

BORALEX

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Loch Toftingall Battery Energy Storage System

Environmental Report

Volume 1: Written Statement

August 2023



Volume 1: Written Statement

Table of Contents

Chapter 1	Introduction
Chapter 2	Site Description
Chapter 3	Alternatives and Scheme Evolution
Chapter 4	Description of the Proposed Development
Chapter 5	Forestry
Chapter 6	Landscape and Visual
Chapter 7	Ecology
Chapter 8	Ornithology
Chapter 9	Cultural Heritage
Chapter 10	Geology and Peat
Chapter 11	Hydrology and Hydrogeology
Chapter 12	Noise
Chapter 13	Traffic and Transport
Chapter 14	Socio-economics
Chapter 15	Outline Battery Safety Management Plan
Chapter 16	Climate Change and Carbon Assessment

1. Introduction

1.1.	Purpose of this Environmental Report	1-2
1.2.	The Applicant.....	1-3
1.3.	Site Description	1-3
1.4.	Overview of the Proposed Development	1-3
1.5.	Evolution of the Proposals	1-4
1.6.	Structure of the Environmental Report.....	1-5
1.7.	The Environmental Consultancy Team.....	1-6
1.8.	Obtaining Further Information	1-7

1. Introduction

1.1. Purpose of this Environmental Report

- 1.1.1. This Environmental Report has been prepared to accompany the application by Toftingall Wind Limited ('the Applicant') to construct, and operate a battery energy storage system with a maximum output of 49.9 megawatts (MW) within the Toftingall plantation, approximately 1.6 km south east of Spittal in Caithness, Highlands (hereafter referred to as the 'Site'). The project is known as the Loch Toftingall Battery Energy Storage System (BESS) (hereafter referred to as the 'Proposed Development').
- 1.1.2. As the proposed development exceeds 20 MW, the Applicant has submitted a 'major development' planning application to The Highland Council, which will be determined under the Town and Country Planning (Scotland) Act 1997 (as amended).
- 1.1.3. At an earlier stage, the project comprised a six turbine wind farm and therefore an Environmental Impact Assessment was commenced under the applicable regulations¹. In response to consultation feedback and grid connection arrangements this was progressively amended so that the proposal now consists only of a battery energy storage system.
- 1.1.4. In April 2023, an EIA screening request was submitted to Highland Council to establish whether a formal EIA was still required for the scheme which consists of a 49.9MW battery energy storage system. In May 2023, the planning authority issued a formal EIA screening opinion which confirmed that an EIA was not required.
- 1.1.5. This Environmental Report has been prepared which covers a number of the topics that would have been included in an EIA Report. However, the assessment methodology differs from what is applicable for an EIA case, and importantly this report and the application is not subject to the EIA regulations.

¹ The Scottish Government (2017). The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

1.2. The Applicant

- 1.2.1. Toftingall Wind Limited is a company established by Boralex Ltd, the UK branch of Boralex Inc, a Canadian independent power provider. Boralex has been providing affordable renewable energy for over 30 years as a developer, builder, owner and operator of hydro, onshore wind, solar PV and battery storage. A leader in the Canadian market and France's largest independent producer of onshore wind power, the company is also active in the United States and the United Kingdom.
- 1.2.2. Over the past five years, Boralex's installed capacity has more than doubled to over 3GW. The development portfolio comprises over 6GW in wind, solar projects and storage projects. Boralex's shares are listed on the Toronto Stock Exchange under the ticker symbol BLX. Further information can be found at www.boralex.comBoralex LLP

1.3. Site Description

- 1.3.1. The Site is located approximately 17km west of Wick and 1.6 km to the south east of Spittal in Caithness, The Highlands. The main part of the site lies immediately to the north of the recently constructed Halsary wind farm. The access corridor part of the site passes through the north western section of the Halsary land, partly along an existing wind farm track. To the west of the A9 road lie several other wind farms including Achlachan, to the west and Causeymire and Bad a Cheo to the south west.
- 1.3.2. The Site covers an area of approximately 40.3 ha and is centred on approximate National Grid Reference (eastings) 317,819 and (northings) 951,896. The main part of the Site comprises commercial forestry plantation consisting of mainly sitka spruce, whilst the access corridor part of the site largely consists of recently felled plantation which is being restored to peatland.
- 1.3.3. The Allt Eireannaich watercourse is situated in the south eastern area of the main part of the site, and flows into Loch of Toftingall which lies a short distance to the east of the site boundary. The Mybster electricity substation and its associated overhead lines lies alongside the A9, approximately 500m to the west of the Site boundary.
- 1.3.4. The Site is relatively flat ranging from 100 m Above Ordnance Datum (AOD) in the west to 80 m AOD in the east. Spittal Hill lies approximately 3.4km to the north west and rises to an elevation of 176m AOD. Backlass Hill lies approximately 2.7km to the north east with an elevation of 112m AOD. Further to the south of the site, there is a large expanse of open 'flow country' peat moorland, with small lochs, which is covered by a number of international ecological designations.

1.4. Overview of the Proposed Development

- 1.4.1. The main components of the Proposed Development are:

- 52 battery storage units which would be installed in groups of four units. Each unit would be approximately 6.1 m long, 2.5 m wide and 2.9 m high.
- Inverter and transformer units serving each group of battery units.
- Two switchgear and control buildings;
- An access route into the site, part of which consists of existing track that forms part of the Halsary wind farm and the remainder comprises 590m of new track formed of crushed rock
- An area of native species landscaping around the compound which will provide screening and biodiversity benefits
- Felling of the commercial plantation to the east of the compound and restoration to peatland over a period of years.
- Native species riparian planting along the corridor of the Allt Eireannaich

1.4.2. The battery storage units would be located within a compound measuring 100 m by 65 m which would be formed of crushed rock laid on permeable membranes. There would also be a potential future augmentation area which will be formed from crushed rock measuring 50m by 50m.

1.4.3. The compound would be enclosed by a 3m high wooden acoustic fence and there would be 3m high CCTV cameras at each corner and at intervals along the compound perimeter.

1.4.1. The maximum height of any structure within the facility would be approximately 4m. The only lighting would be motion sensor activated lighting on the units within the facility. Fire detection and suppression systems would be installed within the facility

Need for the Development

1.4.2. The Battery Energy Storage System would import and store electricity from the electricity network when there is a surplus of generation, and then export this again when there is a deficit. This balancing function reduces the amount of time that renewable generation needs to be curtailed (switched off) reducing the need to create electricity from fossil fuels. The facility would also help make the electricity network more resilient to outages. The project would have a maximum storage output of 49.9 megawatts.

1.5. Evolution of the Proposals

1.5.1. The proposed development has gone through a number of design iterations. In May 2019 a scoping opinion was requested from Highland Council with input from a range of other consultees. At this stage the site area was much larger and the proposal consisted of six wind turbines on land either side of Loch Toftingall.

- 1.5.2. This was amended largely as a result of pre-application consultation with Highland Council and evolving grid connections arrangements so that it comprised only two 149.9m high wind turbines on land to the west of the Loch instead of six, together with the inclusion of the Battery Energy Storage System, which was sized at a capacity of 40MW and located in the south western part of the site area.
- 1.5.3. At the first round of community consultation events at the end of January 2023, the majority of local residents who attended and/or responded using feedback forms made it clear that they objected to the two wind turbines. This was primarily due to potential cumulative effects as a consequence of the large number of existing turbines nearby.
- 1.5.4. In response to the feedback, it was decided to remove the two turbines from the project before the second round of community consultation events in March 2023. The proposal therefore now only consists of a battery energy storage system with a slightly larger maximum output of 49.9MW in the same location as previously indicated.
- 1.5.5. The Pre-application Consultation (PAC) Report which accompanies the planning application provides further details of the consultation undertaken.

1.6. Structure of the Environmental Report

1.6.1. The Environmental Report comprises five parts:

- Volume 1 – Written Statement;
- Volume 2 – Figures and Visualisations;
- Volume 3 – Appendices.

1.6.2. The chapters of the report are organised as follows:

- **Chapter 1:** Introduction - provides background information about the applicant and an overview of the proposed Loch Toftingall Battery Energy Storage System.
- **Chapter 2:** Site Description provides a general description of the site itself and its environs. Further detail on the Site can also be found in the baseline sections of each topic chapter.
- **Chapter 3:** Alternative and Scheme Evolution provides a description of how the project has gone through successive design options before being fixed as a battery energy storage system.
- **Chapter 4:** Description of the Proposed Development provides details of each element of the Proposed Development and information on how the project will be constructed and operated.

- **Chapters 5 through to 16** are the specialist topic chapters. Each of these chapters provides a description of the baseline environmental receptors, a description of the proposed mitigation and enhancement measures, and an account of the predicted residual effects.

1.7. The Environmental Consultancy Team

1.7.1. Table 1.1 below sets out the chapters in this report and sets out consultancy responsible for topic.

Table 1.1 Environmental Topics and Contributors

Chapter	Assessment Topic	Contributor
1	Introduction	Boralex
2	Site Description	Boralex
3	Alternatives and Scheme Evolution	Boralex
4	Description of the Proposed Development	Boralex
5	Forestry	DGA
6	Landscape and Visual	Pegasus
7	Ecology	ERM
8	Ornithology	NRP
9	Cultural Heritage	Headland Archaeology
10	Geology and Peat	ERM
11	Hydrology and Hydrogeology	ERM
12	Noise	ERM
13	Traffic and Transport	ERM
14	Socio-economics	BiGGAR Economics
15	Outline Battery Safety Management Plan (oBSMP)	ERM
16	Climate Change and Carbon Assessment	ERM

1.8. Obtaining Further Information

- 1.8.1. The Environmental Report and accompanying documentation are available online; please visit the project website for the Loch Toftingall Battery Energy Storage System at www.lochtoftingallwindfarm.co.uk. A copy of the report and all the application documents can also be obtained on a memory stick, free of charge, while stocks last.

- 1.8.2. A paper copy of the Environmental Report may be obtained at a cost of £200 + P&P. Please email the applicant at info@lochtoftingallwindfarm.co.uk or write to Freepost Boralex Limited (no further details or stamps required) to request a copy or alternatively call our freephone number on 0800 9804299

2. Site Description

2.1.	Site Context	2-2
2.2.	The Site	2-5
2.3.	Other Developments in the Vicinity of the Site	2-7

2. Site Description

2.1. Site Context

- 2.1.1. The Site is located approximately 17 kilometres (km) west of Wick, 1.6 km south-east of Spittal (at its nearest point) and 5.6 km to the west of Watten in Caithness, The Highlands. Figure 2.1 shows the location and wider context of the Site.
- 2.1.2. To the north and east of the site, the area is characterised by gently undulating topography and scattered properties set within farmland. To the south and west lies part of the ‘flow country’ peatlands which comprise a broad expanse of relatively level land which is sparsely inhabited. There are a number of plantations and lochs within the local area around the site.
- 2.1.3. The Site lies adjacent to several operational wind farms including Achlachan, to the west, Causeymire and Bad a Cheo to the south west and the recently constructed Halsary development which lies immediately to the south, and through which the access corridor part of the site passes. Together these schemes constitute a large wind farm cluster.
- 2.1.4. The land in the immediate vicinity of the site is relatively flat and has an elevation of between 100m and 75m AOD. Spittal Hill lies approximately 3.4km to the north west and rises to an elevation of 176 m AOD. Backlass Hill lies approximately 2.7 km to the north east with an elevation of 112m AOD.
- 2.1.5. The Site lies within the Wick River catchment. In the immediate vicinity of the site, the watercourses drain, in most cases via Loch of Toftingall, into the Burn of Acharole which flows in a shallow valley to the east. The River Thurso lies approximately 3km away to the west.
- 2.1.6. Loch of Toftingall is effectively enclosed by plantation forestry. The Loch is used for fishing on an occasional basis, except in the winter when angling rarely takes place.
- 2.1.7. The northern section of the A9 trunk road (Latheron – Thurso) lies approximately 580m to the west of the main part of the site. The A882 (Wick to Thurso) passes 5km to the north east. The B870 lies approximately 1.2km to the north. There is a private track that leads from the B870 to the boat house on the northern shore of Loch of Toftingall.
- 2.1.8. There are a number of electricity transmission lines that feed into the large Mybster substation which lies approximately 500 m to the west of the Site. To the south of the substation, a 132 kV electricity transmission line runs parallel to the A9.
- 2.1.9. The nearest residential properties, up to a distance of 1.3km of the centre of the battery energy storage system compound, are listed in Table 2.1 below.

Table 2.1 Residential Properties within 1.3km of the nearest edge of the BESS compound*

Property Name	Distance and direction from the centre of BESS compound
Croft of Bowerman	707m (north west)
Wingfield Farm	819m (north west)
Mybster Croft	856m (north west)
Mybster Inn Farm	1,193m (north west)
Fasgadh (Corner Cottage)	1,195m (north west)
Knockglass Farm Cottage	1,211m (north west)
Mountview	1,237m (north west)
Fairview	1,277m (north west)
Moorlands	1,279m (north west)
Knockglass House	1,294m (north west)

* based on Vector District Map base information

Designations in the Wider Locality

- 2.1.10. The Site is not located within or near a national landscape designation. The Causeymire Knockfin Flows Wild Land Area lies approximately 3.5km to the south west of the Site at its nearest point, and the East Halladale Flows Wild Land Area lies approximately 10.5km to the west of the Site at its nearest point.
- 2.1.11. The Flow Country and Berriedale Coast Special Landscape Area lies approximately 4.5km to the south west of the nearest part of the Site and the Dunnet Head Special Landscape Area is situated approximately 15km to the north of the Site.
- 2.1.12. The Site is well separated from Inventoried Gardens and Designed Landscapes, with the nearest, Dunbeath Castle, lying approximately 25 km to the south.
- 2.1.13. The Caithness and Sutherland Peatlands Special Area of Conservation, Ramsar and Special Protection Area and Shielton Site of Scientific Interest lies to the south of the site at a distance of approximately 1.5km at its nearest point
- 2.1.14. The boundary of the Flow Country candidate World Heritage Site (cWHS) lies approximately 1.5 km away to the south east, extending along the southern edges of Halsary and Snottergill burns. The cWHS is being nominated as it is widely recognised to be the largest area of blanket bog in the world. Together with associated areas of heath and open water it is of international importance as a habitat and for the range of wildlife it supports.

- 2.1.15. Loch Watten, which lies approximately 5.5km to the north east, Loch Scarmaclate approximately 6.9km to the north east and Loch Calder approximately 10.7km to the north west are designated as SACs, and are part of the wider Caithness Lochs SPA and Ramsar designation and are also SSSIs. The River Thurso is designated as a SAC and lies approximately 2.7km from the nearest part of the Site.
- 2.1.16. Spittal Quarry which lies approximately 1.7km to the north of the Site and Achanarras Quarry which lies approximately 3.0km to the north west are both designated as SSSIs due to their fossil and geological interest.
- 2.1.17. There are 18 scheduled monuments within 5km of the BESS compound. The nearest scheduled monument is Knockglass Broch (SM561) which lies approximately 1,300m to the north. Gallows Hillock scheduled monument (SM450), a prehistoric burial cairn, is situated approximately 3.6km to the north east of the compound. The other scheduled monuments within 5km include: eight brochs, four prehistoric cairns and a standing stone and three medieval chapels.
- 2.1.18. There are no Category A listed buildings within 5km of the turbines. There is a cluster of Category B listed buildings in Westerdale approximately 5km to the west of the BESS, including Westerdale Bridge, Dale House and its associated Dovecot and Walled Garden. There is one Category C Listed Building, Causeymire Church of Scotland Mission Hall approximately 3.7km to the south west. The nearest Conservation Area is in Wick approximately 17km to the east of the Site.

Landscape Character

- 2.1.19. In 2019, Scottish Natural Heritage (now known as NatureScot) issued refreshed landscape Character Assessments. The site lies within Landscape Character Type 134: Sweeping Moorland and Flows Caithness and Sutherland. Some of the key characteristics of this landscape type set out in the accompanying description are as follows:
- gently sloping or undulating landform which lies generally below 350 metres
 - occasional isolated hills of limited height form local landmark features
 - lochs and mature, meandering rivers
 - very distinct flora, dominated by sphagnum mosses, produced by the wetness and infertility of the flows
 - coniferous forest forming a dominant characteristic within some parts of this landscape character type.
 - very sparsely settled with dispersed crofts, farms and estate buildings largely found on the outer edges of this landscape or near a strath.
 - wind farms, transmission lines, the A9 and a network of minor roads are key features within the more modified outer fringes within Caithness.
 - long, low and largely uninterrupted skylines offering extensive views across this landscape and result in a feeling of huge space

2.1.20. The site lies close to the neighbouring Landscape Character Type 143 Farmed Lowland Plain which lies to the north. Some of the key characteristics of this landscape type set out in the accompanying description are as follows:

- a generally open, low-lying plain, gently undulating to form shallow broad valleys, which are often filled with lochs and mosses, and subtle low ridges.
- occasional smooth hills rise above the more low-lying plain forming local landmarks.
- agriculture the predominant land cover
- larger conifer woodlands located at the transition with the Sweeping Moorland and Flows standing out where they are planted on poorer wetter ground on low ridges
- farm buildings and houses forming focal points within the landscape
- roads reinforce the settlement pattern, often following the field and property boundaries, running straight and then swinging around sharp corners
- a number of large settlements, including the towns of Thurso and Wick, situated on the coast, as well as several smaller settlements
- many historic features, including brochs and cairns, dotted across farmland and situated on hills within, or adjacent to, this area
- small groups of large wind turbines sited on some of the low ridges and hills and prominent visibility of larger wind farms in adjacent Landscape Character Types

2.2. The Site

2.2.1. The Site, which is shown in detail in Figure 2.2, slopes gently from west to east from approximately 100 m above ordnance datum (AOD, approximately equivalent to sea level) near the access junction with the A9 to 80m AOD at its eastern end.

2.2.2. The application Site area totals 40.3 hectares (ha). Photographs of the site are shown below in Figure 2.3 and Figure 2.4.

Figure 2.3 View east towards the site from a position north of Mybster substation on the farm track parallel and to the east of the A9.



Figure 2.4 View north towards the site from within the Halsary site.



Land use

- 2.2.3. The main part of the Site predominately comprises commercial forestry plantation consisting of largely sitka spruce which is densely planted. There are a number of forest rides within the main part of the Site.
- 2.2.4. The access corridor part of the site was formerly also a coniferous plantation, however the trees were felled during the early stages of constructing Halsary wind farm and the land is being restored to peatland.
- 2.2.5. There is an existing wind farm access track (previously a forestry track) within the first half of the access corridor part of the site. There is a pole mounted 33 kV electricity line passing over the access track and a 132 kV transmission line which also passes over the track near the junction with the A9.

Drainage

- 2.2.6. The Allt Eireannaich is located within the southern part of the main site area, and flows from west to east into Loch of Toftingall. There are a number of minor streams that feed into Allt Eireannaich from the neighbouring Halsary site.

Geology

- 2.2.7. British Geological Survey (BGS) bedrock geology mapping indicates that the site is underlain by Spital Flagstone Formation comprising Siltstone, Mudstone and Sandstone. The BGS mapping indicates that the superficial deposits are dominated by peat.
- 2.2.8. The peat probing undertaken across the site indicates that the peat is typically less than 2.0m deep in the eastern half of the main site and is largely between 1.0 and 4.0m deep within the western part. The peat depth along the access corridor element of the site is shallower, with thicknesses generally of less than 1.0m.

2.3. Other Developments in the Vicinity of the Site

- 2.3.1. There are a number of wind farm schemes within the wider context of the site. Table 2.1 gives details of wind energy developments with turbines over 40 m in height that are in operation, approved, or at the planning stage within a 10 km radius of the Site at the time of preparing this application (April 2023).

Table 2.2 Wind Farms within 10km

Name	Number of Turbines	Tip height of turbines	Distance from BESS compound	Status
Halsary	15	120m	730m (S)	Operational
Causeymire	21	101m	1.8km (SW)	Operational
Bad a Cheo Wind Farm	13	112m	2.3km (SW)	Operational
Achlachan	5	115m	2.4km (W)	Operational
Achalachan II	3	110m	2.5km (W)	Consented
Tacher A + B	2	130m	4.4km (SW)	Consented
Tormsdale Wind Farm	12	149.9m	4.5km (SW)	Application
Camster Wind Farm	25	100m	7.3km (SE)	Operational
Bilbster Wind Farm	3	93m	8.6km (E)	Operational
Wathegar Wind Farm	5	100m	9.2km (E)	Operational
Wathegar II Wind Farm	9	110m	9.2km (E)	Operational
Cogle Moss Wind Farm	12	100m	10km (NE)	Consented
Camster II	11	126.5m	10km (SE)	Consented

2.3.2. There is a 40MWH battery energy storage proposal known as Mybster Energy Storage, on land between Croft of Mybster and Bowermans on the A9 approximately 730m to the north west of the Loch Toftingall BESS. The prospective applicant is Potencia and the proposal is at the pre-application consultation stage.

2.3.3. The proposed compound is approximately 60m by 35m and would be located on the eastern side of a wider 2.4 hectare site, approximately 115m from the A9. The compound would contain 72 battery storage cabinets together with 12 invertors and 6 transformers.

2.3.4. In February and March 2023, Scottish and Southern Energy held community consultation events on the Spittal – Loch Buidhe – Beauly 400kv Reinforcement

Project. The consultation set out line routeing and potential substation site options.

2.3.5. Three line route options in the vicinity of Spittal were presented. Option A1.1 which would pass across the Backlass Moss area between the Loch Toftingall plantation and Backlass Hill and then to the south east across part of Sheilton Moss, the approximately 2km to the east and south east of the BESS site. Option A1.2 and Option A.2 would pass to the west initially in the vicinity of Westerdale approximately 4km from the BESS site.

2.3.6. The consultation also set out site options for a new 400kV substation and HVDC convertor station within a 5km radius of Spittal. Option 12 was presented as the preferred site which lies on the northern foot of Spittal Hill to the east of the A9 approximately 4.5km to the north west of the BESS site.

