SW	2	Rain	8	100	500	2
3	2016-12-13 13:55	3	W	1	Rain	5	100	300	2
3	2016-12-13 14:54	3	W	2	Rain	5	100	400	2
3	2016-12-13 15:55	4	W	2	Rain	4	100	100	0
2	2016-12-13 13:49	4	SW	1	Rain	8	90	400	2
2	2016-12-13 14:40	4	SW	0		8	100	300	2
2	2016-12-13 15:42	4	SW	1	Rain	8	100	100	1
1	2016-12-01 9:32	3	SW	0		9	100	500	2
1	2016-12-01 10:46	2	SW	2	Rain	10	90	500	2
1	2016-12-01 11:42	2	SW	3	Rain	10	100	300	2
2	2016-12-01 10:02	2	SW	4	Rain	8	100	200	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
2	2016-12-01 10:31	1	SW	0		8	100	400	2
2	2016-12-01 11:29	3	SW	2	Rain	8	100	300	2
3	2016-12-01 9:30	1	SW	0		8	100	500	2
3	2016-12-01 10:30	1	SW	1	Rain	6	100	500	2
3	2016-12-01 11:30	2	SW	1	Rain	6	100	500	2
3	2016-12-01 9:30	1	SW	0		8	100	500	2
3	2016-12-01 10:30	1	SW	1	Rain	6	100	500	2
3	2016-12-01 11:30	2	SW	1	Rain	6	100	500	2
5	2016-11-30 13:15	4	SW	0		8	90	500	2
5	2016-11-30 14:07	5	SW	0		8	90	500	2
5	2016-11-30 15:24	5	SW	0		8	90	500	2
4	2016-11-30 13:31	3	W	0		10	100	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
4	2016-11-30 14:43	3	W	0		7	100	300	2
4	2016-11-30 15:26	3	W	0		7	100	300	2
6	2016-11-30 13:25	3	NW	0		8	90	500	2
6	2016-11-30 14:25	2	NW	0		7	100	500	2
6	2016-11-30 15:25	2	NW	0		8	90	500	2
6	2016-11-30 13:25	3	NW	0		8	90	500	2
6	2016-11-30 14:25	2	NW	0		7	100	500	2
6	2016-11-30 15:25	2	NW	0		8	90	500	2
3	2016-11-30 9:34	4	NW	0		8	100	500	2
3	2016-11-30 10:25	3	NW	0		8	80	500	2
3	2016-11-30 11:34	3	NW	0		8	80	500	2
1	2016-11-30 9:45	1	SW	0		10	100	400	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
1	2016-11-30 10:45	1	SW	0		10	100	500	2
1	2016-11-30 11:35	1	SW	0		10	100	500	2
2	2016-11-30 9:36	3	NW	0		4	100	500	2
2	2016-11-30 10:34	2	NW	0		4	100	500	2
2	2016-11-30 11:33	2	NW	0		5	90		2
2	2016-11-30 9:36	3	NW	0		4	100	500	2
2	2016-11-30 10:34	2	NW	0		4	100	500	2
2	2016-11-30 11:33	2	NW	0		5	90		2
3	2016-11-29 13:44	1	SW	0		9	90	500	2
3	2016-11-29 15:03	1	SW	0		9	95	500	2
3	2016-11-29 15:38	1	SW	0		6	95	500	2
2	2016-11-29 13:23	1	NW	0		7	70	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
2	2016-11-29 14:32	1	NW	0		7	80	500	2
2	2016-11-29 15:29	0	0	0		7	90	500	2
1	2016-11-29 13:41	1	SE	0		6	0	500	2
1	2016-11-29 14:43	1	SE	0		7	90	500	2
1	2016-11-29 15:40	1	SE	0		7	100	500	2
1	2016-11-29 13:41	1	SE	0		6	0	500	2
1	2016-11-29 14:43	1	SE	0		7	90	500	2
1	2016-11-29 15:40	1	SE	0		7	100	500	2
4	2016-11-29 9:32	2	NE	0		2	90	500	2
4	2016-11-29 10:33	2	NE	0		3	20	500	2
4	2016-11-29 11:44	2	NE	0		4	20	500	2
4	2016-11-29 9:32	2	NE	0		2	90	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
4	2016-11-29 10:33	2	NE	0		3	20	500	2
4	2016-11-29 11:44	2	NE	0		4	20	500	2
5	2016-11-29 9:42	0	N/A	0		7	100	400	2
5	2016-11-29 10:47	1	SW	0		7	30	500	2
5	2016-11-29 11:43	2	SW	0		7	20	500	2
6	2016-11-29 9:35	0	0	0		3	90	500	2
6	2016-11-29 10:37	0	0	0		5	80	500	2
6	2016-11-29 11:34	3	SW	0		5	40	500	2
4	2016-11-28 14:26	2	NE	0		3	100	500	2
4	2016-11-28 15:13	1	NE	0		3	100	500	2
4	2016-11-28 16:12	1	NE	0		2	100	500	2
5	2016-11-28 14:14	1	E	0		2	90	500	2

