A0 Preface

A0.1 Environmental Statement Addendum & Other Planning Documents

This Environmental Statement (ES) Addendum is provided in support of an existing application (07/00263/S36SU) for consent under Section 36 of the Electricity Act 1989, made by SSE Generation Ltd ("the Applicant"), to construct and operate a wind farm at Strathy South forest block (hereafter referred to as Strathy South), near Strathy in Sutherland.

The original application remains undetermined pending receipt of additional environmental information as requested by stakeholders in relation to a number of specific matters arising through the application consultation process. To address these matters and to further reduce environmental impact, the Applicant has made some modifications to the original proposals.

This ES Addendum is submitted by the Applicant, SSE Generation Ltd (SSEG), holder of a generation licence. This ES Addendum has been prepared, on behalf of the Applicant, SSEG, by SSE Renewables Developments (UK) Ltd, to address the matters raised by consultees and to report on the changes to the environmental assessment resulting from the modifications made to the scheme.

The ES Addendum comprises four volumes:

- Volume A1: Non-technical Summary (NTS)
- Volume A2: Main Report
- Volume A3: Figures
- Volume A4: Technical Appendices

A design statement is included as Technical Appendix A4.2 to the ES Addendum. Additional documentation that will be submitted includes:

- Planning Statement;
- Access Route Review; and
- The Highland Council Visualisations[1]

A0.2 Notification

The ES Addendum, will be publicised in accordance with Regulation 14A of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (as amended).
The ES Addendum and associated documents will be available for viewing at the following locations:

The Highland Council Headquarters
Glenurquhart Road
Inverness
IV3 5NX

The Highland Council
Drummuie
Golspie
KW10 6TA

Bettyhill Service Point
NTC
Bettyhill
KW14 7SS

Thurso Library
Davidson's Lane
Thurso
KW14 7AF

[1] Submitted to The Highland Council only.

An electronic version of the submission documents, including the ES Addendum, will be available to download from The Highland Council's 'ePlanning' portal[2].

This document is available at a cost of £450 in hard copy format (including postage and packaging) or on DVD (price £10). Paper copies of the Addendum NTS are available free of charge, on request. Requests for copies of the ES Addendum or Addendum NTS should be made to:

For the attention of Jamie Watt
SSE Renewables Developments (UK) Ltd
200 Dunkeld Road
Perth
PH1 3AQ

Tel 01738 457315

Email: jamie.watt@sserenewables.com
The ES Addendum has been advertised by the Applicant in the following publications:

- The Edinburgh Gazette (in two successive weeks); and
- The Northern Times (in two successive weeks)

A0.3 Commenting on this Development

Any comments you would like to make on this development should be made to the Energy Consents and Deployment Unit at the Scottish Government by email to representations@scotland.gsi.gov.uk or by post to:

Energy Consents and Deployment Unit
Scottish Government
4th Floor
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

Representations should be dated. Please include your full name and full return email or postal address.

A0.4 Fair Processing Notice

The Scottish Government Energy Consents and Deployment Unit process applications under The Electricity Act 1989. During the consultation process letters of representation can be sent to Scottish Ministers in support of or objecting to these applications.

Should Scottish Ministers call a Public Local Inquiry (PLI), copies of these representations will be sent to the Directorate of Planning and Environmental Appeals for the Reporter to consider during the inquiry. These representations will be posted on their website with personal email address, signature and home telephone number redacted (blacked out).

Copies of representations will also be issued to the developer on request, again with email address, signature and home telephone number redacted.

You can choose to mark your representation as confidential, in which case it will only be considered by Scottish Ministers and will not be shared with the Planning Authority, the developer, the Reporter (should a PLI be called) or any other third party.

[2] http://www.highland.gov.uk/yourenvironment/planning/eplanning

If you have any queries or concerns about how your personal data will be handled, please email the Energy Consents and Deployment Unit at: energyconsents@scotland.gsi.gov.uk or in writing to Energy Consents and Deployment, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU.

A1 Introduction

A1.1 Overview

In 2007, SSE Generation Limited (hereafter referred to as 'the Applicant') submitted an application to the Energy Consents and Deployment Unit of the Scottish Government (07/00263/S36SU) for Section 36 Consent, under the Electricity Act 1989, for a wind farm known as Strathy South, located near Strathy, in Sutherland (hereafter referred to as the Original 2007 Scheme) (Figure A1.1: Site Location). An Environmental Impact Assessment (EIA) was undertaken in relation to the proposed wind farm in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (the 'EIA Regulations'), as amended, and an Environmental Statement (hereafter referred to as 'the 2007 ES') was submitted alongside the application. The 2007 application remains undetermined pending receipt of additional environmental information as requested by stakeholders in relation to a number of specific matters arising through the application consultation process.

To address these matters and to further reduce environmental impact, the Applicant has made modifications to the Original 2007 Scheme and, in September 2012 confirmed their intention to produce an ES Addendum for the modified scheme (hereafter referred to as 'the Modified 2013 Scheme'). Therefore, this ES Addendum has been prepared to address the issues raised by consultees and to report on the changes to the environmental assessment resulting from the modifications made to the scheme. Much of the assessment reported within the 2007 ES is still relevant to the Modified 2013 Scheme. Therefore, this ES Addendum does not replace the 2007 ES; rather, the two documents should be read in combination. In all cases, the ES Addendum chapters report how the modifications to the Original 2007 Scheme have affected the conclusions of the 2007 ES (if at all).

This chapter outlines the development context of the scheme, the application details and provides information on the Applicant. This chapter additionally outlines the structure of the ES Addendum. Table A1.1 provides a complete list of the chapters contained within this ES Addendum.

A1.2 Legislative Context

The Applicant is making an application for Section 36 consent to the Scottish Government for permission to construct a wind farm, near Strathy, in Sutherland. The site is located within the Area Planning Office Boundary of The Highland Council (THC). EIA legislation in Scotland follows the 2011 EC Directive (No. 85/337/EEC), as amended, and, with regards to the Modified 2013 Scheme, is transposed into domestic law through the EIA Regulations.

A1.3 The Applicant

This ES Addendum is submitted by the Applicant, SSE Generation Ltd (SSEG), holder of a generation licence. This ES Addendum has been prepared, on behalf of the Applicant, SSEG, by SSE Renewables (UK) Limited, to address the matters raised by consultees and to report on the changes to the environmental assessment resulting from the modifications made to the scheme.

SSEG is a member of the SSE plc (formerly Scottish and Southern Energy plc) group. SSE plc is a FTSE-100 company, formed in 1998 from the merger of Scottish Hydro-Electric plc and Southern Electric plc. The company is headquartered in Perth, and employs around 20,000 people. Core activities include electricity generation, transmission, distribution and supply; gas storage, distribution and supply; the operation of a telecoms network; utility contracting; and electrical and gas appliance retailing. The company has a market capitalisation of around £10 billion, and supplies around 10 million energy customers in Great Britain and Ireland under the Scottish Hydro Electric, Southern Electric, Swalec, Atlantic and Airtricity brands. The Company is co-owner of Scotia Gas Networks, which owns and operates the 'Scotland' and

'South of England' regional gas distribution networks. The gas network business employs around a further 5,000 staff.

SSE's power generation assets total around 11,860 MW, comprising gas and oil-fired capacity; coal-fired capacity; and renewable (including pumped storage, hydro, wind and biomass) capacity.

SSE has over 20 onshore wind farms in operation totalling around 1,300 MW, with over 380 MW under construction and a further 550 MW with consent for development. SSE has also submitted for approval by the relevant planning authorities in the UK and Ireland proposals for onshore wind farms with a total capacity of over 500 MW.

In addition to its onshore capacity, SSE has offshore wind farm capacity in operation or under construction totalling almost 187 MW.

In all, SSE now has a portfolio of 3,240 MW of renewable energy capacity (onshore wind, offshore wind, hydro and dedicated biomass) in operation, under construction or with consent for development in the UK and the Republic of Ireland.

The Company has invested in emerging renewable energy technology and now has interests in companies developing and promoting tidal energy devices and domestic scale wind turbines and solar energy.

A1.4 The Environmental Statement Addendum

A1.4.1 Development Proposals Considered

The Original 2007 Scheme for the proposed Strathy South wind farm comprised 77 wind turbines with associated access tracks, sub-station, borrow pits, control building, construction compounds, anemometry masts and switching station.

The Modified 2013 Scheme has seen a number of changes to the layout presented in the Original 2007 Scheme. The Original 2007 Scheme proposed using a 2.3 MW wind turbine machine. However, a 3.4 MW wind turbine machine has been modelled as the worst case turbine for the proposed for the Modified 2013 Scheme, so that the layout has been developed to reduce the turbine density on site (whilst still delivering the required energy output) and the modifications have been made in order to achieve environmental benefit.

These are set out below:

- 30 turbines have been removed from the Original 2007 Scheme, leaving 47 turbines;
- One lay down area has been removed from the Original 2007 Scheme, leaving two lay down areas;
- Three borrow pits have been removed from the Original 2007 Scheme and two borrow pits have been combined to form only one, leaving four borrow pits;
- All of the remaining turbines have been slightly re-positioned to optimise their location and to take into consideration environmental constraints e.g. ornithology, areas of deep peat and archaeological assets;
- Turbine parameters have been modified for a tip height of up to 135 m, with a modelled tower height of up to 83 m and a modelled rotor diameter of up to 104 m; however the final turbine choice will ensure the tower and rotor combination is within a maximum tip height of 135 m; and
- The remaining network of on-site tracks has been rationalised to accommodate changes in the turbine layout.

Further details of the Modified 2013 Scheme are given in Chapter A4: Development Description.

Since the 2007 ES was submitted, Strathy North wind farm achieved planning consent in November 2011. In addition, a proposal has been submitted for scoping to ECDU for a new

wind farm called Strathy Wood, immediately north of the site. The location of these two wind farms in relation to the Modified 2013 Scheme are presented on Figure A1.2.

A1.4.2 Structure of the ES Addendum

This ES Addendum will address the issues raised by consultees and report on the changes to the environmental assessment resulting from the Modified 2013 Scheme, as they differ from the Original 2007 Scheme. The ES Addendum comprises four separately bound documents:

- Volume 1 - Non-technical Summary;
- Volume 2 – Environmental Statement Addendum (main report);
- Volume 3 – Figures (plans, illustrations and photographs); and
- Volume 4 – Technical Appendices.

The main report (i.e. this document) is structured as follows:

- Chapter A1: Introduction (this chapter) provides a brief introduction to the scheme, the Applicant and the structure of the ES Addendum and presents the rationale for the project;
- Chapter A2: Background: outlines the background to the proposed development in terms of renewable energy policy;
- Chapter A3: Site Selection outlines the modifications made to the Original 2007 Scheme and the evolution of the Modified 2013 Scheme;
- Chapter A4: Development Description provides a detailed description of the Modified 2013 scheme and outlines the principal elements involved in the construction, operation and decommissioning of the wind farm;
- Chapter A5: Environmental Impact Assessment sets out the broad method of approach that has been used in the EIA in order to present the ES Addendum for the Modified 2013 Scheme;
- Chapter A6: Site Context provides an overview of the existing locational and environmental context of the site;
- Chapter A7: Planning Context provides an overview of any changes in relevant climate change, renewable energy and planning policy framework, since the submission of the 2007 ES;
- Chapters A8-A16 contain the detailed technical assessments of the Modified 2013 Scheme, addressing the issues raised by consultees and reporting on the changes to the environmental assessment resulting from the modifications made to the Original 2007 Scheme. Individual chapters report how the modifications to the Original 2007 Scheme have affected the conclusions of the 2007 ES (if at all). In some cases it has been necessary to present a completely revised text – this is explained in the introduction section within the relevant chapters; and
- Chapter A17: Summary presents the overall findings and conclusions of the ES Addendum, with predicted impacts and mitigation measures, additional to those included in the 2007 ES.

To facilitate direct comparison the chapters of the ES Addendum are numbered to reflect the chapter numbers as in the 2007 ES. Figures and appendices are given the same treatment and all have an ‘A’ prefix to differentiate from the 2007 ES. As far as possible the structure of individual chapters mirrors those of the 2007 ES.

A1.4.3 The EIA Project Team

The Applicant has appointed a project team to prepare the ES Addendum. The members of the project team and the technical chapter for which they are responsible are presented listed in Table A1.1.

Table A1.1: Project Team		
Chapter Number	**Chapter Name**	**Author**
A0	Preface	ENVIRON
A1	Introduction	ENVIRON
A2	Background	ENVIRON
A3	Site Selection	ENVIRON/SSER
A4	Development Description	ENVIRON/SSER
A5	Environmental Impact Assessment	ENVIRON
A6	Site Context	ENVIRON/SSER
A7	Planning Context	Jones Lang LaSalle
A8	Landscape	ASH Design + Assessment
A9	Visual Assessment	ASH Design + Assessment
A10	Ecology	RPS and Waterside Ecology
A11	Ornithology	RPS
A12	Noise	Hayes MacKenzie Ltd
A13	Cultural Heritage	Catherine Dagg (independent consultant)
A14	Soil and Water	SLR Consulting and PlantEcol
A15	Traffic	Halcrow
A16	Other Issues	ENVIRON
A17	Summary of Mitigations	ENVIRON

A10 Ecology

A10.1 Introduction

This ES Addendum chapter provides an updated assessment of the ecological effects of the Modified 2013 Scheme following changes to the design, as described in Chapter A4 Development Description. The assessment in this chapter also takes into account updated baseline information for a number of ecological receptors as detailed in Section A10.4 Changes to Baseline Conditions. Updated mitigation and monitoring proposals are also provided in Sections A10.6 and A10.7. The assessment was undertaken by RPS.

The intention of this chapter is not to present an entirely new assessment of potential ecology impacts associated with the Modified 2013 Scheme, nor is it to re-present Chapter 10: Ecology of the 2007 ES and the accompanying drawings with amendments. Instead, it is intended to assess the potential significant effects arising from the Modified 2013 Scheme and highlight how the design and baseline changes would alter the original findings of the 2007 ES, in accordance with the requirements of Regulation 4, Schedule 4 of the EIA Regulations. For this reason it must be read in conjunction with Chapter 10: Ecology of the 2007 ES. Refer also to ES Addendum Chapter A1: Introduction and ES Addendum Chapter A4: Development Description.

Further to the above, this chapter refers to and should be read in association with the following documents:

- 2007 ES Chapter 10 Ecology and supporting Technical Appendices 10.1 – 10.2;
- 2007 ES Technical Appendix 14.4 Environmental Management and Pollution Prevention Plan;
- 2007 ES Technical Appendix 4.1 Landscape/Ecology Mitigation Strategy;
- ES Addendum Technical Appendix A11.2 Forest Clearance and Habitat Management (Report 2);
- ES Addendum Technical Appendix A14.1 Peat Landslide and Hazard Risk Assessment;
- ES Addendum Technical Appendix A4.1 Construction Environmental Management Plan;
- ES Addendum Technical Appendix A10.1 Ecology Specific Consultation Responses;
- ES Addendum Technical Appendix A10.2 Habitats, Vegetation and Protected Species;
- ES Addendum Technical Appendix A10.3 Habitats, Vegetation and Protected Species Confidential Annex;
- ES Addendum Technical Appendix A10.4 Assessment of Fish Habitats and Populations;
- ES Addendum Technical Appendix A10.5 Freshwater Invertebrate Survey; and
- ES Addendum Technical Appendix A10.6 Assessment of Impacts of Access Track Construction on the SAC (Reports 5 and 5b).

A10.1.1 Scope of Assessment

This ES Addendum chapter identifies and assesses the potential for significant effects to valued ecological receptors (VERs) as a result of changes to the Original 2007 Scheme, as presented in the 2007 ES. In addition, where a review of consultation responses has identified that further information, clarification or assessment would be valuable, this is provided.

A10.1.2 Project Interactions

As outlined in Chapter 10: Ecology, Section 10.2.1 of the 2007 ES:

"The development may interact directly with vegetation due to physical disturbance or removal, and indirectly by causing changes to habitat characteristics such as drainage.

The development may interact with mammal species directly due to disturbance or removal of habitat or collision damage, or indirectly by causing changes to habitat characteristics, in particular by introducing noise and movement."

Further to this, the potential key ecological interactions relating to the Modified 2013 Scheme are:

- Conservation status of habitats given the highest levels of statutory protection through inclusion in Annex I of The Habitats Directive[1] through direct and indirect habitat loss and disturbance;
- Conservation status of protected fauna species given the highest levels of statutory protection through inclusion in Annex IV of The Habitats Directive through habitat loss, disturbance and displacement;
- Conservation status of protected fauna species given statutory protection under UK law (e.g. Wildlife and Countryside Act 1981);
- Qualifying features of sites designated for nature conservation (Figure A10.1); and,
- Groundwater dependant terrestrial ecosystems protected under the Water Framework Directive[2];

A10.1.3 Study Area

The study area remains the same as that outlined in Chapter 10: Ecology, Section 10.2.2 of the 2007 ES for assessing ecological receptors in relation to the development with the following exceptions (as detailed in ES Addendum Chapter A4: Development Description):

- The exclusion from the assessment of any infrastructure associated with the previously consented Strathy North Wind Farm. This includes the access track from the A836 to the Strathy North Wind Farm entrance, and any existing infrastructure within this development.
- The exclusion from the assessment of the survey area and associated buffer zone relating to the proposed 2007 ES access track which runs via Cnoc Meala.
- The inclusion of a proposed new segment of access track running from the southern extent of the Strathy North Wind Farm infrastructure, linking with the existing forestry access track running through Strathy Wood to the northern boundary of Strathy South Forest. This section of proposed infrastructure includes a bridge crossing over the River Strathy. Two potential crossings are presented; a preferred crossing (western crossing) and an alternative crossing (eastern crossing).
- The inclusion of the existing forestry access track running from Strathy Wood to the northern boundary of Strathy South Forest through the Caithness and Sutherland Peatlands Special Area of Conservation (SAC).
- The inclusion of 4 x 33kV underground cable circuits connecting a proposed switching station within the Modified 2013 Scheme to the proposed Strathy North 132/33kV substation.
- Buffer zones surrounding protected mammal species and habitat survey areas have been amended as detailed in Table A10.3. Specifically, the mammal species survey buffer has been reduced from 500 m to 250 m and the habitats survey buffer has been reduced from 500 m to 100 m. These updated buffers are in line with other proposals and are deemed suitable to provide an adequate baseline of habitats and protected species with the potential to be affected by the Modified 2013 Scheme.

All components of the study area are presented in the respective habitat and protected species survey overview figures A10.2, A10.4, A10.6, A10.8, A10.10, and A10.12.

[1] Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora

[2] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

A10.1.4 Updated Scoping and Consultation

Reference should be made to the 2007 ES Chapter 10: Ecology, Section 10.2.3 and Table 10.1 for details on scoping and pre-application consultation, along with issues raised by the consultees during this process.

Details of consultation responses received following submission of the application for Section 36 Consent in March 2007 are given in Table A10.1 below.

Table A10.1: Issues Identified during Consultation

Consultee	Issue	Where/How this is Addressed
Scottish Natural Heritage (SNH) (letter dated 25th September 2007 - refer Technical Appendix A5.1)	Responses and objections to the Section 36 Application For a Wind Farm at Strathy South (2007) in relation to ecological issues include:	
	1. Concerns in relation to probable adverse effect on qualifying interests (blanket bog) of the Caithness & Sutherland Peatlands SAC/Ramsar site, primarily relating to the access track between Strathy South and Strathy North proposed wind farms, but also in relation to the inevitable, but not applied for, Section 37 application for connection to the grid. In addition, SNH response stated that no 'compensatory measures' were included within the 2007 ES, and any such measures should be in place before the project proceeds. These should be of at least the same extent and standard as the areas which will be lost or damaged.	1. Modifications to the 2013 modified scheme include making use of the existing forestry access track (see Figure A4.1). A full impact assessment with regards to SAC qualifying habitats has been undertaken (Section 10.5.2 and Technical Appendix 10.6) in order to inform an appropriate assessment of impacts relating to the proposed access track. Proposed mitigation is provided in the form of like for like habitat restoration as outlined in Technical Appendix 10.6. Residual impacts on protected habitats including blanket bog and wet heath have been assessed (Section A10.5.2). An outline Habitat Management Plan (HMP) is provided which seeks to mitigate against any residual effects on habitats (Technical Appendix A11.2).
	2. The proposal will have a significant effect on otter, a qualifying interest of the SAC.	2. Updated surveys of otter are presented (Section A10.4.3(b) and Technical Appendix A10.2). Potential impacts on otter are assessed and mitigation measures outlined (Section A10.6).

Table A10.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	3. Further information is required on the risk to otter and other SAC qualifying species and habitats with respect to peat slide risk. Further information is required on the risk to Atlantic salmon and freshwater pearl mussel with respect to peat slide risk	3. An updated peat slide risk assessment has been undertaken (Technical Appendix A14.1). This assessment has been used to inform an updated assessment of potential effects on otter and other species presented in the current chapter (Section A10.5)
	4. No assessment of the impacts of the existing track which links the 'arms' of Strathy South plantation across Yellow Bog was included in the 2007 ES.	4. Potential impacts on designated habitats adjacent to the existing Yellow Bog track, due to proposals to upgrade this track, have been undertaken (Technical Appendix 10.6) Impacts of Access Track Construction on the SAC). The Modified 2013 Scheme avoids widening of this track and therefore minimising potential impacts on qualifying habitats. Proposed mitigation for residual effects on SAC habitats is provided (Technical Appendix 10.6, Technical Appendix A11.2).
	5. Clarification is required of the proposed turbine and track layout.	5. Cabling works within the wind farm area will be run alongside tracks and as such assessment of habitat impacts is included in overall loss and modification of habitats due to the construction footprint (Section A10.5).
	6. SNH advised mitigation conditions be applied to protect wildcat, pine marten and water vole.	6. Noted. Updated baseline surveys for these species are presented in Section A10.4.3(b) along with updated mitigation proposals in Section A10.6.1.
	7. SNH sought further detail on forest felling, forest management, native woodland creation, habitat improvement, deer management and associated	7. Updated proposals concerning forest and habitat management are provided (Technical Appendix A11.2)

Table A10.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	monitoring to be provided through broadly stated actions regarding habitat management with more detailed proposals to be resolved post consent. SNH advised that deer management must ensure that no damage through deer grazing on the SAC will occur as a result of the proposal.	
	8. SNH recommends that it should be a condition that no elements of the development be micro-sited onto "encapsulated bog" which are described in the ES. SNH also advised limiting micro-siting to 50m and relocating infrastructure onto shallower peat.	8. A 50 m buffer around 'encapsulated bog' was applied during the design process along with a detailed assessment of peat depths in order to avoid deep peat areas – (see Figure A4.2).
Scottish Environmental Protection Agency (SEPA) (letter dated 6th August 2007- refer Technical Appendix A5.1)	Responses and objections to the Section 36 Application for a Wind Farm at Strathy South (2007) in relation to ecological issues include:	
	1. The proposal to create a floating road for main site access utilising an 'existing' ATV track as opposed to an existing forestry track is questioned. No further information was submitted on the existing condition of the ATV track and the impact of developing this route is unclear. SEPA requests further information of the 'existing' ATV track.	1. A full appraisal of access track options has been undertaken taking into consideration all significant ecological constraints and this report has been submitted to accompany the addendum submission (Environ 2013). The preferred access option is presented (Section A10.1.3) and this access route is further assessed for potential impacts (Technical Appendix A10.6).
	2. SEPA note that access to the site proposes to use a bypass to 'Strathy Village through a previously undeveloped area of peat. SEPA preference is for the use of the existing road or that further information should be submitted demonstrating no significant adverse impact from new road.	2. The Strathy bypass road is not included in the Modified 2013 Scheme as this component of infrastructure was consented as part of the Strathy North Wind Farm.

Table A10.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	3. SEPA notes that a number of turbines are to be located on areas of deep peat which SEPA would prefer to be avoided. Where micro-siting of these turbines to shallow peat is not possible to a distance of 50 m or greater from areas of deep peat, SEPA objects to these turbines, and would have a planning condition applied to this.	3. Substantial further peat depth probing has been undertaken in order to assist with the design process which aims at minimising infrastructure located on deep peat (ES Addendum Chapter 14: Soils and Water). This also informs Technical Appendix A14.1: Peat Slide and Hazard Risk Assessments.
	4. Mitigation for habitat loss within designated areas is proposed in the form of blanket bog restoration. These techniques are relatively unproven and it is unclear whether similarly high quality blanket bog will be formed.	4. An updated outline Habitat Management Plan is provided which outlines plans for restoration of habitats to provide mitigation against habitat loss and modification (Technical Appendix A11.2). Specific techniques will be agreed post consent in consultation with SEPA and SNH.
	5. SEPA request a condition be applied that the development cannot be micro-sited onto areas of encapsulated bog as previously identified in Figure 4.2 of the 2007 ES.	5. Comment noted. Changes to the layout have been undertaken in order to ensure all turbines and other infrastructure avoid areas of encapsulated bog. In addition, a buffer distance of 50 m around all such areas has been established and this will be maintained following micro-siting wherever possible.
	6. SEPA request the employment of a construction ecologist be ensured by a condition of permission.	6. Appropriate ECoW presence would be maintained throughout all phases of enabling and construction works (see draft Technical Appendix A4.1 CEMP).
	7. Where migratory fish may be present (such as trout, salmon or eels), any culverts should be designed in accordance with Scottish Executive guidance on River Crossings and Migratory Fish.	7. Comment noted.

Table A10.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	8. SEPA requests a site specific de-forestation method statement is agreed as a condition of permission.	8. Comment noted. The Applicant is aware of potential waste issues with regards to use of forestry residue on site. Proposed forestry proposals including the use of forest residue is detailed in Technical Appendix A11.2.
	9. SEPA requests that timing of construction avoids the wettest winter months when pollution is most likely and this is a condition of permission.	9.Comment noted
	10. SEPA requests that full details of peatland restoration in the form of a Habitat Management Plan are agreed as a condition of permission.	10. Comment noted. An outline HMP is provided (Technical Appendix A11.2). A detailed HMP would be submitted prior to beginning enabling works.
Scottish Environmental Protection Agency (SEPA) (letter dated 17th September 2012- refer Technical Appendix A5.2)	1. SEPA would support the approach of key-holing but may also support clear felling in cases where planting took place on deep peat and it is proposed through a Habitat Management Plan to reinstate peat-forming habitats.	1. (Technical Appendix A11.2). This document outlines proposals with respect to all forest clearance works and site land management during construction operations over the lifetime of the Modified 2013 Scheme. Detailed Forest and Habitat Management Plans would be submitted prior to beginning enabling works.
	2. SEPA are likely to have significant concerns relating to any proposals to fell to waste where the waste generated by the process will be managed by techniques such as chipping, mulching or spreading. In such cases we would wish the ES to include information which explains how the waste hierarchy has been applied in a way which delivers the best overall environmental outcome. If ecological benefit from use of waste is to be claimed, then reliable site-specific evidence must be provided. SEPA asks that where the ecological benefit proposed by the fell to	2. An outline Forest and Habitat Management Plan is provided (Technical Appendix A11.2). This document outlines proposals with respect to all forest clearance works and site land management during construction operations over the lifetime of the Modified 2013 Scheme. Detailed Forest and Habitat Management Plans would be submitted prior to beginning enabling works.