2.3.7 On 14th August 2023, EDF submitted a s36 application for the Watten Wind Farm consisting of 7, 220m to tip turbines on land immediately to the north east of the Halsary wind farm site.

3 Alternatives and Scheme Evolution

3.1.	Introduction.....	3-2
3.2.	Selection of the Site	3-2
3.3.	Layout Iterations.....	3-3

3. Alternatives and Scheme Evolution

3.1. Introduction

- 3.1.1. Assessment and design work has taken place on the Loch Toftingall site over an extended time period. At an early stage the project comprised a six turbine wind farm scheme with the potential to include a battery energy storage element. In response to consultation feedback and grid connection arrangements this was progressively amended so that the proposal now consists only of a battery energy storage system.
- 3.1.2. This chapter explains why the site was originally selected and summarises the project options that were considered by the applicant during the evolution of the proposed scheme.

3.2. Selection of the Site

- 3.2.1. In late 2016, Infinergy undertook some feasibility work on the Loch Toftingall plantation site to establish whether it had potential to accommodate wind turbines. The appraisal work undertaken at the feasibility stage covered a range of different issues, including:
- distance to private dwellings;
 - nearby wind farms;
 - grid connection distances and costs;
 - site access;
 - land designations;
 - landscape and visual considerations;
 - initial noise modelling;
 - wind speed data;
 - ecology and ornithology;
 - archaeology;
 - local development plan policies;
 - telecommunication links; and
 - aviation.

- 3.2.2. In early 2017, the site was progressed to the EIA and wind farm project design stage for reasons that included the following:
- the Site lies next to the existing Causeymire/Bad a Cheo/Halsary/Achlachan wind farm cluster. It was considered that the site presented an opportunity for further turbines to be well integrated with the existing wind farms.
 - the Site does not lie within, nor is it in close proximity to, any areas of national landscape designation nor within or close to a Special Landscape Area or Wild Land Area;
 - the Site lies within a group 3 area with potential for wind farm development in the Highland Council wind farm spatial framework.
 - the Site does not lie within any ecological designation;
 - the Site enables adequate separation to be achieved from the nearest residential properties;
 - the average wind speed is high compared to other sites;
 - the availability of good access route options to the Site involving minimal environmental disruption;
 - the site lies close to a potential grid connection point at Mybster substation;
 - there are no civil and military radar issues.

3.3. Layout Iterations

Pre-scoping layout

- 3.3.1. Ornithological survey work started on the site in April 2017 and continued until April 2019.
- 3.3.2. Initial constraint analysis undertaken in 2018 revealed that there were a number of constraints covering different parts of the site which limited the number and siting of the wind turbines. These included:
- bird activity associated with the Loch,
 - cumulative noise limits,
 - peat depth
 - residential amenity
 - telecoms links
 - cultural heritage

-
- 3.3.3. An initial pre-scoping wind farm layout was formulated in February 2019 which consisted of six, 149.9m to tip wind turbines, four on the western part of the site and another two beyond Loch Toftingall on the eastern side of the site. This pre-scoping wind farm layout is shown in Figure 3.1. The area to the north and to the south east of Loch Toftingall were kept free of wind turbines to preserve corridors for osprey and divers that had been recorded feeding on the Loch.
- 3.3.4. A formal pre-application meeting with Highland Council and key consultees was held in early March 2019 where this initial wind farm layout was presented and a pre-application response letter was received from the council in early April 2019. This response letter raised concerns about the scale of the wind turbines, the gap within the layout created by the Loch, the ability of the location to accommodate further wind turbine development and the number of properties where there would be residential amenity impacts.
- 3.3.5. The proposals presented at the pre-application meeting did not, at that stage, include an energy storage element although this aspect was being considered by the prospective applicant. The response letter stated that the inclusion of energy storage within the scheme would be supported by Highland Council.
- 3.3.6. A cumulative noise feasibility assessment was also undertaken in March 2019. This established that without the use of reduced noise mode there would be exceedances above the applicable cumulative noise limits at the nearest receptors to the west and north of the site.

Wind Farm Scoping Layout

- 3.3.7. In May 2019, a scoping report was then prepared based on a further iteration of the wind farm layout which comprised six, 138.5m to tip wind turbines with two turbines in the western part of the site and a further four turbines on the eastern side of the Loch. This wind farm scoping layout is shown in Figure 3.2.
- 3.3.8. The main reason for relocating two wind turbines from the western side of the Loch to the eastern side was cumulative noise levels at residential receptors to the north and west of the site. The position of the wind turbines was adjusted as a result of phase 1 peat survey results so that no turbine was located within peat of greater than 3m depth.
- 3.3.9. The wind turbine tip height was reduced from 149.9m to 138.5m in response to Highland Council's concerns about the scale of the turbines in the pre-application response letter.
- 3.3.10. The scoping proposals did incorporate a sizeable battery energy storage array in association with the wind farm substation, although the size and location of this facility was not specified.
- 3.3.11. A scoping opinion was received from Highland Council in June 2019.

Two Wind Turbines and Battery Storage Layout

- 3.3.12. In late 2019, a distribution grid application was made to accommodate the output of the six wind turbines in the scoping layout. At the start of 2020, a grid offer was received which provided a relatively early and low cost connection into Mybster substation. The grid offer was accepted in early 2020.
- 3.3.13. The EIA and design work was put on hold from early 2020 to late 2021, while negotiations took place with neighbouring landowners to secure an access track into the site that could accommodate wind turbines.
- 3.3.14. As a consequence of the grid connection agreement, in early 2022 it was decided to progress with a two wind turbine layout (with tip heights of 149.9m) together with a battery array of approximately 20MW output in the southern western part of the site
- 3.3.15. This key design change was made because it was considered that the two turbines would be seen in the context of the adjoining Halsary turbines, Mybster substation and associated pylons. It was decided that this landscape and visual setting could facilitate an approval at committee, without the need for an appeal, which would enable the short grid connection timescale to be met. It was decided that the spare grid agreement output, created by the deletion of four of the wind turbines, could be re-purposed as import-export battery storage output.
- 3.3.16. In the middle of 2022, the grid agreement was modified so that the battery array could import as well as export electricity. At this time it was established that there was further grid capacity available at this location for battery import and export and a second grid application was submitted. The grid offer that was received for this together with the modified agreement enabled the battery array output to be increased to nearer 40MW.
- 3.3.17. At this stage of the project the following two access track options into the site were being considered:
- (i) an access track into the site using the existing northern Halsary wind farm access track with a new stretch into the southern area of the Site and
 - (ii) an alternative northern option, using the existing forestry track into the Loch Toftingall plantation.
- 3.3.18. The substation and battery array compound was located in the south western corner of the overall Loch Toftingall plantation site for two main reasons: (i) to reduce the distance for the future electricity connection to Mybster substation (ii) the peat is shallower in this part of the site compared to other locations.

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- 3.3.19. Due to the deletion of wind turbines on the eastern side of Loch Toftingall the red line of the site area was reduced so that it only included land to the west of the Loch.
- 3.3.20. This two wind turbine and 40MW battery array layout including the two access track options, was the proposal presented at the first round of community consultation events which took place at the end of January 2023. This layout iteration is shown in Figure 3.3.

Initial Battery Facility Layout

- 3.3.21. At the first round of community consultation events at the end of January 2023, the majority of local residents who attended and/or responded using feedback forms made it clear that they objected to the two wind turbines. This was primarily due to potential cumulative effects as a consequence of the large number of existing turbines nearby. A number of residents also objected to the use of the northern forestry track access option.
- 3.3.22. In response to the feedback, it was decided to remove the two turbines from the project so that it only included the battery facility before the second round of community consultation events in the middle of March 2023. It was also decided to only include the southern access track through Halsary wind farm in the scheme.
- 3.3.23. The size of the battery compound was increased to provide a maximum output of 49.9MW and to facilitate a longer period of discharge, compared to the array in the previous layout iteration. The location of the facility remained unchanged compared to the previous stage.
- 3.3.24. Due to the deletion of the wind turbines entirely from the proposals, it was considered that there would now be less of a requirement for clear felling and peatland restoration. The red line of the site was therefore further reduced so that it only covers the battery compound area and the more immediate forestry blocks which would still be required for landscaping, riparian planting along the Allt Eireannaich and peatland restoration.
- 3.3.25. The layout that was shown at the second round of consultation events is shown in Figure 3.4.

Final Battery Energy Storage System (BESS) Layout

- 3.3.26. The battery facility layout underwent a final iteration in April 2023. The size of the compound was further increased to include land immediately to the east.
- 3.3.27. The main reasons for this were as follows:
- (i) to include more units to facilitate a longer period of discharge at the same output;
 - (ii) to increase spacing between battery units for fire safety reasons;
 - (iii) to incorporate a construction compound area which could also serve as a rejuvenation area where extra battery units could be installed if the overall maximum output of the array drops below 49.9MW in the future.
- 3.3.28. The final BESS layout is shown in Figure 3.5.

4 Description of the Proposed Development

4.1.	Introduction.....	4-2
4.2.	Need for the Development	4-3
4.3.	Proposed Development Layout.....	4-4
4.4.	Description of the Proposed Development Elements	4-4
4.5.	Construction of the Proposed Development	4-12
4.6.	Operation of the Proposed Development.....	4-14

4. Description of the Proposed Development

4.1. Introduction

- 4.1.1. This chapter provides a description of the proposed Loch Toftingall Battery Energy Storage System (BESS) ('the Proposed Development'). The planning application is for the construction and operation of a battery energy storage system consisting of up to 52 battery energy storage units, electrical connection and control buildings, landscaping, fencing and ancillary infrastructure.
- 4.1.2. The development will import and export electricity, however it would not generate any additional electricity. The BESS will have a maximum export capacity of up to **49.9MW**. The project has been designed with a **4-hour discharge** period.
- 4.1.3. The battery energy storage sector is continually evolving, and designs continue to improve, both technically and economically. The most suitable technology can change with time and therefore the final technical choice for the development would be made before construction through a procurement process.
- 4.1.4. The planning application drawings, and the description of the proposal in this chapter, have been based on a typical arrangement that would be expected for the BESS. The number and size of battery units, the building design, and the extent of external equipment required may, however, vary as a result of the procurement process.
- 4.1.5. The development will fit within the maximum dimensions shown in the planning application drawings and stated in this chapter. Any variations to the approved plans will be submitted to the council as non-material amendments.
- 4.1.6. It is anticipated at this stage that the battery technology to be deployed will consist of **Lithium-Ion** (Li-Ion) batteries. These batteries are used widely as an energy storage technology because of their high energy density and charge/discharge cycle fatigue resistance compared to other technologies. Li-Ion batteries also have a fast response time which makes them preferable for power application in grid-scale deployment.
- 4.1.7. A grid connection agreement for the project exists which has a final connection date of October 2027. Under Section 58b of the Town and Country Planning Scotland Act (1997), as amended, it is requested that the time period to commence development should be a period of five years, instead of the standard three years, in order to coincide with the projected final grid connection date.
- 4.1.8. The development would be a permanent use. The battery cells within the units would be replaced at various stages in the future. It is likely that there would be initial repowering exercises after 10-15 years and then again at 20-25 years.

4.1.9. When battery cells reach the end of their life, a recycling process would be followed with an approved recycling partner. The partner would transport the batteries to a suitably licensed recycling centre, where cells would be processed. Some materials are recovered from this process, including economically valuable metals. Hazardous materials such as chlorine and fluorine would be collected from the process. A gas cleaning technology would be applied to avoid the formation of dioxins and furans, with only hydrogen, oxygen, and limited volumes of carbon dioxide emitted.

4.2. Need for the Development

4.2.1. The United Kingdom's electricity network has historically relied on large, centralised power stations. However, numerous coal fired power stations have recently been decommissioned and gas fired power stations are increasingly being used intermittently when demand is high and electricity cannot be supplied by renewable sources. Existing nuclear power stations are reaching the end of their design lives and there will be further delays before new nuclear plants come online.

4.2.2. There is an ever-increasing reliance on renewable forms of electricity generation, such as wind and solar, to meet the United Kingdom's electricity demands. The amount of renewable electricity generated from wind and solar is, however, intermittent due to weather dependency. As a consequence, electricity demand and supply are becoming more challenging to balance.

4.2.3. The BESS would import and store electricity from the network when there is a surplus of generation, and then export this again when there is a deficit. This balancing function reduces the amount of time that renewable generation needs to be 'curtailed' (i.e. switched off) reducing the need to generate electricity from fossil fuel sources; primarily gas fired power stations.

4.2.4. The BESS has been largely designed to fulfil a balancing function. The BESS has been sized at 49.9MW maximum output principally as a result of the import export grid capacity that was available at Mybster substation. The use of a 4-hour discharge design parameter enables the BESS to provide a sizeable amount of balancing.

4.2.5. The changing generation mix (explained above) and increasing intermittency is also decreasing the level of system inertia. Lower system inertia affects the ability of the system to manage the electricity network frequency within normal operating limits (within +/- 1% of 50hz). If the network is not maintained within the required frequency tolerance, system stress can result in widespread power supply issues and damage network infrastructure.

4.2.6. The BESS would have the ability to discharge electricity extremely quickly and therefore it could, at least in part, be operated so that it serves a frequency response purpose, as well as a balancing function.

4.3. Proposed Development Layout

- 4.3.1. The overall proposed development layout is shown Figure 4.1. The footprint of the main compound, the potential future augmentation area and the access track covers an area of 1.3 hectares.
- 4.3.2. The main BESS compound would measure 100m by 65m and the potential future augmentation area hardstanding would measure 50m by 50m. The main BESS compound would be surrounded by fencing, and the overall facility would be set within a landscaping scheme.
- 4.3.3. The approximate grid reference of the centre of the main battery facility compound is (eastings) 317,625 (northings) 951,918.
- 4.3.4. A micro-siting allowance is requested for the access track of 25m from the centreline of the track.

4.4. Description of the Proposed Development Elements

Energy Storage Units

- 4.4.1. The main compound is likely to contain up to 52 energy storage units, which would be installed in sets of four units, in a grid arrangement, as shown in Figure 4.2. Each unit would typically be approximately 6.1 m long, 2.5 m wide and 2.9 m high.
- 4.4.2. Figure 4.3 shows a typical energy storage unit. The units would consist of steel containers which are designed to be secure and protect the contents from weather. The containers will have an appropriate RAL light grey and/or green finish, which will be agreed with the planning authority.
- 4.4.3. The container units will house rows of battery modules arranged in racks. The battery cells are likely to be of the Li-Ion type.
- 4.4.4. The battery units are likely to incorporate a liquid cooling system rather than an air conditioning based cooling system. It is therefore unlikely that there would be HVAC (Heating Ventilation and Air Conditioning) units on top or on the side of the container units.
- 4.4.5. It is likely that each unit would have a vent which would be flush with the side of the unit. As explained in more detail below at paragraph 4.4.18 - 4.4.29, the units will also include fire detection and suppression systems.
- 4.4.6. It is likely that the units will sit on small, concrete footings (approximately 0.5m high).

- 4.4.7. It is proposed that the final approval of the appearance and specification of the energy storage units should be made the subject of an appropriate planning condition.

Inverter and Transformer Units

- 4.4.8. The Direct Current (DC) battery voltage needs to be converted into Alternating Current (AC) using inverters and then transformed to a network voltage. Each group of four energy storage units would be associated with a single combined inverter and transformer unit, which means that circa 13 of these would be required, as shown in Figure 4.2.
- 4.4.9. The combined inverter and transformer units would typically be 6.1 m long, 2.4 m wide and 2.9 m high. An indicative elevation is shown in Figure 4.3.

Switchgear and control buildings

- 4.4.10. As shown in Figure 4.2, there would be two switchgear and control buildings. Each could typically be 21.5 m long, 6.0 m wide and have a height to the ridgeline of the roof of 4.0 m. Figure 4.4 provides a typical elevation for the buildings.
- 4.4.11. The building in the southwestern corner of the main compound is the distribution network operator's building. Part of this building would be for switchgear and other connection equipment, and another part would be for control systems. This building would be accessed from within the main compound but it would have its own fence to separate it from the remainder of the BESS.
- 4.4.12. The other building would be for the battery facility operator. Part of this building would house switchgear and other connection equipment. It would also contain the control room which would include the supervisory control and data acquisition (SCADA) and the battery management system (BMS) equipment. There would be an office with stores and welfare facilities within another part of the building.
- 4.4.13. No staff will be based at the Proposed Development. Four parking places will be provided adjacent to the battery facility operator's building for visiting maintenance personnel.
- 4.4.14. The Proposed Development would not have a foul sewer connection. Foul drainage from staff welfare facilities on site would be disposed of either by a packaged biological foul treatment plant with discharge to the surface water system or to a storage tank for offsite disposal via road tanker.
- 4.4.15. The battery units would be connected to the onsite switchgear and control building via cables which would be buried in trenches of around 0.5 m to 1 m in depth, within the compound.

Lighting

- 4.4.16. There will be no permanent visible lighting within the BESS. The visible lighting within the main compound will solely consist of motion-sensitive lighting at the entrances to the storage units and buildings, which will only be activated during occasional visits by maintenance personnel. This will be designed to be downward facing to minimise any light-spill beyond the enclosure.
- 4.4.17. There would also be invisible infra-red lighting within the compound which will be detectable by security cameras. It is proposed that a condition be attached to the planning permission requiring the submission and approval of a lighting scheme for the BESS.

Fire Safety

- 4.4.18. The risk of fire at Li-Ion energy storage sites is low, however, the risks must be considered and mitigated through design and operation practices. The main fire risk concern is known as ‘thermal runaway’. This is a cycle where excessive heat then goes on to create more heat until the energy stored within the batteries runs out.
- 4.4.19. As shown in Figure 4.2, the battery energy storage containers will be separated by a minimum of 3 m, to reduce the risk of thermal runaway, in line with UL9540¹, UL9540a² and NFPA 855³.
- 4.4.20. The battery units are likely to incorporate a liquid cooling system rather than an air conditioning based cooling system, although the use of battery units with heating ventilation and air conditioning (HVAC) units cannot be ruled out.
- 4.4.21. Aspirating smoke gas detectors will be fitted within each enclosure within each unit. This will provide an early warning in the unlikely event of a battery cell fire. This is far more sensitive than past systems which only monitor heat building up. There will also be carbon monoxide detectors within the containers and other

¹ UL9540 Energy Storage Systems and Equipment

² UL 9540A, the Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems

³ National Fire Protection Association 855 Standard for the Installation of Stationary Energy Storage Systems

buildings within the facility. The detectors would send an alarm to a monitoring station and will trigger an automatic power disconnection.

- 4.4.22. The gas detectors will be part of a wider SCADA system. This would include an advanced battery management system which would continually monitor the performance of each battery cell and immediately draw attention to any potential faults to the site operator.
- 4.4.23. Each battery unit will have a three-stage BMS, managing the system at cell, module, and rack level. This will ensure that any issues identified in the any of these levels will lead to a shutdown of that specific part of the system, thereby reducing the chance of further damage and potential for thermal runaway.
- 4.4.24. The SCADA system will incorporate numerous alarms such as intruder, heat and smoke alarms, which are highly sensitive to deviations from pre-defined levels. Once an alarm is raised on the system a remote operator will assess the implications of the alarm and activate a protocol of commands which will dictate the resultant activities. The system can remotely close down the installation, disconnecting the power connection to minimise the risk of any fire hazard developing.
- 4.4.25. A sophisticated fire prevention and suppression system would also be installed where inert gas (non-toxic and environmentally benign) will be automatically discharged in the unit if abnormal levels of heat, gas and, or smoke are detected. This will not require remote activation and will trigger an automatic disconnect. An alarm would also then be sent to the monitoring station. The inert gas would displace oxygen in the battery unit and will stop any fire developing and spreading.
- 4.4.26. Allowance has been made in the drainage design for a concrete slab with water tank and valve house for fire-fighting purposes. This has been sized so that it would contain approximately 160m³ of water. There will be a Sustainable Drainage Systems (SuDS) attenuation pond adjoining the compound which could also be used as an additional source of water.
- 4.4.27. The fire service would not use the water directly on any battery unit fire. The water supply would be used instead to prevent heat build-up at adjacent enclosures.
- 4.4.28. As shown in Figure 4.2, a secondary access point at the northern end of the BESS has been incorporated in the layout. This is so that, in the very unlikely event of a fire within part of the BESS, the fire service can select the access point which is most upwind.
- 4.4.29. Training exercises will be planned with the local fire service when the system is being commissioned. Standard Operating Procedures (SOP) will be drawn up in consultation with the fire service and these will be updated and tested on a regular basis.

Fencing

- 4.4.30. The compound would be enclosed by a 4m high wooden acoustic fence. This would provide acoustic attenuation and screen the internal infrastructure. There would also need to be an outer 3m high steel palisade fence alongside the acoustic fence for security reasons.
- 4.4.31. The exact colour of the fences would be agreed with the council but they are likely to be either dark green or brown. The position of the fences are shown in Figure 4.2 and the details of the fences are shown in Figure 4.5.
- 4.4.32. There will also be a peripheral outer standard wire mesh deer fence, to protect the landscaping while it becomes established.

Closed Circuit Television Masts

- 4.4.33. It is anticipated that there would be seven closed circuit television (CCTV) masts with security cameras on the perimeter of the compound. The masts would be slender and approximately 4 m high.
- 4.4.34. The masts will accommodate infrared night-time cameras, as well as standard cameras, to maintain security surveillance during hours of darkness.
- 4.4.35. The detailed design of the CCTV masts and equipment would be submitted at a later stage to satisfy a planning condition.