Table 7.1.3: Weather Conditions									
VP ID	**Date and Time**	**Wind Speed**	**Wind Direction**	**Precipitation**	**Precipitation Type**	**Temp (°C)**	**Cloud Cover (%)**	**Cloud Base (m)**	**Visibility (km)**
5	2016-11-28 15:11	1	E	0		2	90	500	2
5	2016-11-28 15:10	0	E	0		2	90	500	2
5	2016-11-28 16:10	1	E	0		1	100	500	2
6	2016-11-28 14:05	2	SW	0		5	100	500	2
6	2016-11-28 15:04	1	SW	0		5	0	500	2
6	2016-11-28 16:04	1	SW	0		5	100	500	2

Ornithological Notes

Notes recorded during the VP surveys are detailed in Table 7.1.4.

Table 7.1.4: Ornithological Target Notes

Note Number	Surveyor	Date and Time	Comment
1	Nadine	2017-09-13 16:12	RN in field
2	Nadine	2017-07-12 20:44	Grouse heard lekking
3	Danny	2017-05-11 15:41	HH ringtail seen from car after end of VP
4	Ramboll	2017-04-12 13:14	CU 4-5 feeding/calling
5	Nadine	2017-04-12 13:01	OC sitting by river. Second OC walking about in rushes close by
6	Adam	2017-03-17 9:25	Same RN pair as Danny
7	Adam	2017-03-17 9:25	Same RN pair as Danny
8	Danny	2017-03-16 9:01	Kestrel, female, mobbing corvids. Probable nest.
9	Nadine	2017-03-15 17:38	RN in tree
10	Adam	2017-02-16 11:13	BZ heard calling
11	Adam	2017-02-16 11:13	BZ heard calling
12	Nadine	2017-02-15 18:17	MA calling
13	Nadine	2017-02-15 18:25	TO calling
14	Adam	2017-02-15 18:08	WK heard
15	Adam	2017-02-15 18:08	WK heard
16	Nadine	2017-01-19 9:45	2 BZ in field
17	Nadine	2017-01-19 10:19	Otter swimming down river, hunting.
18	Nadine	2016-12-15 10:52	BZ in field.
19	Adam	2016-12-01 11:20	3/4 RN calling

Table 7.1.4: Ornithological Target Notes			
Note Number	**Surveyor**	**Date and Time**	**Comment**
20	Adam	2016-12-01 11:21	CR: flock heard
21	Adam	2016-12-01 11:20	3/4 RN calling
22	Adam	2016-12-01 11:21	CR flock heard
23	Danny	2016-11-30 9:14	H. around pond
24	Adam	2016-11-30 9:20	8 LT
25	Adam	2016-11-30 10:12	Flock of CR
26	Adam	2016-11-30 9:20	8 LT
27	Adam	2016-11-30 10:12	Flock of CR
28	Nadine	2016-11-28 13:42	SN flushed on walk in