Table A10.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	waste activity does not relate to improvement of peatland habitats that the expected environmental benefit is outlined and fully justified in the ES.	
	3. SEPA request that the layout and design of the proposal, including any associated borrow pits, hard standing and roads, avoid impact on wetland and peatland systems. For areas where avoidance is impossible, details of how impacts upon wetlands including peatlands are minimised and mitigated should be provided.	3.Areas of wetland (including groundwater dependant terrestrial ecosystems) and peatlands have been used as constraints in the design process where possible. Further mitigation proposals for avoiding or minimising impacts on these systems are also provided. Where adverse impacts cannot be avoided and are assessed as significant, further mitigation measures are proposed in the outline HMP (Technical Appendix A11.2).
Northern District Salmon Fishery Board (NDSFB) (email dated 8th August 2007 - refer Technical Appendix A5.2)	Responses and objections to the Section 36 Application for a Wind Farm at Strathy South (2007) in relation to ecological issues include:	
	1. A full and independent baseline survey of salmon and trout within the Strathy River system along with a survey of the condition of the system should be undertaken to inform construction method, mitigation and monitoring.	1. Baseline surveys for salmon, trout, habitats and aquatic invertebrates were undertaken in 2007, with fisheries surveys updated in 2009 and 2012 in order to inform the fisheries assessment (Sections A10.3.2, A10.4.3, A10.5.4 and Tech Appendices A10.4 and A10.5).
Royal Society for the Protection of Birds (RSPB) (letter dated 10th August 2007- refer Technical Appendix A5.2)	Responses and objections to the Section 36 Application For a Wind Farm at Strathy South (2007) in relation to ecological issues include:	
	1. A significant effect on the SPA and SAC is likely to arise and alternative grid linkages should be considered prior to granting consent. A significant effect on the SPA and SAC is likely to arise from	1. Updated proposals are provided for both grid linkages and access routes. These elements are described in ES Addendum Chapter A4: Development Description. A full assessment of the

Table A10.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	the proposed access route.	potential impacts on SAC qualifying habitats is provided (Sections A10.5.2 and Technical Appendix A10.6).
	2. A significant amount of land take is proposed on important habitats out-with the SPA/SAC, within the forestry complex. RSPB believe this should be regarded as of similar importance to the SAC and suggest that important Annex 1 habitats present on site should have been given a greater weighting as an ecological constraint.	2. All areas of intact habitat (primarily blanket bog and wet heath) within the forest boundary have been mapped and used as a constraint in the Modified 2013 Scheme (ES Addendum Chapter A4: Development Description). These areas are avoided wherever possible and areas of encapsulated bog are further protected by implementing a protection buffer zone of 50 m.
	3. Government advice relating to development within or adjacent to SPAs or SACs is outlined in NPPG1, NPPGG14 and SOEnD Circular 6/1995 (as updated June 2000). The habitat regulations require a structured approach to the impact assessments on European sites.	3. Comment noted
	4. RSPB believe that the potential impacts for the qualifying interests of the SAC (blanket bog and transitional mire) are sufficient that there could be an adverse effect on site integrity in their current format. The developer has not been able to produce sufficient evidence to contradict this evaluation.	4. A full assessment of potential impacts on SAC qualifying habitats has been undertaken (Technical Appendix A10.6). Potential direct and indirect impacts on SAC habitats has been avoided or minimised wherever possible. This includes specifically increasing distance between turbines and surrounding SAC and avoiding or minimising impacts due to access track proposals. Where this has not been possible, mitigation measures are outlined (Technical Appendix A11.2, Technical Appendix A10.6).
	5. RSPB states that by law (Scottish Executive Circular 6/1995, as amended 2000)	5. Refer to comment regarding potential impacts on SAC habitats above.

Table A10.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	Scottish Ministers are required to undertake an Appropriate Assessment of the impacts of the Development on the integrity of European designated sites within its vicinity. There is currently insufficient information on the Development's effects to be able to do this.	
	6. RSPB believe the development in its current format is inappropriate and contrary to Policy N1 Nature Conservation of the Highland Region Structure Plan (2001).	6. Policy N1 Nature Conservation of the Highland Region Structure Plan (2001) has been succeeded by the Highland-wide Local Development Plan (2012). The Modified 2013 Scheme, including a reduction of turbine numbers and revised access proposals, has sought to direct development away from designated sites wherever possible.

SNH responded to the re-consultation letter in 2012 indicating they had no comments to make in relation to the Modified 2013 Scheme. No formal response was received from NDSFB or RSPB following the issuing of the 2012 re-consultation letter.

As detailed in the Table A10.1 above, the Applicant has provided responses to all of the matters raised by SNH, SEPA and RSPB with respect to ecological issues. Meetings were held with SNH on 12th March 2013, 5th September and 5th December 2012 and SEPA on 7th September 2012 and 8th March 2013, during which the matters raised by these organisations were discussed. Feedback from these meetings was taken into account in addressing the above issues.

Technical Appendix A5.2 provides copies of the formal responses from SNH and SEPA to these meetings where relevant. These relate specifically to:

- SNH response to an initial assessment of impacts on qualifying habitats due to widening of the access track within the SAC between Strathy Wood and Strathy South (email 28th Nov 2012);
- SNH response to the updated assessment of the proposed widening of the access track within the SAC between Strathy Wood and Strathy South (email 20th March 2013); and
- SEPA response to the meeting held between SSER, Environ and SEPA on 8th March 2013 (file note 8th March 2013).

A10.1.5 Impacts to be Assessed

In general, the construction, operational or decommissioning effects identified in the 2007 ES remain relevant; see Chapter 10: Ecology, Section 10.2.4 in the 2007 ES for further details on these aspects. However, the 2007 ES considered construction effects on habitats to be effects due to borrow pits, cabling and the construction compound that are reversible through habitat reinstatement. In assessing effects due to the Modified 2013 Scheme, effects on habitats due to construction of these components are assessed as operational and ongoing

effects. This is due to the inability to guarantee the success of reinstatement in these areas which could lead to permanently modified habitats. Only the grid connection and machinery movement during construction are considered short term and reversible and are therefore assessed as construction effects.

In terms of valued receptors, all receptors identified in the 2007 ES remain relevant with the exception of freshwater pearl mussel, bats, and deer. These receptors have been scoped out of the assessment as detailed in Section A10.1.6 below. In addition, groundwater dependant terrestrial ecosystems (GWDTEs) are included in the updated assessments.

A10.1.6 Impacts Scoped Out of Assessment

The effects scoped out of the ES Addendum assessment remain unchanged from the 2007 ES with the exception of the construction and forestry operations effects to be assessed for the Modified 2013 Scheme as discussed in A10.1.5 above. Refer to Chapter 10: Ecology, Section 10.2.5 in the 2007 ES for further detail of effects scoped out.

In terms of valued ecological receptors, freshwater pearl mussel (FWPM), bats and deer are scoped out of the Modified 2013 Scheme assessment for the following reasons. In consultation with SNH (Email 26th July 2012), bat surveys were not repeated, and no further assessment of impacts on bats has been undertaken due to the limited potential for bat roosts and the lack of activity within and nearby the site, as stated in the 2007 ES. FWPM surveys were not undertaken on the advice of SNH (Email 26th July 2012) that this would not be necessary. SNH records indicate that the River Strathy had been surveyed in 1974 and 1981 with no record of FWPM being found on either occasion. FWPM are, therefore, no longer considered likely to be present in the River Strathy system and are not considered further in relation to the Modified 2013 Scheme. Deer are no longer considered as a valued ecological receptor. However, deer movements in response to construction and ongoing operations are considered in terms of their potential secondary effect on qualifying habitats within the surrounding SAC.

A10.2 Changes to Policy and Legislative Context

The policy context outlined within Chapter 10: Ecology Section 10.3 in 2007 ES remains current. However, there have been a number of updates since the submission of the 2007 ES. These updates need to be taken into account for the Modified 2013 Scheme and include the new Highland Wide Local Development Plan (2012) and The Highland Council Onshore Wind Energy: Interim Supplementary Guidance (March 2012). Details of the relevant new and updated policies and legislation are presented in Table A10.2.

Table A10.2: Relevant National, Regional, and Local Policy and Legislation Updates Since the 2007 Submission Date

New/updated Policy or Guidance	Associated Superseded or updated Policy/Guidance
National	
The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2008(a), 2008 (b), 2011 and 2012. Key changes (and relevant year) to the 1994 regulations and 2007 amendments are as follows: • an increase in the maximum term of imprisonment for an offence under regulation 39 of the 1994 Regulations in relation to a protected species listed in Annex IV(a) of the Habitats Directive is 6 months (2008(a)); • the addition of the offence to deliberately or	These Regulations, which extend to Scotland only, amend the Conservation (Natural Habitats, &c.) Regulations 1994 and the Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007.

Table A10.2: Relevant National, Regional, and Local Policy and Legislation Updates Since the 2007 Submission Date	
New/updated Policy or Guidance	**Associated Superseded or updated Policy/Guidance**
recklessly to disturb a wild animal or a group of wild animals of a European protected species while it is migrating or hibernating (2008(b)); and • exceptions to regulation 39 shall not apply where it is shown that there was a satisfactory alternative to what was done or that what was done was detrimental to the maintenance of the populations of the species concerned (2008(b)).	
Conservation of Habitats and Species Regulations 2010. These regulations consolidate the habitat and bird regulations for England and Wales. However, they also apply to Scotland in regards to specific activities including Section 36 applications under the Electricity Act 1989 where a Natura 2000 site may be affected. In practice, the updated 2010 regulations are very similar in terms of how consent application are assessed with respect to Natura sites.	Conservation (Natural Habitats, &c.) Regulations 1994 (and amendments)
Wildlife and Natural Environment (Scotland) Act 2011. This act amends the Wildlife and Countryside Act 1981 in the following ways: • introduces new wildlife offences and wildlife management requirements (mainly with respect to wild birds, deer and hares); • strengthens protection of badgers; • makes changes to the licensing system for protected species; and introduces a new regime for regulating invasive and non-native species.	Wildlife and Countryside Act 1981
Scottish Planning Policy (2010) The policy states that planning authorities should seek benefits for species and habitats from new developments including the restoration of degraded habitats, and where peat and other carbon rich soils are present, applicants should assess the likely effects associated with any development work.	
Scottish Government Renewable Energy Policy Subject - Online Advice for Onshore Wind Farms (updated May 2012) The policy states that planning authorities should generally seek to appoint Ecological Clerk of Works to ensure that agreed designs and construction techniques are followed.	PAN45 Renewable Energy Technologies
FCS – UK Forestry Standard Guidelines on Forests and Water, Forests and Biodiversity, and Forests and Soils – Version 2011 5th Edition	FCS - Forests and Water Guidelines – Version is 2003 4th Edition

Table A10.2: Relevant National, Regional, and Local Policy and Legislation Updates Since the 2007 Submission Date	
New/updated Policy or Guidance	**Associated Superseded or updated Policy/Guidance**
These guidelines seek to aid the protection of the aquatic environment, biodiversity and soils within commercial forestry during operational activities such as timber harvesting and construction of infrastructure.	
Scottish Renewables, SNH, SEPA, FCS - Good Practice During Wind Farm Construction (October 2010) This document highlights past examples of where 'Best Practice' has been implemented through case studies of previous wind farm sites and advises on key considerations concerning the construction phase of the development.	
SEPA Regulatory Position Statement - Developments on Peat (2010) The document sets out SEPA's position on the waste management issues arising from the generation of waste peat as a result of developments on these soil types.	
Scottish Renewables and SEPA - Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste (2012) This guidance seeks to provide assistance regarding issues that may arise during developments on peat and how these should be dealt with in regards to the Waste Management Licensing (Scotland) Regulations 2011.The document also sets out guidance on the re-use of peat for the purposes of habitat enhancement and creation.	
SNH - Renewable Energy and the Natural Heritage (2010) The Document outlines SNH's Policy position and role within renewable developments and provides a brief summary of landscape and ecological impacts associated with these developments. The Document further refers to Implementation Guidance with regards to ecological and ornithological issues.	
FCS and SNH (2010) Floating Roads on Peat The work supplements the recommended practices for floating roads contained in the SNH/SEPA guidance document "Good Practice during Wind Farm Construction" (2010)	
Regional	
Highland Wide Local Development Plan (April 2012) The Plan identifies areas to be afforded protection from wind farm development, steering developer towards less constrained tracts of land, and set out criteria which applies to the consideration of	The Highland Structure Plan 2001, Local Plan Policy

Table A10.2: Relevant National, Regional, and Local Policy and Legislation Updates Since the 2007 Submission Date	
New/updated Policy or Guidance	**Associated Superseded or updated Policy/Guidance**
proposals irrespective of size and location. The plan contains a number of Policies directly relating to natural heritage, ecology and compensatory habitat creation with specific reference to peatland habitats.	

A10.3 Changes to Methodology

A10.3.1 Overview

The survey methodologies and approach of the impact assessment in this chapter follows that outlined in Chapter 10: Ecology, Section 10.4 in 2007 ES. Field surveys were undertaken in association with this ES Addendum which focused on updating information on all VERs likely to be affected by the Modified 2013 Scheme. Hence, surveys were extended to incorporate the access track options and grid connection (to Strathy North Wind Farm). Surveys were undertaken during the appropriate field seasons by suitably qualified and experienced ecologists and used to update the information presented in the 2007 ES.

A10.3.2 Baseline Assessment

(a) Desk Surveys

Additional desk studies were undertaken to update the information provided in the 2007 ES. Desk studies utilise a number of online reference collections such as the National Biodiversity Network Gateway and SNH SiteLink to inform the likely or potential presence of protected flora and fauna both on the site and in the surrounding area.

In addition to the above sources, data for habitats and protected fauna species from neighbouring sites was used to provide complete coverage of the Modified 2013 Scheme. The two sources of this data included data collected and provided by E.ON for the proposed Strathy Wood wind farm along with data from surveys undertaken in conjunction with the consented Strathy North Wind Farm development. Data from these two sources was checked to ensure it had been collected in a manner consistent with the 2012 surveys.

Data provided by E.ON in relation to the proposed Strathy Wood wind farm were undertaken between July – October 2011 for protected fauna species, Phase 1 habitats and National Vegetation Classification (NVC) communities. Data was used from these surveys to cover the line of the alternative bridge crossing and adjacent sections of access track and a 200 m buffer for protected species and 100 m buffer for habitats.

Protected fauna species and habitats data was sourced from the consented Strathy North Wind Farm development. Protected species surveys for this site were undertaken in 2012 and 2013 prior to recent forest felling operations. These surveys covered the length of the proposed Strathy South grid connection running through Strathy North Forest and a 200 m buffer. Habitat data was gathered during surveys undertaken in 2004 (Phase 1 habitats) and 2005 (NVC) in support of the Strathy North wind farm 2007 ES.

(b) Field Surveys

The following field surveys were conducted in relation to the Modified 2013 Scheme. These surveys updated existing data for the main wind farm site from surveys associated with the 2007 ES which were considered out of date. In addition, surveys were undertaken in order to obtain baseline data for the proposed access route and grid connection between Strathy South and Strathy North Forests. Surveys were undertaken for habitats and protected fauna species for both areas as detailed below.

(i) Habitat Surveys

The main wind farm area (Figure A10.8) and a 100 m buffer was surveyed for NVC communities in July/August 2011. Habitats were classified wherever possible to sub-community level according to descriptions in the appropriate volumes of British Plant Communities (Rodwell 1991-2000). This additional information, supplementing the 2007 ES surveys, was undertaken to provide more information as to the types, quality and extent of vegetation communities across the site.

Similarly, the access track between Strathy Wood and Strathy South Forests (Figures A10.2 and A10.6) and a 200 m buffer was surveyed for Phase 1 habitats and NVC communities in July 2012.

No specific surveys were undertaken for groundwater dependant terrestrial ecosystems (GWDTEs). However, NVC surveys are considered to provide appropriate baseline data in order to determine the presence and extent of GWDTEs on site. Therefore, the NVC survey data, along with contextual landscape information (e.g. slope and landscape position in relation to surrounding landforms) has been used to assess the presence and extent of GWDTEs and their interaction with proposed infrastructure.

Full details of habitat survey methods are provided in Technical Appendix A10.2.

(ii) Protected Species Surveys

Updated protected species surveys were conducted for the European protected species, otter and wildcat, and the UK protected species, water vole, badger and pine marten. Surveys were conducted between June and August 2012 in periods of suitable weather. Surveys were undertaken for the main wind farm area and part of the proposed access tracks and grid connection extending from Strathy South Forest to Strathy Wood Forest. The balance of the access track and grid connection was covered by data from the proposed Strathy Wood wind farm development and the Strathy North Wind Farm development as outlined above.

Table A10.3 below details the survey areas and associated buffers used for each species (based on the indicative development area as provided at the time of surveys). This ensured that all protected species were surveyed utilising appropriate buffers with the area of survey covering a significantly larger area than that of the site.

Table A10.3: Protected Species Survey Areas and Buffer Zones

Species	**Buffer Zone Around Potential Wind Farm Infrastructure**
Otter	All suitable habitats within the survey area and a 250 m buffer and within 200 m either side of the access track/grid connection.
Water vole	All suitable habitats within the survey area and a 250 m buffer and within 200 m either side of access track/grid connection.
Wildcat	All suitable habitats within the survey area and a 250 m buffer and within 200 m either side of access track/grid connection.
Pine marten	All suitable habitats within the survey area and a 250 m buffer and within 200 m either side of access track/grid connection.
Badger	All suitable habitats within the survey area and a 250 m buffer and within 200 m either side of access track/grid connection.

Full details of protected species survey methods are provided in Technical Appendix A10.2.

(iii) Fisheries and Aquatic Invertebrate Surveys

Surveys aimed at identifying the presence of suitable habitat for fish in order to predict which species may be present, were undertaken in support of 2007 ES. Subsequent, more detailed surveys were undertaken for Atlantic salmon and trout species in 2007, 2009 and 2012. These surveys were undertaken to assess habitat suitability, identify obstacles to fish migration, and to describe fish species composition and distribution. These surveys included electric fishing at 31 locations in 2007 and a sub-set of eight out of the 31 locations in 2009 and 2012. In addition, aquatic invertebrate surveys were undertaken in 2007 in order to provide additional means of assessing potential effects on salmonid populations, water quality and water acidity. Full details on fish and invertebrate survey methods are provided in Appendices A10.4 and A10.5.

Fish habitat surveys were undertaken between August and September 2007 for all main watercourses within the site boundary and for the main stem of the River Strathy down to the A836 bridge. All suitable habitats were surveyed. In-stream habitats were characterised and recorded according to depth, substrate, flow and thus suitability for different age classes of salmonid species. The likely permeability of obstacles for adult salmonids, eels and lampreys were also considered.

Baseline fish population surveys were carried out in September 2007. These surveys covered all watercourses included in the habitat surveys. Surveys were carried out using fully quantitative and semi-quantitative electric fishing methods providing absolute fish abundance estimates but also providing more general information from a wide range of sites. A subset of eight out of the original 31 sites were surveyed in September to October 2009 and 2012 providing assessment of natural population fluctuations over this time period. Most of the re-survey sites were assessed using semi-quantitative methods.

Aquatic invertebrate surveys were undertaken between the 4th and 7th September 2007. Surveys were undertaken using both kick and Surber sampling techniques. A total of 16 sites were sampled within the River Strathy, Allt Badian, Yellowbog Burn, Allt nan Clach and The Uair. The purpose of the surveys was to produce indices of water quality and provide a baseline for monitoring biological consequences of changes in water chemistry.

(iv) Deer Surveys

Woodland deer numbers are generally assessed by counting of faecal pellet groups. Pellet group count data can be transformed into an estimate of deer utilisation of an area if the following are known; (a) the rate at which deer defecate pellet groups; and (b) the period over which counted pellet groups accumulated.

A dung clearance method, which measures faecal accumulation rate (FAR), was used to measure the effective deer utilisation (EDU) within the study area. To ascertain the EDU, 25 linear plots were placed and measured between April 2010 (19-21st) and June 2010 (20-24th). The methodology follows the most updated guidance provided by Forestry Commission (Swanson et al, 2008). FAR data was obtained by counting the accumulation of dung groups on the plots between April and June, a period of 62 days.

Transects were placed within the plantation boundary excluding the open ground to the north known as Yellow Bog. Transects were randomly chosen using a Satmap GPS and locations fell both within tree cover and open areas including rides and glades. Each plot measured 25 m in length and 2 m in width. Each transect was aligned along a north-south axis. The total area of plots was 1250 m^2 (25 plots at 50 m^2 each) with the defecation rate assumed to be 16.5 pellet groups per day for roe and 20 for red deer. On the first visit in April, dung located along the transect was identified for each species of deer and removed from the plot. The subsequent visit then counted the number of new groups found for each species along all transect lines.

In addition to the targeted deer utilisation assessment undertaken within Strathy South Forest, recent utilisation and habitat impact work was undertaken within part of the Strathy Bogs SSSI to the north of Strathy South Forest. Preliminary results from these surveys were used to further inform the assessment in Section 10.5.2.

(v) Access Track Surveys

Issues highlighted by Consultees regarding the route of the proposed access track in the 2007 ES (Section A10.2.3 and Table A10.1) emphasised the requirement for additional surveys to assess alternative access routes to the development. A separate report (Strathy South Wind Farm: 'Access Route Review') provides an appraisal of access route options including information on surveys undertaken in order to assess the best alternative option to that presented in the 2007 ES. Following extensive appraisal of a variety of environmental variables across all potential routes, the existing access track from Strathy Wood to Strathy South was identified as the preferred option.

A further, more detailed assessment of the potential effects of proposals to upgrade and widen the existing forestry track along the preferred route, was undertaken along and adjacent to the access track where it passes through the SAC (between Strathy Wood and Strathy South Forests). This assessment was also undertaken for the section of track within the SAC that spans the area known as 'Yellow Bog' and connects the two 'arms' of Strathy South Forest.

Surveys undertaken in support of the detailed assessment of impacts on SAC qualifying habitats included:

- Phase 1 and NVC habitat surveys;
- Peat depth mapping; and,
- Detailed mapping of the boundaries of qualifying habitats adjacent to the existing track.

The detailed assessment of potential impacts on SAC qualifying habitats is presented in Technical Appendix A10.6. Baseline habitat data associated with the proposed access and Yellow Bog tracks within the SAC are presented in Section A10.4.3. A summary of the findings presented in Appendix A10.6, along with an assessment of other ecological receptors with the potential to be effected by upgrading and widening of the access track, are presented in Sections A10.5.2.

(c) Effects Evaluation

The methodology used to assess the significance of effects associated with the development in the 2007 ES remains unchanged. Table A10.4 summarises the relationship between the Receptor and the Effect Magnitude. The effects or residual effects are considered to be significant under the EIA Regulations if they are at a level of Moderate or Major significance (i.e. "a likely significant effect"). These are coloured in mid and dark grey.

Table A10.4: Significance of the Effects Defined by the Relationship between the Receptor Sensitivity and Effect Magnitude

Effect Magnitude	Receptor Sensitivity				
	International	**National**	**Regional**	**Local**	**Negligible**
Total / near total	Major	Major	Major	Moderate	Minor
High	Major	Major	Major-Moderate	Moderate	Minor
Medium	Major	Major-Moderate	Moderate	Moderate-Minor	Minor

Table A10.4: Significance of the Effects Defined by the Relationship between the Receptor Sensitivity and Effect Magnitude					
Effect Magnitude	**Receptor Sensitivity**				
	International	**National**	**Regional**	**Local**	**Negligible**
Low	Moderate-Minor	Moderate-Minor	Moderate-Minor	Minor	Minor
Neutral	None / Negligible				

(d) Limitations of Assessment

There are not considered to be any significant limitations to this assessment overall. The baseline ecological data used is considered to be of a suitable level of detail to identify VERs for the site and enable a comprehensive impact assessment to be undertaken.

Seasonally dependent surveys were undertaken during appropriate times of the year and under suitable conditions. The majority of protected species surveys were undertaken in appropriate dry weather conditions with water levels in the various watercourses being relatively low during most of the survey period, although there were some periods of high rainfall between site visits, which may have reduced the visibility of some signs (e.g. spraints, droppings and prints).

Given the scale of the site and level of reasonable survey effort undertaken, not all habitats and plant species will have been captured by the habitat surveys, however, the survey effort is considered to be of reasonable coverage and intensity to capture habitats and plants at sufficient detail to allow a robust assessment. It should also be understood that a Phase 1 survey (with NVC classifications) is a subjective interpretation of habitats on the ground. Nonetheless the survey provides a representative account of the habitats across the site and is sufficient to provide an accurate and sound assessment of the proposals to be undertaken.

A10.4 Changes to Baseline Conditions

A10.4.1 Context

The context of the site in the wider landscape remains as outlined in Chapter 10: Ecology, Section 10.5.1 of the 2007 ES. Baseline conditions up to 2007 were reported in Sections 10.5.3 and 10.5.4 and Technical Appendices 10.1 and 10.2 of the 2007 ES. These conditions have been updated in Section A10.4.3 of this ES Addendum, giving an accurate description of the ecological receptors currently present on site. Desk study results for the area are included in Section A10.4.2, Table A10.5 as these were not included in the 2007 ES and add additional context to the 2007 ES and updated field study data.

The proposed access track and grid connection route has been altered in response to feedback received from consultees to the 2007 ES (Table A10.1) and the subsequent undertaking of a full access route options appraisal (Strathy South Wind Farm: 'Access Route Review'). A detailed assessment of potential impacts from road widening (access and Yellow Bog tracks) and grid connection to Strathy North wind farm along the preferred route within the SAC, was undertaken in order to inform an appropriate assessment (Appendix A10.6). In addition to this detailed impact assessment, information relating to habitat and protected species baseline conditions for the access and grid connection routes is included with the main site in Section A10.4.3 below.

A10.4.2 Desk Studies

Updated results for historical records of protected mammals and other key fauna species on the NBN Gateway database can be seen in Table A10.5. These results give an overview of the potential utilisation of the site by these species, adding additional context to the field

survey results. The table includes the approximate distance of the record from the site boundary and the year of the recording.