Hardstanding

- 4.4.36. The BESS compound will be formed of crushed aggregate laid on permeable membranes. The aggregate will be sourced from local quarries and transported to the site via the A9 and the existing northern Halsary Wind Farm access junction and track. The aggregate cannot be obtained from within the Loch Toftingall plantation land using a borrow working because the geology is unsuitable.
- 4.4.37. Cut and fill earthworks across the compound area would be carried out at an early stage of the construction process to create a suitable level development platform. The earthworks will be designed to minimise the need for fill material to be brought to the site or for excess material to be removed from site, as far as practicable.
- 4.4.38. The aggregate within the compound will be uncompacted and therefore permeable. There will be some elements of the compound surface which will not be aggregate, for example the internal access tracks within the main compound will be tarmac.

Potential Future Augmentation Area

- 4.4.39. The storage capacity and maximum output from the battery units is likely to diminish after a period of about 10 years. There are various methods of maintaining the output including: progressive replacement of battery cells within units, replacement of whole units within the main facility (commonly known as repowering) or installing additional battery units within or next to the main facility.
- 4.4.40. The decision on whether to install further battery units would be taken at a later date. As a precaution, a potential future augmentation area measuring 50 m by 50 m has been included in the Proposed Development layout design and planning application. This is located immediately to the east of the access track opposite the main BESS compound access gate.
- 4.4.41. The potential future augmentation area would be laid out as a crushed rock hardstanding, during the construction programme for the main facility. The footprint of this area has been considered in the environmental report.

Construction Compound

- 4.4.42. During the construction phase a temporary construction compound area will be required. This will be located within the potential future augmentation area. The compound would be used to store materials, provide vehicle parking, and would form a location for site cabins, offices and welfare facilities.
- 4.4.43. The construction plant and materials would remain for the anticipated 36-week duration of the groundwork and installation phases of construction but would be removed during the commissioning stage to leave a clear hardstanding.

Access Track

- 4.4.44. The access to the BESS will initially be along the existing northern access track into the Halsary Wind Farm, and then along a new section of track approximately 590m long, orientated north-south, from a point approximately 250m to the west of Halsary Turbine 5 to a point on the southwestern perimeter of the Loch Toftingall plantation land.
- 4.4.45. The new section of track will be constructed of crushed rock and have an approximate running width of 5m. The track passes across land that is relatively flat and therefore would not require sizeable embankments or cuttings. An indicative cross-section of the track is shown in Figure 4.6. There would be no watercourse crossings associated with the track.
- 4.4.46. The use of the Halsary Wind Farm track is an example of developers sharing existing infrastructure and this is environmentally beneficial. The use of the Halsary access track avoids the creation of another access junction on the A9.

- 4.4.47. The existing forestry track into the Loch Toftingall plantation from the B870 will not be used by construction vehicles.

Grid Connection

- 4.4.48. The proposed energy storage scheme will be connected to the Mybster substation which lies approximately 500m to the west of the compound.
- 4.4.49. The distribution network operator will be responsible for assessing, designing, and obtaining consent for the connection. It is anticipated that it will take the form of underground cable along a relatively direct route corridor.

Attenuation Pond

- 4.4.50. An attenuation pond has been included in the overall scheme layout. The pond will be designed as a SuDS feature. Runoff from the impermeable elements of the BESS compound will be collected and directed into the pond which will provide treatment and attenuation prior to discharge to the receiving watercourse.
- 4.4.51. The pond will have graduated margins and will be natural in shape so that it is well integrated into the surrounding landscaping area. The margins would be planted with wetland plant species appropriate to the local area to promote biodiversity.
- 4.4.52. The detailed design of the pond will be provided as part of a surface water drainage scheme which will be submitted to satisfy a planning condition.

Forestry Felling

- 4.4.53. The forestry plantation compartments within the site will be felled as the first stage of the construction programme. These compartments were due to be felled in the period 2026 – 2030 in accordance with the felling plan for the Loch Toftingall plantation. The timber is likely to be extracted using the existing forestry track from the B870.
- 4.4.54. The remainder of the forestry block to the north of the compound (excluding the native landscaping area) will be restocked with sitka spruce and, over time, this will provide further landscape screening. The compartment to the east of the compound containing part of the Allt Eireannaich will not be restocked and instead it will be dedicated to peatland restoration and riparian planting.

Landscaping

- 4.4.55. As shown in Figure 4.7, an area of native species landscaping will be created around the compound which will reduce internal visibility as well as visibility of the wooden acoustic fence and steel palisade security fence. The area of landscaping will also provide some biodiversity enhancement.

- 4.4.56. It is proposed that the landscaping would include the following native tree and shrub species:
- Alder;
 - Silver Birch;
 - Downy Birch;
 - Scots Pine;
 - Crack Willow;
 - Grey Willow;
 - Pussy Willow and
 - Rowan.
- 4.4.57. The planting will be checked annually for the first 5 years and any gaps will be refilled.
- 4.4.58. Open areas within the outer site perimeter fence which are not required for operational reasons or peatland restoration, including the area around the SuDS attenuation pond, will be planted with an appropriate wildflower and grassland mix
- 4.4.59. It is proposed that the full approval of the details of the planting and its aftercare could be agreed through an appropriate planning condition.

Peatland Restoration

- 4.4.60. As shown in Figure 4.7, the land to the east of the BESS will, over an extended period of time, be restored to peatland after the forestry is felled.
- 4.4.61. Two principal restoration techniques are likely to be adopted: (i) cross tracking and (ii) ground smoothing. With cross tracking, a tracked excavator would be used to flatten plantation plough ridges and disrupt drainage pathways. Ground smoothing would involve using an excavator bucket to upturn stumps and infill furrows. The type of technique that would be adopted is likely to vary across the peatland restoration area depending on which is most suitable.
- 4.4.62. Both approaches would impede conifer regeneration and help to raise water levels which are key requirements to facilitate peatland restoration. In addition to the main techniques there would also be hand-clearance of conifer regeneration and damming of existing drains and the deeper furrows to impede water flow.
- 4.4.63. More detailed peatland restoration proposals will be set out in a habitat management plan which would be submitted to satisfy a planning condition.

Riparian Planting

- 4.4.64. As shown in Figure 4.7, the indicative landscaping scheme native species riparian planting is proposed along the course of the Allt Eireannaich to the east of the BESS within the red line of the planning application.
- 4.4.65. The detailed species mix would be agreed at the condition discharge stage. It is anticipated that the native riparian planting will be similar to that proposed within the adjoining Halsary Wind Farm site and will include the following species:
- Downy birch;
 - Goat willow; and
 - Alder.
- 4.4.66. A detailed survey including a water vole and otter species survey would be undertaken to inform the tree planting plan.

4.5. Construction of the Proposed Development

- 4.5.1. The start of construction would depend on the planning process, and the procurement stage.
- 4.5.2. The on-site construction period is estimated to be approximately **9 months**, however, this could be longer if there is a delay between the ground works and the installation stage due to the lead in time for the delivery of the battery units and inverters.
- 4.5.3. The construction activities are listed below in the approximate order that they would take place, albeit that the duration of some activities will overlap.

Ground works

- Felling and extraction of forestry within the main part of the site.
- Formation of the construction compound (potential future augmentation area) immediately to the east of the main BESS compound.
- Construction of new access track from the existing Halsary Wind Farm track into the Loch Toftingall site.
- Levelling and preparation of the main BESS platform.
- Preparation of battery unit and other foundation footings within the compound.
- Trenching and laying of cables within the compound.
- Formation of compound with imported aggregate.

- Construction and electrical fit out of buildings and enclosures within the compound.
- Preparation of landscaping areas and formation of attenuation pond.
- Erection of the acoustic and palisade fences around compound perimeter.

Installation

- Delivery of the battery units, inverters and transformers using heavy goods vehicles and installation using a crane.

Commissioning

- Installation of underground electrical cable to Mybster substation (not part of this application).
- Setting, testing and monitoring initial operation of the battery facility.

Site re-instatement

- Restocking of the remaining part of the forestry block to the north of the compound.
- Landscape planting.
- Seeding of wildflower grassland areas around compound.
- Riparian planting along the course of Allt Eireannaich.
- Longer term peatland restoration to the east of the compound.

4.5.4. The typical construction plant to be used would include: excavators, graders and haulage vehicles, mobile and tower cranes, heavy and light goods vehicles.

4.5.5. The crushed rock used to form the compound hardstanding will be imported from local quarries. The material for the foundations will be imported ready mixed concrete. Material excavated during the ground works phase will be reused within the site.

4.5.6. Normal construction working hours would be Monday to Friday 08:00-18:00 and Saturday 08:00-13:00. No Sunday, bank holiday or night working is proposed except as described below. Up to an hour before and after the normal construction working hours, the following activities may be undertaken:

- arrival and departure of the workforce at the site and movement around the project site that does not require the use of plant;
- site inspections and safety checks; and
- site housekeeping that does not require the use of plant.

-
- 4.5.7. Non-noisy activities such as fit-out within buildings may be undertaken outside of those hours where these would not cause disturbance off-site. It is possible that certain construction activities that cannot be interrupted, such as a continuous concrete pour, may be required for the foundation slabs of the development platforms.
 - 4.5.8. Directional task lighting may be required during normal construction hours in winter. Outside normal construction working hours, motion-activated directional security lighting may be used at the site.
 - 4.5.9. A Construction Environmental Management Plan (CEMP) will be prepared and agreed prior to any work commencing on site. A Construction Traffic Management Plan (CTMP) will also be produced prior to the commencement of construction.

4.6. Operation of the Proposed Development

- 4.6.1. The BESS is likely to operate intermittently on a 24-hour, seven day a week basis, although operation during the middle of the night would be less likely to occur, as electricity demand is lower at this time .
- 4.6.2. The BESS would not require a permanent manned presence. Maintenance would be overseen by suitably qualified personnel who would visit the development as required. This would typically be less than twice per month. Online monitoring of performance and identification of issues would be provided on a 24-hour basis
- 4.6.3. Typical traffic to the site would be one or two vans per month. During the normal course of operations, no heavy good vehicles (HGV) are anticipated to be required. There would, however, be some additional HGV movements if any part of the BESS required replacement during the operational life of the development.

5 Forestry

5.1.	Introduction.....	5-2
5.2.	Legislation, Policy and Guidance.....	5-3
5.3.	Methodology.....	5-5
5.4.	Baseline Conditions.....	5-7
5.5.	Proposed Development Forestry Proposals.....	5-8
5.6.	Design and Mitigation.....	5-11
5.7.	Effects.....	5-11
5.8.	Forestry Waste.....	5-12
5.9.	Forestry Management Practices.....	5-14
5.10.	Standards and Guidelines.....	5-16
5.11.	Concluding Statement.....	5-16

5. Forestry

5.1. Introduction

- 5.1.1. This Chapter provides a description of the forestry proposals associated with the Proposed Development which is described in detail in Chapter 4. This Chapter was prepared by DGA Forestry LLP. The forestry assessment has identified that areas of forestry will require to be felled for the construction and operation of the Proposed Development.
- 5.1.2. Forestry is not regarded as a receptor for assessment purposes. Commercial forests are a dynamic environment and their structure continually undergoes change due to factors such as regular felling and restocking by the landowner; natural events, such as storm damage, pests or diseases; and external factors, such as a wind farms or other developments.
- 5.1.3. This Chapter therefore describes the plans as a result of the Proposed Development for felling, restocking and forest management practices and the changes to the physical structure of the forestry within the site boundary. The environmental effects will be reported on in other Chapters within the report.
- 5.1.4. The responsibility for the management of the remainder of the forest out with the site boundary will lie with the landowner and therefore the wider felling operations, restocking, and aftercare operations within the remainder of the forest do not form part of the Proposed Development for which consent is sought.
- 5.1.5. The Proposed Development infrastructure, as shown on Figure 4.1, is largely located within existing commercial forestry plantations. The woodlands are privately owned and managed. The forestry proposals have been developed to:
- Identify areas of forest to be removed for the construction and operation of the Proposed Development; and
 - Identify areas which may or may not be replanted as part of the Proposed Development.
- 5.1.6. In general, throughout this Chapter data labelled 'baseline' refers to the current crop composition and any existing plans without any modification as a result of the Proposed Development. Data labelled 'Proposed Development' refer to the forestry plans incorporating the Proposed Development infrastructure.

5.2. Legislation, Policy and Guidance

5.2.1. The forestry related policies and documents listed below have been considered within the forestry report.

Legislation

- Forestry and Land Management (Scotland) Act 2018¹;
- The Waste (Scotland) Regulations 2012²;
- UK Environmental Protection Act 1990³; and
- EU Waste Legislation Waste Framework Directive⁴ .

Guidance

- Scotland's Forestry Strategy 2019 – 2029⁵;
- Scotland's Third Land Use Strategy 2021 – 2026⁶;
- National Planning Framework 4 (2023)⁷;
- Right Tree in the Right Place (2010)⁸;

¹ The Scottish Government (2018). The Forestry and Land Management (Scotland) Act 2018, Edinburgh. Available at <https://www.legislation.gov.uk/asp/2018/8/contents/enacted> [accessed on 15.04.19].

² The Scottish Government (2012): The Waste (Scotland) Regulations 2012 No. 148. Available at <https://www.legislation.gov.uk/sdsi/2012/9780111016657> [accessed 20/01/2019].

³ UK Environmental Protection Act 1990 1990 c. 43 Part II Duty of care etc. as respects waste Section 34. A available at <http://www.legislation.gov.uk/ukpga/1990/43/section/34> [accessed 20/01/2019].

⁴ EU Waste Legislation Waste Framework Directive <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098> [accessed 20/01/2019].

⁵ The Scottish Government (2019). Scotland's Forestry Strategy 2019 -2029, Edinburgh.

⁶ Scottish Government (2021): Scotland's Third Land Use Strategy 2021 - 2026 <https://www.gov.scot/publications/scotlands-third-land-use-strategy-2021-2026-getting-best-land/> [accessed 10/03/2022].

⁷ The Scottish Government (2023). National Planning Framework 4. Available at <https://www.gov.scot/publications/national-planning-framework-4/> [accessed 15/02/2023].

⁸ Forestry Commission Scotland (2010): Right Tree in the Right Place - Planning for Forestry & Woodlands. Forestry Commission, Edinburgh.

- The Scottish Government's Control of Woodland Removal Policy (2009)⁹;
- Scottish Government's policy on control of woodland removal: implementation guidance (2019)¹⁰;
- Scottish Forestry Practice Guide Deciding Future Management Options for Afforested Deep Peatland (2015)¹¹
- The Highland Council Forestry and Woodland Strategy¹²;
- The Highland Council Trees, Woodland and Development Supplementary Guidance¹³;
- The Scottish Environment Protection Agency ('SEPA') guidance document WST-G-027, 'Management of Forestry Waste'¹⁴; and
- SEPA (2014): LUPS-GU27 'Use of Trees Cleared to Facilitate Development of Afforested Land'¹⁵

⁹ Forestry Commission Scotland (2009). The Scottish Government's Policy on Control of Woodland Removal. Edinburgh.

¹⁰ Forestry Commission Scotland (2019): Scottish Government's policy on control of woodland removal: implementation guidance. Available at <https://forestry.gov.scot/publications/349-scottish-government-s-policy-on-control-of-woodland-removal-implementation-guidance>

¹¹ Scottish Forestry Practice Guide : Deciding Future Management Options for Afforested Deep Peatland. Available at <https://forestry.gov.scot/publications/forests-and-the-environment/protecting-and-managing-soil-in-forests/1-deciding-future-management-options-for-afforested-deep-peatland> [accessed 31/05/2023].

¹² The Highland Council (2018): Highland Forest and Woodland Strategy. Available at https://www.highland.gov.uk/downloads/file/891/highland_forest_and_woodland_strategy [accessed 17/01/2023].

¹³ The Highland council (2013): Trees, Woodland and Development Supplementary Guidance. Available at https://www.highland.gov.uk/downloads/file/354/trees_woodlands_and_development_supplementary_guidance [accessed 17/01/2023].

¹⁴ SEPA (2017): SEPA Guidance Notes WST-G-027 "Management of Forestry Waste". https://www.sepa.org.uk/media/28957/forestry_waste_guidance_note.pdf [accessed 04/03/2022].

¹⁵ SEPA (2014): LUPS-GU27 "Use of Trees Cleared to Facilitate Development of Afforested Land. https://www.sepa.org.uk/media/143799/use_of_trees_cleared_to_facilitate_development_on_afforested_land_sepa_snh_fcs_guidance-april_2014.pdf [accessed 20/01/2019].

5.3. Methodology

Forestry Study Area

5.3.1. The Forestry Study Area (FSA), as shown on Figure 5.1, extends to approximately 24.96 ha and consists of privately owned and managed woodlands. The forests are comprised of commercial conifers with areas open ground. Further information on the composition of the woodlands in the FSA is provided in the baseline description below. The FSA is only part of the wider Toftingall Forest. There will be no effects from the Proposed Development on the remainder of the forest outside of the FSA and it is therefore not considered within this chapter.

Desk Based Research and Data Sources

5.3.2. The following data sources have informed the assessment:

- The Native Woodland Survey of Scotland¹⁶;
- The National Forest Inventory Scotland¹⁷;
- Scottish Forestry Map Viewer public databases¹⁸;
- Ancient Woodland Inventory Scotland¹⁹; and
- Baseline forest data and mapping supplied by the landowner.

Field Survey

5.3.3. The desk based assessment was supplemented by a site walkover survey in 2022 to inform the assessment and verify the desk based research.

¹⁶ Forestry Commission Scotland (2013). The Native Woodland survey of Scotland. Available at <https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18> [accessed on 10 February 2022].

¹⁷ Forestry Commission Scotland (2020). The National Forest Inventory Scotland. Available at https://data-forestry.opendata.arcgis.com/datasets/b71da2b45dde4d0595b6270a87f67ea9_0 [accessed on 10 February 2022].

¹⁸ Scottish Forestry Map Viewer. Available at <https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18> [accessed 10 February 2022].

¹⁹ Scottish Natural Heritage (2010). Ancient Woodland Inventory Scotland. Available at: <https://map.environment.gov.scot/sewebmap/> [accessed on 10 February 2022].

Development of the Proposed Development Forestry Proposals

- 5.3.4. This section describes the process by which the forestry proposals are developed for a Proposed Development within forestry. Existing crop information is collated from the landowner including current forestry information on species, planting year and felling and restocking plans, where available. This is supplemented by further desk-based assessment and field surveys as necessary. In this case only very limited data was provided by the landowners and the baseline composition of the forest is based on field observations and aerial photographs.
- 5.3.5. Details of Proposed Development infrastructure are provided by other disciplines within the project team. This data is then amalgamated with the forestry data to construct the forestry proposals for the Proposed Development.
- 5.3.6. The location of infrastructure is heavily influenced by environmental constraints and technical considerations (e.g. sensitive habitats or ground conditions). The final location of infrastructure takes the various site constraints into consideration. Land management requirements associated with the construction of the Proposed Development will also be incorporated into the forestry proposals, where appropriate.

Proposed Development Felling Plan

- 5.3.7. Felling required for a development can be divided into two categories.
- Firstly, that required during the construction phase of the Proposed Development, which for the purposes of this assessment, has been anticipated as commencing in late 2024 ; and
 - Secondly, felling required during the operational period of the Proposed Development.
- 5.3.8. In this case there is no felling required out with that required for the construction phase.
- 5.3.9. The crops were assessed to identify those areas which will require to be felled for the reasons described above. Due to the quality of the crop and the risk of windblow it has been assessed that the infrastructure within the forest will require clear felling of entire coupes back to either a wind firm edge or a management boundary. Where entire coupes are to be felled, the infrastructure will be incorporated into the Proposed Development Restocking Species Plan.
- 5.3.10. The resultant Proposed Development Felling Plan shows which woodlands within the FSA will be felled as a result of the Proposed Development and when this felling will take place.

Proposed Development Restocking Species Plan

- 5.3.11. The Proposed Development Restocking Species Plan shows the species composition and land use of the forest area within the FSA after the Proposed Development felling and restocking had been completed. This will include replanting of felled areas; changes of land use for habitat management purposes and on site landscape planting.
- 5.3.12. The Proposed Development forestry felling and restocking proposals are assessed by each of the separate environmental disciplines/consultants and the effects are reported in individual chapters of this Environmental Report and their supporting appendices.

5.4. Baseline Conditions

- 5.4.1. The existing woodlands are covered by a Forest Plan approved by Forestry Commission Scotland in 2015; reference No 5027337. This plan expires in 2025 and gives the landowner permission to fell parts of the forest in the first 10 years of the plan with outline proposals for felling the remainder of the forest.

Baseline Current Species

- 5.4.2. The current baseline species composition of the woodlands within the FSA is shown in Figure 5.2 and summarised in Table 5.1 below.
- 5.4.3. Please note there may be minor discrepancies in the totals within the tables contained in this Chapter. This is due to rounding of the individual values for the different parameters in the database.

Table 5.1: Baseline Species Composition

Baseline Species	Area (Ha)	Area (%)
Sitka spruce / Lodgepole pine mixtures	22.63	91%
Open ground	2.34	9%
Total	24.96	

- 5.4.4. The main species are commercial conifers, principally Sitka spruce in mixture with Lodgepole pine, which accounts for 91% of the FSA. Open ground accounts for the balance. There is no broadleaf woodland within the FSA.

Baseline Age Class

- 5.4.5. Based on data provided by the landowner the crops within the FSA were all planted in 1982.

Baseline Felling Plan

- 5.4.6. Based on the information contained in the Forest Plan the crops within the FSA were all due to be felled in Phase 3 of the plan – 2026 – 2030. It should be noted the crops do not have valid permission to fell. This would have been incorporated into the plan renewal due in 2025, subject to any amendments by the landowner.

Baseline Restocking Plan

- 5.4.7. No baseline restocking data was available.

5.5. Proposed Development Forestry Proposals

- 5.5.1. In the absence of baseline restocking data the effect of the Proposed Development on the structure of the forest within the FSA has been compared against the baseline current species. This has focussed on the species composition and the loss of forest area.

Proposed Development Felling Plan

- 5.5.2. The Proposed Development felling plan is shown on Figure 5.3 and summarised in Table 5.2 below.

Table 5.2: Proposed Development Felling Plan

Felling	Area (Ha)	Area (%)
Construction felling	22.63	91%
No felling	2.34	9%
Total	24.96	

- 5.5.3. All standing crops within the FSA will be felled to enable the construction of the Proposed Development, totalling 22.62ha. This includes the coupe to the north of the development which has already suffered some windblow and will be at greater risk of further windblow once the adjacent coupes are felled for the Proposed Development.

Proposed Development Restocking Plan

- 5.5.4. The baseline species composition has been amended to integrate the Proposed Development infrastructure requirements into the forest design and to take account of the site conditions. The Proposed Development Restocking Species and Habitats Plan is shown in Figure 5.4 and summarised in Table 5.3 below.

Table 5.3: Proposed Development Restocking Species / Habitats

Proposed Development Restocking Species / Habitats	Area (Ha)	Area (%)
Sitka spruce / Lodgepole pine mixtures	6.93	28%
Riparian broadleaf planting	2.98	12%
Native broadleaf landscape planting	1.27	5%
Forest to Bog Restoration	9.77	39%
Open ground	2.81	11%
Water	0.19	1%
Proposed Development Open Ground	1.02	4%
Total	24.96	

- 5.5.5. The coupe to the north of the site will be replanted with commercial conifers with the objective of creating a long term screen to the Proposed Development infrastructure. An area to the east of the development has been identified for forest to bog restoration, together with native broadleaf riparian woodland. The rationale behind this is described in Chapter 7 Ecology.
- 5.5.6. The area to the west of the Proposed Development infrastructure has been identified for landscape planting with native broadleaves. This is described in more detail in Chapter 6 Landscape and Visual.
- 5.5.7. Proposed Development Open Ground refers to the permanent loss of crop to Proposed Development infrastructure, which together with associated open ground comprises the remainder of the area within the FSA. The baseline and Proposed Development Species / Habitat plans are compared in Table 5.4 below.

Table 5.4: Species Comparison

Species / Habitat	Baseline Species	Proposed Development Restocking Species Area (Ha)	Variance (Ha)
Sitka spruce / Lodgepole pine mixtures	22.63	6.93	-15.7
Riparian broadleaf planting	0	2.98	2.98
Native broadleaf landscape planting	0	1.27	1.27
Forest to Bog Restoration	0	9.77	9.77
Open ground	2.34	2.81	0.47
Water	0	0.19	0.19
Proposed Development Open Ground	0	1.02	1.02
Total	24.96	24.96	0.0

5.5.8. As a result of the Proposed Development forestry proposals the species and habitat structure of the FSA diversifies. In particular:

- The area of conifer woodland decreases by 15.7ha;
- 4.25ha of broadleaf woodland is created;
- 9.77ha of priority habitat is created; and
- Total open ground, including Proposed Development Open Ground increases by 1.68ha.

Stocked Woodland Assessment

5.5.9. The baseline species and the Proposed Development Restocking Species have been compared to identify the loss of woodland area as per the guidance within the Implementation Guidance to the Control of Woodland Removal Policy. Normally the comparison would be against the baseline restocking plan but in this case that information was not available.

5.5.10. The change in area of stocked woodland in the forests due to the Proposed Development is shown in Table 5.5 below.

Table 5.5: Stocked Woodland Area Comparison

Description	Baseline	Proposed Development	Variance
Forest crops	22.63	11.18	-11.45
Unplanted land	2.34	13.78	11.45
Total	24.96	24.96	0

5.5.11. Proposed Development infrastructure accounts for 1.02ha within the FSA. However, the total area of woodland within the FSA decreases by 11.45ha due to the forest to bog restoration and additional open ground around the infrastructure.

5.6. Design and Mitigation

5.6.1. The key sensitivity is the loss of woodland area and compliance with the Control of Woodland Removal Policy. This has been mitigated through on site replanting and restoration of a priority habitat.

5.7. Effects

5.7.1. While the net area of woodland removal is 11.45ha, 9.77ha is for the restoration of a priority habitat. Under the Control of Woodland Removal Policy Implementation Guidance, Annex 3, woodland removal associated with “enhancing priority habitats and their connectivity” does not require compensatory planting. The net woodland removal which requires compensatory planting is therefore 1.67ha.

5.7.2. In order to comply with the Scottish Government's Control of Woodland Removal Policy, off-site compensation planting will be required. The Applicant is committed to providing appropriate compensatory planting. The extent, location and composition of such planting to be agreed with the relevant authorities.

5.8. Forestry Waste

5.8.1. The Scottish Environment Protection Agency (SEPA) guidance document WST-G-027, 'Management of Forestry Waste' (SEPA, 2017)²⁰ highlights that all waste producers have a statutory duty to adopt the waste hierarchy as per the Waste (Scotland) Regulations 2012 (the Scottish Government, 2012)²¹, which amended Section 34 of the Environmental Protection Act (EPA) 1990 (duty of care) (UK Government, 1990)²². This places a specific duty on any person who produces, keeps or manages (controlled) waste to take all such measures available to them to apply the waste hierarchy in Article 4 (1) of the revised Waste Framework Directive (rWFD)²³, which is:

- Prevention;
- Preparing for re-use;
- Recycling;
- Other recovery, including energy recovery; and
- Disposal, in a way which delivers the best overall environmental outcome.

5.8.2. Further guidance is contained in the document LUPS-GU27, 'Use of Trees Cleared to Facilitate Proposed Development on Afforested Land'" (SEPA, 2014)²⁴.

5.8.3. A hierarchy of uses for forestry materials is proposed, derived from the waste hierarchy contained within the Regulations, summarised as follows:

- Prevention via the production of timber products and associated materials for use in timber and other markets;

²⁰ SEPA (2017): SEPA Guidance Notes WST-G-027 "Management of Forestry Waste". https://www.sepa.org.uk/media/28957/forestry_waste_guidance_note.pdf [accessed 04/03/2022].

²¹ The Scottish Government (2012): The Waste (Scotland) Regulations 2012 No. 148 available at <https://www.legislation.gov.uk/sdsi/2012/9780111016657> [accessed 20/01/2019].

²² UK Environmental Protection Act 1990 1990 c. 43 Part II Duty of care etc. as respects waste Section 34 available at <http://www.legislation.gov.uk/ukpga/1990/43/section/34> [accessed 20/01/2019].

²³ EU Waste Legislation Waste Framework Directive <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098> [accessed 20/01/2019].

²⁴ SEPA (2014): LUPS-GU27 "Use of Trees Cleared to Facilitate Development of Afforested Land". https://www.sepa.org.uk/media/143799/use_of_trees_cleared_to_facilitate_development_on_afforested_land_sepa_snh_fcs_guidance-april_2014.pdf [accessed 20/01/2019].

- The re-use of materials on-site for a valid purpose, where such a use exists e.g. track construction including floating tracks;
- There is no valid re-cycling use for forestry residues other than as detailed below;
- Other recovery via collection and use as biomass for energy recovery or other markets, where not included above; and
- Where no valid on-site or off-site use can be found for the material, disposal would be in a way that is considered to deliver the best overall environmental outcome.

5.8.4. Where no valid on-site or off-site use, or other disposal method, can be found for the material, it should be regarded as waste and handled accordingly. Disposal of timber residues as waste in or on land requires a landfill permit or a waste exemption licence and should be considered the option of last resort.

5.8.5. As discussed in this Chapter, the crops will be replanted except where required for infrastructure associated with the Proposed Development or habitat management purposes. Brash would be left in situ to provide nutrients for the next rotation where the crops are being replanted as per standard forestry practice. Where crops are not being replanted brash would be removed and treated in line with the proposed hierarchy described above.

5.8.6. Stumps would be left in situ as per good practice guidance, except where excavated as part of the construction activities. Excavated stumps would be treated in line with the proposed hierarchy described above.

5.8.7. Where areas of timber crops are to be felled to accommodate the Proposed Development infrastructure the objective would be to recover as much merchantable timber as possible. Failing that to treat the material in line with the hierarchy outlined above. Where suitable, whole trees would be extracted and used in the biomass market. As a result, it is anticipated the forestry waste arising from the works will be minimal.

5.8.8. It is proposed that full consideration and further clarification on this issue would be included in a Forestry Waste Management Plan to form part of the Construction Environmental Management Plan (CEMP) following receipt of planning consent and prior to commencement of construction.

5.9. Forestry Management Practices

Crop Clearance

- 5.9.1. Areas of crops of sufficient tree size and standing volume would be harvested conventionally. Timber operations would be undertaken with conventional harvesting and forwarding equipment utilising, as required, flotation tracks (flotation devices are fitted to each machine wheel, giving the machines very low ground pressure and minimising the ground disturbance during the forestry operations).
- 5.9.2. Stem wood down to 7 centimetres (cm) or below would be removed from site and sold into the timber markets. The harvester would maximise timber recovery wherever possible, this would result in the maximum timber volume being recovered to ensure the volume used in the brash mats is kept to a minimum. On wetter ground the harvester would build stronger brash mats to ensure there would be minimal damage to the peat and soil structure by the forwarder during extraction. On soft ground, the bottom layers of brash mats become embedded into the soil and removal could result in more environmental damage than leaving the material to naturally degrade.
- 5.9.3. Stumps would be left in situ as per the guidance contained in the Forestry Commission Research Note "Environmental effects of stump and root harvesting" (Forestry Commission, 2011)²⁵ except where they would be removed for infrastructure requiring excavation. Such material would be treated as described above.

Restocking/Planting Methodology

- 5.9.4. Restocking would be carried out to current standard practice and in accordance with the guidelines contained in the UKFS and UKWAS as a minimum, where applicable. The methodology would vary depending on the type of restocking being carried out. The following information is provided for guidance only as to the restocking methodology which may be adopted.
- 5.9.5. On commercial conifer areas the methodology would normally include:

²⁵ Forestry Commission Research Note "Environmental effects of stump and root harvesting" (Forestry Commission, 2011). [https://www.forestry.gov.uk/pdf/FCRN009.pdf/\\$FILE/FCRN009.pdf](https://www.forestry.gov.uk/pdf/FCRN009.pdf/$FILE/FCRN009.pdf) [accessed 20/01/2019]

- Site preparation by machine cultivation and drainage;
- Manual planting;
- Subsequent follow-up establishment operations such as the replacement of failures, weeding and protection measures until the crops are satisfactorily established; and
- Replanting would be carried out with the conifer species identified in the restocking plan at the minimum density of 2,500 trees per ha.

5.9.6. Restocking within the broadleaf woodland areas would be carried out to the same specification with the following changes:

- A lower planting density of 1,600 trees per ha; and
- The principal species would be mixed native broadleaves including, for example, downy and silver birch with small components of other species as appropriate to site such as oak, rowan, hazel, gean, grey willow, goat willow, alder and woody shrubs.

Aftercare Works

5.9.7. Aftercare establishment works would normally include, but are not limited to, the following:

- The woodlands would be beaten up (replacement of failures) to ensure satisfactory stocking levels by year 5, broadleaf woodlands by year 10;
- The woodlands would be weeded as necessary to ensure satisfactory establishment by year 5/ year 10 for broadleaf woodlands;
- The woodlands would be protected against pine weevils by management inspections and remedial treatment as necessary;
- The woodlands would be protected against browsing damage from wild and domestic animals;
- The woodlands would be protected against fire;
- Fertiliser would be applied as necessary to ensure satisfactory establishment and growth; and
- Other works as reasonably required ensuring satisfactory establishment of the woodlands.

5.10. Standards and Guidelines

5.10.1. All forestry operations would be carried out in accordance with current good practice and guidelines. Including guidance and policy detailed earlier this will include, but not be limited to:

- UK Forestry Standard (Forestry Commission 2017);
- Forest Industry Safety Accord Guides (or equivalent) (FISA, 2014)²⁶; and
- Current relevant legislation including, but not limited to, Health and Safety at Work Act 1974 (UK Government, 2014)²⁷.

5.11. Concluding Statement

5.11.1. The FSA extends to 24.96ha and is comprised of privately owned and managed commercial conifer woodlands.

5.11.2. Felling will be advanced on 22.62ha for construction of the Proposed Development.

5.11.3. The species composition of the forestry within the FSA will diversify as a result of the Proposed Development forestry proposals. In particular, 4.25 ha of broadleaf woodland will be created where there is currently none and the area of commercial conifers will decrease by 15.7ha. There will be 9.77 for forest to bog restoration, enhancing a priority habitat.

5.11.4. As a result of the on-site replanting plan and the enhancement of a priority habitat the net loss of forest area which will require compensatory planting is 1.67ha. In order to comply with the Scottish Government's Control of Woodland Removal Policy, off-site compensation planting will be required. The Applicant is committed to providing appropriate compensatory planting. The extent, location and composition of such planting to be agreed with the relevant authorities.

²⁶ Forest Industry Safety Accord (2014). FISA Safety Guides (various). Edinburgh.

²⁷ UK Government (1974): Health and Safety at Work etc. Act 1974 available at <http://www.legislation.gov.uk/ukpga/1974/37/contents> [accessed 20/01/2019].

6. Landscape and Visual

6.1.	Introduction.....	6-2
6.2.	Assessment Methodology.....	6-4
6.3.	Baseline Conditions.....	6-8
6.4.	Assessment of Effects.....	6-17
6.5.	Assessment of Visual Effects.....	6-25
6.6.	Mitigation Measures.....	6-33
6.7.	Summary.....	6-33

6. Landscape and Visual

6.1. Introduction

6.1.1. This chapter of the Environmental Report (ER Chapter) evaluates the effects of the Proposed Development on landscape and visual receptors.

6.1.2. The purpose of a Landscape and Visual Impact Assessment (LVIA) is to identify any likely landscape and visual effects arising as a result of the proposals. An LVIA must consider both:

- Effects on the landscape, as a resource in its own right (the landscape effects); and
- Effects on specific views and visual amenity more generally (the visual effects).

6.1.3. Therefore, this assessment considers the potential effects of the Proposed Development upon:

- Individual landscape features and elements;
- Landscape character;
- Specific views; and
- People who view the landscape.

6.1.4. In this chapter, landscape and visual effects are assessed separately although the procedure for assessing each of these is closely linked.

6.1.5. The main objectives of the landscape assessment can be summarised as follows:

- To identify, evaluate, and describe the baseline landscape character of the site and its surroundings as well as any notable individual landscape features within the site;
- To determine the nature of the landscape receptor (i.e. the sensitivity of the landscape) through a consideration of its susceptibility to the Proposed Development and any values associated with it;
- To identify and describe any impacts of the Proposed Development, in so far as they affect the landscape resource;
- To evaluate the nature of the landscape effects (i.e. the magnitude, duration and reversibility of the effect);

- To identify and describe mitigation measures that have been adopted to avoid, reduce, and compensate for landscape effects; and
- To evaluate the level of residual landscape effects.

6.1.6. The main objectives of the visual assessment are similar and can be summarised as follows:

- To identify, evaluate, and describe the baseline visual context of the site and its surroundings with a focus on both specific views and the more general visual amenity experienced by people who have views of the site;
- To determine the nature of the visual receptor (i.e. the sensitivity of the viewpoint or person whose visual amenity is affected) through a consideration of the susceptibility of the viewpoint/person to the Proposed Development and any values associated with either the viewpoint or visual amenity experienced;
- To identify and describe any impacts of the Proposed Development in so far as they affect a viewpoint or views experienced;
- To evaluate the nature of the visual effects (i.e. the magnitude, duration and reversibility of the effect);
- To identify and describe mitigation measures that have been adopted to avoid, reduce, and compensate for visual effects; and
- To evaluate the level of residual visual effects.

6.1.7. The assessment presented in this chapter is supported by:

- Figures 6.1 to 6.6 in Environmental Report Volume 2 Figures and Visualisations;
- Visualisations and a photomontage, Figure 6.15 a-c in Environmental Report Volume 2 Figures and Visualisations;
- Viewpoint photo records Figure 6.7 to 6.13 in Environmental Report Volume 2 Figures and Visualisations;
- A landscape masterplan in Figure 6.14
- Appendices 6.1 to 6.2 in Environmental Report Volume 3.

6.1.8. The location of the Proposed Development and the Study Area for the LVIA is illustrated on Figure 6.1.

6.1.9. This chapter is structured as follows:

- Assessment Methodology;

- Baseline Conditions;
- Assessment of Potential Effects;
- Mitigation;
- Residual Effects; and
- Summary.

6.2. Assessment Methodology

6.2.1. The primary source of best practice for LVIA in the UK is the Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3)¹.

6.2.2. The LVIA presented in this chapter has been undertaken in accordance with the principles established in this document. It must however be acknowledged that GLVIA3 establishes guidelines not a specific methodology. The preface to GLVIA3 recognises that:

“This edition concentrates on principles and processes. It does not provide a detailed or formulaic ‘recipe’ that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand.”

6.2.3. The methodology for this assessment has therefore been developed specifically for this LVIA to ensure that it is appropriate and fit for purpose.

6.2.4. Consideration has also been given to the following documents:

- Landscape Sensitivity Assessment Guidance (Methodology), (2022), NatureScot;
- Guidelines for Landscape Character Assessment, (2002) Countryside Agency and Scottish Natural Heritage (SNH);
- LI Technical Guidance Note 06/19 Visual Representation of Development Proposals (September 2019) Landscape Institute; and

¹ Landscape Institute and the Institute of Environmental Management & Assessment (2013). Guidelines for Landscape and Visual Impact Assessment. Third Edition. Routledge.

- LI Technical Guidance Note 02/21 Assessing landscape value outside of national designations.

Scope of Assessment

- 6.2.5. The LVIA assesses both long-term direct and indirect landscape and visual effects relating to the operation of the Proposed Development and the short-term landscape and visual effects associated with the construction of the Proposed Development.
- 6.2.6. Consideration has been given to seasonal variations in the visibility of the Proposed Development and these are described where necessary.
- 6.2.7. Both beneficial and adverse effects are identified in the assessment and reported as appropriate. Where effects are described as 'neutral' this is where beneficial effects are deemed to balance the adverse effects. The adverse and beneficial effects are communicated in each case so that the judgement is clear.
- 6.2.8. As part of the proposed development, new planting would be introduced. Newly planted vegetation takes a number of years to mature and average growth rates have been taken into consideration in this assessment. The effectiveness of vegetation would improve over time (both in terms of integrating the development into the surrounding landscape and in providing visual screening) and this needs to be considered appropriately.
- 6.2.9. The criteria used in assessing the effects of the Proposed Development are set out in Appendix 6.1.

Study Area

- 6.2.10. With reference to the Screened Zone of Theoretical Visibility (SZTV) presented at Figure 6.2, a 3 kilometre (km) Study Area has been selected as a proportionate distance within which notable effects are most likely to be experienced.
- 6.2.11. An explanation of how the SZTV has been produced is included on Figure 6.2.

Landscape Assessment Methodology

- 6.2.12. A baseline landscape assessment was carried out to determine the current features and character of the landscape within and surrounding the site.
- 6.2.13. The baseline landscape assessment involved firstly a review of desk material including:
- Ordnance Survey maps at 1:250,000; 1:50,000; 1:25,000 and 1:10,000 scales;
 - Aerial photographs of the site and surrounding area;

- Topography;
- Current & historical land use;
- Geology and soil maps;
- Historic Parks and Designated Landscapes;
- Relevant planning policy;
- Relevant landscape sensitivity/capacity studies;
- Relevant landscape character assessments; and
- Relevant Historic Landscape Character Assessments.

6.2.14. Field visits have been conducted in a variety of weather conditions and at different times of the year during the pre-application stage. Surveys have been undertaken between April 2020 and February 2023.

6.2.15. The baseline assessment identified the existing landscape features on the site, and in the immediate vicinity, and how these elements combine to give the area a sense of landscape character. Plans and construction details of the Proposed Development were used to determine the impacts of the scheme on landscape features and character.

6.2.16. The LVIA firstly assesses how the Proposed Development would impact directly on any existing landscape features or elements (e.g. removal of trees etc.).

6.2.17. The LVIA then considers impacts on landscape character with reference to landscape character areas/types identified in published landscape character documents.

Visual Assessment Methodology

6.2.18. A Zone of Theoretical Visibility (ZTV) illustrates the extents from which a feature would theoretically be visible over a given distance. Due to relatively low height of the Proposed Development and the amount of localised screening a Screened Zone of Theoretical Visibility (SZTV) has been produced.

6.2.19. This has been prepared using Ordnance Survey (OS) terrain height data that has been combined with OS Open Map Local data for woodland amended to take account of recent felling in the vicinity of the site and buildings to create a Digital Surface Model (DSM). Indicative woodland and building heights are modelled at 15m and 8m respectively and the viewer height set at 1.7m in accordance with para 6.11 of GLVIA3.

6.2.20. The theoretical visibility of the Proposed Development has been calculated using GIS software with calculations allowing for earth curvature and light refraction. The resulting SZTV illustrates the theoretical extent of where the development may

be visible from, assuming 100% atmospheric visibility, and includes the screening effect from vegetation and buildings, based on the assumptions stated above. The SZTV is presented at Figure 6.2.

- 6.2.21. Potential visual receptors of the Proposed Development were then identified by interpretation of the SZTV. A selection of viewpoints was identified to represent a range of views and viewer types as discussed in paragraphs 6.16-6.20 of GLVIA3.
- 6.2.22. The viewpoints cover a variety of different locations and at a range of distances from the Proposed Development to illustrate the varying magnitude of visual impacts.
- 6.2.23. Each of the representative viewpoints was visited to gain an understanding of the sensitivity of the viewpoint receptors and to make professional judgements on the likely visual effects arising from the Proposed Development. Furthermore, the Study Area was visited to appreciate the visibility of the development as receptors move throughout the landscape.
- 6.2.24. Annotated viewpoint photographs (Landscape Institute Type 1²) were produced for each of the viewpoints and a photomontage (Landscape Institute Type 4) was produced from Viewpoint 1 (Figure 6.15c). The visuals are presented in Volume 2 of this Environmental Report.
- 6.2.25. The viewpoints were used as the starting point for considering the effects on visual receptors within the entire Study Area. The visual assessment does not rely solely on the viewpoint assessments to determine the level of effects on different visual receptor groups throughout the Study Area. It should be recognised that the viewpoints illustrated in the LVIA simply represent a series of snapshots from a small selection of the locations within the Study Area from where the Proposed Development will be visible. The LVIA considers the effect on visual amenity throughout the Study Area with reference to different visual receptor groups at varying distances from the site.