Table A10.5 Historical Key Fauna Species Records Available for a 10 km Area Surrounding the Site

Protected Species	Closest Historical Records To Site
Otter	Otter records are present showing activity within the site boundary from 1979, 2 km to the west of site from 2000, and 5 km to the west of site from 2005.
Water vole	Water vole records are present 9 km north west of site at Betty Hill from 1984.
Wildcat	Wildcat have been recorded 10 km to the north east of site in 1995 along the Halladale River.
Pine marten	Records of pine marten 5 km to the west of site are present from 2008.
Badger	Badger has been recorded 8 km to the north west of site from 1984 along the River Naver.
Red squirrel	A single record of red squirrel presence is recorded at Borgie Forest from 1998, approximately 10 km to the west of the Development area.
Adder	Adder have been recorded 4 km to the east of site in 2010.
Common lizard	Common lizard has been recorded 7 km to the west of site in 2010.
Common frog	Records of common frog are present 7 km to the north west of site from 1984.
Common toad	Records of common toad 6 km to the north west of site are present from 1984
Slow worm	Slow worm records 7 km to the north west of site are present from 1984.
Atlantic salmon	Records of Atlantic salmon are present at the mouth of the River Strathy approximately 12 km north of the Development's boundary. These records date from 1990.
Trout	Records of brown/sea trout are present for the mouth of the River Strathy from 1990.

The above table shows the range of fauna species recorded to be present within 10 km of the site. The site offers potentially suitable habitat for all species. However, the dominant blanket bog and slow growing, small, conifer forestry habitats mean the majority of the site is likely to be of poor quality for badger, red squirrel, wildcat, slow worm and bat species.

A10.4.3Field Studies

(a) Habitat Surveys

Habitat survey data for the site have been collated from a variety of sources as described in Section A10.3.2. The results of these surveys are presented below. Full details of habitat survey results are provided in Technical Appendix A10.2.

(i) Main Wind Farm Site

NVC habitat surveys were conducted across the study area and a 100 m surrounding buffer between the 5th - 9th July 2011 and 5th August 2011. All rides, glades, and waterbodies

were covered within the survey area giving an accurate assessment of the habitat outwith the coniferous plantation areas. Results of Phase 1 and NVC habitat surveys undertaken prior to submission of the 2007 ES can be seen in Section 10.5.4(a) of the 2007 ES, with Figure 10.2 showing an overview of the habitats present at the time of submission. Results of the 2011 surveys can be seen in Figures A10.8 and A10.9 showing an overview of the NVC communities present throughout the survey area at the time of these surveys.

Baseline habitat conditions resulting from the 2007 ES surveys and updated 2011 surveys are very similar indicating little change over the intervening years. The habitat is dominated by plantation coniferous woodland on areas of varying peat depths; dominant species within the forest canopy include lodgepole pine (*Pinus contorta*) and Sitka spruce (*Picea sitchensis*).

Rides and glades throughout the plantation areas are a mixture of blanket mire, wet and dry heath, with scattered areas of acid grassland on areas of shallow mineral soil. Areas of marshy grassland and acidic flush habitat surround watercourses and waterbodies across the site. Part of the survey area outwith the site boundary falls within the Caithness and Sutherland Peatlands SAC and the Strathy Bogs SSSI and are dominated by the wet heath and blanket mire habitats for which the areas are designated. Table A10.6 shows the dominant habitats present within the survey boundary, their conservation designations under EU and UK legislation, along with the total areas these habitats occupy.

Table A10.6 also indicates which habitats are predicted to have potential for high or medium dependency on groundwater according to SEPA guidelines (SEPA 2012). Figures A10.14 and A10.15 show potential GWDTEs in relation to the site including the access track and grid connection. These maps are based on the dominant NVC code where polygons were mapped as mosaics.

Whilst extensive areas within Strathy South Forest are mapped as having potential for groundwater dependence, in general, given the flat or gentle sloping nature of these areas, the majority of these habitats will be largely ombrotrophic (rainfed). In addition, the majority of these habitats relate to NVC M15 wet heaths, however, there is a strong likelihood that these habitats are the result of changes in vegetation composition over a period of time due to the influence of forestry and drainage. Prior to afforestation, these habitats are likely to have been M17 or similar non-groundwater dependant habitat types, particularly in areas of peat >0.5 m. Hence, at the scale of mapping at which the NVC surveys were undertaken, only one entire polygon within Strathy South Forest is likely to be confirmed as groundwater dependant. This is marked in red in Figure A10.15 and sits east of turbine locations 15 and 18.

GWDTEs mapped adjacent to the access track and grid connection are generally found on shallow peat (wet heath) on sloping ground and therefore have the potential to be dependent on groundwater to some extent as shown in Figure A10.14.

Table A10.6 Dominant Habitats Present in the 2011 Survey Area and their European and UK Designations

NVC Community	Area of site covered (ha)	European Annex 1 Habitat	UK BAP Priority Habitat	Scottish Biodiversity List	SEPA - Potential GWDTE Dependency Level
Plantation Coniferous Forestry	1141	-	-	-	None
M17 *Trichophorum germanicum – Eriophorum*	490	Blanket bogs	Blanket bogs	H1, H3, SO1	None

Table A10.6 Dominant Habitats Present in the 2011 Survey Area and their European and UK Designations

NVC Community	Area of site covered (ha)	European Annex 1 Habitat	UK BAP Priority Habitat	Scottish Biodiversity List	SEPA - Potential GWDTE Dependency Level
vaginatum mire					
M15 *Trichophorum germanicum – Erica tetralix* wet heath	139	Northern Atlantic wet heaths with *Erica tetralix*	Upland heathland	H1, H3, SO1	Medium
M25 *Molinea caerulea – Potentilla erecta* mire	86	-	Blanket bogs	-	Medium
M19 *Calluna vulgaris – Eriophorum vaginatum* mire	42	Blanket bogs	Blanket bogs	H1, H3, SO1	None
M20 *Eriophorum vaginatum* mire	14	Blanket bogs	Blanket bogs	H1, H3, SO1	None
M23 *Juncus effusus/acutiflorus – Galium saxatile* mire	4	-	Upland flush, fen & swamp	H1, SO1	High
M18 *Erica tetralix – Sphagnum papillosum* mire	2	Blanket bogs	Blanket bogs	H1, H3, SO1	None

(ii) *Access Track, Yellow Bog Track and Grid Connection (Within the SAC)*

Full details of the access track surveys, the current disturbance caused by historical construction and maintenance activities from existing forestry tracks, and the further predicted disturbance and habitat loss to qualifying habitats within the Caithness and Sutherland Peatlands SAC are presented in Technical Appendix A10.6. A summary of the report's findings is provided below. Survey results are presented in Figures A10.6 and A10.7.

NVC surveys along the proposed access track and Yellow Bog track within the SAC, identified habitats dominated by wet heath and blanket mire communities including M15 *Trichophorum cespitosum – Erica tetralix* wet heath and M17 *Trichophorum cespitosum – Eriophorum vaginatum* blanket mire communities. Adjacent to the access track, occasional areas of acidic flush vegetation and wet modified bog are present surrounding small watercourses running east to west through the survey area including the M25 *Molinea caerulea – Potentilla erecta* mire community.

Peat depth surveys found peat soils to be present along the majority of the length of both sections of track. Average peat depth was 0.65 m for the access track and 1.28 m for Yellow Bog track.

Detailed mapping and habitat surveys of the disturbance currently caused by the existing road identified the current footprint of disturbance to be on average 28 m in width for the access track and 24 m for the Yellow Bog track. Disturbance and modification to habitats has historically been caused through alterations to the hydrology of the surrounding

peatlands, nutrification caused by increased surface water runoff from the current tracks mineral running surface, and the piling of spoil (including peat) to the side of the track. All of the above have resulted in the creation of modified habitats adjacent to the track that no longer fit the description of the SAC qualifying habitats. Despite these effects, qualifying habitats outwith the zone of track disturbance, show minimal sign of being affected by the presence of the access track and support the range of species expected to be found in the NVC communities present.

(iii) Access Track Options and Grid Connection (Outwith the SAC)

Areas outwith the SAC are dominated by coniferous forestry with associated rides and open areas comprised mainly of modified wet heath and mire communities. Rides are dominated by the M25 *Molinea caerulea – Potentilla erecta* mire community with areas to the north of the River Strathy outwith the afforested habitats containing remnant patches of M17 *Trichophorum cespitosum – Eriophorum vaginatum* blanket mire and M15 *Trichophorum cespitosum – Erica tetralix* wet heath.

Rides within northern sections of the Strathy North Wind Farm, through which the grid connection will pass, are similarly dominated by wet heath and mire communities. Occasional areas of acidic flush containing the M6c *Carex echinata – Sphagnum fallax mire, Juncus effusus* sub-community are present surrounding burns and drains, with scattered areas of bracken and dry heath confined to areas of shallow mineral soil and rocky outcrops.

Results of surveys for these areas are presented in Figures A10.6 and A10.7.

(b) Protected Species Surveys

Protected species surveys were conducted for otter, water vole, wildcat, pine marten and badger within the study area and survey buffers defined in Table A10.3. Results from these surveys are presented in Figures A10.10 – A10.13. Signs of protected species found in 2012 are summarised in Table A10.7 along with a comparison of differences between 2012 data and that from the 2007 ES. Signs of species not listed in the table below indicate either no sign was found during 2012 or 2007 ES surveys or, in the case of bats, surveys were not repeated in 2012.

Table A10.7 Evidence Of Protected Species Presence Encountered During the 2012 Surveys and the Differences in this Data from the 2007 ES

Protected Species	Sign Encountered During 2012 Surveys	Differences From 2007 ES Data
Otter	Otter signs including spraints, feeding sites and slides were present across the survey area surrounding watercourses and waterbodies.	The holt previously identified on Yellow Bog Burn was not present in 2012. Other signs were on a similar scale and distribution to those found in 2007.
Water vole	Water vole signs including burrows and droppings were found along the length of Yellow Bog burn and a number of smaller unnamed watercourses in the west of the survey area.	Signs were on a similar scale and distribution to those found in 2007. However, further signs of water vole colonies were found along a tributary of Allt Dhonuill Ghuinne burn to the west of the access track north of the preferred crossing of the River Strathy.
Pine marten	Pine marten scats were present along the existing forestry tracks and rides throughout the survey area. An individual live sighting was recorded at the eastern end of the track crossing Yellow Bog.	Signs were on a similar scale and distribution to those found in 2007.

Updated 2012 surveys presented in Table A10.7 indicate levels of protected species activity on site were generally similar to those presented in the 2007 ES. The exception to this relates to the additional water vole colonies found along a tributary of Allt Dhonuill Ghuinne, to the west of the access track and north of the preferred crossing of the River Strathy. These colonies are approximately 200 m from the proposed access track and 150 m from the proposed grid connection.

Records available from 2012/2013 pre-construction surveys undertaken within 200 m of the proposed access track and grid connection routes within Strathy North Forest, found no sign of otter, pine marten or water vole along the route of the proposed grid connection. The main finding was the identification of additional badger sett entrances in close proximity to a badger sett identified during surveys undertaken prior to the Strathy North 2007 ES. This site is being monitored to establish likely use. Please refer to the protected species confidential annex (Technical Appendix A10.3) for further information in relation to this badger sett. All other findings within Strathy North during recent surveys are in line with findings presented in the 2007 ES for Strathy North Wind Farm.

(c) Fisheries and Aquatic Invertebrate Surveys

(i) Habitat Assessment

The River Strathy is the largest of the watercourses studied in terms of size and volume and therefore contains the majority of spawning, juvenile and adult habitats for salmon (Table A10.8). This suggests that the main stem of the River Strathy will be the main resource supporting the bulk of the salmon population. In general, spawning habitat suitable for salmon was scarce in tributary streams and in most of these streams juvenile habitat appeared better suited to trout than salmon, with relatively slow flows and good overhead cover alongside the banks. Details of the habitat survey results for each watercourse can be found in Technical Appendix A10.4.

Table A10.8 Salmon Habitat Availability in the River Strathy and Tributary Systems

Watercourse	Wetted Area (m^2)	Area (m^2)							
		Fry	Mixed Juvenile	Deep Juvenile	Glide	Pool	Bedrock	Peat	Spawning
River Strathy	221,723	15,764	126,163	16,490	41,197	20,147	280	0	1,682
Allt L. na Saobhaidhe	510	250	60	0	0	0	0	200	0
Allt Badian	2,220	0	1,187	0	967	66	0	0	0
Yellowbog Burn	14,385	827	5,716	0	6,152	1,097	0	550	43
Allt nan Clach*	10,252	354	2,762	0	2,940	615	0	3,548	32
Allt na Dubh-chlaise	2,585	460	915	0	50	0	0	1,090	70
The Uair	20,820	758	12,401	0	4,507	943	1,240	900	70
Allt Dhonuill Ghuinne	3,515	0	1,725	0	987	91	0	712	0
Total	276,010	18,414	150,930	16,490	56,801	22,960	1,520	7,000	1,897

*= includes Allt an Reidhe

Obstacles to migration were recorded and assessed; the key observations are summarised in Table A10.9.

Table A10.9 Obstacles to Salmon Migration					
Watercourse	**Section**	**Grid Ref**	**Type**	**Passable?**	**Notes**
River Strathy	RS28	NC 8052 5491	Waterfall	Yes	May impede fish briefly but easily passable in all flows (height <1m).
River Strathy	RS42	NC 7968 4913	Ford	Yes	Low flow obstacles, fish probably run up-stream in spate and hence not likely to cause problems
Allt na Dubh-chlaise	DC1	NC 8260 6110	Wind-blown trees	Uncertain	Numerous log-jams caused by fallen trees. Stream banks broken down and channel braided. Impossible to fully survey.
The Uair	U4	NC 8275 5492	Rapid/waterf all not vertical	Yes, flow dependent	May be flow/temperature dependent.
Allt an Fhithich	AF1	NC 8230 5793	Waterfall	No	No suitable habitat above fall (tiny, peat-based stream).

(ii) Fish Populations

Full details of the population assessments for salmon, trout and other species can be found in Technical Appendix A10.4.

(iii) Salmon

Salmon were present at all 12 of the 2007 survey sites in the River Strathy. They were also present in the lower reaches of Allt na Dubh-chlaise, The Uair, Allt Badian, Yellowbog Burn, Allt nan Clach and Allt Dhonuill Ghuinne. Salmon were not observed in the middle and upper reaches of the larger tributaries (Allt nan Clach, Yellowbog Burn and The Uair) or in all of the smaller tributaries. In summary, the results suggest that the River Strathy itself is the main area for salmon production in the catchment, with only limited contribution from tributary streams. This is consistent with the results of the habitat survey. Single-run minimum density data give mean densities of 17.8 fry (±12.5 s.d.) and 9.8 (±5.0 s.d.) parr.100 m^{-2} in the main stem of the River Strathy. By regional standards both densities would be classified as good. Salmon parr numbers were good at all four sites on the River Strathy that lie within the site boundary (RS9, 10, 11 and 12). However, fry abundance was more variable at these sites. The lack of fry at sites RS10 and RS12 is likely to be a reflection of lack of suitable fry habitat.

Repeat surveys in 2009 and 2012 were conducted on eight representative sites which were selected to provide a wide coverage of streams draining the site. Generally, densities of salmon fry and parr were once again highest in the main stem of the River Strathy, with no, or a low density of fry/parr observed in the tributaries. The results from the subset of sample locations would suggest that salmon numbers may be declining. However, it is well documented that significant annual variation in the abundance of salmon fry or parr may occur as a result of natural factors.

(iv) Trout

Trout were present at most survey sites in 2007, the exceptions being site RS5 on the River Strathy and AF1 on Allt an Fhithich, which was fishless. RS5 is dominated by fast, shallow riffle habitat, better suited to salmon. AF1 is a small peat-based channel and the lack of fish was expected on the basis of the poor habitat. The broad trend in the trout distribution and abundance was opposite to that for salmon i.e. trout abundance was highest in tributary streams and the upper reaches of the River Strathy and lowest in the lower reaches of the River Strathy. Due to their relatively large size, the Yellowbog Burn, Allt nan Clach and The

Uair along with the upper River Strathy are likely to be the most important areas for trout production. It is probable that a proportion of the trout population migrate as seat trout.

Due to the large variation in results across the sample sites, the densities of trout are considered in relation to reaches, or sections, of each main watercourse. The average trout densities for the River Strathy are low, however, densities in the upper reaches are at higher levels. The average trout densities in the mid and lower sections of the River Strathy would be classified as poor by regional standards. The average trout densities in tributaries would be classified as 'excellent' by regional standards. Trout were plentiful in the Yellowbog Burn and Allt nan Clach, both of which flow through the site. Given the relatively large size of these streams, it is probable that they are important producers of trout within the wider catchment.

Densities of trout fry and parr in the repeat surveys in 2009 and 2012 showed variation (both an increase and decrease) in densities across the sites and years. On average, trout parr densities were lower than in preceding years.

(v) Other Fish Species

Lamprey larvae were found at only one site in 2007 (RS2) on the River Strathy downstream from the *Allt na Dubh-chlaise* confluence. The larvae were *Lampetra* sp. (either brook or river lamprey). The surveyors also carried out a spot check in the bottom 50 m of Allt na Dubh-chlaise at NC 8274 6116 and *Lampetra* larvae were found to be present.

The only other fish species present was European eel. Eels were present at most sites. They were more abundant at sites in the lower River Strathy than elsewhere. Most of the eels in the lower river were small, mainly less than 20 cm in length. Further upstream fewer eels were present but individuals tended to be larger. This is a fairly common pattern since young eels do not show such rapid upstream migrations as salmon and may remain in the lower reaches of rivers for many years (Tesch 2003; Moriarty 1978).

Following the repeat surveys on selected sites in 2009 and 2012, lamprey were observed at a few sites, including the lower reaches of Allt nan Clach, indicating they are wide spread in the River Strathy catchment. Eels were also recorded in 2009 and 2012; although their numbers in 2012 were lower than in previous years. Survey effort for eel and lamprey was limited and it should be assumed that they might occur elsewhere in the catchment.

(d) Invertebrate Surveys

Invertebrate species observed during the surveys consisted of species commonly found in Scottish watercourses and no rare species were found. The relative proportions of invertebrate groups indicated clean, well oxygenated, conditions with no significant organic enrichment. Abundance, diversity and biomass of invertebrates appeared moderate in all watercourses. Average Score per Taxon (ASPT) indicate that the River Strathy had good to excellent water quality (A1-A2) and all the other Strathy South watercourses had good water quality (A2). Water Chemistry Status and Index of Acidity Scores indicated that the watercourses are slightly acidic being pH 5.6 or above. The watercourses are acidic enough to affect the invertebrate community and some of the more sensitive acid intolerant species were entirely absent from the survey area. The Allt Badian and the upper reaches of the Yellowbog Burn may be significantly acidified, but further work is required to establish this conclusively. Overall the water quality, invertebrate communities and productivity should support sustainable salmonid populations if other environmental factors are suitable.

(e) Deer Surveys

The results of the updated deer population assessment, undertaken by RPS within Strathy South Forest between 19th – 21st April and 20th – 24th June 2010, estimate there to be approximately 231 red and 38 roe deer utilising the forest area at this time of year. This equates to an estimated deer utilisation (EDU; number of deer utilising the survey area at the time of the survey) of approximately 11.3 red deer per km2 and 2 roe deer per km2 giving an overall EDU of 13.3 deer per km2.

This survey suggests an increase in red deer and a decrease in roe deer numbers from the 2007 surveys which estimated 112 - 165 red deer and 60 - 90 roe deer. However, this change is likely to be associated with a combination of factors including a) differences in survey methodology, b) sampling error associated with indirect sampling of this nature, and c) actual changes in deer populations over time. The 2010 survey methodology is considered to be more accurate than the survey undertaken in 2007, however, whilst absolute estimates of deer numbers is presented here, it is important to note that the methodology is based on a small sample and therefore provides an approximate estimate only.

Information from DCS counts carried out in 2006 show deer populations on the open hills in the wider surrounding area to be low, ranging from 3 deer per km2 around the Strathy area to up to 8 deer per km2 further south.

The evidence therefore suggests higher deer densities within the Strathy South Forest than on the adjacent SAC. This is likely to reflect their preference for the forest's more sheltered environment and the lower annual cull levels within the forest compared to the surrounding estates.

A10.5 Changes to Effects Evaluation

A10.5.1 Basis of Assessment

Changes to the effects to be assessed in respect to the Modified 2013 Scheme are presented in Sections A10.1.5 and A10.1.6. The 2007 assessment of the effects of the Original 2007 Scheme on all VERs previously identified is presented in Section 10.6 of the 2007 ES. Changes to the effects arising from the Modified 2013 Scheme on these VERs are highlighted in the current section of this ES Addendum.

With respect to assessment of impacts on habitats, the 2007 ES assessed impacts under the following headings: (a) Construction; (b) Ongoing and Operational; (c) Potential Secondary Impact; and (d) Predicted Secondary Impacts. In updating this assessment, the current chapter assesses impacts on valued habitats under the headings *Construction Effects* and *Ongoing* and *Operational Effects*. Potential and Predicted Secondary Impacts are included in the assessment of impacts under the heading *Ongoing and Operational Effects*.

(a) Development Characteristics

The development characteristics of the Modified 2013 Scheme used to assess impacts on VERs are presented in Chapter A4: Development Description.

(b) Assumed Design, Management and Mitigation Measures

This assessment assumes the design, management, and mitigation measures outlined in Section 10.6.1(b) of the 2007 ES are still relevant. More detail has been provided on some of these measures elsewhere in the ES Addendum (Chapter A4: Development Description and Technical Appendix A4.1 CEMP). Additional assumed design and mitigation measures are detailed below.

The main change to assumed design of the proposed wind farm relates to a reduction in turbine numbers. The wind farm layout has altered since the 2007 ES, taking into account a number of issues raised by consultees. Turbine numbers have been reduced from 77 to 47. This has allowed greater flexibility to locate turbines away from areas of deep peat, 'encapsulated bog', the boundary of the surrounding SAC where possible but to a minimum of 50 m, and other habitats of conservation concern. A reduction in turbine numbers also results in an overall substantial reduction in habitat loss and impacts due to the reduced land take associated with road and turbine infrastructure.

Furthermore, all infrastructure has been designed, and will be micro-sited, at least 70 m from all watercourses with the exception of watercourse crossing points as requested by SEPA (6th August 2007 response to the 2007 ES). In addition, wherever possible, the design of

the Modified 2013 Scheme, locates infrastructure within areas of afforested ground thus reducing the footprint and impacts on valued habitats.

A10.5.2 Impacts on Habitats and Vegetation

In general, predicted construction and operational/ongoing effects on habitats, remain unchanged from those outlined in the 2007 ES Chapter 10: Ecology Section 10.6.2. However, this updated assessment presents a number of changes to the way in which effects are calculated and assessed.

The 2007 ES considered construction effects on habitats in terms of those habitat effects that could be reversed due to habitat reinstatement. These effects were assessed in relation to borrow pits, cabling and the construction compound. The updated assessment of these effects in relation to valued habitats takes the view that in peatland habitats the ability to reverse these effects cannot be guaranteed. For this reason, these effects are considered and assessed as operational and ongoing effects (i.e. permanent habitat loss or direct effects due to changes in hydrology). Effects due to the grid connection installation and machinery movement are considered reversible and are therefore assessed as construction effects.

The assessment of impacts on habitats is separated into areas within designated and non-designated sites as follows:

- The proposed upgrading and widening of the access track, and installation of the grid connection, where these pass through the Caithness and Sutherland Peatlands SAC; and
- All components of infrastructure outwith the SAC, including the proposed section of track and grid connection between Strathy Wood and Strathy North.

The effects on habitats identified in this section as requiring an updated assessment relate to:

- Changes in land take due to the reduction in turbines and subsequent changes to the development design;
- Changes in location and design of the proposed access track where this passes through a designated site.

Habitat loss, direct and indirect habitat impact calculations have, therefore, been updated in response to the Modified 2013 Scheme. An updated method for calculating these impacts is presented below. Habitat figures (Figures 10.2a-g) presented in the 2007 ES show the Phase 1 habitats present across the site. These figures have been updated (Figure A10.3) along with new figures showing the NVC habitats present within the site boundary (Figures A10.4 and A10.5).

(a) Habitat Impact Calculation Methods

The following principles were applied when calculating habitat loss for all components of the Modified 2013 Scheme. The habitat loss area, in all cases, was based on the footprint of individual construction elements as indicated in Chapter 4: Development Description (Figure A4.6). For tracks, the footprint width various according to the running width of each track section and whether the track is floating, cut or existing track upgrade. In addition to the footprint area, direct and indirect impact zones within peatland habitats are applied beyond the edge of the footprint

In order to take a precautionary approach to designated sites, these zones are applied in their entirety within the SAC where the updated design interacts with peatland habitats. The design mitigation included restricting widening to the down-slope side of the access track only. Hence, direct and indirect impacts were only applied on the down-slope (western) side of the track.

Outwith the SAC, due to the presence and strong influence of forestry and drainage, the indirect impact zone is not applied. In addition, outwith the SAC, the direct impact zone is only applied to new infrastructure involving cut through construction methods. Hence, outwith the SAC, direct impacts are not applied to floating roads or existing track upgrades. This is due to floating roads being unlikely to create a significant draw down effect within this

zone and the existing impacts of tracks and forestry resulting in little additional impact from track upgrades.

In consultation with SNH (email 25th September 2012), direct impacts are applied 10 m beyond the edge of the footprint area, where peat is cut through, thereby altering the hydrological system and creating a drawdown effect. Indirect impacts are calculated in these same situations based on a 15 m zone applied beyond the 10 m direct impact zone. Indirect impacts relate to a zone whereby a change in habitat characteristics may occur due to changes in hydrology, albeit of a less serious nature than within the direct impact zone. There is a high degree of uncertainty regarding the level of change within the indirect impact zone and in many instances the long-term changes may be imperceptible.

(b) Designated Sites

The Modified 2013 Scheme interacts with designated sites in two locations (Figure A10.1). These are a) along the access track and grid connection route which follows the existing forestry track between Strathy Wood and Strathy South Forests; and b) along the route of the existing track across Yellow Bog. These areas are dominated by qualifying wet heath and blanket bog habitats. The Yellow Bog section of track would have cables installed within the existing running surface (Chapter A4: Development Description). However, no widening of the track would be undertaken and therefore no impacts on qualifying habitats are predicted. A detailed assessment of impacts associated with the access track and grid connection between Strathy South and Strathy Wood, is presented in Technical Appendix A10.6. In their consultation response regarding this assessment (meeting 12th March 2013 and email 20th March 2013), SNH agreed with the assessment and felt the proposed compensation was adequate. However, SNH asked that further information be provided in the ES Addendum in order to address a number of outstanding issues regarding mitigation for potential impacts within the SAC. Where these issues are not covered in the 2007 ES, they have been addressed under construction and ongoing effects below.

(i) Construction Effects

In upgrading and widening the access track, it may be necessary to remove the existing peat spoil heaps adjacent to the track. These spoil heaps consist of a mix of oxidised peat and, to a lesser extent, mineral soil. The fate of the spoil heaps would be confirmed post consent and detailed through the Peat Management Plan. This may require further investigation of the nature of the material in the spoil heaps and careful consideration as to its suitability for re-use within the SAC.

In removing the spoil heaps, there may be an area of bare peat exposed on which machinery may be required to pass in order to lay grid cables adjacent to the access track. Careful consideration would be given to the most appropriate means of protecting this area. Detailed methods would be provided post consent. Mitigation would include the use of bog mats where required to minimise disruption to peat and retain a flat working surface through this area. However, given the proximity of the spoil heaps to the side of the road, any grid connection cables being ploughed into these areas is likely to be achieved by machinery working from the upgraded track.