Assessment Criteria

- 6.2.26. The purpose of an LVIA is to identify any landscape and visual effects within the Study Area to assist the determining authority in deciding the acceptability of the scheme under consideration.

² LI Technical Guidance Note 06/19 Visual Representation of Development Proposals (September 2019) Landscape Institute

- 6.2.27. In accordance with the GLVIA3, the level of an effect is ascertained by considering in tandem the nature (sensitivity) of the baseline landscape or visual receptor and the nature (magnitude) of change as a result of the Proposed Development. These two judgements are described as very high, high, medium, low or very low.
- 6.2.28. The level of landscape or visual effects is described as major, major/moderate, moderate, moderate/minor, minor or minor/no effect. No effect may also be recorded where the effect is so negligible.
- 6.2.29. The detailed assessment criteria used to determine landscape and visual sensitivity, magnitude of change and level of effect is set out in Appendix 6.1.

Assessment Limitations

- 6.2.30. The assessment of effects within this LVIA has been derived through the use of publicly available information only. The authors of the LVIA have, however, spent a considerable length of time 'in the field' and visited all important viewpoints and locations within the Study Area.
- 6.2.31. There are inherent limitations to any photomontage visualisations included as part of LVIA which are well known and understood. However, whilst they form a useful guide to assist with the LVIA process, none of the assessments set out in this report are reliant solely on the visual material and instead are based on the professional judgement of the Landscape Architect undertaking the assessment.

6.3. Baseline Conditions

- 6.3.1. For the avoidance of doubt all distances are approximate and have been measured from the perimeter of the battery storage compound to the asset unless otherwise stated.

Site Location

- 6.3.2. The Site is located approximately 17km west of Wick, 1.6km south-east of Spittal (at its nearest point) and 5.6km to the west of Watten in Caithness, The Highlands. Figure 2.1 shows the location and wider context of the site.
- 6.3.3. To the north and east of the site the area is characterised by gently undulating topography and scattered properties set within farmland. To the south and west lies part of the 'flow country' peatlands which comprise a broad expanse of relatively level land which is sparsely inhabited. There are a number of plantations and lochs within the local area around the site.
- 6.3.4. The Site lies adjacent to several operational wind farms including Achlachan, to the west, Causeymire and Bad a Cheo to the south west and the recently constructed Halsary development which lies immediately to the south, through which the proposed access to the site passes.

- 6.3.5. The land in the immediate vicinity of the site is relatively flat and has an elevation of between 93m at its north western corner and at the proposed access from the A9 via Halsary Wind Farm and approximately 80m AOD at its eastern end. Spittal Hill lies approximately 3.4km to the north west and rises to an elevation of 176m AOD. Backlass Hill lies approximately 2.7km to the north east with an elevation of 112m AOD.
- 6.3.6. The Site lies within the Wick River catchment. In the immediate vicinity of the site, the watercourses drain, in most cases via Loch of Toftingall, into the Burn of Acharole which flows in a shallow valley to the east. The River Thurso lies approximately 3km away to the west.
- 6.3.7. Loch of Toftingall is effectively enclosed by plantation forestry. The Loch is used for fishing on an occasional basis.
- 6.3.8. The northern section of the A9 trunk road (Latheron – Thurso) lies approximately 580m to the west of the main part of the site. The A882 (Wick to Thurso) passes 5km to the north east. The B870 connecting the A9 and Watten lies approximately 1.2km to the north. There is a private track that leads from the B870 to the boat house on the northern shore of Loch of Toftingall.
- 6.3.9. In addition to the number of wind turbines within the vicinity of the site, there are a number of electricity transmission lines that feed into Mybster Substation which lies approximately 500m to the west of the site. To the south of the substation, a 132 kV electricity transmission line runs parallel to the A9.
- 6.3.10. The location of the Proposed Development and the Study Area is shown on Figure 6.1. All measurements within this section have been measured to the site boundary.

Landscape Designations and Assets

Landscape Designations

- 6.3.11. There are no national or locally designated landscapes located within the 3km Study Area. The nearest landscape designation is The Flow Country and Berriedale Coast Special Landscape Area (SLA) located approximately 5.4km to the south west of the Proposed Development beyond the 3km Study Area, beyond the existing Halsary Wind Farm.

Wild Land

- 6.3.12. The Proposed Development is not located within a Wild Land Area (WLA). The nearest WLA is the Causeymire – Knockin Flows Wild WLA (WLA 36) located approximately 4.4km to the south west.

- 6.3.13. Given the distance from this WLA and with reference to Policy 4 (g) of National Planning Framework 4³ that states that “*Buffer zones around wild land will not be applied and effects of development outwith wild land areas will not be significant consideration.*” effects on wild land are not considered further within the assessment.

Gardens and Designed Landscapes (GDL)

- 6.3.14. There are no GDL located within the 3km Study Area. As such they are not considered further within the assessment.

Candidate World Heritage Site

- 6.3.15. The boundary of the Flow Country candidate World Heritage Site (cWHS) overlaps the south eastern edge of the 3km Study Area, extending along the southern edges of Halsary and Snottergill burns. The cWHS is being nominated as it is widely recognised to be the largest area of blanket bog in the world. Together with associated areas of heath and open water it is of international importance as a habitat and for the range of wildlife it supports.

- 6.3.16. As the cWHS is being nominated for its natural habitat, it is of limited relevance to this LVIA. Furthermore, the Proposed Development is separated from it by the operational Halsary Wind Farm to the north of Halsary Burn. As such, effects on the cWHS are not considered further within this assessment.

Published Landscape Character Descriptions

- 6.3.17. A review was undertaken of the following published sources of information regarding regional landscape character, landscape value and landscape capacity:
- National Landscape Character Assessment (2019), SNH; and
 - Caithness and Sutherland Landscape Character Assessment. Scottish Natural Heritage Review No 103, 1998, Caroline Stanton.
- 6.3.18. At this point, for clarity, it is necessary to distinguish between two terms that are frequently used in published guidance and this chapter. They originate from the ‘Guidelines for Landscape Character Assessment’ (Countryside Agency and SNH, 2002):-

³ The Scottish Government (2023). National Planning Framework 4

- Landscape Character Types (LCTs) are defined as tracts of landscape, which have a generic unity of character due to the particular combinations of landform, land cover, pattern and elements. The same landscape character type can occur at several different locations throughout a Study Area; and
- Landscape Character Areas (LCAs) are defined as discrete geographical areas of a particular landscape character type and can only occur at a single location.

6.3.19. At a national level, the Proposed Development site falls within the landscape covered by the 2019 SNH digital map-based Landscape Character Assessment. The 2019 Landscape Character Type map and associated Landscape Character Type Descriptions now supersede the previous 1990s landscape character descriptions and mapping (which in the case of this landscape comprised the 'Caithness and Sutherland Landscape Assessment (1998)').

6.3.20. LCTs covering the Study Area are illustrated on Figure 6.3 and are overlaid with the SZTV on Figure 6.4.

Landscape Character Types Covering the Proposed Development Site

6.3.21. The National Landscape Character Assessment identifies that the site lies within LCT 134 'Sweeping Moorland and Flows', the key characteristics of which are identified as follows:

- Gently sloping or undulating landform which lies generally below 350metres;
- Occasional isolated hills of limited height form local landmark features;
- Lochs and mature, meandering rivers;
- Very distinct flora, dominated by sphagnum mosses, produced by the wetness and infertility of the flows;
- Areas of peat cuttings and haggings;
- Pockets of improved grazing, mainly within the outer fringes of sweeping moorland;
- Coniferous forest forming a dominant characteristic within some parts of this landscape character type;
- Ribbons of broadleaf woodland occasionally run along the water courses and loch edges;
- Very sparsely settled with dispersed crofts, farms and estate buildings largely found on the outer edges of this landscape or near a strath;
- Vehicular tracks within parts of the landscape;

- Wind farms, transmission lines, the A9 and a network of minor roads are key features within the more modified outer fringes within Caithness;
- Long, low and largely uninterrupted skylines offering extensive views across this landscape and result in a feeling of huge space;
- Consistent views to the distant Lone Mountains and Rugged Mountain Massif – Caithness & Sutherland;
- Great sense of exposure on areas of flat peatland on upland plateau; and
- A strong sense of remoteness is associated within the largely uninhabited, inaccessible core flows and moorlands of this landscape.

Other Landscape Character Types to be Assessed

6.3.22. LCT 143 Farmed Lowland Plain is situated approximately 555m to the north west of the site boundary. Its key characteristics are identified as follows:

- A generally open, low-lying plain, gently undulating to form shallow broad valleys, which are often filled with lochs and mosses, and subtle low ridges;
- Occasional smooth hills rise above the more low-lying plain forming local landmarks;
- The broad and shallow valley of the River Wick forming the largest of a series of valleys generally aligned south east/north west across the plain;
- Agriculture the predominant land cover;
- More intensively managed farmland near the coast around Thurso and Wick, and close to Loch Watten;
- Distinctive Caithness flagstone fences in some parts, creating low, sharp edges to fields;
- Sparse woodland, mainly comprising small angular coniferous plantations planted for shelter on farms;
- Larger conifer woodlands located at the transition with the Sweeping Moorland and Flows standing out where they are planted on poorer wetter ground on low ridges;
- Farm buildings and houses forming focal points within the landscape;
- Occasional loose clusters of croft houses located on more marginal upper slopes and near the coast;
- A number of historic environment features, including conspicuous castles, Baronial mansions and tall 'Lairds' houses, usually with broadleaf shelter woods planted around them;

- Roads reinforce the settlement pattern, often following the field and property boundaries, running straight and then swinging around sharp corners;
- A number of large settlements, including the towns of Thurso and Wick, situated on the coast, as well as several smaller settlements;
- Many historic features, including brochs and cairns, dotted across farmland and situated on hills within, or adjacent to, this area;
- Small groups of large wind turbines sited on some of the low ridges and hills and prominent visibility of larger wind farms in adjacent Landscape Character Types;
- Extensive views due to the openness of the landscape, and the clarity of northern air and light; and
- Dramatic views from the northern part of this landscape to Dunnet Head and the distant Orkney islands, and views from the A9 on the western edge of this landscape of the Lone Mountains of Movern and Scaraben seen across the low-lying Sweeping Moorland and Flows.

Local Landscape Description and Character Appraisal

6.3.23. A plan illustrating the landscape features/elements within the site and its immediate context is provided in Figure 6.6. The following discussion provides an overview of the physical and perceptual characteristics of the site and immediately surrounding landscape without particular reference to published landscape character types.

Topography

6.3.24. Topography within the Study Area is illustrated at Figure 6.5.

6.3.25. The Proposed Development is located on an area of gently sloping land known as the Moss of Toftingall that falls in an easterly direction towards Loch Toftingall. Levels range from around 93m at its north western corner and at the proposed access from the A9 via Halsary Wind Farm and approximately 80m AOD at its eastern end.

6.3.26. Beyond the site, the topography to the north becomes slightly more undulating as part of the Farmed Lowland landscape and in particular rising up to Spittal Hill at 176m AOD. To the south and west the landscape remains relatively flat before falling towards Strath Beag.

6.3.27. Overall, the topography of the site and its immediate environs can be summarised as broadly uniform before falling to the west and east towards waterbodies.

Watercourses and Drainage

- 6.3.28. Within the site, the primary watercourse is the Allt Eireannaich which drains Moss of Toftingall to its north and the northern fringes of the Halsary site to its south. This watercourse flows east into Loch Toftingall to the east of the site. The watercourse is located within the coniferous plantation that covers the site and thus does not form a noticeable feature in the landscape.

Vegetation

- 6.3.29. The site is largely covered with coniferous plantation woodland on the Moss of Toftingall that is actively managed to provide a timber crop. The proposed access track corridor to the south west that leads north from the Halsary Wind Farm access track crosses cleared forest land managed by Forestry and Land Scotland.
- 6.3.30. Felling has also taken place to the immediate north of the site between its northern boundary and Knockglass, with large areas having been replanted. The presence of coniferous plantation at various stages of growth creates a patchwork of colour and texture within the immediate vicinity of the site.
- 6.3.31. There are also small areas of rough grassland and moorland within the site, such as along the margins of the woodland blocks. However, such areas are limited, and the primary land cover of the site is plantation woodland.
- 6.3.32. Within the wider landscape, vegetation varies relative to topography. The north of the site features farmland and more isolated pockets of woodland, whereas the south and west are covered by large scale moorland and bog.

Built Infrastructure

- 6.3.33. There is no built infrastructure on the site itself. However, the site lies immediately adjacent to the north of the existing Halsary Wind Farm and the Mybster electricity substation compound to the immediate west, along with overhead power lines. The A9 road also lies close to the site boundary to the west and other wind energy development also lie close to the site on the opposite side of the A9 at Bad a Cheo, Causeymire and Achlachan.
- 6.3.34. There are a number of residential properties situated along the A9 and along the B870 that passes to the north of the site.

Sensory and Perceptual Characteristics

- 6.3.35. As the site lies close to several existing wind farms, the presence of energy development is already an existing characteristic of the landscape providing a sense of vertical scale to what is otherwise a wide open expansive large scale moorland landscape. Aside from the wind farms and substation there is relatively little other development, but the presence of the A9 is such that the site does not feel especially remote or wild in its nature.

Forces for Future Change in the Landscape

- 6.3.36. The main foreseeable forces for change in the landscape surrounding the site relate to changes to the forest plantations with areas of felling and replanting in line with forest management plans. Further changes may also occur due to changes in agricultural land use in the farmed landscape to the north and through peatland restoration within the Halsary site to the south.
- 6.3.37. Within the wider landscape, there are several commercial wind energy developments, consented, in planning or being considered at scoping which, if approved, would also influence the existing nature of the immediate landscape surrounding the Proposed Development.
- 6.3.38. In addition to the consented or proposed developments within the vicinity of the site, it is widely recognised that climate change will have an impact on the future character of the Scottish landscape through changes to weather conditions that will in turn result in changes to vegetation that will affect the intrinsic character of the landscape.

Visual Receptors

- 6.3.39. With reference to the SZTV at Figure 6.2 and the layout of the Proposed Development as shown at Figure 4.1, despite the battery energy storage system (BESS) compound occupying a land area of approximately 6,500 square metres (100m by 65m) and the number of battery storage units (52 no.), due to the low height of the units (3.4m maximum) and the height of the acoustic fence surrounding the compound (4m) the actual extent of theoretical visibility is limited.
- 6.3.40. Topography to the south of Mybster Substation limits visibility from the A9 to a short section north of the substation. Woodland at Mybster also limits theoretical visibility at the junction between the A9 and B870.
- 6.3.41. Along the B870 there is patchy theoretical visibility between Knockglass, Achnamoine and Toftingall Farm that will be further reduced in the short-term due to the replanting of plantation woodland south of Knockglass. To the north of the B870 there is theoretical visibility as the landform rises towards Spital Hill.
- 6.3.42. To the immediate north east of the site the plantation woodland around the western shore of Loch Toftingall prevents visibility extending further eastwards.
- 6.3.43. To the south of the site visibility does extend across the Halsary Wind Farm and across part of The Flows.

Residential Properties and Settlements

- 6.3.44. Residential properties within the vicinity of the site can be broadly grouped in two separate groups. Within 1km are three properties situated alongside the A9 between the B870 junction and Mybster Substation. The second group of

properties situated within 2km of the Proposed Development comprises properties situated along the B870 that leads towards Watten.

- 6.3.45. Effects on these two groups of the properties are considered further within the assessment.
- 6.3.46. Further north along the A9 is the settlement of Spittal. With reference to the SZTV at Figure 6.2, there is no predicted visibility from the settlement. As such effects on it are not considered further within the assessment.

Core Paths

- 6.3.47. With reference to Figure 6.6 the nearest core paths to the site are located to the west of the A9 and comprise Causeymire Wind Farm Core Path situated approximately 628m to the south west of the site boundary that follows the proposed access route via Halsary Wind Farm and approximately 1.5km to the south west of BESS compound.
- 6.3.48. The Achanarras Quarry and The Old Quarry core paths are located approximately 1.9km to the north west and north of the BESS compound respectively. However, SZTV at Figure 6.2 indicates that there will be no visibility from any of these core paths. As such effects on core paths are not considered further within the assessment.

Other recreational routes

- 6.3.49. The Halsary Wind Farm access tracks situated to the south of the Proposed Development, the Mybster Substation Haul Road leading south from the B870 to Mybster Substation and the forest track from the B870 leading to the Boat House at Loch Toftingall are used for informal recreation. With reference to the SZTV at Figure 6.2 there is predicted visibility from each of these routes. As such effects on these routes are considered further within the assessment.

Roads

- 6.3.50. Within the 3km Study Area the northern section of the A9 trunk road (Latheron – Thurso) lies approximately 580m to the west of the main part of the site. The B870 connecting the A9 and Watten lies approximately 1.2km to the north.
- 6.3.51. Referring to the SZTV at Figure 6.2, there is limited theoretical visibility from these routes and as such effects on receptors using these routes are considered further within the assessment.

Viewpoint Locations

- 6.3.52. The following table sets out the viewpoint locations that are included within the LVIA Photo Record included in Figures 6.7 – 6.13 of Volume 2 Figures and Visualisations. They were identified through desk-based study, site work and

interpretation of the SZTV. The viewpoint locations are representative of the range of views towards the Proposed Development. They are not intended to cover every single view but are representative of a range of distances from the site and receptor types (e.g. residents, walkers, road users) and have been used to inform the assessment of effects on landscape character, the visual assessment.

Table 6.1 – Viewpoint Locations

Viewpoint	OS Grid Reference	Approx. Distance to the BESS Compound	Receptor Type
1 – A9 Mybster Substation	316896, 952084	716m	Road users
2 – B870 near Achnamoine	317636, 953821	1,844m	Residents Road users
3 – B870 near Toftingall Farm	318265, 954391	2,503m	Residents Road users
4 – Toftingall forest track near northern boundary	317861, 952698	763m	Walkers
5 – Toftingall forest track south of Knockglass	317597, 952976	1,000m	Walkers
6 – Haul road to Mybster Substation	317058, 952668	881m	Residents Walkers
7 – Halsary Wind Farm access track	317706, 951291	576m	Walkers

6.4. Assessment of Effects

6.4.1. Following a brief summary of the Proposed Development, this section of the LVIA ER Chapter considers the effects of the Proposed Development on the physical features of the site (landscape fabric), landscape character, and visual amenity. It considers the effects at three different stages in the lifetime of the Proposed Development:

- During construction of the Proposed Development; and
- During the operational lifetime of the Proposed Development.

6.4.2. As stated in Paragraph 4.1.8 of Chapter 4: Description of the Proposed Development, it will be permanent. Therefore, decommissioning will not be assessed as part of this ER Chapter.

- 6.4.3. Effects during construction are considered to be temporary and would have a short duration. Effects associated with the operational phase of the Proposed Development are considered to be permanent.

Project Description

- 6.4.4. A detailed description of the Proposed Development is set out in Chapter 4. The description below summarises those details of the Proposed Development that have particular relevance to this LVIA.

- 6.4.5. The Proposed Development will principally comprise the following visible features which may have an impact on landscape character or visual amenity:

- A gravel access track leading from Halsary Wind Farm. This will have the appearance of a typical wind farm or forest access track. During the construction phase it will be used to provide access for construction vehicles, workers vehicles and delivery of materials and the units themselves;
- A BESS compound measuring approximately 100m by 65m. The compound will include an internal metalled access road that will be used by construction and maintenance vehicles, car parking spaces, a Distribution Network Operator switchgear and control room building and a battery facility operator switchgear and control room building, both measuring approximately 21.5m in length and approximately 6m in width. The buildings will have a maximum height of approximately 4m;
- The BESS will also include 52 no. battery units measuring 6.089m in length and 2.45m in width with a height of 2.9m. Each battery unit will sit on padstones resulting in each unit having a maximum height of approximately 3.4m above ground level. The units will have the appearance of small shipping containers and will be painted green to help reduce their visual impact. The battery units will be positioned in pairs at approximately 3m separation between each pair of units;
- At the end of each pair of units will sit an inverter unit with the same dimensions as a battery;
- The BESS compound will also include a stand by water tank adjacent to the battery facility operator switchgear and control room building and four parking spaces for vehicles;
- The BESS will be enclosed by an acoustic fence with a maximum height of 4m, with a 3m high steel palisade fence immediately adjacent to its outer edge;
- Downwards pointing motion activated security lighting will be fitted to each battery unit and control building;
- CCTV cameras will provide 24 hour remotely monitored surveillance;

- A connection into Mybster Substation via buried underground cable;
- A potential future augmentation area will be sited adjacent to the south east edge of the BESS compound, measuring 50m by 50m;
- An attenuation basin will be provided with a maximum water depth of 500mm with 1:4 side slopes;
- Landscape mitigation planting around the BESS compound comprising mixed deciduous and evergreen trees; and
- An area for peat restoration within the eastern part of the site boundary.

Effects during Construction on Existing Landscape Features

6.4.6. As identified in the baseline section, the existing landscape features present on the site are:

- Commercial plantation woodland;
- Moorland and rough grassland; and
- Watercourse/drainage channels.

6.4.7. Land within the main site area is currently commercial plantation woodland. At the commencement of construction activities this would be clear felled allowing construction of foundations for the battery compound. Soils stripped as part of the enabling works would be stored in accordance with established soil handling best-practice for use during reinstatement works on completion of construction activities. The clear felling within the eastern limb of the site around Allt Eireannaich that flows through this part of the site would allow for an extensive area for peatland restoration activities that would be adjacent to similar peatland restoration activities that are taking place on the Halsary site to the south of the watercourse.