During all works, measures will be adopted to avoid, or otherwise minimise, damage to surface vegetation. Through the use of cable ploughing and machinery operating from the upgraded track or bog mats where necessary, areas of bare peat are predicted to be restricted to the strip of ground from which peat spoil is to be removed and to areas excavated for cable jointing. Where areas of bare peat result, techniques are proposed below for immediate stabilisation and revegetation.

Laying of cables associated with the grid connection would be undertaken using plough methods designed to reduce excavation and disturbance. Mitigation measures to limit the extent of potential disturbance effects would be implemented including identifying and avoiding qualifying habitats where possible, minimising the working area outwith the cable corridor, and use of an ECoW to oversee works and monitor effects on valued habitats.

Cable jointing areas would be selected to avoid areas of qualifying habitat wherever possible, including locating into areas where disturbance from machinery would be avoidable or minimised. Vegetated peat turves extracted from jointing areas will be cut and stored separately to underlying excavated material. All material will be replaced in the reverse order of extraction such that peat turves are relayed over the excavated areas. Storage of peat turves will be kept to less than one week. If a longer storage period is required or, if the prevailing weather is hot enough to warrant, turves will be watered during storage to prevent drying.

In areas where peat spoil has been removed leaving the bare peat beneath exposed, these areas will be stabilised following the completion of works using, for example, biodegradable mesh fibre laid over bare peat. This area would then be seeded with a mix of plant species appropriate to the adjacent qualifying habitats.

In addition to the above, potential pollution effects would be reduced by restricting refuelling of all plant to the track or outwith the SAC. More detail on refuelling would be incorporated into the Construction Environmental Management Plan (CEMP) of which a draft is included with the ES Addendum (Appendix A4.1).

As requested by SNH, detailed Method Working Statements would be provided prior to installation of cables (similar to those provide for the Campster Wind farm) to demonstrate measures to avoid direct impacts on qualifying habitats and minimising indirect impacts. This might include using an excavator located on the track, or the use of bog mats and demonstrate that temporary placement of excavated material would avoid further damage to qualifying habitat.

Taking into account the mitigation measures outlined above, the magnitude of effect of disturbance on qualifying habitats due to construction is assessed as Low and the overall effect as Minor (Not Significant).

(ii) Ongoing and Operational Effects

Due to alterations in the access route, impacts upon habitats, particularly within designated sites, have changed from those outlined in the 2007 ES Section 10.6.2(b). Further Information provided in Technical Appendix A10.6 details the route of the proposed access track and grid connection and the impacts these may have upon the Caithness and Sutherland Peatlands SAC. The report also details the methodology used to assess the current levels of disturbance due to the existing track. Widening and upgrading of the proposed access track seeks to avoid, or otherwise minimise, the impact of the Modified 2013 Scheme on the SAC including, where possible, siting any new track construction (including passing places), and grid connection cables, within currently disturbed ground (i.e. non-qualifying habitats). In order to do this, detailed surveys of the extent of qualifying habitats would be used as a key input to the final design and micro-siting process.

As has been described within Technical Appendix A10.6, a substantial area of the habitat within the SAC potentially impacted due to the Modified 2013 Scheme is already modified through the historic construction and maintenance of the track. The predicted impacts on qualifying habitats are detailed in Table A10.10 below. Further detail on habitat impact calculation methods within the SAC are provided in Technical Appendix A10.6.

Table A10.10 Predicted Habitat Loss, Direct and Indirect Impacts on SAC Qualifying Habitats

Phase 1 Habitat	NVC Community	Habitat Loss (Footprint) (Ha)	Direct Impact (10m buffer) (Ha)	Indirect Impact (15m buffer) (Ha)	Phase 1 Total (Ha)
Blanket bog	M17 / M25	0.00	0.37	0.99	1.36
Wet heath	M15	0.00	0.29	1.26	1.55

Table A10.10 Predicted Habitat Loss, Direct and Indirect Impacts on SAC Qualifying Habitats					
Phase 1 Habitat	**NVC Community**	**Habitat Loss (Footprint) (Ha)**	**Direct Impact (10m buffer) (Ha)**	**Indirect Impact (15m buffer) (Ha)**	**Phase 1 Total (Ha)**
Total per Impact Type		0.00	0.66	2.25	**2.91**

Taking into account mitigation measures implemented through the design process, the magnitude of effect is assessed as Low. Given the International importance of the Caithness and Sutherland Peatlands SAC, the overall level of effect of these impacts is assessed as Moderate (Significant). In order to mitigate for these predicted impacts, a like for like area within the SAC has been identified whereby restoration activities would be undertaken in order to reverse historical impacts in the form of forestry drainage. This area is dominated by qualifying blanket bog and wet heath habitats and is substantially larger (c. 23.5 ha) than the total area of impacts identified. More detail is provided in Technical Appendix A10.6 and A11.2.

There are widespread groundwater dependant habitats adjacent to the access track through the SAC. These consist primarily of wet heath habitats over shallow peat. These are likely to have a moderate dependence on groundwater which maintains their current characteristics. Any effects due to the proposed track upgrade and widening would have a likely long-term effect in terms of modifying the local characteristics of these habitats. Such modification could lead to changes in habitat classification from, for example, wet heath to acid flush. Given the long-term presence of the existing forestry access track, such changes are likely to have occurred over this time and this is the case in localised areas due to concentrated track runoff. Any further changes brought about by upgrading of the track are likely to be, at worst, additive due to changes in runoff. The Modified 2013 Scheme design includes a restriction on widening of the track to the downhill (western) side only. In addition, the majority of widening would be undertaken into modified habitats with current runoff channels being maintained and upgraded. No new runoff pathways onto currently unmodified habitats would be created. For these reasons, the magnitude of any additive impacts on GWDTEs from track widening are assessed as Low and the overall impact is assessed as Minor (Not Significant).

(iii) Secondary Impacts on Designated Sites due to Herbivore Displacement

As a result of forest removal and wind farm construction, deer are predicted to disperse into the wider landscape in order to seek replacement shelter and foraging, at least until concentrated construction operations have finished. A decision would be required, in consultation with neighbouring landowners and SNH, as to whether it is more appropriate to leave the deer fence in place or remove it.

It is difficult to predict how deer are likely to disperse in reaction to construction activity. Evidence from some construction sites indicates deer become habituated to machinery movement and the disturbance effects are limited. However, taking a precautionary approach to impact assessment, it is assumed that these deer will disperse away from construction activity whilst attempting to remain close to their current range. Given that the forest is surrounded by SAC on all sides, it is therefore assumed that the deer will disperse onto and graze on those habitats within the SAC which they have access to. Hence, if the boundary deer fence is removed, deer dispersal is likely to be over a large area on all sides of the forest. If the fence is left intact, deer are likely to disperse onto the smaller area of the SAC contained within the current deer fence, the majority of which is to the north of the forest in the area known as Yellow Bog.

Red deer populations occur throughout the Highlands at densities ranging from less than one animal per km2 to over 30 per km[23]. Differences in habitat quality and management regimes contribute to variations in deer density. High densities of deer occur where deer have access to low ground or woodland, while low densities occur where sheep density or culling rates are high. Heather moorland will be sustained at about 6-15 deer per km[24].

If the deer fence was removed and a conservative estimate of 1 km is used as the buffer area surrounding the forest into which deer are likely to disperse initially, this would equate to a total area of 26.4 km2. Using the population estimate of 231 red deer, this would therefore equate to an increase of 8.76 red deer per km2 within this area if all deer from the forest were to disperse permanently onto the surrounding SAC. Roe deer have not been considered here as this species is more likely to travel further distance in order to seek appropriate shelter and hence, are unlikely to utilise the open moorland habitats adjacent to the site.

This assessment is considered to be a worst case scenario for the following reasons. Firstly, it is likely a proportion of the deer population will disperse over a much wider area than 1 km from the forest in order to find shelter and better foraging habitats. Secondly, a portion of the population will remain in or return to the non-SAC portion of the site during or following construction. However, with current densities surrounding the forest of between 3-8 deer per km^2 and therefore a potential maximum increase to 11 – 17 deer per km^2, this could have a detrimental effect on SAC qualifying habitats.

If the boundary fence were left in place then deer density within Strathy Bog SSSI could reach levels higher than those outlined above, placing considerable pressure on these sensitive habitats. Mitigation measures to avoid these impacts would be implemented through a Deer Management Plan (DMP). This plan would set out the range of management options to be considered including culling and removal or maintenance of deer fences. Determining the appropriate level of culling required would be crucial to ensuring no adverse impacts on the SAC. The level of culling will in turn, depend on final decisions regarding fence management whereby, if the fence is retained, a significantly higher level of culling would be required in order to protect the Yellow Bog area. In order to inform the level of cull and assess effects during and post construction, appropriate monitoring would be installed prior to works starting on site. Monitoring would be designed to inform timely decisions regarding the required level of culling and other ongoing management actions. The DMP would be agreed with SNH in advance. With correct implementation of an agreed DMP, it is considered likely that no effects would occur. However, it is recognised, a small level of uncertainty exists in regards to implementation of these measures due to a) sampling error associated with deer population estimates, and b) restrictions on timing of deer culling (closed seasons). Taking into account the mitigation measures outlined and the small level of uncertainty associated with implementation of these measures, the magnitude of effect is assessed as Low and the overall affect as Minor (Not Significant).

(c) Outwith Designated Sites

(i) Construction Effects

Forestry and construction machinery traversing valued habitats has the potential to disturb and cause damage detrimental to the condition of these habitats. The extent of these effects would be limited to within close proximity to the construction footprint.

Laying of cables associated with the grid connection would be undertaken using plough methods designed to reduce excavation and disturbance. Details of this method are provided in Chapter A4: Development Description. More detailed methods would be provided in the Construction Method Statement. This method of cable laying is proposed along the full length of the grid connection. The grid connection would run c. 7 km along

[3] http://www.snh.org.uk/publications/on-line/advisorynotes/100/100.htm

[4] Cairngorms & Speyside Deer Management Group Deer Management Plan.

http://www.csdmg.co.uk/Public%20Pages/Plan/SummaryofIssues.htm

forest rides within Strathy North, Strathy Wood and Strathy South Forests. Such habitats tend to be in poor condition due to the effects of forestry drainage, shading and nutrification.

Mitigation measures to limit the extent of these effects would be implemented including identifying and avoiding valued habitats where possible, minimising the working area outwith the construction footprint, and use of an ECoW to oversee works and monitor effects on valued habitats. Taking into account these mitigation measures, it is predicted that such effects would have a Low magnitude of effect due to their limited extent, the poor condition of habitats and the temporary nature of effects. Therefore, the overall level of effect is assessed as Minor (Not Significant).

(ii) Operational and Ongoing Effects

Tables A10.11 - 13 show the estimated habitat loss and direct impacts from the Modified 2013 Scheme within the main wind farm area and access track options (non-SAC habitats).

Table A10.11 Predicted Habitat Loss and Direct Impacts outwith Designated Sites by Infrastructure Component

Modified 2013 Scheme Area	Infrastructure Component	Phase 1 Habitat	Habitat Loss (Footprint) (Ha)	Direct Impact (10m buffer) (Ha)
Main wind farm area	Borrow pit	Blanket bog	3.37	0.57
		Wet heath	1.45	0.38
		Acid flush	0.00	0.00
		Dry heath	0.09	0.08
		Wet modified bog	0.33	0.10
		Conifer Plantation	4.16	1.41
	Concrete batching	Blanket bog	0.00	0.01
		Acid flush	0.00	0.01
		Wet modified bog	0.00	0.01
		Conifer Plantation	1.00	0.27
	Construction compound	Wet heath	0.18	0.15
		Wet modified bog	0.05	0.03
		Conifer Plantation	0.78	0.26
	Cut track	Blanket bog	1.40	1.26
		Wet heath	0.94	1.01
		Acid flush	0.06	0.05
		Wet modified bog	0.88	0.75
		Conifer Plantation	9.28	8.76
	Float track	Blanket bog	1.06	na

Table A10.11 Predicted Habitat Loss and Direct Impacts outwith Designated Sites by Infrastructure Component

Modified 2013 Scheme Area	Infrastructure Component	Phase 1 Habitat	Habitat Loss (Footprint) (Ha)	Direct Impact (10m buffer) (Ha)
		Wet heath	0.55	na
		Acid flush	0.01	na
		Wet modified bog	0.81	na
		Conifer Plantation	11.44	na
	Laydown area	Blanket bog	1.13	0.41
		Wet modified bog	0.17	0.03
		Conifer Plantation	0.70	0.32
	Met mast	Wet heath	0.03	0.07
		Conifer Plantation	0.14	0.41
	Switching station	Blanket bog	0.37	0.29
		Conifer Plantation	0.88	0.19
	Turbine hardstanding	Blanket bog	0.20	0.35
		Wet heath	0.41	0.41
		Acid flush	0.00	0.03
		Wet modified bog	0.39	0.56
		Conifer Plantation	9.34	9.35
	Upgrade track	Blanket bog	1.80	na
		Wet heath	2.64	na
		Acid flush	0.00	na
		Wet modified bog	0.03	na
		Conifer Plantation	0.69	na
Preferred access	Float track	Blanket bog	0.05	na
		Wet heath	0.01	na
		Wet modified bog	0.12	na
		Conifer Plantation	1.67	na
Alternative	Float track	Acid flush	0.02	na

Table A10.11 Predicted Habitat Loss and Direct Impacts outwith Designated Sites by Infrastructure Component

Modified 2013 Scheme Area	Infrastructure Component	Phase 1 Habitat	Habitat Loss (Footprint) (Ha)	Direct Impact (10m buffer) (Ha)
access		Wet modified bog	0.04	na
		Conifer Plantation	2.40	na
	Upgrade track	Wet heath	0.01	na
		Wet modified bog	0.02	na
		Conifer Plantation	0.73	na

Table A10.12 Predicted Habitat Loss and Direct Impacts outwith Designated Sites by Phase 1 and NVC Community

Modified 2013 Scheme Area	Phase 1 Habitat	NVC Community	Habitat Loss (Footprint) (Ha)	Direct Impact (10m buffer) (Ha)
Main wind farm area	Blanket bog	M17	0.02	0.00
		M17a	2.29	0.64
		M17b	6.40	1.92
		M19a	0.61	0.32
	Wet heath	M15a	0.36	0.36
		M15b	5.49	1.49
		M15c	0.34	0.17
	Acid flush	M6c	0.02	0.04
		U6d	0.06	0.06
	Dry heath	H10b	0.09	0.08
	Wet modified bog	M20	0.52	0.07
		M25	1.67	1.03
		M25a	0.48	0.38
	Conifer Plantation	Forestry	38.42	20.98
Main Wind Farm Area Total			**56.77**	**27.54**
Preferred access	Blanket bog	M17	0.05	na
		M17b	0.00	na
	Wet heath	M25/M15	0.01	na
	Wet modified bog	M25	0.12	na
	Conifer Plantation	Forestry	1.67	na

Table A10.12 Predicted Habitat Loss and Direct Impacts outwith Designated Sites by Phase 1 and NVC Community				
Preferred Access Route Total			**1.85**	**na**
Alternative access	Wet heath	M15	0.01	na
		M15c	0.00	na
	Acid flush	M6c	0.02	na
	Wet modified bog	M25	0.02	na
		M25a	0.04	na
	Conifer Plantation	Forestry	3.13	na
Alternative Access Route Total			**3.22**	**na**

Table A10.13 Predicted Habitat Loss and Direct Impacts outwith Designated Sites (Main Wind Farm Area and Preferred Access Track)				
Phase 1 Habitat	**NVC Community**	**Habitat Loss (Footprint) (Ha)**	**Direct Impact (10m buffer) (Ha)**	**Total All Impacts (Ha)**
Blanket bog	M17	0.07	0.00	
	M17a	2.29	0.64	
	M17b	6.40	1.92	
	M19a	0.61	0.32	
Blanket Bog Total		**9.37**	**2.88**	**12.25**
Wet heath	M15a	0.36	0.36	
	M15b	5.49	1.49	
	M15c	0.34	0.17	
	M25/M15	0.01	0.00	
Wet Heath Total		**6.20**	**2.02**	**8.22**
Acid flush	M6c	0.02	0.04	
	U6d	0.06	0.06	
Acid Flush Total		**0.08**	**0.10**	**0.18**
Dry heath	H10b	0.09	0.08	
Dry Heath Total		**0.09**	**0.08**	**0.17**
Wet modified bog	M20	0.52	0.07	
	M25	1.79	1.03	
	M25a	0.48	0.38	
Wet Modified Bog Total		**2.79**	**1.48**	**4.27**
Conifer plantation	Forestry	40.09	20.98	
Conifer Plantation Total		**40.09**	**20.98**	**61.08**

The total predicted habitat loss within the main wind farm area and non-SAC section of the Preferred Access Track for the Modified 2013 Scheme is 58.62 ha (56.77 ha within main wind farm area and 1.85 ha within preferred access track). This is comprised primarily of coniferous plantation forestry (40.09 ha, 68%). In terms of habitats of conservation concern, total predicted habitat loss for European Annex 1 habitats is 15.66 ha comprised of blanket bog (9.37 ha), wet heath (6.20 ha) and dry heath (0.09 ha). The total predicted direct habitat impact within the main wind farm area for the Modified 2013 Scheme is 27.54 ha and of this 4.98 ha comprises the European Annex 1 habitats, blanket bog (2.89 ha), wet heath (2.01 ha) and dry heath (0.08 ha). If the Alternative Access Track were to be used, there would be a slight decrease in blanket bog habitat loss (0.05 ha) and an increase in plantation forestry loss.

The overall impact (habitat loss and direct impact) on European Annex 1 habitats is therefore 20.64 ha (15.66 + 4.98) for the main wind farm area and Preferred Access Track. In addition, there would be a small loss of, and impact on, acid flush habitats (0.18 ha) and wet modified bog (4.27 ha).

The 2007 ES assessed blanket bog, wet heath and dry heath in the forestry context as being of District importance. However, given the increased focus on, and importance attributed to peatland habitats on a Scotland and UK level in the intervening years, blanket bog and wet heath are considered, for the purpose of this updated assessment, as being of Regional importance. Dry heath is still considered of Local/District importance. Taking into account the area of overall impact on these habitats (20.65 ha of total impact), and the forestry setting in which they are found, the magnitude of effect is assessed as Medium. The overall effect of impacts on habitats is therefore assessed as Moderate (Significant). In order to mitigate for these predicted impacts, areas of suitable ground within Strathy South Forest would be identified and targeted for peatland restoration works following forest removal. Despite this area being previously forested, the potential for success is considered high for an area at least equivalent to the impacts identified. In reality, an area considerably greater than this is likely to be successfully restored both within the forest and adjacent to SAC qualifying peatland habitats. This presents a real opportunity to create a net environmental benefit in terms of peatland habitats.

A10.5.3 Fauna

The predicted construction, operational and ongoing effects on protected species remain as outlined in Chapter 10: Ecology, Section 10.6.3 of the 2007 ES.

(a) Otter

The range and significance of effects of the development on otter remains as presented in the 2007 ES. However, further clarification is provided below where the Modified 2013 Scheme and associated proposed mitigation measures differ to those presented in the 2007 ES.

Updated surveys of otter presence on-site indicate similar levels of otter activity in 2012 as those presented in the 2007 ES. These surveys confirm the wide use of the site by otter and the importance of the larger waterbodies in particular, for foraging and movement.

The reduced number of turbines associated with the Modified 2013 Scheme results in a reduction in the number of watercourse crossings required from 26 to 18 which in turn reduces the potential effects on otter and their habitats across the site.

Riparian planting and pool creation outlined in the 2007 ES, are no longer proposed in order to mitigate against loss of foraging area. On further investigation, riparian planting was deemed to be out of character with the surrounding habitats. Given the negligible impact on open water habitats and the focus on peatland restoration, which itself is likely to create additional wet areas, the creation of additional pools was deemed unwarranted.

SNH in their 25th September 2007 response to the 2007 ES stated “Information is still required on the risk to otter from peat slide caused by the proposal”. Further assessment of

peat landslide hazard, including gathering more accurate site peat depth data, has been undertaken and is presented in ES Addendum (Chapter A14: Hydrology and Soils and Appendix A14.1 Peat Landslide Hazard Assessment). The Modified 2013 Scheme uses the updated peat landslide hazard assessment as an input constraint in order to avoid or minimise the risk of peat slide. The updated peat slide assessment concluded that there is a negligible or low risk of peat instability over the most of the site. However, some limited areas of medium risk were identified. For the medium risk areas, a hazard impact assessment was completed which concluded that, subject to the employment of appropriate mitigation measures, all these areas can be considered as an insignificant risk. In the event of a peat slide occurring, this could result in a sharp decline in water quality sufficient to reduce local fish numbers to low levels and therefore have a significant effect on the food resources of the local otter population. In addition, there could be localised impacts on otter habitats including resting places and holts. These impacts would be unlikely to eliminate otter from using the area but could significantly reduce the local population level until fish numbers recovered. The effects of a peat slide would be ameliorated over time with the duration of effect on habitats, water quality and fisheries likely to last from months to years dependant on the severity of the slide. Thus the otter populations would be expected to recover in the medium term. Taking into account the negligible risk of a peat instability and the medium-term duration of effects, the magnitude of effect is assessed as Low. Given the International sensitivity of otter, the overall level of effect is assessed as Minor (Not Significant). Mitigation measures including micro-siting of infrastructure in response to ground investigations would be implemented during construction in order to further reduce the risk of peat slide and the subsequent effects on otter.

(b) Pine Marten

The range and significance of effects of the development on pine marten remains as presented in the 2007 ES. However, the discussion surrounding the potential impacts on pine marten from forest removal is updated below. In addition, further clarification is provided below where the Modified 2013 Scheme and associated proposed mitigation measures differ to those presented in the 2007 ES.

Pine marten are primarily a woodland species relying on woodland or similar habitats to provide shelter and denning sites. It is expected that the site will be largely unsuitable for this species following removal of the forest plantation. Hence, contrary to the predicted effects presented in the 2007 ES, it is likely that ongoing effects due to tree removal will have a significant impact on this species on a local level. However, a number of other woodland habitats exists in the area which provide suitable habitat in order for the species to maintain a sustainable population in this part of the country. Tree removal by the proposed methods, primarily harvesting and mulching, would take place in a phased process over a suitable period of time, allowing pine marten time to adjust to landscape changes. During forestry and construction operations, a number of mitigation measures would be put in place in order to protect breeding pine marten including pre-construction surveys, exclusion zones should any potential breeding sites be found, and vehicle speed restrictions.

Taking into account impacts on pine marten in terms of their distribution within the wider landscape, the magnitude of effect of the Modified 2013 Scheme due to loss of, or disturbance to, habitats on pine marten is assessed as Low. The overall level of effect is assessed as Minor (Not Significant) provided all proposed mitigation measures are implemented at the time of forest felling and construction operations to prevent deaths or disturbance to breeding pine marten.

Habitat creation via riparian native tree planting is no longer proposed within the site. As indicated under otter above, riparian planting is deemed to be out of character with the surrounding habitats. In addition, riparian planting in the context of the site following removal of plantation forestry, is unlikely to provide suitable habitat to sustain a long-term population of pine marten.

(c) Wildcat

The range of potential effects of the development and the significance of these effects on wildcat remains as presented in the 2007 ES. This assessment is further confirmed on the basis that no sign of wildcat was found during 2012 surveys. However, surveys found areas of potentially suitable habitat for wildcat within the site, hence, their presence cannot be ruled out.

The primary mitigation measures for potential effects on wildcat would be pre-construction surveys designed to specifically identify and assess areas of habitat with reasonable potential to support wildcat. Any such habitat would be monitored for signs of use by wildcat well in advance of forestry operations.

(d) Badger

The 2007 ES found that 'no impacts on badger were considered likely at Strathy South'. Due to the continued lack of sign of badger within Strathy South Forest and along the route of the proposed access track, this assessment remains valid for these parts of the Modified 2013 Scheme. However, the potential presence of badger has been confirmed within 150 m of the proposed grid connection running through Strathy North Forest. The following potential effects are therefore assessed with respect to badger adjacent to this part of the Modified 2013 Scheme.

(i) Destruction of, or disturbance to, foraging areas

Badger forage over a wide area with a large proportion of their diet consisting of earthworms, along with a mixture of fruit, berries, small mammals, birds, carrion, and insects whenever available (SNH 2001). In the vicinity of the sett near the proposed grid connection, badger are likely to favour foraging ground within grassland habitats along the River Strathy and the adjacent steeper mineral soil slopes given the important of earthworms within their diet. Above these slopes, including along the direct route of the proposed grid connection, habitats tend to be dominated by closed canopy forest with wet heath along rides and within glades. These habitats tend to be of less importance to badger due to the minimal foraging potential they contain. The methodology proposed for installing grid connection cables is mole ploughing which aims to lay the cable directly into the underlying substrate with little or no permanent disturbance to the overlying habitat. Machinery used to lay cables is designed to avoid or minimise impact on vegetation. Where wet ground conditions prevail, bog mats will be used if necessary to further minimise impacts.

Taking into account the minimal extent of disturbance of habitat and the temporary nature of this disturbance, the magnitude of this effect is assessed as Neutral (Not Significant). The overall level of effect is therefore considered to be Negligible in terms of the species' overall conservation status in the wider area. In addition, habitat creation via riparian native tree planting following removal of the conifer plantation within this area as part of the Strathy North Wind Farm Habitat Management Plan is likely to result in a net benefit with respect to badger foraging.

(ii) Temporary direct disturbance during construction

Badger are crepuscular in their foraging habits, remaining in their setts during the day. The majority of the works will be undertaken during daylight hours. Outwith daylight hours lights would be directed away from potential foraging or pathways used by badger. The duration of works in this area would be relatively short (approximately one week) with cable being laid at a rate of approximately 1 km per day. Given the short term duration of works, the predicted low use of this area by badger and the distance from the sett, the magnitude of effect is assessed as neutral. The overall level of effect is therefore assessed as Negligible (Not Significant).

(iii) Destruction of, or disturbance to, setts

Given the proximity of the sett entrances to the proposed route of the grid connection is greater than 100 m, there is unlikely to be any disturbance to setts during the course of the proposed works. Therefore, the magnitude of effect is assessed as Neutral and the overall level of effect as Negligible (Not Significant).

(iv) Increased risk of road traffic injury and mortality

There are no new roads associated with the Modified 2013 Scheme proposed within 1 km of the badger sett. The road from Dallangwell to Strathy Wood runs down the eastern side of the River Strathy and would not be expected to carry wind farm related traffic. There would, however, be increased wind farm related traffic using road infrastructure to be constructed by the consented Strathy North Wind Farm. The nearest road to be constructed for the Strathy North Wind Farm is some 400 m from the badger sett. However, this road is unlikely to be used in conjunction with the proposed Strathy South wind farm, instead the Strathy North Wind Farm spine road would take the majority of traffic. The spine road is approximately 1 km from the badger sett. Taking into account the distance between the badger sett and roads likely to be used to provide access through Strathy North, the magnitude of effect of is assessed as Neutral and the overall level of effect is Negligible (Not Significant). Mitigation for potential increased road traffic injury or mortality would include restrictions on vehicle speeds and monitoring of badger activity in this area to identify and manage potential conflicts.

(e) Water vole

The range and significance of effects of the Modified 2013 Scheme on water voles remains as presented in the 2007 ES. However, further clarification is provided below where the Modified 2013 Scheme and associated proposed mitigation measures differ to those presented in the 2007 ES.

As outlined under 'otter' above, the Modified 2013 Scheme results in a reduction from 26 to 18 watercourse crossings. These reductions further reduce the potential effects on water vole and their habitats across the site.

As for otter, the risk of peat slide is also relevant to water vole. Unlike otter, water vole are not reliant on fish populations and therefore the impact of a peat slide would be due to direct mortality or loss of habitat. Loss of habitat could impact on several colonies over one or more watercourses. In the event of a slide resulting in the loss of a colony and its habitat, it could take months, but more likely years, for the habitat to recover the colony to re-establish. The magnitude of effect of a peat slide on water vole could therefore be low-medium dependant on the volume and location of the slide. Taking into account the negligible risk of a peat instability and the medium-long term duration of effects, the magnitude of effect is assessed as Low. Given the national sensitivity of water vole, and the assumed mitigation measures in place, the overall level of effect is assessed as Minor (Not Significant). Mitigation measures including micro-siting of infrastructure in response to ground investigations in order to further reduce the risk of peat slide and the subsequent effects on water vole.

A10.5.4Fish

(i) Construction effects

The magnitude and significance of effects associated with construction remain as stated in the 2007 ES for Atlantic salmon and sea/brown trout. These were assessed as Not Significant following implementation of mitigation measures outlined in the 2007 ES (Sections 10.6.4, 10.7, Appendices 4.2 and 14.4). Further mitigation is provided within the ES Addendum (Appendix A4.1 CEMP).

No electro-fishing surveys were completed prior to the 2007 ES, however, a complete survey of the catchment was undertaken in 2007, with subsequent partial surveys conducted in 2009 and 2012. Surveys additionally highlighted the presence of lamprey larvae within the catchment. Effects to this species are deemed to be of a similar degree to those identified for both Atlantic salmon and trout species.

Alterations to the development in the Modified 2013 Scheme have further decreased the potential impacts upon watercourses and the fish species found therein. The decrease in turbine numbers from 77 to 47 also results in a significant decrease in the number of watercourse crossings required from 26 to 18. This, in conjunction with the overall general

decrease in the level of construction requirements, is likely to decrease potential siltation, acidification and pollution risks.

Risk from peat slide was not considered during the 2007 ES in relation to the effects on fish species. Further assessment of peat landslide hazard, including gathering more accurate site peat depth data, has been undertaken and is presented in ES Addendum (Chapter A14: Hydrology and Soils and Appendix A14.1 Peat Landslide Hazard Assessment). The Modified 2013 Scheme uses the updated peat landslide hazard assessment as an input constraint in order to avoid or minimise the risk of peat slide. The updated peat slide assessment concluded that there is a negligible or low risk of peat instability over the most of the site. However, some limited areas of medium risk were identified. For the medium risk areas, a hazard impact assessment was completed which concluded that, subject to the employment of appropriate mitigation measures, all these areas can be considered as an insignificant risk. In the event of a peat slide occurring, this could result in a sharp decline in water quality sufficient to have a serious impact on fish populations. The magnitude of effect of a peat slide on fish could therefore be medium-high dependant on the volume and location of the slide. Taking into account the negligible risk of a peat instability and the medium term duration of effects, the magnitude of effect is assessed as Low. Given the regional sensitivity of Atlantic salmon, and the assumed mitigation measures in place, the overall level of effect is assessed as Minor (Not Significant).

The access route option now seeks to link with the Strathy North Wind Farm's infrastructure, crossing the River Strathy within Strathy Wood using the Preferred Access Route. An alternative access route has also been considered. This will require the construction of a new bridge to span the River Strathy. Mitigation measures to avoid or minimise potential impacts on water quality with respect to the construction of a bridge over the River Strathy are outlined in the draft CEMP (Appendix A4.1). Any effects due to construction would be easily monitoring and rectified and of short-term duration. As such the magnitude of effects on fish due to the construction of a bridge over the River Strathy are assessed as Low. Given the Regional sensitivity of Atlantic salmon, the overall level of effect is assessed as Minor (Not Significant).

(ii) Operational and Ongoing effects

Effects and significance associated with Operational and Maintenance Effects remain as stated in the 2007 ES for Atlantic salmon and sea/brown trout. These were assessed as Not Significant following implementation of mitigation measures outlined in Sections 10.6.4 and 10.7 of the 2007 ES.

Effects identified in the 2007 ES are further reduced by the reduced number of watercourse crossings required. In addition, long-term water quality monitoring begun in September 2011, in conjunction with the Strathy North Wind Farm, has resulted in a greater level of understanding of water quality within the Strathy Catchment. This work is ongoing, and would be supplemented with additional work specific to the Strathy South site (Appendix A4.1: CEMP).

A10.5.5 Cumulative Effects

Assessment of potential cumulative effects on ecological receptors was not undertaken in the 2007 ES. Taking into consideration the updated baseline conditions, the Modified 2013 Scheme, and the adjacent developments (Figure A1.2) of Strathy North Wind Farm (consented) and Strathy Wood Wind Farm (pre-application), potential cumulative impacts are considered and discussed for the following specific receptors.

In assessing cumulative impacts for all receptors it is important to reiterate that, wherever possible, proposed infrastructure for the Modified 2013 Scheme aims to utilise any infrastructure for the consented Strathy North Wind Farm, to minimise environmental impacts as far as possible.

(a) Habitats

The only potential cumulative effect identified with regards to habitats is in relation to the interaction between the proposed Strathy South access track and proposed Strathy Wood Wind Farm. The cumulative effects due to the interaction of these two proposed developments within the SAC are difficult to measure given the draft format of Strathy Wood design. However, the applicant has attempted to work with the neighbouring developer of Strathy Wood to minimise impacts on SAC or Annex 1 habitats. The potential exception to this would be regarding the grid connection for which each development would require cables to be laid separately. However, given the minimal impact and short term effect from laying cables using mole plough techniques, the cumulative impact is considered to be Negligible.

(b) Fauna

(i) Wildcat

Whilst the presence of wildcat has been recorded at Strathy North, there exists limited potential for wildcat in Strathy South due to the more abundant peatland habitats. For this reason, the cumulative effect due to forest removal and construction at Strathy South is assessed as Negligible.

(ii) Otter

Surveys indicate low use of all three development areas by otter. However, given the range of otter territories, it is likely that a local otter population rely on the network of waterbodies and adjacent habitat running through and connecting these areas for foraging and breeding. The main potential cumulative impacts on otter are due to landscape changes in habitat primarily due to forest removal and pollution/sedimentation of watercourses. However, in many parts of Scotland, otter exist in open moorland habitats without relying on a forested landscape. Therefore, provided construction operations are undertaken in accordance with a comprehensive otter protection plan which limits direct disturbance or disturbance of riparian zone adjacent to waterbodies, any effects on otter are likely to be of short term duration. In addition, provided appropriate mitigation measures are implemented with respect to control of pollution/sediment and peat slide risk it is considered unlikely that cumulative effects would significantly impact on the resident population of otter in the area. For this reason, the cumulative effect on otter due to forest removal and construction at Strathy South in combination with other projects is assessed as Minor

(iii) Water vole

Provided appropriate mitigation measures are implemented with respect to control of pollution/sediment and changes to riparian zones adjacent to watercourses, it is considered unlikely that any cumulative impacts would occur with respect to water vole colonies.

(iv) Pine Marten

Pine marten are a forest dwelling species and as such it is certain that pine marten populations will be displaced due to forest removal. Therefore, it is considered there will be definite cumulative impacts due to the removal of Strathy North, Strathy South and Strathy Wood forests. However, research indicates this species is expanding its range across many parts of Scotland (Croose et al, 2013). In addition, considerable suitable habitat exists outwith the Strathy forested areas into which pine marten can spread. The magnitude of cumulative effects on pine marten in the wider landscape is therefore assessed as Low and the overall effect as Minor (Not Significant).

Recent research (Sim et al, 2005) indicates a strong negative edge effect on dunlin (qualifying SPA species) and red grouse, due to forestry plantations harbouring predators such as pine marten. Strathy South Forest also provides a good example of a commercial forest planted on the wrong habitats thus creating an entirely artificial environment into which pine marten have moved. Therefore, despite the loss of pine marten habitat and the likely cumulative effect on the species locally, the net conservation benefits of removing plantation forests in these landscape settings is considered positive.

(v) Fish

There is potential for cumulative effects on fish stocks from the level of development within the River Strathy catchment. For this reason, it is critical that suitable mitigation measures are implemented in order to ensure impacts on the water environment are avoided. In addition, an appropriate water quality monitoring plan is necessary to ensuring any potential impacts are identified allowing these to be rectified in a timely manner. This type of approach has been implemented successfully at Strathy North Wind Farm where collection of baseline data has allowed accurate analysis of water quality variability. With the onset of enabling works and construction operations, a combination of daily inspections and weekly water quality sampling and testing is undertaken in order to ensure any irregularities are identified in a timely manner allowing appropriate management action to be taken.

With respect to fisheries, construction and maintenance of Strathy South Wind Farm would follow the relevant mitigation measures outlined in Section A10.6 during all stages of the development. This cumulative impact is based on Strathy North Wind Farm, and the assumption that the proposed Strathy Wood wind farm, will also adhere to similar mitigation methods to ensure impacts to fisheries are avoided or minimised.

A10.6 Changes to Mitigation

A Construction and Environmental Management Plan for the site (CEMP) would be provided prior to enabling or construction works. A draft CEMP is included with the ES Addendum (Technical Appendix A4.1). The final CEMP would include the following documents:

A10.6.1 Ecological Protection Plan (EPP)

An EPP would be produced as part of the CEMP prior to any works commencing on site. A number of changes have been made to the proposed mitigation measures detailed in the 2007 ES relating to habitats and protected species. For ease of reference a summary of all proposed mitigation measures (changed or unchanged from 2007 ES) is provided below.

(a) Preconstruction Surveys

Preconstruction surveys for protected mammal species would be undertaken by suitably qualified ecologists on the proposed site, including a 250 m buffer around all proposed construction areas.

(b) Work Programming with Respect to Protected Mammal Species

If, during construction, otter breeding holts or resting sites, water vole territories, pine martin or wild cat breeding dens, or additional badger setts are discovered, additional survey work would be undertaken by a suitably qualified ecologist in consultation with SNH. If confirmed, construction within 30 m of a badger sett, or 200 m of otter holts, pine marten or wildcat dens would cease and SNH would be contacted immediately for advice on an appropriate exclusion zone or required mitigation.

(c) Micro-siting of Infrastructure and Demarcation of Exclusion Zones

Infrastructure would be micro-sited to ensure that the most sensitive and highest quality habitats are avoided wherever possible. All turbines would be located at least 50 m from the SAC boundary, with all infrastructure located a minimum of 50 m from all watercourses with the exception of crossing points. Where watercourses are required to be crossed, machinery working areas would be limited in order to minimise the working area adjacent to crossings.

(d) Control of Pollution and Sedimentation

Best practice as outlined in the Pollution Prevention Plan (PPP) for the site as stated in Chapter 14: Soil and Water of the 2007 ES, would be followed; these include SEPA's Pollution Prevention Guidelines (PPG01 – PPG26).

(e) Watercourse Crossings

Development design has sought to minimise the number of watercourse crossings required as part of the associated infrastructure. However, where these are required best practice would be followed, as described in SEPA and Forestry Commission guidance.

(f) Habitat Reinstatement

Best practice techniques as described in SNH (2010) 'Good Practice During Wind farm Construction' would be followed for habitat reinstatement following temporary construction activities. These include the reinstatement of existing peat turves and the restriction of the use of lime and fertiliser in reinstatement. Reinstatement would be undertaken as quickly as practically possible following completion of localised works.

A10.6.2 Water Quality Monitoring Plan (WQMP)

A WQMP would be developed as part of the CEMP. This document would detail the requirements in terms of collecting baseline water quality data, setting of target thresholds for individual key variables and the range of water quality sampling methods to be implemented for the duration of all works on site. The WQMP would provide strict controls on the methods and timing of water sampling and analysis along with detailed procedures of steps to be undertaken in order to react to and rectify water quality issues should they arise. As part of the WQMP, an agreed programme of fish and invertebrate surveying would be undertaken in order to monitor these receptors and assist in detecting potential changes to water quality.

A10.6.3 Forestry Management Plan (FMP)

A FMP would outline the felling plan and detailing steps taken to mitigate the potential environmental impacts associated with these activities and incorporating a detailed deforestation method statement as requested by SEPA (7th August 2007). An outline FMP is provided (Technical Appendix A11.2).

A10.6.4 Habitat Management Plan (HMP)

The HMP would detail mitigation measures to be implemented to offset direct and indirect habitat impacts to designated and non-designated areas caused by the Modified 2013 Scheme. An outline HMP is provided (Technical Appendix A11.2).

A10.6.5 Deer Management Plan (DMP)

A DMP is required for the site due to the removal of the coniferous plantation forestry and thus the potential displacement of the deer populations from within this area to the neighbouring SAC and the impact this may have on sensitive qualifying habitats. Surveys were undertaken in 2010 in order to estimate the size of the deer population within Strathy South Forestry for the purposes of assessing the potential impacts. Further surveys would be undertaken prior to works starting on site in order to obtain updated population size estimates to inform the DMP. Details of the pre-development population sizes are presented in Section A10.4.3 and the 2007 ES.

The DMP would outline the measures to be implemented in estimating, controlling, and monitoring deer populations in association with the Modified 2013 Scheme during and post-construction, ensuring disturbance to the surrounding SAC is negligible from additional large herbivore impacts.

A10.7 Changes to Monitoring

Monitoring proposals set out in the 2007 ES, Chapter 10: Ecology, Section 10.8 would be implemented, along with additional proposals agreed in consultation with SNH and as detailed Technical Appendix A11.2.

A10.8 Changes to Summary & Conclusion (Inc. Residual Impacts)

This ES Addendum chapter provides an updated assessment of the ecological effects of the Modified 2013 Scheme in response to changes to wind farm design and requests for further information or clarification of specific ecological issues.

Additional NVC habitat surveys were undertaken across the site including the new proposed access track route. This survey data provided the basis for updated calculations of habitat loss, direct and indirect habitat impacts.

Updated protected species surveys were carried out across the site in 2012. In addition, protected species surveys were undertaken to account for changes to the proposed access track route. The findings from these surveys were very similar to those presented in the 2007 ES and provide further indication of the distribution of use across the site by the key species, namely otter, water vole and pine marten.

Further fisheries and invertebrate surveys were undertaken within the River Strathy and tributaries catchments in 2007, with a subset of sampling locations visited in 2009 and 2012. These surveys have highlighted the presence of key species throughout all catchments along with indications of key sections of the catchments with particular importance to each species.

An updated peat landslide hazard assessment was used in order to provide an updated assessment of potential impacts on protected species and fish.

(i) *Impact Assessment*

Table A10.14 below shows the predicted changes to potential impacts of the proposed development originally outlined in the 2007 ES, along with proposed mitigation measures, their means of implementation, and the residual impact of the Modified 2013 Scheme.

Table A10.14: Summary of Potential Impacts of the Modified 2013 Scheme, Mitigation and Residual Impacts

Potential Impact	Mitigation Proposed	Means of Implementation	Outcome/Residual Impact
Construction			
Temporary loss or disturbance to SAC-designated habitat as a result of underground cable grid connection installation and machinery movement during the construction phase.	▪ Demarcation of working zones to limit the potential area of damage and disturbance. ▪ Use of micro-siting where necessary and appropriate under advisement by ECoW. ▪ Periodic checks of vehicles for leaks and implementation of best practice as outlined by method statements.	▪ Detail to be provided in CEMP (Technical Appendix A4.1). ▪ Contractors to provide construction method statements. ▪ All works to be supervised by an ECoW. ▪ Watercourse crossings would be designed to allow continued movement of otter and water vole.	Minor Adverse
Temporary loss or disturbance to non-designated habitats as a result of underground cable grid connection installation and machinery movement during the construction phase.			Minor Adverse

Table A10.14: Summary of Potential Impacts of the Modified 2013 Scheme, Mitigation and Residual Impacts

Potential Impact	Mitigation Proposed	Means of Implementation	Outcome/Residual Impact
Disruption to protected fauna from noise, habitat fragmentation, road related mortality, decrease in prey resources, changes to water quality, and habitat loss/change and disturbance during arising from construction activities.	▪ Timings of works to avoid periods of heavy rainfall. ▪ Underground cable installation adjacent to the access route through between Strathy North and Strathy South would use cable ploughing technique and machinery operating from the upgraded track or bog mats to minimise disruption to peat and surface vegetation. ▪ Reinstatement of areas of disturbance as soon as feasibly possible using existing previously removed vegetation. ▪ Restrictions on vehicle speeds to reduce mortality risk. ▪ Restrictions of works in/near waterbodies and riparian zones. ▪ Watercourse crossings designed to avoid water vole habitat; ▪ Ensure no restriction on otter/water vole movement along water features.		Impacts range from Neutral to Minor Adverse
Operational/Ongoing			
Direct and indirect impact on SAC-	▪ Habitat restoration	Detail to be provided in CEMP, Habitat	Neutral/Minor Beneficial

Table A10.14: Summary of Potential Impacts of the Modified 2013 Scheme, Mitigation and Residual Impacts

Potential Impact	Mitigation Proposed	Means of Implementation	Outcome/Residual Impact
designated habitat through upgrading of the access track and installation of cable jointing areas along the grid connection between Strathy South Wind Farm and Strathy Wood.	activities will be undertaken in order to compensate for habitat impacts as outlined in A10.5.3. ▪ Specific vegetation monitoring programme will be implemented to ensure no further unforeseen degradation to SAC habitats occurs. ▪ Monitoring of potential large herbivore impacts within the SAC caused by displacement from afforested areas will be implemented. A programme of culling would be agreed where required.	Management Plan and Deer Management Plan documents.	
Direct and indirect impact on non-designated protected habitats through installation of wind farm infrastructure (this includes all aspects of the Modified 2013 Scheme).			Likely Moderate Beneficial
Temporary loss or disturbance to SAC designated habitats through ongoing operational and maintenance activities e.g. track maintenance between Strathy South and Strathy Wood.			Negligible
Indirect impact on SAC-designated habitat by displaced deer from Strathy South Forest.			Minor Adverse
Direct and indirect impact on non-designated habitats through ongoing operational and maintenance activities within Strathy South Forest and Strathy North Forest e.g. upgrading tracks, drainage works.			Negligible

(ii) *Appropriate Assessment*

The data collected on the baseline habitat and terrestrial species interests at Strathy South are comprehensive, with all relevant pre-2007 surveys being updated between 2010 and

2013. In addition, detailed assessments of habitats adjacent to sections of the Modified 2013 Scheme located within the Caithness and Sutherland Peatlands SAC have been undertaken in order to provide a high level of accuracy of baseline data in these areas.

A thorough assessment using these detailed datasets has been completed to predict the potential effects of the Modified 2013 Scheme on the qualifying features of the Caithness and Sutherland Peatlands SAC. This assessment has also taken particular note of the issues highlighted by SNH in their previous response to the original 2007 application.

It is therefore considered that there is sufficient information available for the competent authority to carry out an appropriate assessment of the Modified 2013 Scheme, alone and in combination with other plans and projects.

The SAC has six qualifying habitats, one qualifying plant species, and one qualifying mammal species. A summary of information to inform the appropriate assessment is provided for all the SAC's qualifying habitats and species in Table A10.15 below. The range of impacts, impact assessment, mitigation measures and residual impacts are provided for each qualifying feature in the context of the site's conservation objectives. In assessing impacts on habitats, the species related habitat objectives (distribution of typical species of the habitat, viability of typical species of the habitat, no significant disturbance of typical species of the habitat) are not included. Impacts on the individual plant species (which together comprise the overall habitats) are considered to be no different from the impacts on the habitats they form.

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
Blanket Bog	To ensure the extent of the habitat on site is maintained in the long term	Construction	Through careful design and implementation, construction effects due to road widening and cable installation would be limited to temporary disturbance of vegetation. These effects are considered to be temporary and reversible. Therefore, these are not considered to lead to a reduction in extent of blanket bog habitats within the SAC. Habitat loss and long term modification are dealt with under the Operations Phase.	None	None	None
		Operation	There is no loss of blanket bog habitat due to the construction footprint within the SAC. However, there are measurable direct and indirect impacts on blanket bog habitat within the SAC following completion of widening of the access track and cable installation between Strathy Wood and Strathy South Forests. Direct and indirect impacts are predicted to affect the area of habitat adjacent to the construction footprint. The magnitude of effect cannot be predicted accurately, however, direct impacts may lead to a loss of habitat long term, while indirect impacts may lead to a change in habitat character long term. The degree of certainty attributed to these measures is moderate and low for direct and indirect impacts respectively.	Direct impact of 0.37 ha and indirect impact of 0.99 ha on blanket bog habitat. Could result in an adverse effect on site integrity with respect to the extent of blanket bog.	Restoration of blanket bog habitats (in mosaic with wet heathland) within an area of the SAC to the west of Strathy South Forest. This area comprises a core restoration area of c. 23.5 ha of qualifying habitats. The area is currently heavily modified by a network of historical forestry drains which show active signs of erosion. A significantly larger area (restoration area is 8x total	None

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
					blanket bog and wet heath habitat impacts) has been chosen as mitigation in recognition of the fact that, the direct impacts may lead to a complete loss of habitat, while restoration does not create new habitat but rather restores heavily modified and deteriorating habitat. Restoration techniques for blanket bog drainage of the type found in the restoration area are will proven and therefore, the degree of certainty of successful restoration is high.	
		Decommission	No reduction in extent of blanket bog habitats within the SAC.	None	None	None
	To ensure the distribution of the habitat within the site	Construction	No change in distribution of blanket bog habitats within the SAC due to construction effects being temporary and reversible. Habitat loss and modification are dealt with	None	None	None

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
	is maintained in the long term		under the Operations Phase.			
		Operation	The operational (long term) impacts that may affect the distribution of blanket bog within the SAC are the same as those outlined for habitat extent above. However, the magnitude and overall impact on distribution is negligible given the widespread distribution of blanket bog throughout the Caithness and Sutherland Peatlands SAC.	Direct impact of 0.37 ha and indirect impact of 0.99 ha on blanket bog habitat. No adverse effect on site integrity with respect to the distribution of blanket bog.	Mitigation would be as outlined for habitat extent above.	None
		Decommission	No change in distribution of blanket bog habitats within the SAC.	None	None	None
	To ensure the structure and function of the habitat is maintained in the long term	Construction	No change in structure and function of blanket bog habitats within the SAC due to construction effects being temporary and reversible. Habitat loss and modification are dealt with under the Operations Phase.	None	None	None
		Operation	The operational (long term) impacts that may affect the structure and function of blanket bog within the SAC are the same as those outlined for habitat extent above. These effects are predicted to adversely affect the structure and function of blanket bog within the localised zone of impact adjacent to construction. However, the magnitude and overall impact on the structure and function of blanket bog habitats across the wider SAC will be negligible given the localised extent of	Direct impact of 0.37 ha and indirect impact of 0.99 ha on blanket bog habitat. No adverse effect on site integrity with respect to the structure and function of blanket bog across the	Mitigation would be as outlined for habitat extent above.	None

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
			these effects.	SAC.		
		Decommission	No change to structure or function of blanket bog habitats within the SAC.	None	None	None
	To ensure the processes supporting the habitat is maintained in the long term	Construction	No change to processes supporting blanket bog habitat within the SAC due to construction effects being temporary and reversible. Habitat loss and modification are dealt with under the Operations Phase.	None	None	None
		Operation	The operational (long term) impacts that may affect the processes supporting blanket bog within the SAC are the same as those outlined for habitat extent above. These effects are predicted to adversely affect the processes supporting the protection and formation of blanket bog within the localised zone of impact adjacent to construction. This is primarily due to altering the hydrological regime that supports blanket bog. However, the magnitude and overall impact on the processes supporting blanket bog habitats across the wider SAC will be negligible given the localised extent of these effects.	Direct impact of 0.37 ha and indirect impact of 0.99 ha on blanket bog habitat. No adverse effect on site integrity with respect to the processes supporting blanket bog across the SAC.	Mitigation would be as outlined for habitat extent above.	None
		Decommission	No change to supporting processes of blanket bog habitats within the SAC.	None	None	None
Northern Atlantic Wet Heath with cross-leaved	To ensure the extent of the habitat on site is maintained in the long	Construction	Through careful design and implementation, construction effects due to road widening and cable installation would be limited to temporary disturbance of vegetation. These effects are considered to be temporary and	None	None	None

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
heath (*Erica Tetralix*)	term		reversible. Therefore, these are not considered to lead to a reduction in extent of wet heathland habitats within the SAC. Habitat loss and long term modification are dealt with under the Operations Phase.			
		Operation	There is no loss of wet heathland habitat due to the construction footprint within the SAC. However, there are measurable direct and indirect impacts on wet heathland habitat within the SAC following completion of widening of the access track and cable installation between Strathy Wood and Strathy South Forests. Direct and indirect impacts are predicted to affect the area of habitat adjacent to the construction footprint. The magnitude of effect cannot be predicted accurately, however, direct impacts may lead to a loss of habitat long term, while indirect impacts may lead to a change in habitat character long term. The degree of certainty attributed to these measures is moderate and low for direct and indirect impacts respectively.	Direct impact of 0.29 ha and indirect impact of 1.26 ha on wet heathland habitat. Could result in an adverse effect on site integrity with respect to the extent of wet heathland.	Restoration of wet heathland habitats (in mosaic with blanket bog) within an area of the SAC to the west of Strathy South Forest. This area comprises a core restoration area of c. 23.5 ha of qualifying habitats. The area is currently heavily modified by a network of historical forestry drains which show active signs of erosion. A significantly larger area (restoration area is 8x total blanket bog and wet heath habitat impacts) has been chosen as mitigation in recognition of the fact that, the direct	None

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
					impacts may lead to a complete loss of habitat, while restoration does not create new habitat but rather restores heavily modified and deteriorating habitat. Restoration techniques for wet heathland drainage of the type found in the restoration area will be proven and therefore, the degree of certainty of successful restoration is high.	
		Decommission	No reduction in extent of wet heathland habitats within the SAC.	None	None	None
	To ensure the distribution of the habitat within the site is maintained in the long term	Construction	No change in distribution of wet heathland habitats within the SAC due to construction effects being temporary and reversible. Habitat loss and modification are dealt with under the Operations Phase.	None	None	None
		Operation	The operational (long term) impacts that may affect the distribution of wet heathland within the SAC are the same as those outlined for habitat extent above. However, the magnitude and overall impact on distribution	0.29 ha and indirect impact of 1.26 ha on wet heathland habitat. No adverse effect on	Mitigation would be as outlined for habitat extent above.	None