6.4.8. Coniferous forest forms a dominant characteristic of this part of the Sweeping Moorland and Flows Landscape Character Type (LCT 134) in the character description above. It does not form part of the fabric of a site designated for its scenic value, it is an introduced landscape element that is subject to change over time through forest management practices, resulting it being of low value and susceptibility. Combining its value and susceptibility results in the sensitivity of the forestry vegetation being low as it would be felled in time even without the introduction of the Proposed Development.

6.4.9. The forestry vegetation would experience a high magnitude of change resulting from clear felling. The overall level of effect on the forestry vegetation resulting from the Proposed Development is considered to be moderate minor.

6.4.10. Once the main site area is felled the area would comprise moorland and rough grassland vegetation and that would be similar in nature initially to the cleared

Halsary site to the south. This vegetation is considered to have low value and susceptibility which combined, resulting in the sensitivity of the vegetation being low.

- 6.4.11. A part of this vegetation would be removed to facilitate the construction of the access track spur from Halsary to the south and the battery compound itself. This would introduce a large change to a small part of the overall site grassland within the site area resulting in medium magnitude of change to the vegetation. Combining its sensitivity and magnitude of change the overall level of effect on the vegetation resulting from the Proposed Development is judged to be moderate minor.
- 6.4.12. The Allt Eireannaich watercourse flows into Loch Toftingall and is the only watercourse crossing through the south eastern part of the site. This feature is considered to be of low value in landscape terms but highly susceptible to changes which affect its course or its quality. Combining its value and susceptibility results in the watercourse having a medium level of sensitivity.
- 6.4.13. The location of the proposed access track would avoid the need to cross this watercourse. Furthermore, all proposed infrastructure is set back from it and it would be protected during the construction phase. Therefore, there would be no change to it and no effects on this landscape feature.

Table 6.2 - Summary of Effects on Landscape Features during construction

Landscape Feature	Sensitivity	Magnitude of change	Level of Effect
Commercial plantation woodland	Low	High	Moderate minor
Moorland and rough grassland	Low	High	Moderate minor
Watercourse and drainage	Medium	No change	No effect

Sensitivity of Landscape Character to Battery Energy Storage Scheme

- 6.4.14. The first stage in assessing the effects of the Proposed Development on landscape character is to evaluate the sensitivity of the receiving landscape to the type of change proposed. As indicated within GLVIA3, sensitivity of landscape character should be determined through a consideration of both susceptibility to change and any values associated with the landscape.

LCT 134 Sweeping Moorland and Flows

- 6.4.15. The Proposed Development is situated within the northern part of this LCT that extends across a large proportion of Caithness and Sutherland. The part of the LCT where the Proposed Development is located is not designated for its particular scenic value, although its large sweeping scale and broad uninterrupted

skylines provide a perception of huge space and exposure. The Proposed Development is located within the outer fringes of the LCT within Caithness whose character is noted as being influenced by wind farms, electricity transmission lines and the A9 and minor roads. These factors combine to result in this part of the LCT being of medium value.

- 6.4.16. The susceptibility of this part of the LCT to the change proposed is assessed as medium. It would result in the permanent loss of some forestry which is noted as being a characteristic feature of the LCT, although the forestry would be felled over time in any case as part of the management of the plantation. The Proposed Development is also located in a part of the LCT that is influenced by other energy and electricity development reducing its susceptibility. Overall, the susceptibility of this part of the LCT is judged as medium.
- 6.4.17. The value of the LCT combined with its susceptibility to the Proposed Development results in the LCT having an overall medium sensitivity.

LCT 143 Farmed Lowland Plain

- 6.4.18. This LCT is situated to the north of the Proposed Development and extends across a large proportion of north Caithness to the northern and eastern coasts. It is an open, low-lying, gently undulating plain with shallow broad valleys, lochs and low ridges that is predominantly agricultural in land use.
- 6.4.19. The value of the LCT is assessed as medium. It is not covered by any designations that indicate a particular scenic quality but its large lochs provide opportunities for recreation.
- 6.4.20. The susceptibility of the landscape to the introduction of the Proposed Development in an adjacent character area is considered to be low, noting that views across the southern parts of the LCT closer towards the Proposed Development are already influenced by adjacent wind farms, substations, quarries and other forms of development.
- 6.4.21. The value of the LCT combined with its susceptibility to the Proposed Development results in the LCT having an overall low medium sensitivity.

Table 6.3 - Summary of Landscape Character Sensitivity

Landscape Character Type	Value	Susceptibility	Sensitivity
LCT 134 Sweeping Moorland and Flows	Medium	Medium	Medium
LCT 143 Farmed Lowland Plain	Medium	Low	Low medium

Effects during Construction on Landscape Character

- 6.4.22. The BESS and all its associated infrastructure are located in the Sweeping Moorland and Flows landscape character type (LCT 134). This would result in direct effects on landscape character during construction on only this LCT.
- 6.4.23. As noted above and with reference to Figure 4.1 access to the Proposed Development from the A9 will be via a newly constructed access track that spurs off from the existing Halsary Wind Farm access tracks and crossing land that has been clear felled as part of that wind farm development. In total, approximately 720m of new access track will be constructed to provide access to the BESS.
- 6.4.24. During the construction phase, there will be the temporary presence of hiab-type lorries delivering the battery units and other construction traffic, consistent with the formation of the access track, the battery compound and the installation of all the associated elements of the scheme.
- 6.4.25. Whilst there would be localised areas of high magnitude of change directly on landscape features, there would be an overall medium magnitude of change upon the part of LCT 134 Sweeping Moorland and Flows where the Proposed Development is sited during the construction phase. This would result in no greater than a moderate temporary additional effect on a very localised and small part of the northern fringes of the LCT as that part of the LCT is already influenced by other infrastructure development at Mybster Substation and Halsary Wind Farm.
- 6.4.26. Overall, there would be no greater than a low magnitude of change and a moderate minor temporary additional effect on the LCT as a whole.
- 6.4.27. In terms of indirect effects on the adjacent Farmed Lowland Plain (LCT 143), Moray LCT 13 Narrow Farmed Valleys some very limited additional effects would be experienced as construction takes place. However, views would be largely restricted by intervening plantation woodland, resulting in no greater than a very low magnitude of change and a minor temporary effect.

Table 6.4 - Summary of Effects on Landscape Character during construction

Landscape Character Type	Sensitivity	Magnitude of change	Level of Effect
LCT 134 Sweeping Moorland and Flows	Medium	Low	Moderate minor
LCT 143 Farmed Lowland Plain	Low medium	Very low	Minor

Assessment of Effects on Landscape Character during operation

- 6.4.28. The LCTs covering the 3km LVIA Study Area are shown on Figure 6.3 and overlaid with the SZTV at Figure 6.4. The magnitude of change on landscape character as a result of the Proposed Development has been determined using professional judgement based on the following factors:
- The percentage of the character type from where the site would theoretically and actually be visible;
 - The distance between the character type and the site;
 - The likely prominence of the structures from the character type taking account of existing locally dominant characteristics in the character type; and
 - The degree to which the physical and perceptual characteristics of the landscape would change as a result of the Proposed Development.
- 6.4.29. It is noted that in general, the magnitude of change in landscape character will incrementally decrease with distance from a development as it becomes gradually less prominent. A summary of the effects on landscape character is presented in Table 6.5. Note that for all character types stated within this table, the duration of the Proposed Development is considered to be permanent.

LCT 134 Sweeping Moorland and Flows

- 6.4.30. The battery energy storage compound, the proposed access track and all ancillary elements are located within this LCT. Views from the LCT are represented by viewpoints 1 (Figure 6.7), 4 (Figure 6.10), 5 (Figure 6.11) and 7 (Figure 6.13).
- 6.4.31. With reference to Figure 6.4 showing the landscape character types overlaid with the SZTV there is theoretical visibility of the Proposed Development from the northern edge of the LCT over a distance of approximately 2.3km extending between the A9 at Mybster to a point south of Toftingall Farm. Visibility is restricted by remaining plantation woodland around Loch Toftingall but further parts of this may be felled over time potentially increasing the visibility of the BESS from the northern fringes of the LCT. However, as the new plantation woodland south of Knockglass matures it will restrict views south from the northern edge of the LCT towards the Proposed Development.
- 6.4.32. To the west visibility extends to the A9. However, Mybster Substation to the immediate east of the road would partially screens views east from this part of the LCT. As the mitigation planting around the substation grows it will further reduce the visibility of the BESS from the road. To the south of the Proposed Development and the access track, predicted visibility extends across the Halsary Wind Farm site until the valley of Halsary Burn screens views. To the south of Halsary Burn visibility continues into The Flows and to the south eastern edge of the 3km LVIA Study Area.

- 6.4.33. The Proposed Development introduces a new access track leading off the Halsary access tracks that crosses clear felled land and a significant area of land in the eastern part of the site that is to be given over to peatland restoration. It also introduces additional low height structures comprising the battery units, control buildings and acoustic and security fencing into the LCT with a maximum height of 4m. These elements would introduce direct effects on the LCT in the immediate vicinity of the site and indirect effects on the remaining parts of the LCT.
- 6.4.34. The Proposed Development introduces a small size and scale of change that occupies a small part of the LCT, in a location that is already influenced by commercial forestry plantation, substation development, overhead powerlines and large wind turbines.
- 6.4.35. This change would influence the character of this part of the LCT extending approximately 700m west to the A9, north to the approximate extent of newly planted forestry and south to the Halsary turbines. Due to the diminutive height of these elements this would result in no greater than a medium magnitude of change which combined with the sensitivity of the LCT results in a moderate effect.
- 6.4.36. Beyond approximately 700m Mybster Substation and the Halsary turbines would have a much stronger influence on the wider character of the LCT, resulting in the Proposed Development introducing no greater than a low magnitude of change. Combined with the sensitivity of the LCT this is judged to result in a moderate minor indirect effect.

LCT 143 Farmed Lowland Plain

- 6.4.37. This landscape character type is located approximately 800m to the north west of the battery storage compound at its closest point. Therefore, any effects discussed below are indirect. Views towards the Proposed Development at varying distances are represented by viewpoints 6 (Figure 6.12) , 2 (Figure 6.8) and 3 (Figure 6.9).
- 6.4.38. With reference to Figure 6.4 showing the landscape character types overlaid with the SZTV there is limited theoretical visibility across a small part of the southern fringe of the LCT to the east of Spittal. This visibility results from the recent felling of plantation woodland south of Knockglass. However, as noted earlier this woodland has been replanted as illustrated by Viewpoint 5 (Figure 6.11). Over time, this new planting will restrict the visual influence on the southern fringe of the LCT as it screens the development.
- 6.4.39. South of the B870 the Proposed Development introduces a small size and scale of change that occupies a small part of the adjoining LCT where views towards it are already influenced by commercial forestry plantation, substation development, overhead powerlines and wind turbines. This change would result in no greater than a very low magnitude of change and a minor indirect effect.
- 6.4.40. North of the B870, the increased distance from the Proposed Development coupled with the greater influence of the large-scale quarry operations at Spittal

Quarry on the character of the LCT and the limited theoretical visibility results in the level of indirect effects reducing to minor/no effect.

Table 6.5 - Summary of Effects on Landscape Character during operation

Landscape Character Type	Sensitivity	Magnitude of change	Level of Effect
LCT 134 Sweeping Moorland and Flows <i>Within approximately 700m</i>	Medium	Medium	Moderate
LCT 134 Sweeping Moorland and Flows <i>Beyond approximately 700m</i>	Medium	Low	Moderate minor
LCT 143 Farmed Lowland Plain South of the B870	Low medium	Very low	Minor
LCT 143 Farmed Lowland Plain North of the B870	Low medium	Very low	Minor/no effect

6.5. Assessment of Visual Effects

6.5.1. Effects on visual amenity arise from changes to views resulting from the introduction of the Proposed Development. It comprises:

- An assessment of visual effects from the viewpoint locations; and
- An assessment of visual effects on receptor groups identified in the baseline section.

6.5.2. The assessment has been carried out through a combination of site visits and desk study using the SZTV and with reference to the viewpoint photo record included in Figures 6.7 – 6.13 of Volume 2.

Construction Effects

6.5.3. Due to the limited theoretical visibility as illustrated at Figure 6.2 construction activities will be screened from most parts of the Study Area. Where views are available, activities will comprise felling of the existing plantation woodland that occupies the site area at present. This is an activity that is already experienced in some views in the wider landscape through ongoing forestry management activities. This will be followed by delivery and construction vehicles and general construction activities associated with the construction of the facility and will be experienced for a short period during the construction phase. It is assessed that

any views of these works will result in a low magnitude of additional change and no greater than a moderate minor, temporary effect.

Operational Effects

- 6.5.4. A viewpoint assessment of the operational effects of the Proposed Development is included at Appendix 6.2 and this considers the long-term visual effects during the operational phase of the Proposed Development from each viewpoint.
- 6.5.5. For each of the viewpoints, a short description is given of the baseline view, and a judgement is provided regarding the sensitivity of the key receptors likely to experience the view.
- 6.5.6. This is followed by a description of the features of the Proposed Development that would be visible from that viewpoint. For each viewpoint, there is a comment on how vegetation or topography would affect the actual visibility of the development.
- 6.5.7. A judgement is then provided of the magnitude of visual change that would be experienced at each viewpoint, the level of the effect on the view.
- 6.5.8. A summary of the sensitivity of the view, magnitude of change in the view and the level of effect is given in Table 6.6 below. Where a viewpoint is representative of more than one type of visual receptor, the assessment carried forward into the table represents the most sensitive receptor group represented by the viewpoint.

Table 6.6 - Summary of Effects on Visual Effects during operation

Viewpoint	Sensitivity	Magnitude of change	Level of Effect
Viewpoint 1 – A9 Mybster Substation	Low	High	Moderate minor
Viewpoint 2 – B870 near Achnamoine	Medium	Medium	Moderate
Viewpoint 3 – B870 near Toftingall Farm	Medium	Low	Moderate minor
Viewpoint 4 – Toftingall Forest track near northern boundary	Medium	Medium	Moderate
Viewpoint 5 – Toftingall Forest track south of Knockglass	Medium	Medium	Moderate
Viewpoint 6 – Haul road to Mybster Substation	Medium	High	Major/moderate

Viewpoint 7 – Halsary Wind Farm access track	Medium	High	Major/moderate
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Assessment of Effects on Visual Receptor Groups

6.5.9. This section considers the effects of the Proposed Development on the visual receptor groups identified in the baseline as having the potential to experience effects.

Construction Effects on Visual Receptor Groups

6.5.10. It is recognised that there would be some additional temporary visual effects during the construction of the Proposed Development over and above those assessed under the operational phase.

6.5.11. The vast majority of effects, of note, when considering the construction phase will be experienced within the local environs of the site, with views contained by remaining forestry blocks to the east and gently sloping topography due to the low height of the proposed scheme elements.

6.5.12. The construction works will be visible from a limited number of areas within the local landscape. Views will be restricted to views of delivery and construction vehicles and general construction activities. These views would only be experienced for a relatively short duration during the construction and they would not be an uncommon occurrence in the wider landscape with such vehicles regularly accessing Mybster Substation and Halsary Wind Farm.

6.5.13. Overall, it is assessed that there would be a low magnitude of additional effect during construction over and above the operational phase effects assessed below. This would result in a temporary moderate minor additional effect and these effects need to be considered in conjunction with the operational effects identified below.

Operational Effects on Visual Receptor Groups

6.5.14. The below assessment considers the effects of the Proposed Development on residential properties identified in the baseline as potentially experiencing effects. As set out in Appendix 6.1, the sensitivity of residential receptors is considered to be high.

Effects on Residential Properties on the A9 between the B870 and Mybster Substation

6.5.15. With reference to Figure 6.6 Local Landscape Context this group of properties comprises Mybster Croft and Croft of Bowerman situated to the east of the A9 and Wingfield Farm on the western edge.

Wingfield Farm

- 6.5.16. Wingfield Farm is situated approximately 816m to the north west of the proposed battery compound. It is orientated north south with the potential for oblique views of the Proposed Development from its southern façade. Existing views from the property comprise Causeymire and Achlachan wind farms to the south west and south, overhead pylons and Mybster Substation and the A9 road directly adjacent to the eastern boundary of the property, which is open with no boundary vegetation to the south of the property.
- 6.5.17. Intermittent scrub and trees to the east of the A9 would provide some limited filtering of south easterly views towards the Proposed Development which would be seen at some distance backclothed against the remaining plantation woodland to the east. However, the Proposed Development would introduce additional built form into the view but due its low height and the distance from the property it would introduce a small size and scale of change that would occupy a small lateral extent of the view, resulting in a low magnitude of change and a moderate minor effect.

Mybster Croft

- 6.5.18. Mybster Croft is situated approximately 850m to the north west of the proposed battery compound. The main facades of this property face west to east, with a smaller façade facing south, with external amenity space surrounding the property. The property is flanked by tree planting along its eastern boundary that screen views towards the Proposed Development. Therefore, it is assessed that there is very limited potential for views towards the proposed battery compound, resulting in receptors at this property experiencing no greater than a very low magnitude of change and a minor effect.

Croft of Bowerman

- 6.5.19. This property is situated approximately 700m to the west north west of the Proposed Development. Its main facades are orientated west to east with external amenity space to the west, south and east of the dwelling.
- 6.5.20. Existing views east from the property extend across its open eastern boundary across rough grassland towards Toftingall Forest, with oblique views available of Mybster Substation and Halsary Wind Farm and intervening overhead powerlines. Viewpoint 6 from the haul road to Mybster Substation serves as a useful reference to illustrate the nature of views from the property.
- 6.5.21. The battery storage compound and its associated elements would introduce additional built form into views experienced to the east from the property, occupying a moderate proportion and lateral extent of south easterly views in relative proximity. The full lateral extent of the battery compound would be seen. However, the new structures would be low in height and would be seen against the backdrop of the remaining forestry to the east of the BESS, resulting in a high magnitude of change and a major effect.

Effects on Residential Properties on the B870

- 6.5.22. With reference to Figure 6.6 Local Landscape Context, properties situated along the B870 are situated to the north of the Proposed Development and referring to the SZTV at Figure 6.2 are largely screened by forestry blocks on the southern side of the road or by existing boundary vegetation that prevent views of the Proposed Development. As such it is assessed that these properties would experience no greater than a very low magnitude of change and moderate minor effects.

Effects on Road Users

A9

- 6.5.23. The section of this road that passes through the western part of the Study Area does not cross through any landscapes designated for their particular scenic value, although it is acknowledged that extensive views are available across the remote moorland landscape, but in the context of the existing wind farms and energy infrastructure present within the Study Area. As outlined in Appendix 6.1 users of main A roads are typically considered to have lower susceptibility to changes in visual amenity and to have a low sensitivity to the change proposed.
- 6.5.24. With reference to the SZTV at Figure 6.2, theoretical visibility is experienced from a very short section of the road, over a distance of approximately 440m immediately north of Mybster Substation, as illustrated by Viewpoint 1 (Figure 6.7, see also Figure 6.15a-c). Over this section of the road, motorists would experience oblique to perpendicular views towards the Proposed Development that would be experienced as glimpsed views over a very short section of the road in the immediate vicinity of Mybster Substation. This would result in a high magnitude of change and a moderate minor effect.

B870

- 6.5.25. As outlined in Appendix 6.1 users of B roads are typically considered to be moderately susceptible to changes in visual amenity and to have a medium sensitivity to the change proposed.
- 6.5.26. With reference to the SZTV at Figure 6.2, theoretical visibility commences near Achnamoine and continues for approximately 410m with typical views illustrated by Viewpoint 2 (Figure 6.8). Over this section of the road the battery compound and the associated elements would be seen as small-scale elements at an oblique angle to the direction of the road and experienced as glimpsed views while travelling along the road resulting in a medium magnitude of change and a moderate effect.
- 6.5.27. As the road continues north eastwards there is no visibility for a short distance before recommencing south of Toftingall Farm as the road turns to the east. Over this section of the road the battery compound and the associated elements would be seen as very small-scale elements at an oblique to very oblique angle to the

direction of the road and experienced as glimpsed views while travelling along the road resulting in a low magnitude of change and a moderate minor effect.

Effects on Recreational Routes

- 6.5.28. As outlined in the baseline section there are several informal routes within the surrounding landscape that are used for informal recreation comprising the Halsary Wind Farm access tracks, the former haul road to Mybster Substation and the Toftingall forest tracks. As these routes are not formally identified walking routes receptors are considered to have medium sensitivity to the change proposed.

Toftingall Forest tracks

- 6.5.29. With reference to the SZTV at Figure 6.2, theoretical visibility of the Proposed Development commences south of Knockglass and continues for a distance of approximately 810m before views are screened by forestry plantation blocks. Representative views are illustrated by viewpoints 4 (Figure 6.10) and 5 (Figure 6.11).
- 6.5.30. Over this section of the track the battery compound would be seen along with its security fencing and associated buildings. However, the new structures would be low in height and the change would be experienced an oblique angle to the track and due to the scale of the proposed structures would appear relatively small in scale resulting in a medium magnitude of change and a moderate effect.
- 6.5.31. It is acknowledged that over time further views may become available as further plantation blocks are felled. However, as subsequent areas are felled, replanted areas such as south of Knockglass will be maturing and will screen views from parts of the route where views of the BESS are currently available. As such there is unlikely to be visibility from the whole route at any one time meaning that effects would be likely to remain moderate.