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
			is negligible given the widespread distribution of wet heathland throughout the Caithness and Sutherland Peatlands SAC.	site integrity with respect to the distribution of wet heathland.		
		Decommission	No change in distribution of wet heathland habitats within the SAC.	None	None	None
	To ensure the structure and function of the habitat is maintained in the long term	Construction	No change in structure and function of wet heathland habitats within the SAC due to construction effects being temporary and reversible. Habitat loss and modification are dealt with under the Operations Phase.	None	None	None
		Operation	The operational (long term) impacts that may affect the structure and function of wet heathland within the SAC are the same as those outlined for habitat extent above. These effects are predicted to adversely affect the structure and function of wet heathland within the localised zone of impact adjacent to construction. However, the magnitude and overall impact on the structure and function of wet heathland habitats across the wider SAC will be negligible given the localised extent of these effects.	0.29 ha and indirect impact of 1.26 ha on wet heathland habitat. No adverse effect on site integrity with respect to the structure and function of wet heathland across the SAC.	Mitigation would be as outlined for habitat extent above.	None
		Decommission	No change to structure or function of wet heathland habitats within the SAC.	None	None	None
	To ensure the processes supporting the	Construction	No change to processes supporting wet heathland habitat within the SAC due to construction effects being temporary and	None	None	None

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
	habitat is maintained in the long term		reversible. Habitat loss and modification are dealt with under the Operations Phase.			
		Operation	The operational (long term) impacts that may affect the processes supporting wet heathland within the SAC are the same as those outlined for habitat extent above. These effects are predicted to adversely affect the processes supporting the protection and formation of wet heathland within the localised zone of impact adjacent to construction. This is primarily due to altering the hydrological regime that supports wet heathland. However, the magnitude and overall impact on the processes supporting wet heathland habitats across the wider SAC will be negligible given the localised extent of these effects.	0.29 ha and indirect impact of 1.26 ha on wet heathland habitat. No adverse effect on site integrity with respect to the processes supporting wet heathland across the SAC.	Mitigation would be as outlined for habitat extent above.	None
		Decommission	No change to supporting processes of wet heathland habitats within the SAC.	None	None	None
Depressions on peat substrates of the *Rhynchosp-orion* and Very wet	To ensure the extent of the habitat on site is maintained in the long term	Construction	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the extent of the habitat within the SAC.	None	None	None
		Operation	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the extent of the habitat within the SAC.	None	None	None

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
mires often identified by an unstable 'quaking' surface and Acid peat-stained lakes and ponds and Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels		Decommission	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the extent of the habitat within the SAC.	None	None	None
	To ensure the distribution of the habitat within the site is maintained in the long term	Construction	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the distribution of the habitat within the SAC.	None	None	None
		Operation	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the distribution of the habitat within the SAC.	None	None	None
		Decommission	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the distribution of the habitat within the SAC.	None	None	None
	To ensure the structure and function of the habitat is maintained in the long term	Construction	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the structure and function of the habitat within the SAC.	None	None	None
		Operation	No habitats of this type were found within or adjacent to the proposed widening of the	None	None	None

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
			access track and cable installation. No effects on the structure and function of the habitat within the SAC.			
		Decommission	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the structure and function of the habitat within the SAC.	None	None	None
	To ensure the processes supporting the habitat is maintained in the long term	Construction	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the processes supporting the habitat within the SAC.	None	None	None
		Operation	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the processes supporting the habitat within the SAC.	None	None	None
		Decommission	No habitats of this type were found within or adjacent to the proposed widening of the access track and cable installation. No effects on the processes supporting the habitat within the SAC.	None	None	None
Otter (*Lutra lutra*)	To ensure the population of the species as a viable component of	Construction	There is the potential for death of individual animals or destruction of breeding holts during construction. These effects would be avoided by implementation of assumed mitigation including restricting vehicle	Taking into account assumed mitigation, there exists a negligible risk due to minor	No further mitigation is required.	Negligible

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
	the site is maintained		speeds, providing escape routes from excavations, use of otter friendly bridges and culverts, minimising the number of watercourse crossings, pre-construction surveys for otter holts and resting sites, exclusion zones along watercourses, and thorough assessment of peat slide risk. Pre-construction surveys and micro-siting would further reduce specific risks where required.	uncertainties in mitigation e.g. peat slide risk.		
		Operation	There is the potential for death of individual animals during operations. This would be avoided by the use of bridges and culverts which provide safe passage along key watercourses and restricting vehicle speeds on site for the duration of the wind farm.	Negligible	No further mitigation is required.	Negligible
		Decommission	Believed to be similar in nature and magnitude to construction effects.	As per construction effects	No further mitigation is required.	Negligible
	To ensure the distribution of the species within the site is maintained	Construction	There is potential for disruption of otter movement along key watercourses. These effects would be avoided by implementation of assumed mitigation including, use of otter friendly bridges and culverts, minimising the number of watercourse crossings, and exclusion zones along watercourses.	Negligible	No further mitigation is required.	Negligible
		Operation	There is the potential for disruption of otter movement along key watercourses. This would be avoided by use of otter friendly bridges and culverts.	Negligible	No further mitigation is required.	Negligible
		Decommission	Believed to be similar in nature and	Negligible	No further mitigation	Negligible

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
			magnitude to construction effects.		is required.	
	To ensure the distribution and extent of habitats supporting the species is maintained	Construction	No significant loss of habitat important to the species during construction. Permanent loss of habitat dealt with under operation phase.	None	None	None
		Operation	There would be no loss of habitat important to otter within the SAC. Loss of important otter habitat outwith the SAC would be restricted to watercourse crossings. The Modified 2013 Scheme reduces the number of watercourse crossings required. Overall loss of habitat in these areas is considered negligible, for the project alone and in combination, as the loss of habitat would comprise a very small percentage of the overall otter foraging habitat within the wider landscape.	Negligible	No further mitigation is required.	Negligible
		Decommission	Believed to be similar in nature and magnitude to construction effects.	None	None	None
	To ensure the structure, function and supporting processes of habitats supporting the species is maintained	Construction	Effects and findings as per extent of habitats objective above.	None	None	None
		Operation	Effects and findings as per extent of habitats objective above.	Negligible	No further mitigation is required.	Negligible
		Decommission	Effects and findings as per extent of habitats objective above.	None	None	None
	To ensure there is no	Construction	There is the potential for disturbance to foraging areas, couches or resting sites along	Negligible	No further mitigation is required.	Negligible

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
	significant disturbance of the species		key watercourses used by otter during construction. Pre-construction surveys, controls on lighting and working at night in key areas, and micro-siting would be used to avoid or minimise the potential for disturbance.			
		Operation	There is the potential for disturbance of otter due to site traffic and plant maintenance during the operational phase. Mitigation would include speed restrictions and controls on lighting and working at night in key areas.	Negligible	No further mitigation is required.	Negligible
		Decommission	Believed to be similar in nature and magnitude to construction effects.	Negligible	No further mitigation is required.	Negligible
Marsh saxifrage (*Saxifraga hirculus*)	To ensure the population of the species as a viable component of the site is maintained	Construction	This species was not found within or adjacent to the proposed widening of the access track and cable installation. Further, targeted, pre-construction surveys would be undertaken to ensure no disruption or loss of this species. No effects on the population of the species within the SAC.	None	None	None
		Operation	This species was not found within or adjacent to the proposed widening of the access track and cable installation. Further, targeted, pre-construction surveys would be undertaken to ensure no disruption or loss of this species. No effects on the population of the species within the SAC.	None	None	None
		Decommission	This species was not found within or adjacent to the proposed widening of the access track	None	None	None

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
			and cable installation. Further, targeted, pre-construction surveys would be undertaken to ensure no disruption or loss of this species. No effects on the population of the species within the SAC.			
	To ensure the distribution of the species within the site is maintained	Construction	This species was not found within or adjacent to the proposed widening of the access track and cable installation. Further, targeted, pre-construction surveys would be undertaken to ensure no disruption or loss of this species. No effects on the distribution of the species within the SAC.	None	None	None
		Operation	This species was not found within or adjacent to the proposed widening of the access track and cable installation. Further, targeted, pre-construction surveys would be undertaken to ensure no disruption or loss of this species. No effects on the distribution of the species within the SAC.	None	None	None
		Decommission	This species was not found within or adjacent to the proposed widening of the access track and cable installation. Further, targeted, pre-construction surveys would be undertaken to ensure no disruption or loss of this species. No effects on the distribution of the species within the SAC.	None	None	None
	To ensure the distribution and extent of	Construction	This species was not found within or adjacent to the proposed widening of the access track and cable installation. However, there is the	Negligible	No further mitigation is required.	Negligible

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
	habitats supporting the species is maintained		potential for impacts on the extent of habitats with the potential to support this species, however, no suitable habitats (base-rich flushes) were identified during surveys. Further, targeted, pre-construction surveys would be undertaken to ensure no disruption or loss of this species.			
		Operation	This species was not found within or adjacent to the proposed widening of the access track and cable installation. However, potential impacts have been identified which may affect the extent of habitats with the potential to support this species. The findings in relation to potentially supporting habitats are detailed under the blanket bog and wet heath tables above. Further, targeted, pre-construction surveys would be undertaken to ensure no disruption or loss of this species.	Negligible	No further mitigation is required.	Negligible
		Decommission	This species was not found within or adjacent to the proposed widening of the access track and cable installation. However, potential impacts have been identified which may affect the extent of habitats with the potential to support this species. The findings in relation to potentially supporting habitats are detailed under the blanket bog and wet heath tables above. Further, targeted, pre-decommissioning surveys would be undertaken to ensure no	Negligible	No further mitigation is required.	Negligible

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
			disruption or loss of this species.			
	To ensure the structure, function and supporting processes of habitats supporting the species is maintained	Construction	This species was not found within or adjacent to the proposed widening of the access track and cable installation. However, potential impacts have been identified which may affect the structure, function and supporting processes of habitats with the potential to support this species. The findings in relation to potentially supporting habitats are detailed under the blanket bog and wet heath tables above. Further, targeted, pre-construction surveys would be undertaken to ensure no disruption or loss of this species.	Negligible	No further mitigation is required.	Negligible
		Operation	This species was not found within or adjacent to the proposed widening of the access track and cable installation. However, potential impacts have been identified which may affect the structure, function and supporting processes of habitats with the potential to support this species. The findings in relation to potentially supporting habitats are detailed under the blanket bog and wet heath tables above. Further, targeted, pre-construction surveys would be undertaken to ensure no disruption or loss of this species.	Negligible	No further mitigation is required.	Negligible
		Decommission	This species was not found within or adjacent to the proposed widening of the access track and cable installation. However, potential	Negligible	No further mitigation is required.	Negligible

Table A10.15: Summary of Information to Inform the Appropriate Assessment						
Qualifying Feature	**Conservation Objective**	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**
			impacts have been identified which may affect the structure, function and supporting processes of habitats with the potential to support this species. The findings in relation to potentially supporting habitats are detailed under the blanket bog and wet heath tables above. Further, targeted, pre-decommissioning surveys would be undertaken to ensure no disruption or loss of this species.			

A10.9 References

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Table A10.16: Glossary and Abbreviations

Glossary	
Term	**Definition**
Floating road	A road constructed over an existing peat surface without binding the road to the bed rock beneath thus ensuring minimal disruption to an area's hydrological integrity.
Cut-through road	Roads typically constructed through areas of 1.5 m of peat depth or less, where peat is removed down to the bed rock beneath. The road is then constructed on this bed rock.
Abbreviations	
SNH	Scottish Nature Heritage
SEPA	Scottish Environmental Protection Agency
RSPB	Royal Society for the Protection of Bird
FCS	Forestry Commission Scotland
NDSFB	Northern District Salmon Fisheries Board
NVC	National Vegetation Community
VER	Valued Ecological Receptor
CEMP	Construction Environment Management Plan
EPP	Environmental Protection Plan
FMP	Forestry Management Plan
HMP	Habitat Management Plan

Table A10.16: Glossary and Abbreviations	
DMP	Deer Management Plan
SAC	Special Area of Conservation
SPA	Special Protected Area
SSSI	Site of Special Scientific Interest

A11 Birds

A11.1 Introduction

This ES Addendum chapter assesses the predicted ornithological effects of the Modified 2013 Scheme, following changes to the design described in Chapter A4 Development Description.

The current assessment and the extensive additional surveys and other work underpinning this ES Addendum chapter have been undertaken by RPS, retained by the Applicant to address the ornithological clarifications, concerns and objections raised by Scottish Natural Heritage (SNH) to the Original 2007 Scheme. Ecology UK had previously undertaken the fieldwork for the 2007 ES, during 2003 – 2005.

RPS has addressed the bird-related matters in four reports (submitted as ES Addendum Technical Appendices A11.1 – A11.4). Each responds to specific elements of SNH's response, focussing on the species highlighted by SNH as being of residual concern. The four Technical Appendices are appended to this chapter. They are as follows:-

- Technical Appendix A11.1:Report 1 - Compilation of Historical and 2003-2012 Bird Data and Collision Risk Modelling from 2003 – 2012 Vantage Point Data;
- Technical Appendix A11.2:Report 2 - Forest Clearance and Habitat Management At Strathy South: An Assessment of the Effects on Birds Connected with the Caithness and Sutherland Peatlands Special Protection Area (SPA);
- Technical Appendix A11.3: Report 3 -Theoretical Collision Risk Modelling for Greenshank and Golden Plover at Strathy South Wind Farm; and
- Technical Appendix A11.4: Report 4 - An Assessment of Impacts from Strathy South Wind Farm on the Qualifying Birds of the Caithness and Sutherland and Peatlands SPA.

This ES Addendum chapter itself therefore only serves to either summarise the key findings of these ES Addendum Technical Appendices, or where more appropriate, to direct readers to information provided in these documents.

This ES Addendum chapter and associated Technical Appendices supersede all the bird-related elements of the 2007 ES (specifically 2007 ES Chapter 11: Birds and supporting Technical Appendices 11.1 – 11.6 and Confidential Annexes, and the 2007 ES Technical Appendix 14.4 Environmental Management and Pollution Prevention Plan).

This ES Addendum chapter must therefore be read in conjunction with:

- 2007 ES Chapter 11 Birds and supporting Technical Appendices 11.1 – 11.6 (to provide the context for SNH's comments)
- SNH's response letter dated 2nd October 2007 contained within Technical Appendix A5.1
- ES Addendum Technical Appendixes A11.1 to A11.4.
- ES Addendum Chapter A1: Introduction and Chapter A4: Development Description

Information in ES Addendum Chapter A10: Ecology also provides contextual information on the habitats of the site and its surroundings, which clearly have a significant bearing on the distribution of bird interests at present and once the plantation forest has been removed. The habitat mitigation and enhancement measures proposed in Chapter A10: Ecology are also of relevance.

A11.2 Scope of Assessment

This ES Addendum chapter and its Technical Appendixes identify and assess the potential for significant effects of the Modified 2013 Scheme on Valued Ornithological Receptors (VORs) and their designated sites, paying specific attention to the resolution of issues raised by consultees arising from the Original 2007 Scheme, as presented in the 2007 ES.

The effects of the Modified 2013 Scheme are considered cumulatively, in terms of its impacts, and in combination with other plans and projects, for the Habitats Regulation Appraisal (HRA) to be carried out by the competent authority.

Of particular note for cumulative issues is the fact that since the 2007 ES, Strathy North wind farm has been consented (and is under construction), and the adjacent Strathy Wood wind farm is at scoping stage. Both of these developments have been taken into consideration, together with other projects identified by SNH.

A11.2.1 Project Interactions

As described in 2007 ES Chapter 11: Birds, the Modified 2013 Scheme may interact with bird species directly due to disturbance or removal of habitat, or collision with rotor blades or turbine structures; or indirectly by causing changes to habitat characteristics, in particular by introducing noise and movement.

Further to this, the key ornithological interactions from the Modified 2013 Scheme are its potential to affect the:

- conservation status of bird species due to habitat loss/change (notably the removal of the Strathy South plantation, and its replacement with open habitats), plus disturbance, displacement or collisions with the turbines or other structures. The species given the highest levels of statutory protection are those included in Annex I of the EU Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- conservation status of other breeding birds, through habitat loss/change disturbance, displacement and collisions with the turbines;
- conservation status of wintering and migratory geese and other wildfowl due to the risk of turbine collisions or barrier effects as they fly through the area on migration or while commuting locally; and
- ornithological interests of adjacent designated sites for their ornithological features.

From this range of potential effects, SNH has identified in their 2nd October 2007 response (and their accompanying 25th September 2007 response which dealt with habitat and protected species issue), a range of key concerns that it wished to see addressed. It highlighted that once this information had been provided it would be in a position to give further consideration to this proposal, including any mitigation measures.

To this end, it should therefore be noted from the outset, that the majority of the changes incorporated into the Modified 2013 Scheme, as set out in Chapter A4: Development Description, have been implemented to help resolve the ornithological (and ecological) concerns raised by SNH to the Original 2007 Scheme. In particular, these modifications include:

- The deletion of the proposed new link track from Strathy North to Strathy South, via Cnoc Meala – a preferred and an alternative access route are now proposed, both through Strathy Wood, following for the most part the existing Strathy South access track (which would be partially widened);
- The re-routing of the majority of the grid connection – the transmission connection no longer crosses the SPA from the east of Strathy South, but instead is proposed under a separate Section 37 application to connect to Strathy North, north of the SPA. Strathy South is now limited to the underground cabling between Strathy North and South following the preferred or alternative routes integrated with the existing access track into Strathy North (Figure A4.1).
- The reduction in number of turbines, from 77 to 47, albeit with an increased tip height and rotor diameter, to reduce the rotor swept area (important for reducing collision risk) and reducing the wind farm's physical footprint (helping to reduce the extent of habitat effects, and increasing the area available for habitat restoration). The layout itself also includes embedded mitigation, notably through its inclusion of a northwestern habitat corridor and several areas of habitat enhancement.

In addition to these measures, the Applicant is also proposing specific targeted mitigation that would ensure overall net environmental gain to be delivered, through the Modified 2013 Scheme, and integrated with the habitat management being carried out for Strathy North.

A11.2.2 Study Area

The main study area used for bird surveys is broadly in keeping with the 2004 survey extent, i.e. 500 m to 1 km for breeding moorland birds, 2 km for most raptors, 1 to 3 km for divers (depending on the survey year), and extending to 6 km for golden eagle. In addition, specific additional survey areas were also covered, specifically the Cnoc Meala track route in 2005, and for the more recent surveys, the proposed new preferred access route and an alternative segment of access track running from the southern end of Strathy North Wind Farm, linking with the existing access track running through Strathy Wood, to the northern boundary of Strathy South Forest (Figure A4.1), the latter part of which is through the Caithness and Sutherland Peatlands SPA. Surveys were also completed in 2012 for the alternative access study, and in 2010, 2011 and 2012 for the grid connection route S37 application, which provided additional contextual information for certain wider ranging species (such as divers).

A11.2.3 Updated Scoping and Consultation

Reference should be made to Chapter 11: Birds, Section 11.2.3 and Table 11.1 in the 2007 ES for details on scoping and pre-application consultation, along with issues raised by the consultees during this process.

Details of consultation responses received following submission of the application for Section 36 Consent in March 2007 in relation to the Original 2007 Scheme are given in Table A11.1 below.

Table A11.1: Issues Identified During Consultation

Consultee	Issue	Where/How this is Addressed
Scottish Natural Heritage (SNH) (letter dated 2nd October 2007 – refer to Technical Appendix A5.1)	Objections to the Section 36 Application due to insufficient information within the ES regarding the potential effects on the qualifying bird interests of the Caithness and Sutherland Peatlands Special Protection Area (SPA) and Ramsar Sites. In order for this to be determined, SNH requested additional ornithological information on the following points: A) Qualifying interests: red-throated diver, black-throated diver, golden eagle, hen harrier, greenshank, golden plover and merlin – 13 bullet points, as follows:- 1. Additional information in the form of a 'Desk Study' on the occurrence of the SPA qualifying species in the area. 2. A thorough assessment of flight collision risks for greenshank and golden plover (including off-site commuting flights for the latter species). In the absence of on-site flight data, if this occurs, the assessment should assume any territories within 500m of turbines will be lost through collisions.	ES Addendum Technical Appendix A11.1 covers SNH's points A1 – 9. The first section provides up-dated baseline information on breeding bird numbers and distribution for species SNH highlighted as specific concerns in their response. These are red and black-throated divers, qualifying species of raptors and waders. It includes a description of the breeding survey methods used over the data collation period, and covers any methodological points of clarification requested by SNH in their response. Following this description of baseline data collection methods, the results from desk study and field survey elements are presented for each species, from 2003 to 2012 (supplemented by 2013 in some cases). This breeding information has been collected for the site and its surroundings (in accordance with the relevant recommendations on survey extent in SNH Guidance), and its wider hinterland and Natural Heritage

Table A11.1: Issues Identified During Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	3. Clarification of greenshank survey dates. 4. Loss of greenshank and golden plover from disturbance effects should be assumed if territory centres were within 200m of turbines. 5. and 6. Additional flight information on red and black-throated divers was needed. 7. 8. and 9. Related to improvements in calculation of all collision risk estimates. 10. Requested more rigorous assessment of the effects of the proposal on golden eagle, using 'PAT' (Predicting Aquila Territories) modelling, and use of historical data on territory productivity and SPA and Natural Heritage Zone data. 11. A thorough assessment of forest clearance effects on bird populations connected with the SPA. 12. Cumulative impact assessment of potential effects on SPA qualifying species. 13. An assessment of the predicted impacts on the SPA's qualifying interests, in relation to the conservation objectives of the site, with and without mitigation, and assuming territories off the SPA were nonetheless associated with it and therefore contributing to their SPA populations. B) Qualifying interests: wood sandpiper, dunlin and short-eared owl – 2 bullet points as follows: (a) it will be necessary to provide information that allows a high level of confidence that the changes in environment will not lead to an increase in risk to these qualifiers of the SPA. (b) For dunlin, a more robust assessment of disturbance and collision effects as a result of construction and operational effects, before mitigation is considered, using a 500m radius from the territory centre. SNH further noted that their position on the Ramsar site mirrors that of the SPA for dunlin and greenshank, i.e.	Futures Zone. Together with population information at the SPA, Scottish and UK level, this contextual data aims to put the site and predicted development impacts in their conservation context. The second section of Technical Appendix A11.1 gives up-dated baseline information on flight activity for the same species. Specific details of survey method and coverage are given, and the up-dated predicted collision risk presented, based on the combined Ecology UK (2003-2004) and RPS (2007-2012) data. Included in this section of the report are specific clarifications and explanations requested by SNH, in relation to flight survey methods and analysis (i.e. Points 7, 8, 9). Also in relation to collision risk modelling, ES Addendum Technical Appendix A11.3 has been produced to supplement collision risk analysis for greenshank and golden plover, the two species whose more complex flight behaviour warrants additional consideration. It therefore responds to Point A2 from SNH's response. It examines the detection rates for these species and presents adjusted collision predictions, taking this into account. ES Addendum Technical Appendix A11.2 addresses Points A10 and A11, and B (a) and (b), describing the land management history of the site and its hinterland, to identify how this has influenced breeding and foraging populations of SPA qualifying species, within and around the proposed wind farm. It then provides evidence to demonstrate how forest clearance and future land management of the wind farm area will be carried out in order to avoid impacts on the SPA's qualifying species. Specifically this illustrates the forest clearance and land management approaches that would be used, providing evidence from other sites where tree removal and subsequent management have allayed SNH's (and RSPB Scotland's) concerns that birds might

Table A11.1: Issues Identified During Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	they objected to the Original 2007 development. In relation to the SPA, SNH did not object for wigeon or common scoter, and in relation to the Ramsar site, they do not object for breeding greylag geese. The comments SNH raised above regarding the SPA also apply to the Lochan Buidhe Mires, Skelpick Peatlands, Strathy Bogs and West Halladale SSSIs. SNH therefore objected to the original proposal as submitted, on the basis of these same concerns.	be attracted to the wind farm site. The report covers each species that SNH has raised as a concern, giving the evidence used to predict the effects on breeding and foraging behaviour once the forest has been removed. ES Addendum Technical Appendix A11.4 combines all the above evidence together to address SNH's issues A12 and A13, i.e. to assess the predicted impacts on all qualifying species of the SPA and its integrity. ES Addendum Technical Appendix A11.4 therefore explains the predicted effects on qualifying species during construction, operation and decommissioning of the Modified 2013 Scheme, taking into account disturbance, displacement, barrier effects and collision risk. It also provides the cumulative assessment in terms of the VORs, and the in combination assessment of relevant plans and projects, to inform the Habitats Regulations Appraisal. ES Addendum Technical Appendix A11.4 effectively replaces the original ornithological impact assessment contained in the 2007 ES.
Royal Society for the Protection of Birds (RSPB) (letter dated 10th August 2007- refer to Technical Appendix A5.1)	Objected to the Section 36 Application as they considered that, in combination with the associated grid connection and Strathy North wind farm, it is likely to affect adversely the integrity of the adjacent Special Protection Area. Key issues were: The ES lacks sufficient detail to support an Appropriate Assessment as required by the Habitat Regulations, with particular regard to red-throated diver, black-throated diver, hen harrier, golden eagle and greenshank SPA populations Cumulative impacts on the adjacent SPA were insufficiently addressed. The proposed monitoring strategy during and after construction was insufficient to assess bird population changes in a radically modified habitat. The proposed grid connection and access route is likely to have a	As these points overlap with those raised by SNH, they are responded to in the same manner, through ES Addendum Technical Appendices A11.1-A11. 4.

Table A11.1: Issues Identified During Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	significant effect on the qualifying features of the SPA.	

As detailed in the table above, the Applicant has provided responses to all of the matters raised by SNH and RSPB Scotland with respect to ornithological issues. Meetings were held with SNH on 5th September 2012, 5th December 2012 and 12th March 2013, and 3rd October 2012 with RSPB Scotland, during which the matters raised by these organisations were discussed. Feedback from these meetings was taken into account in addressing the above issues. In addition, a re-consultation letter was sent to statutory and non-statutory consultees dated 4th September 2012. This explained the changes to the scheme and invited feedback.

A11.2.4 Impacts to be Assessed

No additional construction, operational or decommissioning effects have been identified; see Chapter 11: Birds, Section 11.2.4 in the 2007 ES for further details on these aspects.

A11.2.5 Impacts Scoped out of Assessment

The effects scoped out of the ES Addendum assessment remain unchanged from the 2007 ES; refer to Chapter 11: Birds, Section 11.2.5 in the 2007 ES for detail of these.

A11.3 Changes to Policy and Legislative Context

The policy context outlined within Chapter 11: Birds Section 11.3 in the 2007 ES remains current. However, there have been a number of updates since the submission of the 2007 ES. Details of the relevant new and updated policies and legislation are presented in Table A11.2.