Haul Road to Mybster Substation

- 6.5.32. The former haul road leads from the B870 and continues south to Mybster Substation. At the commencement of the haul road there is no predicted visibility for the first 395m of the route as existing woodland to the east of the haul road restricts views of the Proposed Development. Views of the Proposed Development commence at the end of the forestry block and extend across rough grassland towards Toftingall Forest.
- 6.5.33. The full lateral extent of the battery compound would be seen. However, the new structures would be low in height and would be seen against the backdrop of the remaining forestry to the east of the compound. The change would be experienced at a perpendicular angle to the track and in a location where existing views are already partly characterised by existing energy infrastructure, introducing a high magnitude of change and resulting in a major moderate effect.

These effects would continue for the remainder of the route as it continues to Mybster Substation.

Halsary Wind Farm access tracks

- 6.5.34. With reference to the SZTV at Figure 6.2, there is extensive theoretical visibility across the Halsary site due to its open nature after having been clear felled to allow construction of the wind farm. Referring to Viewpoint 7 (Figure 6.13), at the point where the proposed BESS access track would spur off from the wind farm tracks the battery compound would be seen from its southern, narrower edge along with the associated fencing with the proposed access track crossing the cleared forest land in the foreground of the view. The change would be experienced at a perpendicular angle to the track and in a location where existing views are already partly characterised by existing energy infrastructure, introducing a high magnitude of change and resulting in a major moderate effect. These effects would be experienced within approximately 1km along the northern-most access tracks.
- 6.5.35. Beyond approximately 1km, the scale and prominence of the Halsary turbines would have a much stronger influence on available views. Coupled with the increased distance from the Proposed Development, the magnitude of change would reduce to medium resulting in moderate effects.
- 6.5.36. From the southern-most access tracks situated approximately 2km from the Proposed Development the magnitude of change introduced by the Proposed Development would be low, with effects judged as no greater than moderate minor.

Table 6.7 - Summary of Effects on Receptor Groups

Receptor	Sensitivity	Magnitude of change	Level of Effect
Residential Properties on the A9			
Wingfield Farm	High	Low	Moderate/minor
Mybster Croft	High	Very low	Minor
Croft of Bowerman	High	High	Major
Residential Properties on the B870			
Properties on the B870	High	Low	Moderate/minor
Roads			
A9	Low	High	Moderate minor
B870 near Achnamoine	Medium	Medium	Moderate
B870 near Toftingall Farm	Medium	Low	Moderate minor
Recreational Routes			
Toftingall Forest track	Medium	Medium	Moderate
Haul road to Mybster Substation	Medium	High	Major/moderate
Halsary Wind Farm access track - <i>northern edge within 1km</i>	Medium	High	Major/moderate
Halsary Wind Farm access track – <i>between approximately 1 and 2km</i>	Medium	Medium	Moderate
Halsary Wind Farm access track – <i>southern edge – 2km</i>	Medium	Low	Moderate/minor

6.6. Mitigation Measures

- 6.6.1. The project team have worked corroboratively as part of an iterative design process, to ensure that the baseline assessment of landscape features, character and visual receptors has influenced the design and indicative layout of the Proposed Development. This has resulted in a landscape and visual mitigation strategy that seeks to minimise the landscape and visual effects of the proposed scheme and wherever possible, deliver landscape, visual, and ecological benefits.
- 6.6.2. All of the mitigation measures proposed are located within the red line of the application on land under an option and lease. Therefore, the measures can be secured through the development.
- 6.6.3. The key landscape and visual mitigation measures are shown on Figure 6.14 - Landscape Masterplan, and are summarised as follows:
- Provide a compact development area that minimises land take thus avoiding introducing landscape and visual effects over a broader area;
 - Provision of a substantial offset of approximately 700m from the nearest residential property to minimise potential effects on residential receptors;
 - Introduce an extensive buffer of new native woodland planting around the BESS compound that over time will screen views of the development and provide a biodiversity net gain;
 - The battery units will be coloured green to help assimilate the development into its setting; and
 - Motion activated security lighting will be angled downwards to avoid the need for permanent security lighting and to reduce light spill.
- 6.6.4. It is anticipated that the final landscape mitigation plan will be agreed through an appropriate planning condition.

6.7. Summary

- 6.7.1. This chapter presents the findings of the Landscape and Visual Impact Assessment (LVIA) and identifies the likely effects arising from the Proposed Development on landscape character and visual amenity. The assessment has been informed by field visits carried out on separate occasions at different times of the year.
- 6.7.2. The existing landscape and visual baseline has been documented and presented at Section 6.4, the assessment of effects on landscape character at Section 6.5 and the assessment of effects on visual amenity at Section 6.6. The assessment

has been supported by a photo record at figures 6.7 to 6.13 and a photomontage at Figure 6.15c that has been prepared in accordance with Landscape Institute technical guidance.

- 6.7.3. The Site is located approximately 17 kilometres (km) west of Wick, 1.9km south east of Spittal (at its nearest point) and 5.6km to the west of Watten in Caithness, The Highlands. With reference to the Screened Zone of Theoretical Visibility (SZTV) presented at Figure 6.2, a 3km Study Area was selected as a proportionate distance within which notable effects are most likely to be experienced.
- 6.7.4. There are no landscape designations or wild land areas located within the Study Area. The Site is located within the Sweeping Moorland and Flows landscape character type (LCT 134). The Farmed Lowland Plain landscape character type (LCT 143) crosses the northern part of the Study Area. The A9 trunk road (Latheron – Thurso) lies approximately 580m to the west of the main part of the site and the B870 connecting the A9 and Watten lies approximately 1.2km to the north. The nearest residential properties are a group of three properties along the A9 to the west and a group to the north along the B870.
- 6.7.5. The nearest core paths are Causeymire Wind Farm Core Path situated approximately 628m to the south south west, the Achanarras Quarry and The Old Quarry core paths are located approximately 1.9km to the north west and north. However, there is no predicted visibility from these routes. Other informal recreational routes comprise Halsary Wind Farm access tracks situated to the south of the Proposed Development, the Mybster Substation Haul Road leading south from the B870 to Mybster Substation and the forest track from the B870 leading to the Boat House at Loch Toftingall.
- 6.7.6. The Proposed Development would result in direct effects on a localised part of the landscape character type in which it is located. Indirect effects on the Farmed Lowland Plain landscape character type (LCT 143) would occur.
- 6.7.7. In relation to visual effects, it is accepted that the Proposed Development would be visible from a limited number of nearby locations as well as the surrounding road network and informal recreation routes. It has been assessed that there would be major/moderate visual effects at two of the seven representative viewpoints as summarised at Table 6.7. The assessment also found that major effects would also be experienced by one of the nearby residential properties and major/moderate effects from several sections of the nearby informal recreation routes.
- 6.7.8. A landscape masterplan is included at Figure 6.14 that over time will screen views of the Proposed Development resulting in all reported effects reducing.
- 6.7.9. Overall, although a very limited number of moderate to major visual effects have been identified, they would be highly localised and only experienced from those locations closest to the Proposed Development within approximately 1km, with moderate to minor effects experienced from the A9.

7. Ecology

17.1.	Introduction.....	7-2
17.2.	Legislation, Policy and Guidance.....	7-2
17.3.	Baseline Methodology.....	7-2
17.4.	Baseline Conditions.....	7-7
17.5.	Potential Ecological effects.....	7-16
17.6.	Compensation and Enhancements.....	7-19
17.7.	Summary.....	7-20

7. Ecology

7.1. Introduction

7.1.1. This Chapter of the Environmental Report (ER) considers the potential effects of the construction and operation of the Loch Toftingall Battery Energy Storage System (BESS) (the 'Proposed Development') on biodiversity features, including flora and fauna. It summarises the baseline conditions within the Site (defined as the area within the red line boundary) and its surroundings and the methods used to establish them. Where effects are identified, it outlines mitigation and / or compensation measures that will be implemented and how Biodiversity Net Gain (BNG) will be achieved.

7.1.2. Information about bird usage of the site and surrounds is presented in Chapter 8 – Ornithology.

7.1.3. The ER is supported by the following Appendices:

- Appendix 7.1: Bat Surveys; and
- Appendix 7.2: Outline Habitat Management Plan.

7.2. Legislation, Policy and Guidance

7.2.1. The assessment has taken account of relevant legislation, national and local planning policies and guidance. Reference is made throughout the document as appropriate.

7.3. Baseline Methodology

7.3.1. Baseline data were collected through a combination of desk study and site surveys in 2021 and 2022, with some supporting data collected in 2019 as part of an earlier scheme design. As part of the desk study information was obtained from the Highland Biological Recording Group¹ (HBRG) including on:

- Statutory designated sites up to 5 km from the Site boundary;

¹ Highland Biological Recording Group (undated). Available online at: <https://www.hbrg.org.uk/> (Accessed February 2023).

- Non-statutory designated sites up to 2 km from the Site boundary, including Ancient Woodland Inventory (AWI) sites; and
- Records of protected and priority species (as well as invasive non-native species) up to 5 km from the Site boundary.

7.3.2. Site survey methods are summarised below.

Habitat Surveys

Phase 1 Habitat Survey and National Vegetation Classification Survey

7.3.3. Phase 1 Habitat Surveys based on standard methods² were undertaken in September and October 2021 encompassing all accessible land within the site boundary. The Phase 1 Habitat Survey was undertaken for a wind farm with a wider footprint and therefore information was collected in a wider area surrounding the Site (Figure 7.3). National Vegetation Classification (NVC) surveys were undertaken at the same time in locations identified by the Phase 1 Habitat Survey. The NVC Survey involved mapping distinct areas of homogenous vegetation and recording detailed descriptions of the vegetation communities, with reference to published community descriptions^{3,4,5}.

7.3.4. Wetland habitats were identified in accordance with the habitat's descriptions given in 'A Functional Wetland Typology for Scotland' guidance⁶. As part of the NVC survey, any wetland habitats were evaluated in terms of their potential to be groundwater-dependent terrestrial ecosystems (GWDTEs). This was done based on the hydrogeological setting of each NVC community identified, and with reference to Scottish Environment Protection Agency (SEPA 2017) guidance,^{7,8} modified from the United Kingdom Technical Advisory Group (UKTAG) list of NVC communities and associated groundwater dependency scores.

7.3.5. GWDTE potential was scored as low, moderate or high following SEPA (2017). Where habitat mosaics contained significant proportions of habitats with different

² JNCC (2010) Handbook for Phase 1 Habitat Survey: A technique for environmental audit. 5th Edition

³ Rodwell, J. S (ed.) (1991 et seq.). British Plant Communities. Vol 1–5. Cambridge University Press

⁴ Elkington, T., Dayton, N., Jackson, D. L. and Strachan, I. M. (2001). National Vegetation Classification: Field Guide to Mires and Heaths. Joins Nature Conservation Committee, Peterborough

⁵ Averis, B., Birks, J., Horsefield, D., Thompson, D. and Yeo, M. (2004). An Illustrative Guide to British Upland Vegetation, JNCC, Peterburgh

⁶ SNIFFER (2009) WFD95: A Functional Wetland Typology for Scotland – Field Survey Manual. Version 1.

⁷ SEPA 2017 Groundwater | Scottish Environment Protection Agency (SEPA) (accessed August 2023)

⁸ SEPA (2009) Land Use Planning Systems SEPA Guidance Note 4 Planning Guidance on on-shore windfarms developments [Online] Available at: <https://www.sepa.org.uk/media/136117/planning-guidance-on-on-shore-windfarms-developments.pdf> (Accessed April 2023).

GWDTE potential, these were given a split score (e.g. Low-Moderate). Where the wetland habitat present was peat-based (e.g. a blanket bog or modified bog habitat), the habitat was classed as 'peatland' rather than assigning a GWDTE potential, as these ombrogenous mire types are predominantly rainwater fed rather than groundwater dependent.

Protected Species Surveys

7.3.6. In line with NatureScot guidance⁹, Protected Mammal Surveys were carried out between April and October 2022. Lead Surveyors were members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and experienced in undertaking protected species surveys; as per CIEEM's Competency Framework¹⁰. The surveys focused on species most likely to be encountered based on their desktop records and current range¹¹, habitats identified from the Phase 1 habitat survey and professional judgement. Methodologies and survey areas relating to different species types are listed below. Survey areas are shown in Figure 7.4, except for bats that are shown in Figure 7.5.

Badger

7.3.7. The survey area included potentially suitable habitats in and up to 100 m from the site. The survey included a search for paths, snuffle holes, feeding signs, scratching posts, latrines (dung pits used as territorial markers), prints and guard hairs¹² and setts^{13,14}.

Otter

7.3.8. The survey area for otters comprised sections of suitable watercourses up to 200 m from the Site.

⁹ NatureScot (2021) Protected Species Advice for Developers. Guidance on Planning and Protected Animals [Online] Available at: <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species> (Accessed April 2023).

¹⁰ CIEEM. (2021) Competency Framework. Chartered Institute of Ecology and Environmental Management [online]. Available at: <https://cieem.net/wp-content/uploads/2022/01/Competency-Framework-2022-Web.pdf> (accessed February 2023).

¹¹ The Mammal Society (2020) Atlas of the Mammals of Great Britain and Northern Ireland. Exeter: Pelagic Publishing.

¹² NatureScot (2020) Protected Species Advice for Developers: Badger. Available at <https://www.nature.scot/species-planning-advice-badger> (accessed February 2023).

¹³ Harris, S., Cresswell, P., and Jefferies, D. (2022) Surveying Badgers. An occasional publication of the mammal society – No.9. The Mammal Society: London.

¹⁴ Scottish Badgers (2018). Surveying for Badgers: Good Practice Guidelines (Version 1). Available at: <https://www.scottishbadgers.org.uk/> (accessed February 2023).

- 7.3.9. The survey included a search for spraint (droppings), prints, paths, slides and feeding remains¹⁵. The survey also included a search for structures or places used for shelter or protection¹⁶.

Water Vole

- 7.3.10. Water vole surveys focused on areas 50 m up and downstream of watercourses on the Site (eg Allt Eireannaich). The surveys recorded signs of droppings, prints, burrows, feeding stations, runs, 'nests', lawns of short vegetation around burrow entrances and suitable habitat¹⁷.

Pine Marten

- 7.3.11. The surveys focused on potentially suitable habitats in and up to 250 m from the Site and sought signs of pine marten such as dens, scats, sightings of the animal and prints surveys¹⁸. In September 2022, Bushnell Prime Trail cameras were installed at a single location along one of the rides where pine marten scats and pathways into the commercial forestry blocks had been identified (see Figure 7.4).

Bat Surveys

- 7.3.12. Bat Surveys were carried out between April and October 2022 with reference to NatureScot guidelines published in 2021¹⁹. The surveys/survey area were designed considering an earlier project design and therefore followed onshore wind guidance with the deployment of static detectors at historic turbine locations (as discussed in Section 3.3, Chapter 3: Alternatives and Scheme Evolution).
- 7.3.13. No Roost Surveys were carried out, as woodland areas on the Site which are dominated by conifer plantations of Sitka spruce and observations during the Phase 1 Habitat Survey recorded no potential roost features (PRF).

15 NatureScot (2020) Protected Species Advice for Developers: Otter. Available at: <https://www.nature.scot/species-planning-advice-otter>. Accessed February 2023.

16 Harris, S., and Yalden, D.W. (2008) Mammals of the British Isles; Handbook (4th edn). The Mammal Society: Southampton.

17 NatureScot (2020) Protected Species Advice for Developers: Water Vole. Available at: <https://www.nature.scot/species-planning-advice-water-vole>. Accessed February 2023.

18 NatureScot (2020) Protected Species Advice for Developers: Pine Marten. Available at: <https://www.nature.scot/species-planning-advice-pine-marten>. Accessed February 2023.

19 NatureScot. (2021) Bats and Onshore Wind Turbines: Survey, Assessment And Mitigation [online]. Available at: <https://www.nature.scot/sites/default/files/2021-08/Bats%20and%20onshore%20wind%20turbines%20-%20survey%2C%20assessment%20and%20mitigation_0.pdf> (Accessed December 2022)

- 7.3.14. Two full spectrum Anabat Swift bat detectors (hereby referred to as Anabats), were deployed along rides in the plantations (see Figure 7.5) to assess species assemblage and activity levels. They were secured to 1m high posts for a period of ten consecutive nights (see below). The Anabats were set to record from approximately half an hour before sunset until approximately half an hour after sunrise.
- Survey Session 1: 14th April- 28th June (Spring);
 - Survey Session 2: 21st July- 3rd August (Summer); and
 - Survey Session 3: 6th September- 27th October (Autumn).
- 7.3.15. The two detectors were located for the previous wind farm development and the location of one of the two detectors was outside the BESS Site boundary (Figure 7.5). However, the locations were in the same conifer plantation as the Site and were considered to be representative of the coniferous woodland plantation and edge habitat which will be lost to allow for construction of the BESS.
- 7.3.16. To correct for temporal bias in levels of bat activity, the data were interpreted using the Bat Activity Index (BAI). BAI was calculated for each location by dividing the number of recorded Anabat files (expressed as passes) by the total number of sampling hours (between 0.5 hours before sunset to 0.5 hours after sunrise), to provide the mean number of bat passes per hour (pph). The mean BAI for each survey session recorded across both locations was calculated by dividing the number of recorded Anabat files (combined from both locations) by the total number of detector hours per session (total session sampling hours multiplied by number of detectors). The mean BAI across the survey season, for example BAI per species, was calculated by dividing the number of recorded Anabat files across the season per species, by the total number of detector hours across the total season (sampling hours multiplied by number of detectors).

Herptofauna Surveys

- 7.3.17. Habitats present onsite were assessed for their suitability for reptiles and amphibians, based on the findings of the desk study, the Phase 1 Habitat Survey and observations during walkovers for other protected species. Suitable habitats were then searched for signs of reptiles and amphibians, following best practise guidance²⁰. This included a search of the Site for individual reptiles basking in the open, and a search under natural refugia present onsite such as logs and stones.

²⁰ NatureScot (2020). Species Planning Advice: Reptiles [Online]. Available at NatureScot (2020). Species Planning Advice: Reptiles [Online]. <https://www.nature.scot/doc/standing-advice-planning-consultations-reptiles-adder-slow-worm-common-lizard> (Accessed February 2023)

Due to the majority of the site comprising coniferous woodland plantation and wet modified bog, placement of artificial refugia was not undertaken.

- 7.3.18. Only one waterbody was present on the Site (along the access road corridor, but not affected by the road alignment), however, this was found to be dry at the time of survey over the summer months (July / August).

Limitations

- 7.3.19. Due to the dense nature of the plantation forestry, surveyors could not access the full extent of the woodland. In addition, due to health and safety reasons, it was not possible for surveyors to access areas around wind-blown trees, steep ground and wetland areas (including boggy ground). Therefore, there is potential for signs of protected species activity to have been missed in these areas. However, inaccessible areas were generally small and the perimeters around them were surveyed (with binoculars where necessary) for signs of any mammal paths. This constraint was not considered to have a significant effect on the evaluation of the use of the site by protected fauna species.
- 7.3.20. The Phase 1 habitat survey was undertaken late in the survey season, although this was not considered to have had significant effects on the surveys findings, given much of the habitat comprised coniferous plantations and wet modified bog and the experience of the surveyors.

7.4. Baseline Conditions

Designated Sites

- 7.4.1. Five statutory designated sites were recorded within 5km of the site; as shown in Figure 7.2. Information relating to these statutory designated sites is provided and summarised in Table 7.1. There are no non-statutory designated sites, or any records of Ancient Woodland Inventory (AWI) sites within 2km of the Site boundary.
- 7.4.2. Shielton Peatlands SSSI and Caithness and Sutherland Peatlands SAC, SPA and Ramsar are situated downslope of Loch Burn and are therefore hydrologically connected to the site.

Table 7.1: Statutory Designated Sites within 5 km

Name	Designation	Relevant Designated Features	Approximate Distance and Direction to Site
Caithness and Sutherland Peatlands	Ramsar ²¹	Bogs: Blanket Bog	1.5 km south-east.
	SAC ²²	Otter Acid peat-stained lakes and ponds Bogs: Blanket Bog Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels Depressions on peat substrates Marsh saxifrage (<i>Saxifraga hirculus</i>) Very wet mires often identified by an unstable 'quaking' surface Wet heathland with cross-leaved heath	
Shielton ²³ Peatlands	SSSI	Blanket Bog — This site has been well managed, with relatively little muirburn in the wetter areas where the hummock-forming species of bog moss <i>Sphagnum fuscum</i> and the nationally scarce <i>S. austinii</i> grow. Breeding bird assemblage — the blanket bog provides suitable habitat for a wide range of breeding birds of prey, waders and waterfowl, such as hen harrier, merlin, peregrine and short-eared owl.	1.5 km south-east.

21 NatureScot Site Link (2023). Caithness and Sutherlands Peatlands RAMSAR [Online]. Available at: <https://sitelink.nature.scot/site/8412> (Accessed February 2023)

22 NatureScot Site Link (2023). Caithness and Sutherlands Peatlands SAC [Online]. Available at: <https://sitelink.nature.scot/site/8218> (Accessed February 2023)

23 NatureScot Site Link (2023). Shielton Peatlands SSSI [Online]. Available at: <https://sitelink.nature.scot/site/1426> (Accessed February 2023)

Name	Designation	Relevant Designated Features	Approximate Distance and Direction to Site
		A range of wader and waterbird species breed on the site including dunlin, golden plover, greenshank, greylag goose and wigeon. The dubh lochans provide ideal breeding habitat for red-throated diver. Several pairs of Arctic skua also breed on the blanket bog.	
River Thurso ²⁴	SAC	Atlantic salmon (<i>Salmo salar</i>)	2.6 km west
Blar nam ²⁵ Faoileag	SSSI	Blanket Bog— Together with the adjacent Coire na Beinne Mires and Strathmore Peatlands SSSIs, Blar nam Faoileag forms part of the largest expanse of actively growing blanket bog in Britain. The site consists almost entirely of blanket bog, with numerous dubh lochans.	3.3 km south-west
Loch Watten	SSSI ²⁶	Base-rich loch Open water transition fen	5.3 km north-east
	SAC ²⁷	Naturally nutrient-rich lakes or lochs which are often dominated by pondweed	

Protected and Priority Species

7.4.3. Records were obtained from HBRG. Table 7.2 provides a summary of recent (last 20 years) records of protected or priority species identified within 5km of the proposed BESS (Figure 7.2).

24 NatureScot Site Link (2023). River Thurso SAC [Online]. Available at: <https://sitelink.nature.scot/site/8368> (Accessed February 2023)

25 NatureScot Site Link (2023). Blar nam Faoileag SSSI [Online]. Available at: <https://sitelink.nature.scot/site/229> (Accessed February 2023)

26 NatureScot Site Link (2023). Loch Watten SSSI [Online]. Available at: <https://sitelink.nature.scot/site/1068> (Accessed February 2023)

27 NatureScot Site Link (2023). Loch Watten SAC [Online]. Available at: <https://sitelink.nature.scot/site/8304> (Accessed February 2023)

Table 7.2: Records of Protected and Priority Species within the DSA

Species	Conservation Status	Closest Record from Site (approximate)
Water vole (<i>Arvicola amphibious</i>)	WCA ⁷ , SBL ²¹ , LBAP	0.8 km north-east
Otter (<i>Lutra lutra</i>)	HR, SBL	0.6 km north-west
Pine Marten (<i>Martes martes</i>)	WCA ⁷ , SBL, LBAP	3.5 km west
Mountain Hare (<i>Lepus timidus</i>)	WCA, SBL, LBAP	2 km south-west
Hedgehog (<i>Erinaceus europaeus</i>)	WCA, SBL, LBAP	4.2 km west
Common Lizard (<i>Zootoca vivipara</i>)	WCA, SBL	4.8 km south-east
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	HR, SBL, LBAP	1.5 km south-east
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	HR, SBL, LBAP	5.1 km north-west

Habitats

- 7.4.4. Habitat on the main part of the Site was predominantly coniferous woodland plantation, with areas of blanket bog in the rides and occasional watercourses with marshy grassland along their margins in places (Figure 7.3). The access road runs through an area of wet modified bog. Habitats adjacent to the Site are largely similar, but with an area of felled plantation to the north and small areas of flushes in the wet modified bog to the west.

Coniferous Plantation

- 7.4.5. The commercial conifer plantation was dominated by dense mature Sitka spruce (*Picea sitchensis*), with occasional Norway spruce (*Picea abies*) present throughout the stands. There was little or no ground flora, except in the open rides, where blanket bog remained (see below). Trees along the edge of recently felled areas that adjoin the Site to the north were subject to wind-blow. The plantation is approximately 40 years old and due to be felled between 2026 and 2030.

Wet Modified Bog

- 7.4.6. The wet modified bog was likely blanket bog habitat that had been planted with conifers and the trees recently felled. The felling has allowed the underlying bog habitat to start regenerating naturally. There was evidence of draining, grazing and trampling and Sitka Spruce regeneration was occurring throughout. Species present included hare's-tail cotton-grass (*Eriophorum vaginatum*), purple moor grass (*Molinia caerulea*), wavy hair grass (*Deschampsia flexuosa*), cross leaved heath (*Erica tetralix*), tormentil (*Potentilla erecta*) and Yorkshire fog (*Holcus lanatus*), with some Sphagnum papillosum. In places on waterlogged substrates there were areas of soft rush, star sedge, and lesser spearwort (*Ranunculus flammula*).

Blanket Bog

- 7.4.7. Species poor blanket bog occurred in the open rides throughout the coniferous woodland (Figure 7.3). It was dominated by *Sphagnum capillifolium*, *Sphagnum papillosum*, and hare's tail cotton grass (*Eriophorum vaginatum*), with infrequent heather (*Calluna vulgaris*) and tufted hair grass (*Deschampsia flexuosa*). These areas showed some signs of modification through drainage and presence of Sitka spruce saplings.

Watercourses

- 7.4.8. There are eight streams associated with Loch of Toftingall in the Wick River catchment, these all flow directly into the loch. Only Allt Eireannaich lies within the Site boundary. It flows west to east through the main part of the Site into Loch of Toftingall and at the time of the survey visit comprised a wet channel blocked by vegetation.

Marsh / Marshy Grassland

- 7.4.9. This habitat was recorded on the Site along some parts of the banks of Allt Eireannaich (see Figure 7.5) on waterlogged substrates and was dominated by sedges and rushes including star sedge (*Carex echinata*), common sedge (*Carex nigra*), soft rush (*Juncus effusus*) and jointed rush (*Juncus articulatus*), with velvet bent grass (*Agrostis canina*) and purple moor grass (*Molinia Caerulea*), and herbs such as tormentil (*Potentilla erecta*), marsh bedstraw (*Galium palustre*), marsh thistle (*Cirsium palustre*) and lesser spearwort (*Ranunculus flammula*).

Acid / Neutral Flush in Wet Modified Bog

- 7.4.10. Acid flush habitats (priority habitats on the Scottish Biodiversity List) totalling 1.8 ha were recorded amongst wet modified bog habitats to the west of the Site (Figure 7.3). They comprised typically a sward of star sedge, soft-rush, hairy woodrush (*Luzula acuminata*), cross-leaved heath, Yorkshire fog, sweet vernal grass (*Anthoxanthum odoratum*), tufted hair grass (*Deschampsia cespitosa*), bog asphodel (*Narthecium ossifragum*), tormentil, sneezewort (*Achillea ptarmica*), marsh willowherb (*Epilobium palustre*), and a ground layer of *Sphagnum capillifolium*, and *Sphagnum papillosum*.
- 7.4.11. Several areas of wetland habitats were identified by the Phase 1 Habitat Survey and were subject to more detailed NVC surveys and the following communities were confirmed, often close to watercourses (Figure 7.3):
- M25 *Molinia caerulea* – *Potentilla erecta* tussocky grassland and occasional M23b rush pastures (sub-community with lower forb abundance) in the areas of wet modified bog;
 - M20 *Eriophorum vaginatum*-blanket and raised mire, which is typically species poor and has resulted from factors such as grazing pressure and is

of less nature conservation value than the bogs from which it has been derived;

- M23 rush pastures, and M6 Carex echinata – Sphagnum recurvum / auriculatum mire;
- M23b rush pasture with Juncus effusus sub-community;
- M6c Carex echinata-Sphagnum fallax/denticulatum mire and acid flush, with Juncus effusus sub-community.

Groundwater Dependant Terrestrial Ecosystems (GWDTE)

7.4.12. The below table summarises ground water dependency for the NVC communities (Figure 7.3)

Phase 1 habitat	NVC community	Potential groundwater dependency
Blanket Bog	M20	Low
Wet Modified Bog	M25/M23b	M25 (Moderate) M23b (Low)
Acid Flush/Spring	M6c	High
Marshy grassland	M6c, M23b	High

7.4.13. The areas of high / moderate potential groundwater dependant habitats included the flushes, sedge and rush dominated mires adjacent to the Site to the north west and along Allt Eireannaich and an associated tributary.

7.4.1. As the Site comprises existing and felled coniferous forestry plantation, the drainage regime has been affected by artificial drainage and hence in these areas much of the habitat has become rain fed rather than being supported by groundwater (Chapter 11).

Protected Species

7.4.2. The following sections summarise the findings on protected fauna species which are illustrated in Figure 7.4. Detailed findings on bats are presented in Appendix 7.1. No flora species of conservation concern were recorded.

Badger

7.4.3. No evidence of badger was recorded by the surveys (during either the Phase 1 survey or subsequent protected species surveys) and this aligned with the absence of records from the Desk Study. The majority of the Site consisted of enclosed conifer plantation, whereas they are most commonly associated with

deciduous woodland, arable farmland and intensive grassland²⁸. The underlying wet conditions throughout are generally unsuitable for badgers that require drier ground for sett creation.

Otter

- 7.4.4. Otter is known to occur on Loch Toftingall and connecting tributaries to the north and south (Figure 7.2). Whilst the loch is suitable for otters, supporting wild brown trout, eels and lampreys, and with rocky habitat and grassy banks around its margins, Allt Eireannaich, that runs through the centre of the Site is unsuitable for otter foraging or commuting. It lacks any flow, has been degraded by forestry activity, is blocked by vegetation and would not support key fish prey species. No signs of otter were recorded during the surveys.

Water Vole

- 7.4.5. Allt Eireannaich and its tributaries are unsuitable for water vole as it has been heavily modified and degraded by commercial forestry activity. The stream is blocked in sections by vegetation, with no flow and unsuitable bank profiles.

Pine Marten

- 7.4.6. Pine marten was confirmed in the western part of the Site through camera trapping (two images and three videos – see Photograph 1). However, whilst they may move through and forage across the Site, it is unsuitable for den building. The ground under the conifer woodland was extremely waterlogged and the trees lacked natural holes / crevices.

²⁸ Rainey, E., Butler, A., Bierman, S., and Roberts, A.M.I. (2009) Scottish Badger Distribution Survey 2006 – 2009: estimating the distribution and density of badger main setts in Scotland. Scottish Badgers and Biomathematics and Statistics Scotland

Photograph 1 – Trail Camera Image of Pine Marten in Forest Ride



Red Squirrel

- 7.4.7. No evidence of red squirrel was recorded during the surveys or from historical data. Whilst there are large stands of conifer plantation across the Site, they comprise evenly aged monocultures of Sitka spruce, which do not provide great seed diversity²⁹. Red squirrels prefer habitats with a mixture of tree species which provide a more reliable food resource. In addition the site is bordered by wet modified bog to the south and west and areas of felled conifers to the north, all of which reduces connectivity for squirrel with surrounding forest habitats.

²⁹Forestry Commission (2023) Red Squirrels and forestry operations in England- operations note 65 available from : Red squirrels and forestry operations in England - operations note 65 - GOV.UK (www.gov.uk)

Wildcat

- 7.4.8. There were no records of wildcat during the surveys and no records from the desk study. Wildcats prefer a mosaic of habitats, including moorland and woodland, for denning and foraging³⁰, however, the coniferous woodland on site lacked natural denning features, such as hollow trees or rocky outcrops, and was characterised by wet and boggy understory which would not provide dry denning opportunities at ground level, such as fallen dead wood³¹.

Bats

- 7.4.9. The conifer plantations were assessed as having limited suitability for roosting bats with no potential roost features.
- 7.4.10. Data from static detectors located on and north of the Site boundary (see Figure 7.5) differed with no activity recorded at Location B on the Site boundary. Overall, bat activity within the conifer plantation was low with a mean Bat Activity Index (BAI) of 0.81 passes per hour (pph), equating to one bat every 1h 14 min. Of the activity recorded, the majority (98.1%) was attributed to common pipistrelle, a common and widespread species in Scotland and the Highlands. The remaining activity was attributed to Nathusius' pipistrelle, which is scarce in this area of Scotland³² and brown long-eared bat a widespread species (excluding exposed islands)³³. All bat species in the UK are protected species.
- 7.4.11. The Ecobat assessment³⁴, found that bat activity across the two survey locations varied between the low activity category (0-20th median percentiles) and the low to moderate activity category (21st- 40th median percentiles). As noted above there was no activity recorded at Location B.

Reptiles

- 7.4.12. The habitats on the Site were varied in suitability for reptiles. Reptiles require structurally diverse habitats of vegetation of different heights and composition to

30 NatureScot (undated) Guidance – Wildcat Survey Methods. Available at: <https://www.nature.scot/doc/guidance-wildcat-survey-methods> (Accessed February 2023)

31 FCS Guidance Note 35d: Forest operations and wildcats in Scotland

32 NatureScot. (2021) Bats and Onshore Wind Turbines: Survey, Assessment And Mitigation [online]. Available at: https://www.nature.scot/sites/default/files/2021-08/Bats%20and%20onshore%20wind%20turbines%20-%20survey%2C%20assessment%20and%20mitigation_0.pdf (Accessed December 2022)

33 NBN atlas Scotland Available from : Chiroptera : Bat | NBN Atlas Scotland

34 <http://www.ecobat.org.uk/about-ecobat>

manage thermoregulation³⁵. Typically, structured moorland can provide suitable foraging, refuge and hibernacula opportunities for reptiles. However, with monoculture conifer plantation and the subsequent clear-felling, the habitats become more structurally simplistic, lacking microhabitats and microclimates favoured by reptiles. Moreover, strong winds can have a negative impact on reptiles' ability to regulate their body temperatures, and clear-fell habitats in the uplands typically have strong winds with little shelter. The areas of wet modified bog in the southern parts of the Site could provide suitable foraging and hibernating potential for species such as slow-worm, common lizard and adder should they be present within the area. No reptiles were observed during surveys and during checking of natural refugia, however, it is assumed that they may occur in the wet modified bog areas.

Other Species

- 7.4.13. Several common frogs were seen along the wet forest rides on Site during the surveys.

7.5. Potential Ecological effects

- 7.5.1. The assessment considers effects from the Proposed Development on biodiversity (excluding birds) both on the Site and in the surrounds. The assessment takes account of the Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Chartered Institute of Ecology and Environmental Management (CIEEM))³⁶. Examples of the potential effects considered, which may be positive or negative; are listed below.

- Loss of habitat or species of flora and fauna from permanent or temporary land take.
- Disturbance to, or displacement of a species from the Project site because of permanent or temporary land take.
- Impacts to adjacent habitats (and the species that use them) that are not directly required for construction or operation (e.g. through movements of vehicles and site personnel, lighting, dust, noise and vibration, discharges to water, alteration to drainage regimes).

³⁵ Edgar, P., Foster, J. and Baker, J. (2010). Reptile Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth.

³⁶Chartered Institute of Ecology and Environmental Management (2022) Guidelines for Ecological Impact Assessment in the UK and Ireland. Available at : [ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf](#) (cieem.net)

- Fragmentation of habitat or severance of ecological corridors (such as watercourses).
- Creation of new habitat and the introduction of species as a result of the reinstatement works and landscaping.

7.5.2. The assessment relies on input from other technical disciplines (eg hydrology (Chapter 11)) to provide the basis for assessing effects on biodiversity features.

7.5.3. The following sections present an assessment of the significance of the residual effects that takes account of the design and best practice measures committed to by the Project and other mitigation measures.

7.5.4. A pre-construction check survey will be undertaken across the Project site prior to any works commencing to allow the status of the site to be reviewed and determine whether there have been any significant changes. Any signs of fauna species would be recorded and the need for any survey updates considered.

Residual Effects on Designated Sites

7.5.5. The nearest designated sites are approximately 2 km to the south-east of the Site and will not be affected either directly, or indirectly by construction or operation of the Proposed Development.

Residual Effects on Habitats

7.5.6. The Proposed Development will result in the direct loss of approximately 23 ha of coniferous woodland plantation, of which approximately 1 ha will be permanently lost for the BESS infrastructure and 0.3 ha of wet modified bog will be lost for the construction of the access road. The remaining areas will comprise a mix of land to be restored back to peatland habitats, another habitat type created, or to be replanted with commercial conifer plantation.

7.5.7. The conifer plantation is a commercial plantation and was, in any event, due to be felled between 2026 and 2030. Its loss is not significant. The area of modified wet bog has resulted from the felling of other parts of the commercial forestry plantation in the area. Whilst it is starting to regenerate, it is still heavily modified and the loss of 0.3 ha is not predicted to be significant. The habitat management proposals will seek to create new areas of peatland habitat to offset the losses of the small areas of the wet modified bog and coniferous forest (see Appendix 7.2).

7.5.8. Existing peatland habitats will either be retained (eg species poor blanket bog along the wet forest rides on the Site, wet modified bog adjacent to the access road), or are adjacent to the Site (eg blanket bog and acid flush and wet modified bog adjacent to the Site). Measures will be implemented to avoid significant effects on these habitats during construction (eg marking / fencing off these areas to avoid incursions and prevent compaction by construction machinery and personal, contain surface run-off and control discharges after attenuation, prevent

spillages - see Outline Water Construction Environmental Management Plan (OWCEMP)).

- 7.5.9. Once operational significant effects on surrounding habitats are not predicted. Measures will be in place to control effects of surface run-off from roads and a long-term drainage strategy will be agreed with The Highland Council and SEPA to allow attenuated discharge of run-off into the Allt Eireannaich via collection in an attenuation basin which connects to the watercourse by a swale (see Chapter 11). The Allt Eireannaich was heavily vegetated with little, or no flow in it, so a discharge of treated water (under licence from SEPA) is predicted to improve the value of the watercourse and will help improvements to the watercourse along with the other restoration measures that will be implemented (see Outline Habitat Management Plan).

Residual Effects on Fauna Species

- 7.5.10. The Site is unlikely to support many fauna species with survey evidence only of foraging pine marten (a protected species), with no suitability for dens and common frog, a common and widespread species. Bats are known to forage along the rides in the conifer plantations to the north, although the detector on the Site boundary recorded no activity. No roosting opportunities for bats were identified during surveys. It is likely some common reptile species occur.
- 7.5.11. Clear felling on the Site during construction will not fragment the woodland for foraging pine martens, as the blocks to be felled are on the edge of the current plantation. The clear felling will be undertaken gradually to avoid removal of the whole area as a potential food resource in a few days. New areas of commercial conifers will be planted to the north of the BESS and broadleaved trees around it, that will provide future foraging opportunities for pine martens.
- 7.5.12. Felling work will be undertaken at times when bats will not be active to avoid any effects on them whilst foraging or commuting. Given the absence of activity recorded on the northern edge of the Site, significant effects on foraging habitat are not predicted. The blocks to be felled are on the edge of the plantation, as the habitat to the west and south comprises areas of open wet modified bog and part of the area to the north has been felled recently. Hence the loss of the conifers is unlikely to have significant effects on commuting routes. Works at night are not expected, but any lighting required during the hours of darkness will be designed to avoid spill into surrounding areas and be of a type that is likely to reduce the risk of effects on foraging / commuting bats, especially light sensitive species such as brown long-eared bats. The design of the operational scheme will incorporate similar concepts to avoid effects on bats in the longer term, given the proposals for new tree planting around the new facility, to the north of it and along the Allt Eireannaich.
- 7.5.13. Loss of habitat for some common reptile species is expected where the access road is created through the modified wet bog. A method statement will be drawn up and implemented to avoid effects. Blanket bog along the wet forest rides will

be retained and hence significant effects on common amphibian species during construction are not predicted.

7.6. Compensation and Enhancements

- 7.6.1. The Proposed Development includes compensation for habitats lost and further enhancements as part of fulfilling the requirement of National Planning Framework 4 (NPF4) Policy 3 that “*development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats*”. The new habitats will provide opportunities for fauna species.
- 7.6.2. The habitat losses due to the Proposed Development are predominantly of commercial conifer plantation of little nature conservation value (see Section 7.5). The creation of new peatland habitat such as good quality blanket bog (a priority habitat on the Scottish Biodiversity List and an Annex I habitat type), that is of much greater nature conservation importance than the habitat lost, will not only compensate for the Site losses, but also generate significant enhancements / biodiversity gain, in keeping with the above policy.
- 7.6.3. A large part of the Site (approximately 10 ha) will be managed to restore blanket bog. This will form part of a mosaic of habitat with areas of natural regeneration and native deciduous tree planting around the BESS, linking via the attenuation basin and the discharge swale, with the Allt Eireannaich watercourse and its areas of new riparian planting. In addition to the benefits on the Site, these habitats will complement the habitat management approach associated with the nearby Halsary Wind Farm.
- 7.6.4. Where the peatland is to be restored, measures will be included to avoid effects on the underlying peat during the tree felling / removal process. Restoration of the habitat will commence as soon as possible after felling, not only to help achieve the creation of the blanket bog as soon as possible, but also to reduce the carbon emissions. The approach will require removal of the ridge and furrow pattern created by the tree planting, smoothing of the land and raising of the water table. Removal of regenerating conifers is important also and hand-clearance may be required. In areas where peat will be permanently developed (eg for the BESS), soils / turves will be excavated, stored and used in the creation of new habitats, infilling of furrows *etc* in line with the OPMP. The approach will seek to programme restoration works to avoid back-tracking over habitat and peat restoration areas.
- 7.6.5. Further surveys will be undertaken prior to the habitat management works commencing, to confirm the exact measures and the extent of the intervention that is required. This will be easier post felling, when the cleared grounds allow a better visualisation of the drainage, slopes *etc*. The surveys will check also the existing habitat types along the Allt Eireannaich watercourse and its corridor and confirm where new riparian planting should be established along its margins, including areas of W4 (*Betula pubescens-Molinia caerulea* woodland) to complement the approach on the Halsary WF site and other typical wetland tree species such as downy birch; goat willow and alder.

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- 7.6.6. Various water features will be created as part of the drainage strategy and opportunities will be sought to create habitat that will provide biodiversity value including for fauna species, link the habitat creation around the BESS and the riparian planting along the Allt Eireannaich and combine the clearance of the vegetation in the watercourse channel with the use the drainage discharges to provide beneficial increases in flow in the river to benefit local biodiversity.
- 7.6.7. Deer fencing will be provided to prevent grazing and help surface vegetation become established.
- 7.6.8. Further details are provided in the Outline Habitat Management Plan (oHMP) (Appendix 7.2) and details about the removal of the trees is contained in Chapter 5 (Forestry).

7.7. Summary

- 7.7.1. The Proposed Development will result in the loss of predominantly commercial conifer plantation of low biodiversity value with a small area of modified wet bog. Few fauna species were recorded using the Site, with only foraging pine marten and common frog recorded. It is likely that the modified wet bog habitat is used by common reptile species and bats may forage across the Site. No significant residual effects are predicted on either habitats, or flora / fauna species. The habitat management proposed will replace the lost habitats with a range of new habitats of much greater nature conservation value including good quality blanket bog a priority and Annex I habitat type, native deciduous tree planting, water features as part of the drainage strategy and improvements to the Allt Eireannaich watercourse through clearing of excessive vegetation in the channel, riparian planting and increased water flow. /wherever possible measures proposed will complement the approach in the adjacent Halsary Wind Farm. Overall, the Proposed Development will result in a significant biodiversity gain.