Table A11.2: Relevant National, Regional, and Local Policy and Legislation Updates Since the 2007 Submission Date		
New/updated Policy or Guidance	**Source**	**Outline**
International		
Directive 2009/147/EC	European Parliament	The conservation of wild birds (codified version); (the "Birds Directive") which replaces and updates the 1979 version of the Directive
National		
Conservation of Habitats and Species Regulations 2010.	UK and Scottish Parliaments	These regulations consolidate the Conservation (Natural Habitats, &c.) Regulations 1994 (and amendments) for England and Wales. However, they also apply to Scotland in regards to specific activities including Section 36 applications under the Electricity Act 1989 where a Natura 2000 site may be affected. In practice, the updated 2010 regulations are very similar in terms of how consent applications are assessed with respect to Natura sites.
Wildlife and Natural Environment (Scotland) Act 2011.	Scottish Parliament	This act amends the Wildlife and Countryside Act 1981 in the following ways: • introduces new wildlife offences and wildlife management requirements (mainly with respect to wild birds, deer and hares); • strengthens protection of badgers;

Table A11.2: Relevant National, Regional, and Local Policy and Legislation Updates Since the 2007 Submission Date

New/updated Policy or Guidance	Source	Outline
		• makes changes to the licensing system for protected species; and • introduces a new regime for regulating invasive and non-native species.
Policy	Scottish Parliament	Scottish Planning Policy (2010) The policy states that planning authorities should seek benefits for species and habitats from new developments including the restoration of degraded habitats, and where peat and other carbon rich soils are present, applicants should assess the likely effects associated with any development work.
Policy	Scottish Parliament	Scottish Government Renewable Energy Policy Subject - Online Advice for Onshore Wind Farms (updated May 2012) The policy states that planning authorities should generally seek to appoint Ecological Clerk of Works to ensure that agreed designs and construction techniques are followed.
Guidance	SNH, SEPA, FCS	Scottish Renewables, SNH, SEPA, FCS - Good Practice During Wind Farm Construction (October 2010) This document highlights past examples of where 'Best Practice' has been implemented through case studies of previous wind farm sites and advises on key considerations concerning the construction phase of the development.
Guidance	SNH	SNH - Renewable Energy and the Natural Heritage (2010) The Document outlines SNH's Policy position and role within renewable developments and provides a brief summary of landscape and ecological impacts associated with these developments. The Document further refers to Implementation Guidance with regards to ecological and ornithological issues.
Guidance	SNH	Survey methods for assessing the impacts of onshore wind farms (2005 Revised 2010)
Guidance	SNH	Assessing the cumulative impact of onshore wind farm developments (2012)
Guidance	SNH	Monitoring the impact of onshore wind farms on birds in Scotland (January 2009)
Guidance	SNH	Guidance on methods for monitoring bird populations at onshore wind farms (2009)
Guidance	SNH	Guidance on Environmental Statements and Annexes of Environmentally Sensitive Bird Information (2009)
Guidance	SNH	Guidance on Assessing Connectivity with Special Protection Areas (SPAs) (2012)
Guidance	SNH	Post-construction management of wind farms on clear-felled forestry sites: reducing the collision risk for hen harrier, merlin and short-eared owl from Special Protection Areas (revised 2012)

Table A11.2: Relevant National, Regional, and Local Policy and Legislation Updates Since the 2007 Submission Date		
New/updated Policy or Guidance	**Source**	**Outline**
Guidance	SNH	Dealing with construction and breeding birds (2011)
Guidance	SNH	Geese and wind farms - new information (2013)
Guidance	SEPA	Management of Forestry Waste (2013)
Guidance	FCS	FCS – UK Forestry Standard Guidelines on Forests and Water, Forests and Biodiversity, and Forests and Soils – Version 2011 5th Edition These guidelines seek to aid the protection of the aquatic environment, biodiversity and soils within commercial forestry during operational activities such as timber harvesting and construction of infrastructure.
Policy	FCS	The Scottish Government's Policy on Control of Woodland Removal (2009)
Regional		
Plan	THC	Highland Wide Local Development Plan (April 2012) The Plan identifies areas to be afforded protection from wind farm development, steering developer towards less constrained tracts of land, and set out criteria which applies to the consideration of proposals irrespective of size and location. The plan contains a number of Policies directly relating to natural heritage, ecology and compensatory habitat creation with specific reference to peatland habitats.

A11.4 Changes to Methodology

A11.4.1 Overview

The survey methodologies and impacts highlighted by SNH as requiring further consideration are provided in the ES Addendum Technical Appendices A11.1 – A11.4. A brief descriptions of each Appendix and also provided below.

(a) ES Addendum Technical Appendix A11.1

The ES Addendum Technical Appendix A11.1 is structured into two broad sections. The first gives a completely up-dated baseline on **breeding bird numbers and distribution** for the species that either SNH or RSPB Scotland highlighted as being of specific concern. These are red and black-throated divers, qualifying species of waders and qualifying species of raptor. Technical Appendix A11.1 also includes a description of the breeding survey methods and gives the clarification on survey methods that SNH requested in their 2nd October 2007 response letter. Following this description of baseline data collection methods, the results from desk study and field survey work are presented for each species, up to 2012 (and for 2013, where recent information is available).

This breeding information has been collected for the site and its surroundings (in accordance with the relevant recommendations on survey extent in SNH Guidance 2010), and its wider hinterland and Natural Heritage Zone. Together with population information at the SPA, Scottish and UK level, this contextual data aims to put the site and predicted development impacts in their conservation context.

Having provided a clear over-view of the areas' bird interests, the second section gives up-dated baseline information on **flight activity** for these species. Details of survey method and coverage are given, and the up-dated predicted collision risk presented, based on the combined Ecology UK (2003-2004) and RPS (2007-2012) data. Included in this section of the report are specific clarifications and explanations requested by SNH or RSPB Scotland, in relation to flight survey methods and analysis (see Table A11.1).

(b) ES Addendum Technical Appendix A11.2

Using the up-dated baseline data from ES Addendum Technical Appendix A11.1, ES Addendum Technical Appendix A11.2 addresses the seventh point of SNH's 2nd October 2007 issues:

"A thorough assessment of the effects of forest clearance on bird populations connected with the SPA. There is a risk, not fully explored, that forest clearance and habitat improvement works will result in SPA populations being attracted onto the site and placed at risk of collision with turbine rotors... This is because the tree felling and proposed habitat improvement plans are likely to lead to changed use and ultimately increased collision risk to a number of qualifiers…It will be necessary to demonstrate that the changes in environment will not lead to an increase in risk to qualifiers of the SPA."

ES Addendum Technical Appendix A11.2 therefore describes the land management history of the site and its hinterland, to understand how this has influenced breeding and foraging populations of SPA qualifying species, within and around the site. It then provides evidence to demonstrate how forest clearance and future land management of the site will be carried out in order to avoid impacts on the SPA's qualifying species. Specifically this illustrates the forest clearance and land management approaches that will be used, providing evidence from other sites where tree removal and subsequent management have allayed SNH's (and RSPB Scotland's) concerns that birds might be attracted to the site. The report covers each species that SNH has raised as a concern, giving the evidence used to predict the effects on breeding and foraging behaviour once the forest has been removed.

ES Addendum Technical Appendix A11.2 therefore focuses on forest clearance and management prescriptions to be applied to the site, plus the effects these are predicted to have on the breeding and foraging activity of SPA species.

(c) ES Addendum Technical Appendix A11.3

ES Addendum Technical Appendix A11.3 has been produced to supplement analysis of collision risk for greenshank and golden plover, the two species whose more complex flight behaviour warrants additional consideration. It therefore responds to Point A.2 from the 2nd October 2007 SNH response (Table A11.1). It assesses detection rates during flight activity surveys and uses the results to adjust the predicted collision rates, drawing on flight characteristics of these species and their breeding distribution in relation to the site.

(d) ES Technical Appendix A11.4

ES Technical Appendix A11.4 combines all the above evidence together to address SNH's issue A12 and A13 (Table A.11.1), i.e. to assess the predicted impacts on all qualifying species of the SPA and determine whether or not it is possible to demonstrate no adverse effect on site integrity. Technical Appendix A11.4 therefore explains the predicted effects on qualifying species during construction, operation and decommissioning of the Modified 2013 Scheme, taking into account habitat loss and change, disturbance, displacement, barrier effects and collision risk. For the latter it also repeats the findings on the cumulative impact assessment from Technical Appendix A11.3 (but adding any further 'plans and projects' other than wind farms that SNH considers relevant). Technical Appendix A11.4 therefore provides information to inform the appropriate assessment by the competent authority. Technical Appendix A11.4 effectively replaces the original ornithological impact assessment contained in the 2007 ES.

Through provision of this sequence of ES Addendum Technical Appendices, it is intended to enable SNH and RSPB to fully assess the impacts of the Modified 2013 Scheme. It should

also enable the competent authority, the Scottish Government, to carry out an appropriate assessment of the Modified 2013 Scheme.

From this information it will be able to conclude whether or not the Modified 2013 Scheme would have an adverse impact on the integrity of the Caithness and Sutherland Peatlands SPA (and the Caithness and Sutherland Peatlands SAC).

A11.5 Changes to Baseline Assessment

A11.5.1 Desk Surveys

Additional desk studies were undertaken to update the information provided in the 2007 ES. These utilised a number of online reference collections such as the National Biodiversity Network Gateway and SNH Sitelink, as well as field data supplied by Highland Raptor Study Group (HRSG), RSPB and EON (relating to the proposed development at the adjacent Strathy Wood). In combination, this enabled a full assessment of the historical presence of key bird species both on the site and in the surrounding area. Additional modelling of golden eagle range suitability was also carried out as part of the desk study.

See ES Addendum Technical Appendix A.11.1 for full details.

A11.5.2 Field Surveys

Subsequent to the submission of the 2007 ES, in order to come to a robust understanding of abundance and distribution of the SPA qualifying species identified by SNH and RSPB, additional surveys directly relating to the site were carried out in 2007, 2009, 2010 and 2012 (with some additional information collected in 2013).

Survey work comprised standard vantage point watches, and breeding divers, raptors and moorland bird surveys, plus wader VP surveys specifically designed to investigate and monitor lesser-known elements of flight behaviour, including differences in flight activity over forestry, felled forestry and open moorland.

In addition, where relevant (to provide additional contextual information or help assess cumulative impacts), data collected during field surveys for the consented Strathy North wind farm in 2007, 2008, 2009 and 2012 and for the proposed Strathy Wood wind farm in 2008, 2009, 2010 and 2011 were also incorporated. This is of value for the wider ranging species whose foraging and/or breeding distribution can vary through the year and between years, and may potentially overlap both sites (such as red and black-throated divers, hen harrier and golden eagle).

See ES Addendum Technical Appendix A11.1 for full details.

A11.5.3 Effects Evaluation

The methodology used to assess the significance of effects associated with the development in the 2007 ES remains unchanged, although cumulative effects are now considered. Table A11.3 summarises the relationship between the Receptor and the Effect Magnitude, with the effects or residual effects considered to be significant under The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 if they are at a level of Moderate or Major significance (i.e. “a likely significant effect”). These are coloured in mid and dark grey. Full details are presented in Section 2, ES Addendum Technical Appendix A11.4.

Table A11.3: Significance of the Effects Defined by the Relationship between the Receptor Sensitivity and Effect Magnitude

Effect Magnitude	Receptor Sensitivity				
	International	**National**	**Regional**	**Local**	**Negligible**
Total / near total	Major	Major	Major	Moderate	Minor
High	Major	Major	Major-Moderate	Moderate	Minor
Medium	Major	Major-Moderate	Moderate	Moderate-Minor	Minor
Low	Moderate-Minor	Moderate-Minor	Moderate-Minor	Minor	Minor
Neutral	Non / Negligible Effects				

It is important to note however, that the purpose of the additional ornithological work completed for the Addendum has been specifically to address the issues raised by SNH (and RSPB Scotland), following the Original 2007 application. As evident in Table A11.1, their points do not generally state specific disagreement with the 2007 ES' ornithological assessment outcome. Instead, the issues are either simpler (on survey methods, collision risk modelling etc.) or more complex (dealing with the effects of the wind farm on the integrity of the SPA). The effects evaluation in terms of the EIA Regulations is therefore less relevant as the dominant measure of impact acceptability for Modified 2013 Scheme is whether it can be demonstrated beyond reasonable scientific doubt that it will have no adverse effect on site integrity of the SPA.

The Technical Appendices are therefore specifically intended to fulfil this effects evaluation, in order to inform the Habitat Regulations Appraisal (HRA).

See ES Addendum Technical Appendix A11.4 for full details.

A11.5.4 Limitations of Assessment

SNH and RSPB Scotland highlighted concerns over elements of the previous assessment (see Table A11.1). These have addressed through additional fieldwork and analysis. As a result, the baseline ornithological data (ES Addendum Technical Appendix A11.1) used to identify VORs and enable a comprehensive impact assessment (ES Addendum Technical Appendix A11.4) to be undertaken is considered to be at a suitable level of detail to enable an Appropriate Assessment to be undertaken.

A11.6 Changes to Baseline Conditions

A11.6.1 Context

The context of the site in the wider landscape remains as outlined in Chapter 11: Birds, Section 11.5.1 of the 2007 ES. Baseline conditions up to 2007 were reported in Sections 11.5.3 and 11.5.4 and Technical Appendices 11.1, 11.2 and 11.3 of the 2007 ES. These conditions have been updated in ES Addendum Technical Appendix A11.1 of this ES Addendum, giving a comprehensive and accurate assessment of the ornithological constraints currently present on site.

The proposed access track route has been altered in response to feedback received from consultees to the 2007 ES (Table A11.2) and the subsequent undertaking of a full access route options appraisal (and submitted as a separate application document 'Strathy South Wind Farm Access Route Review'). The baseline conditions of the preferred access track

option are reported in ES Addendum Technical Appendix A11.1, and are assessed in ES Addendum Technical Appendix A11.4.

The Modified 2013 Scheme layout has also altered since the 2007 ES, taking into account a number of issues raised by consultees. Turbine numbers have been reduced from 77 to 47, and tip height has been raised to enable a greater ground clearance from the rotor. This has allowed greater flexibility to site turbines away from key breeding areas, flight corridors and the boundary of the surrounding SPA, where possible. In addition, since it is considered that for the majority of qualifying species, the majority of collision risk is at the bottom of the rotor swept area than the top, this modification is also likely to reduce collision risk to a number of species.

A11.6.2 Baseline Data

Results of the data obtained from surveys carried out at the site between 2003 and 2012 and from other historical records (referenced in the Technical Appendices) have shown that the site and its immediate surroundings are used by SPA qualifying species for foraging and breeding (for hen harrier and red-throated diver, there were also 2013 records available for key locations).

Red and black-throated diver, merlin, golden plover and dunlin were all confirmed as breeding within the survey boundaries. Hen harrier and greenshank were recorded breeding within the site as well as within the wider survey boundaries. There are two well established golden eagle territories, to the south and northwest, and golden eagles were occasionally recorded flying across the site. Three SPA species, common scoter, wigeon and wood sandpiper, were not confirmed as breeding within the survey boundaries and were absent from the site itself. There have been no breeding records for peregrine or short-eared owl since 2003 within 2 km of the site boundary, and site usage is rare. Greylag geese and whooper swan flew over the site, primarily during the non-breeding season.

Full details of the baseline bird surveys are in ES Addendum Technical Appendix A11.1.

(a) Collision Risk Modelling Results

Details of the up-dated collision risk modelling (CRM) are provided in ES Addendum Technical Appendix A11.1. Detailed additional modelling of collision risk has been carried out for greenshank and golden plover, in response to SNH's request, to quantify and take account of under-recording of these species from standard vantage point surveys. The results of this additional theoretical modelling are presented in ES Addendum Technical Appendix A11.3.

A11.7 Changes to Effects Evaluation

A11.7.1 Basis of Assessment

All effects to be assessed are presented in the 2007 ES Chapter 11: Birds, Tables 11.2 and 11.3, and remain unchanged.

The effects of the Modified 2013 Scheme on VORs, including cumulative and 'in combination' effects, are highlighted in Technical Appendices A11.1, A11.2 and A11.4 of this ES Addendum. As highlighted, the desire to avoid or minimise any negative effects on these receptors has been a key influence on the revisions made to the Scheme. Therefore the assessment of effects has taken into account the changes to the layout, site infrastructure, access, turbine specifications, forest removal and subsequent management, and the revised SSER Construction and Environment Management Plan.

(a) Construction Effects

An updated evaluation of construction effects, to take into account both comments by consultees and the Modified 2013 Scheme are presented in ES Addendum Technical Appendices A11.2 and A11. 4.

In summary, of the species highlighted by SNH as requiring further consideration, without mitigation there would be potentially significant disturbance impacts from noise, traffic movements and people, to breeding red-throated diver, black-throated divers, hen harrier, greenshank, golden plover and dunlin and all other breeding birds. In order to avoid these impacts (as is required in any case by the Nature Conservation (Scotland) Act, 2004), a range of mitigation measures will be incorporated into the development during construction (as is being done for Strathy North, for example). These are pre-commencement breeding bird surveys (covering the site and standard buffers around it, for moorland breeding birds, raptors and divers), the deployment of a suitably qualified Ecological Clerk of Works team to carry out pre-clearance checks ahead of forest or open habitat removal, retention of selected forest blocks for screening, the use of additional screening bunds if required (along the access track (for red-throated divers and possibly hen harriers), traffic management measures (no horns sounded, no stop zones, no personnel out of vehicles etc.), on-going monitoring for all breeding birds on and adjacent to the site through the construction period, and the implementation of strict activity-free buffers to prevent disturbance, where breeding birds occur. All of these measures would be incorporated into a Breeding Bird Monitoring and Protection Plan, which would form part of the CEMP.

Following implementation of these mitigation measures, and drawing on extensive first-hand practical experience of successfully implementing these measures on a range of sites, the residual impact of construction on all VORs has been assessed as negligible.

Habitat Loss: The extent of direct and indirect habitat loss from the Modified 2013 Scheme is limited in extent. From a thorough assessment of the baseline conditions at locations where open habitat will be lost, the assessment has concluded there will be no significant effects for any VOR. Removal of the conifer plantation is in accordance with a wide range of national, regional and local biodiversity policies, and is a widespread approach to peatland restoration. From an equally thorough assessment of baseline conditions, again the assessment has concluded there would be no significant impacts on any VOR.

(b) Operational Effects

An updated evaluation of operational effects, to take into account both the comments by consultees and the Modified 2013 Scheme are presented in ES Addendum Technical Appendices A11.1 (on collision risk), A11.2 (on all operational effects), A11.3 (collision risk for greenshank and golden plover) and A11.4 (on all of these). In summary, there findings of the assessment of operational effects are as follows:

Change in Habitat Over the Lifetime of the Wind Farm: Given that SNH and RSPB Scotland have raised concerns that forest removal could result in increased collision risk, detailed consideration has been given to the effect of plantation removal, and the subsequent creation of open habitats that would be managed for peatland restoration. The effect on the distribution of breeding and foraging activity of SPA and SPA-associated birds has been the focus of this analysis (and is covered in detail in ES Addendum Technical Appendices A11. 2, A11.3 and A11.4).

It has been concluded, on the basis of the site's physical topography, peat depth, drainage, current forest cover, residual and existing open habitats and vegetation, and the likely succession of peatland habitats once the plantation is removed, that without mitigation, there would be the risk of areas of habitat evolving over the lifetime of the wind farm that could provide attractive nesting habitat for short-eared owl and hen harriers (notably through conifer regeneration, the existence of forest brash or establishment of taller vegetation including rushes). Whilst this, in itself, would not necessarily result in increased collision risk to these species to any significant degree, the Outline Habitat Management Plan that has been proposed (ES Addendum Technical Appendices A11.2) as part of the overall mitigation package, includes measures (vegetation and bird monitoring, control of conifer regeneration, provision for mechanical vegetation control and grazing, and drain blocking) that would all combine to reduce the extent of suitable nesting habitat within the turbine array for these species. Once this mitigation is taken into account, this risk of attracting additional breeding or foraging activity for these species is therefore considered to be negligible. There are no

other raptor species for which habitat change is considered likely to have any significant impact: merlin are sufficiently uncommon in the area, and with the absence of tree cover post-felling, their colonisation of the site is considered a low risk. Evidence suggests that golden eagle generally avoid foraging over wind farms, so the change in habitat is not considered to pose a significant risk to them (a finding supported by PAT modelling detailed in Technical Appendix A11.2).

It is acknowledged that the change in habitat will, however, create over time conditions that are more suitable for breeding and foraging waders than at present. The factor that is particularly relevant, however, is that the evidence from the breeding surveys on and around Strathy South, Strathy North and Strathy Wood, plus known habitat requirements of these species, all show a strong affinity for pool systems, particularly dunlin and greenshank, and golden plover to a lesser degree. This information, combined with the forest edge modelling carried out by FCS, SNH and RSPB, has informed the layout, including the habitat corridor created in the north-west of the site, and the proposed management compartments of the Outline Habitat Management Plan. The Modified 2013 Scheme therefore does include embedded mitigation to reduce the risk of collision to breeding or foraging waders, but no further mitigation is proposed. This is because the recorded flight activity, including taking into account the effects of distance detection, produces predicted collision rates that are considered negligible in population terms (see collision risk below). The impact of habitat change for waders is therefore assessed as negligible.

The change in habitat is not predicted to have any significant negative effect on breeding divers.

For breeding waders in particular, but also for other ground-nesting species (including divers), the removal of the plantation will bring indirect benefits through the removal of edge effects. This is likely to include reduced predation, as a result of lower numbers of foxes in particular. This is predicted to have a beneficial effect on the breeding population of these species, on the adjacent SPA.

Displacement: As a result of the increasing number of operational wind farms, there is a growing body of evidence for more species' on their ability (or otherwise) to breed or forage in proximity to operational wind farms. Information from multiple sites, collected over several years, indicates that the embedded mitigation of the Modified 2013 Scheme (specifically its north-western habitat corridor) is sufficient to ensure there would be no significant displacement of breeding or foraging hen harriers at Strathy South. Given the conifer edges, where occasional breeding activity was recorded in some survey years, will be felled for peatland restoration, no displacement of this species is predicted. No other raptors were recorded breeding within the site or proximity to the proposed wind farm, other than merlin.

Information on the ability of divers to breed and forage in proximity to operational turbines is still relatively restricted. However, within approximately 90 km of Strathy, the Burgar Hill Wind Farm on Orkney has had breeding divers within 300 m over a number of years. On this basis, and drawing on known disturbance distances for this species from other activities, combined with the distance to breeding and foraging lochans from the wind farm infrastructure, the risk of displacement for red-throated divers is considered to be low. Should displacement occur, the evidence from breeding diver monitoring over 2003 to 2012 shows that there are a number of alternative nesting lochs within range for these birds. At the population level therefore, it has been assessed that the impact on this species is negligible. Whilst there are currently no known operational wind farms in proximity to black-throated diver lochs, from the published disturbance distances for this species for other activities, the predicted impact without mitigation for this species is considered to be low. The mitigation proposed for this species, that will also benefit red-throated divers to a lesser degree, is the provision of diver rafts at suitable locations, over the life-time of the wind farm. With this mitigation in place, the risk of displacement effects at the population level is assessed as negligible.

For breeding and foraging waders, there is also a body of evidence to draw on from several operational wind farms in Scotland, although results do indicate a range of distances at

which displacement of breeding waders is considered to occur. Whilst there is evidence for golden plover successfully breeding within 200 m of turbines over a number of years, SNH have sought a precautionary 500 m buffer be applied for this species, greenshank and dunlin. On this basis, the wind farm could potentially displace up to one dunlin territory, four to five greenshank territories, and one to three golden plovers. These are all the peak number of territories in any survey year, and the mean numbers would therefore be significantly lower. Part of the mitigation for wader effects is the removal of the conifer plantation, to remove the edge effect (as highlighted above). Since SNH, FCS and RSPB suggest the influence of forestry may extend up towards 800 m, the replacement of the forest edge by the wind farm (with many turbines set back from what was the forest edge), creates a theoretical net habitat 'gain' around parts of the SPA boundary (depending on the distance of turbines from the forest edge). Added to this, the potential for the habitat management area in the north-west of the site (to accommodate additional breeding pairs), as well as the wind farm area as a whole, means the precautionary maximum number of territories that could be displaced is considered to be off-set by these effects. As a result, the overall predicted impact on breeding and foraging waders from displacement is considered to be minor or negligible.

Barrier Effects: From emerging knowledge on avoidance behaviour, the energy costs of relatively minor deviations in flight path, and flight activity data collected over 2003 to 2012, the Modified 2013 Scheme is not predicted to cause any significant barrier effects to any species.

Collision Risk: For all raptor VORs, on the basis of (i) Strathy South, Strathy North and Strathy Wood flight activity and breeding survey results over 2003 to 2012, (ii) desk study data on historic and more recent breeding raptor locations in the area, (iii) a wide range of evidence from operational wind farms in Scotland and elsewhere, and (iv) specific flight characteristics of the species involved (hen harrier, merlin, golden eagle, and short-eared owl, and also peregrine, white-tailed eagle and osprey), the levels of predicted collision, taking into account forest removal and implementation of the Outline HMP, are minor, in the case of hen harrier, or negligible. Predicted collisions for hen harrier, the raptor with the highest modelled collision rate, are well below the level that would risk a possible population-level effect.

Predicted collisions for all wader species are negligible, including taking into account the reduction in detection with distance.

For red-throated divers, in the majority of survey years, the pattern of occupation of breeding lochans avoided flight activity that caused any noteworthy collision risk. In one year out of the five surveyed, however, breeding at one lochan in the habitat corridor in the north-west of the site (which is outside the SPA) led to a flight pattern that generated a collision rate of 0.58 birds a year. In order to avoid this risk, the mitigation proposed is to ensure this lochan cannot be occupied, diverting the divers onto the other lochs in the wider area (off-site and into the SPA). Evidence from the breeding diver surveys over 2003 to 2012 shows that there is capacity within these lochans to accommodate this pair, if required. The lochan within Strathy South is relatively small and it is practical and realistic to implement a suitable means of diverting breeding from this non-SPA lochan. For black-throated divers, the collision risk is significantly lower and predicted effects without mitigation are assessed to be low. Mitigation is proposed, as highlighted above, in the form of diver raft provision off-site, at locations where land owner approval can be obtained, and that are considered appropriate by SNH. The provision and maintenance of diver rafts would be for the duration of the wind farm's operational life.

(c) Cumulative Effects

An evaluation of cumulative effects, to take into account both the comments by consultees and the Modified 2013 Scheme are presented in ES Addendum Technical Appendix A11.4. In summary, the cumulative impact from all other wind farms, Strathy South and Strathy North (taking into account the mitigation and Detailed HMP for Strathy North), are not significant. The cumulative impact of Strathy Wood will depend on the final submitted layout

and therefore may or may not have cumulative implications. Given that the calculation of collision risk, displacement and barrier effects depends so much on turbine position and parameters it was not considered possible at this stage to quantify the cumulative effects of Strathy Wood with sufficient accuracy.

(d) Appropriate Assessment

Given the Likely Significant Effect of the proposed wind farm on the Conservation Objectives of the SPA, an assessment has been made of the potential impacts of the Modified 2013 Scheme on the qualifying features of the SPA, specifically against the Conservation Objectives of the SPA.

RPS has examined the evidence on whether or not these conservation objectives will be prejudiced by the Modified 2013 Scheme, drawing on all survey results and a range of published and un-published information, discussed in detail in Technical Appendix 11.4. Further details of the outcome of this are provided below (in A11.10 ii). There is sufficient information to conclude beyond reasonable scientific doubt that the Modified 2013 Scheme will not have an adverse impact on the integrity of the SPA alone, after mitigation has been applied. In combination, this conclusion remains valid, although until the application is submitted for Strathy Wood, it is not possible to include this in the 'in combination' assessment.

A11.8 Changes to Mitigation

Full details of changes to mitigation are provided in ES Addendum Technical Appendix A11.2 and A11.4. In summary, the mitigation measures set out in the Original 2007 ES have been superseded. In their place is a comprehensive mitigation package to cover the pre-construction phase, the construction phase and the operational phase.

The measures are designed to (i) ensure there are no residual significant negative effects on valued ornithological receptors (ii) the proposed development causes no adverse effect on the integrity of the Caithness and Sutherland Peatlands SPA, (iii) causes no negative impacts on the underlying Sites of Special Scientific Interest or Ramsar Site, and (iv) full compliance with wildlife protection legislation, notably prevention of disturbance to all breeding birds.

Pre-construction, a complete re-survey of moorland breeding birds, breeding divers and breeding raptors will be completed, using the same survey methods and extent as in 2012. The purpose of this pre-construction survey is to ensure the Applicant and their contractors have an up-dated baseline knowledge of any ornithological sensitivities to take into account during forest removal. Data from these surveys will be combined with the breeding information presented in ES Addendum Technical Appendix A11.1, and also feed into the Breeding Bird Protection Plan, which will form part of the CEMP. This will:

- set out the survey methods, coverage, and reporting schedule for all bird monitoring during construction;
- include protocols and buffer distances to be put in place for all breeding birds; and
- provide all the necessary material for bird-related tool-box talks for construction staff, to ensure they are aware of obligations under the relevant legislation and best practice.

For the subsequent construction phase, the mitigation is two-fold, comprising the implementation of the Breeding Bird Protection Plan by suitably experienced ornithological specialists, plus the employment of a one or more full-time Ecological Clerk of Works. This combined approach has been used at Strathy North (and several other sites, including Whitelee, the Clyde Wind Farm, Black Law etc) and ensures the necessary combined expertise is available to protect bird interests on and adjacent to the site. The appointed individuals will work closely together and ensure the full implementation of the Bird Monitoring and Protection Plan. Notably during the forest removal phase, this will focus on ensuring breeding birds are protected from disturbance, in accordance with wildlife legislation, using pre-clearance checks before any forest removal and monitoring of breeding bird activity on open ground and water bodies within and adjacent to the site. The results of

this work will be reported on a monthly basis to SNH, THC and RSPB Scotland throughout the construction period, through ECoW Reports. As has been the case with Strathy North when the presence of key species has been identified, the Applicant will ensure SNH signs off the detailed measures put in place to avoid disturbance risk.

For the operational phase, generic and species-specific mitigation measures are proposed.

The generic mitigation is to provide the mechanism, should SNH require it, for controlling non-peatland vegetation (notably conifer regeneration and rushes) within proximity to turbines if they consider the vegetation cover is attracting nesting hen harrier or waders sufficient to cause an elevated significant risk of collisions. This measure is therefore precautionary feature of the mitigation package, given that the collision risk modelling for the Modified 2013 Scheme revealed negligible predicted collisions for all species other than red-throated diver (for which there is species-specific mitigation – please see below). It also reflects the fact that SNH has indicated their preference for peatland restoration, rather than short-sward management for the turbine envelope. This appears to signal a growing belief that collision risk to most species is lower than previously considered. This generic 'vegetation control' mitigation will be implemented (through mechanical means, grazing or both), in proximity to turbines, where vegetation and/or breeding bird monitoring results show that an unacceptable risk of collision is emerging, in SNH's view. The mechanisms required to implement this vegetation control are set out in the Strathy South Outline Habitat Management Plan, which forms part of the Addendum (see Technical Appendix A11.2). The purpose of this vegetation control is to help achieve the peatland restoration objective of the HMP but also to minimise the risk of collisions of ground-nesting breeding birds that would otherwise potentially nest in young conifer regeneration, brash piles or rushes (notably hen harrier and short-eared owl).

The species-specific operational phase mitigation that would be carried out is firstly for red-throated divers. The bird monitoring completed for the site over 2003 to 2012 has revealed that occasional 'atypical' breeding activity by this species can occur in the north-west part of the site (on a un-named lochan referred to as Loch ID 64 – see Technical Appendix A11.1 Figure A11.1.40 – A11.1.42). Use of this lochan (which is outside the SPA) by breeding divers resulted in orientation of flight activity that lead to the highest predicted collision risk to the birds out of any of the five years monitored. Whilst the removal of turbines from this north-western 'corridor' forms part of the embedded mitigation for the Modified 2013 Scheme, and as monitoring of breeding lochs in and around Strathy South (and north) has shown there are alternative breeding lochs/lochans available in the surrounding SPA, it is proposed to make Loch ID 64 unsuitable for breeding divers, to divert any breeding attempt off-site for the lifetime of wind farm. The lochan is sufficiently small (less than 50m wide) that this is considered practically achievable. The method proposed to make it unsuitable would be agreed with SNH, but may include floating strings of coloured buoys across the lochan, for the duration of the breeding season (April to August). Such equipment is proven and could comprise the rope and moorings deployed in mussel farms, so that they are sufficiently robust (but using the coloured floats and flags often used to mark lobster pots).

In addition to this diversion work for the red-throated divers, off-site mitigation will be implemented in the form of diver rafts, to benefit the wider SPA population (and potentially more widely, outside the SPA, if that is considered beneficial by SNH). Whilst these rafts have been statistically shown to benefit the breeding success and productivity of black-throated divers, it is also recognised that rafts provide increased nesting options for red-throated divers that are likely to help reduce losses to predation. Depending on SNH's requirements and the availability of permissions from landowners to put out rafts, a number of rafts, to be agreed with SNH, would be provided and maintained over the lifetime of the wind farm. This is considered sufficiently comprehensive to ensure mitigation goes above and beyond off-setting the residual predicted collisions for both red and black-throated divers.

A11.9 Changes to Monitoring

Full details are provided in ES Addendum Technical Appendix A11.2 and A11.4. In summary, the monitoring set out in the Original 2007 ES has been superseded. In its place is a fully-comprehensive bird monitoring package to cover the pre-construction phase, the construction phase and the operational phase.

The bird monitoring already completed for the ES Addendum's baseline has been extremely comprehensive, exceeding standard requirements set by SNH to ensure there is a comprehensive knowledge of the breeding distribution and flight activity of all species highlighted by SNH for additional consideration. As well as a time span of 10 years, five breeding seasons and two over-wintering periods have been monitored, surveys have generally covered wider buffers than required and significant efforts have been made to secure all relevant existing secondary data through desk studies and consultation with SNH, the RSPB Scotland and the Highland Raptor Study Group. Although limited information was ultimately available, significant efforts were also made to source any pre-afforestation bird data that existed for the site.

In accordance with good practice and SNH Guidance on post-construction monitoring, the Applicant proposes to continue comprehensive monitoring, from pre-commencement to operation, if the development is consented. This is in order to monitor breeding bird and flight activity so that the predictions underlying the assessment of effects can be validated.

The coverage proposed is again comprehensive, and has been designed to (i) fully integrate with the bird monitoring at Strathy North, (ii) avoid duplication of effort with RSPB's monitoring on its adjacent Forsinard Flows Reserve, and (iii) support the bird monitoring work of local individuals and groups, should they wish to undertake parts of the monitoring package (the groups in mind include the Highland Raptor Study Group, the Highland Wildlife Foundation and the RSPB).

The geographical scope of bird monitoring would be sufficient to cover the wider ranging species recorded at Strathy South (golden eagle) and the off-site mitigation and enhancement areas. It is therefore proposed that the following survey work will be completed (Table A11.4):-

Table A11.4: Proposed Bird Monitoring for Strathy South: Pre-Commencement, Construction and Operation

Species	Scope
Moorland Breeding Birds	Standard moorland breeding bird survey of suitable habitat on site and to a 2km buffer around Strathy South Forest, for the pre-commencement breeding season, during forest removal and construction, and during Year 1, 2, 3, 5, 10, 15 and 20 of operation.
All breeding species	Standard vantage point (VP) surveys using the 2012 VP locations (Figure A11.1.19), for a minimum of 36 hours per VP, for the pre-commencement breeding season, during forest removal and construction, and during Year 1, 2, 3, 5, 10, 15 and 20 of operation.
Red and black-throated divers	Standard breeding diver survey of suitable habitat on site and to a 3km buffer around Strathy South Forest, for the pre-commencement breeding season, during forest removal and construction, and during Year 1, 2, 3, 5, 10, 15 and 20 of operation. In addition to standard survey techniques, remote video cameras will also be deployed to monitor nesting activity, breeding success and productivity.

Table A11.4: Proposed Bird Monitoring for Strathy South: Pre-Commencement, Construction and Operation	
Species	**Scope**
Red and black-throated divers	Targeted diver VP surveys using the 2012 diver VP locations (Figure A11.1.27), for a minimum of 36 hours per VP, for the pre-commencement breeding season, during forest removal and construction, and during Year 1, 2, 3, 4, 5, 10, 15 and 20 of operation.
Red and black-throated divers	Standard breeding diver survey of all rafts deployed as mitigation and enhancement for this species. This will be for the pre-commencement breeding season, during forest removal and construction, and annually during the lifetime of the wind farm, up to a limit of 25 years. In addition to standard breeding survey techniques, remote video cameras may also be deployed on a sample of diver rafts to monitor nesting activity, breeding success and productivity.
All raptors	Standard breeding raptor survey of suitable habitat on site and to a 2km buffer around Strathy South Forest, starting from April in the pre-commencement breeding season (to August), during forest removal and construction, and during Year 1, 2, 3, 5, 10, 15 and 20 of operation.
Hen harrier	Targeted breeding season VPs to determine flight activity of hen harriers on site and within a 2km buffer of Strathy Forest, from late March in the pre-commencement breeding season (to August), during forest removal and construction, and during Year 1, 2, 3, 5, 10, 15 and 20 of operation. The location of these VPs will be chose so they cover hen harrier breeding locations on or adjacent to the site.
Golden eagle	As a minimum, the territory occupation, breeding success and productivity of the two territories to be monitored (Strathy Loch and Calf Rock). This will be carried out in cooperation with the Highland Raptor Study Group's monitoring of golden eagles at the Calf Rock and Loch Strathy, to avoid duplication of effort.
Golden eagle	Targeted golden eagle VP surveys using the 2012 golden eagle VP locations (Figure A11.1.29), for a minimum of 36 hours per VP, for the pre-commencement breeding season, during forest removal and construction, and during Year 1, 2, 3, and 5 of operation.

The results of this monitoring will be reported in September each monitoring year, with analysis and presentation of data completed in accordance with the requirements of SNH. In particular, it is anticipated that results will set out breeding distribution, breeding success (where known), and flight activity for the following target species: red and black-throated divers, hen harrier, golden eagle, merlin, short-eared owl, kestrel, white-tailed eagle, red kite, greenshank, golden plover, dunlin, wood sandpiper, common scoter, wigeon and greylag geese for the survey areas. Monitoring will also cover the diver rafts provided as part of the development's mitigation package.

A11.10 Changes to Summary & Conclusion (Inc. Residual Impacts)

(a) Impact Assessment

Table A11.5 provides a summary of the predicted impacts, mitigation and the residual impact.

Table A11.5: Summary of Predicted Impacts of the Proposed Wind Farm, Mitigation and Residual Impacts

Likely Significant Impact	Mitigation Proposed	Means of Implementation	Outcome/Residual Impact
Construction			
Disturbance to breeding birds	Pre-commencement breeding bird surveys (covering the site and standard buffers around it, for moorland breeding birds, raptors and divers) The deployment of a suitably qualified ECoW team to carry out pre-clearance checks ahead of forest or open habitat removal; Retention of selected forest blocks for screening, the use of additional screening bunds if required (along the access track (for red-throated divers and possibly hen harriers); Traffic management measures (no horns sounded, no stop zones, no personnel out of vehicles etc.), On-going monitoring for all breeding birds on and adjacent to the site through the construction period, and the implementation of strict activity-free buffers to prevent disturbance, where breeding birds occur. The above measures would be incorporated into a Breeding Bird Protection Plan which would form part of	ECoW, implementation of Bird Protection Plan and CEMP, plus and specialist ornithology support.	Negligible

Table A11.5: Summary of Predicted Impacts of the Proposed Wind Farm, Mitigation and Residual Impacts			
Likely Significant Impact	**Mitigation Proposed**	**Means of Implementation**	**Outcome/Residual Impact**
	the CEMP. The CEMP would be agreed in consultation with SNH and SEPA prior to the commencement of construction works. All works would be completed in compliance with the CEMP.		
Operation			
Collision Risk to red-throated diver	In consultation with SNH, dual approach of diverting red-throated diver breeding from within identified lochan, and provision of diver rafts off-site. The lochan within Strathy South is relatively small, and options for diverting breeding from this location, if required, will be agreed with SNH, but could include a combination of buoys, floats and flags would be used to ensure any prospecting birds were diverted from this non-SPA lochan. The provision and maintenance of diver rafts off-site, within the SPA, would be for the duration of the wind-farm's operational life, at locations to be agreed with SNH.	Outline HMP to be finalised into a Detailed HMP, as a condition of consent.	Minor Adverse
Collision Risk to black-throated diver	Provision of diver rafts off-site, as above. The provision and maintenance of diver rafts would be for the duration of the wind-farm's operational life.	Outline HMP to be finalised into a Detailed HMP, as a condition of consent.	Negligible

Table A11.5: Summary of Predicted Impacts of the Proposed Wind Farm, Mitigation and Residual Impacts			
Likely Significant Impact	**Mitigation Proposed**	**Means of Implementation**	**Outcome/Residual Impact**
Collision Risk to other species	Peatland restoration and vegetation management, notably control of conifer regeneration, treatment of brash and any vegetation (such as rushes) in proximity to turbines that SNH consider pose an unacceptable risk of increasing collision).	Implementation of HMP	Negligible
Displacement of breeding birds	Dual approach of removal of forest plantation and peatland restoration, combined with peatland enhancement.	Implementation of HMP	Minor Adverse

(b) Appropriate Assessment

The data collected on the baseline bird interests at Strathy South are comprehensive, spanning the period 2003 to 2012 (with some further 2013 results for key species). Fieldwork has been extensive, collected by experienced field ornithologists (two of the original 2003 and 2004 field team are also part of the current RPS ornithology team which has produced this ES Addendum Chapter and the supporting Technical Appendices).

The 2003 – 2012/2013 survey data has been collated, combined with desk study results and analysed, and the combined insights used to inform the layout of the Modified 2013 Scheme. As well as detailed knowledge of the site's bird interests, off-site fieldwork completed by RPS for the consented Strathy North wind farm, together with a range of post-construction monitoring results has generated significant insights into patterns of flight behaviour that can be anticipated, including once forest removal has taken place.

A thorough assessment using this data has been completed to predict the potential effects of the Modified 2013 Scheme on the qualifying species of the Caithness and Sutherland Peatlands SPA. This assessment has also taken particular note of the issues highlighted by SNH in their previous response to the original 2007 application.

SNH has provided details of other plans and projects which it wishes to see included for the 'in combination' assessment, and considerable attention has been paid to this analysis, given the proximity of the consented Strathy North Wind Farm, and the proposed Strathy Wood site. Of note, RPS has been used as the ornithological specialists for Strathy North, as well as Strathy South. Therefore data on flight activity, breeding distribution and collision risk modelling from both sites have been completely compatible, and readily combined for the 'in combination' assessment. There has additionally been sharing of bird (and habitat) data between the Applicant and the developer of Strathy Wood proposed wind farm EON, detailed consideration of the 'in combination' effects of all three schemes.

In light of all the above, it is therefore considered that there is sufficient information available for the competent authority to carry out an appropriate assessment of the Modified 2013 Scheme, alone and in combination with other plans and projects.

The SPA has 12 qualifying species, all notified for their breeding populations. From the original 2007 application, it was concluded there were no predicted impacts on common scoter or wigeon as neither qualifying species had been recorded on site or adjacent to it. This has remained the case throughout the additional years of field surveys, so the Modified 2013 Scheme has no implications for the conservation objectives of these birds.

A summary of information to inform the appropriate assessment is provided for all the SPA's qualifying species below (Tables A11.6 to A11.14). Some of this information has been redacted due to its confidential nature.

Table A11.6: Summary of Information to Inform the Appropriate Assessment: Red-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
1. To avoid deterioration of the habitats of the qualifying species	Construction	No deterioration of diver habitat within the SPA.	None	None	None	High
	Operation	No deterioration of diver habitat within the SPA	None	None	None	High
	Decommission	No deterioration of diver habitat within the SPA	None	None	None	High
2. To avoid significant disturbance to the qualifying species	Construction	There is a risk of disturbance [redacted] from access track widening, forest and construction traffic in and out of Strathy South. There is also the potential risk of disturbance [redacted] although both are >1 km from the Loch. This loch complex is consistently used by red-throated diver breeding within 1km of Strathy South. It is important therefore to ensure disturbance is prevented. Other locations where there is a slight disturbance risk to [redacted] (a) breeding has not been confirmed at this site, and (b) there is screening from the [redacted]). Loch [redacted]	Risk of disturbance at one consistently used breeding location, plus some risk at less-frequently used lochans.	The construction of the bridge across Strathy River, from Strathy North, and the link track from the bridge to the Strathy Wood track, would be needed early on during construction, to enable forestry machinery onto Strathy South. Widening of the existing Strathy Wood track from there to Strathy South would not be required until larger plant needed site access. Therefore, for the majority of the construction period, until such point as the track needs to be widened for larger construction vehicles, the predicted traffic along the Strathy Wood track [redacted] would be relatively limited, limited to initial one-off mobilisation of forestry machinery, caravans, fuel storage plant etc. to enable tree removal. After this, plant will remain on site until all the work is completed, returning eventually (after 18 months/two years) [redacted]. In between, traffic would	None	High

Table A11.6: Summary of Information to Inform the Appropriate Assessment: Red-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		[redacted] has also been used by the divers but no breeding has been recorded at this location.		comprise daily movement (primarily in the morning and early evening) of 4x4 vehicles and vans travelling on and off-site. After the initial forestry works to open up the footprint for wind farm infrastructure, site investigation plant would need access, but again the volume of traffic will be relatively limited, and comprise mainly 4x4 trucks plus drilling rig/s. The landform [redacted] means that [redacted] are likely to be screened [redacted]. The risk of visual disturbance therefore only arises from [redacted]. In addition to this mitigation, a Breeding Bird Protection Plan will impose strict traffic control measures throughout the divers' breeding season (i.e. no stopping, no		

Table A11.6: Summary of Information to Inform the Appropriate Assessment: Red-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
				engine revving or blasting of horns, no flashing lights, no personnel to get out of vehicles) over this 1 km stretch. There will also be a strict site induction requirement for all staff coming on to site, to communicate the need to adhere to the above traffic control measures during the breeding season. This will be reinforced by road-side signage over this period. These traffic control measures will remain in place throughout all April to August months (inclusive) for the construction period. [redacted] construction [redacted] would only be done outside the diver breeding season, unless intensive monitoring confirms the lochs are not being used at all over the breeding period. [redacted] this mitigation would ensure disturbance is		

Table A11.6: Summary of Information to Inform the Appropriate Assessment: Red-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
				avoided. As part of the above measures, the ECoW [redacted] ensure there is no disturbance to divers during construction [redacted] This combination of mitigation measures through the relevant phases of construction will ensure there is no disturbance [redacted]). To help prevent disturbance to any		

Table A11.6: Summary of Information to Inform the Appropriate Assessment: Red-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
				divers [redacted] buffer would be retained [redacted] for the duration of construction, adjacent to the track. [redacted]		
	Operation	A low risk that maintenance traffic causes disturbance to the breeding divers at the above locations.	Low risk of disturbance and breeding failure at any location.	A strict site induction requirement for all staff coming on to site, [redacted] will be scheduled outside the April to August breeding season. SNH would be notified if any emergency works were required [redacted]	None	High
	Decommission	As for construction, except the extent of disturbance would be reduced, as there	Intermediate risk of	As for construction.	None	High

Table A11.6: Summary of Information to Inform the Appropriate Assessment: Red-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		would be no widening of tracks required.	disturbance and breeding failure.			
3. Population of the species as a viable component of the site is maintained in the long term	Construction	None, as the risk of disturbance and nest failure will be prevented through the disturbance-prevention measures for the Conservation Objective above. Consequently, there will be no risk to the viability of the SPA population from construction.	None	None	None	High
	Operation	Collision risk modelling, based on a precautionary 98% avoidance rate, and incorporating a 200 m buffer around the risk area, gives a predicted average collision rate of approximately one bird every five years (0.19 collisions a year). This mean is derived from annual rates of predicted collision from 0.00 to 0.58 collisions a year (2003 = 0.00, 2004 = 0.00, 2007 = 0.35, 2010 = 0.00 and 2012 0.58 collisions per year). The highest predicted collision rate was in 2012, when the divers bred [redacted] leading to a flight pattern that generated a higher collision risk. The SNH assessed condition of this qualifying feature is favourable maintained (2006).	The addition of an average of 1 diver collision every five years is not judged significant addition to existing levels of background mortality, and would not threaten the viability of the SPA population being maintained	In recognition of the need to minimise collision risk where possible, a dual approach to mitigation is proposed. The first is to reduce the level of risk itself, [redacted] This would be achieved [redacted] in consultation with SNH. By diverting the occasional use of this [redacted] lochan for breeding (recorded one year out of five), the chance of 'at risk' flight activity is reduced and the collision risk would also be reduced. The accompanying positive mitigation measure that would be used, if required by SNH, and in consultation with them, is the sustained provision of diver rafts	None	Moderate to High

Table A11.6: Summary of Information to Inform the Appropriate Assessment: Red-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
			in the long term.	aimed at increasing breeding success and productivity of red (and black) throated divers. A variety of locations are being considered for these rafts, at sufficient distance from the wind farm to avoid any additional risk. If considered necessary for mitigation, it is proposed to provide funding and staff resources to construct, deploy, maintain and monitor between diver rafts, depending on site availability and SNH requirements. By avoiding breeding at [redacted] and assuming the diverted birds bred locally, leading to flight patterns in 2007 (the next highest predicted collision rate), the mean predicted collision rate would fall from 0.19 to 0.14, equivalent to going from 1 every 5.3 years to 1 every 7.1 years. This would mean a reduction from approximately 4.7 collisions over the lifetime of the wind farm, to approximately 3.5 birds. If the 98% avoidance rate for red-throated divers proves to be over-precautionary, as emerging evidence would seem to suggest, then the frequency of collisions would be lower. The extent to which the provision of diver rafts would generate additional birds (i.e. the difference in the number		

Table A11.6: Summary of Information to Inform the Appropriate Assessment: Red-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
				of young fledged, compared to the number of young fledged without the diver rafts) would be considered in liaison with SNH. The aim would be to enable sufficient additional fledged birds, so that, allowing for natural mortality of these offspring, there would be sufficient birds entering the adult breeding population to mitigate. This is considered to be a realistic and achievable outcome.		
	Decommission	None, as the risk of disturbance and nest failure will be prevented. Consequently, there will be no risk of any effect on the viability of the SPA population.	None	None	None	High
4. Distribution of the species within site is maintained in the long term	Construction	None, as the risk of disturbance would be avoided through the measures described above.	None	None	None	High
	Operation	The consistent presence of successfully breeding red-throated divers in close proximity (within 300 m) to the Burgar Hill Wind Farm, in Orkney, indicates the distribution of breeding red-throated divers will be maintained in the long term.	None	Provision of diver rafts aims to increase breeding opportunities (and success).Therefore in the long-term, this would support the distribution of this species within (and beyond) the SPA.	None	Moderate
	Decommission	None, as the risk of disturbance would be avoided through the measures	None	None	None	High

Table A11.6: Summary of Information to Inform the Appropriate Assessment: Red-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		described above.				
5. Distribution and extent of habitats supporting the species is maintained in the long term	Construction	No effects on the distribution and extent of diver habitat within the SPA.	None	None.	None	High
	Operation	No effects on the distribution and extent of diver habitat within the SPA.	None	Provision of diver rafts aims to increase breeding opportunities (and success). Therefore in the long-term, this would support the distribution and extent of habitats supporting this species within (and beyond) the SPA.	None	High
	Decommission	No effects on the distribution and extent of diver habitat within the SPA.	None	None	None	High
6. Structure, function and supporting processes of habitats supporting the species is maintained in the long term	Construction	No effects on the structure, function and supporting processes of habitat supporting divers within the SPA.	None	None	None	High
	Operation	No effects on the structure, function and supporting processes of habitat supporting divers within the SPA.	None	None	None	High
	Decommission	No effects on the structure, function and supporting processes of habitat supporting divers within the SPA.	None	None	None	High
7. No significant disturbance of the species is maintained in the long term	Construction	This is already covered under the 2nd Conservation Objective, above.	See the 2nd Conservation Objective.	See the 2nd Conservation Objective	None	High
	Operation	This is already covered under the 2nd Conservation Objective, above.	See the 2nd Conservation Objective.	See the 2nd Conservation Objective	None	High

Table A11.6: Summary of Information to Inform the Appropriate Assessment: Red-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
	Decommission	This is already covered under the 2nd Conservation Objective, above.	See the 2nd Conservation Objective.	See the 2nd Conservation Objective	None	High

Table A11.7: Summary of Information to Inform the Appropriate Assessment: Black-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
1. To avoid deterioration of the habitats of the qualifying species	Construction	No deterioration of diver habitat within the SPA.	None	None	None	High
	Operation	No deterioration of diver habitat within the SPA	None	None	None	High
	Decommission	No deterioration of diver habitat within the SPA	None	None	None	High
2. To avoid significant disturbance to the qualifying species	Construction	Risk of disturbance to breeding black-throated divers on [redacted] There is also a risk to birds using [redacted]. They have been present most survey years, although possible breeding only was recorded once at this location. These lochs are over [redacted] km from the nearest turbine and therefore the risk of disturbance is negligible.	Risk of disturbance to one consistently used breeding location within 2 km, plus very slight risk at less-frequently used lochans.	To prevent disturbance to any breeding divers on [redacted] depending on the timing of any consent and the resulting construction programme, the presence of divers (and other breeding birds) using this loch complex will be monitored, and work timed to avoid risk of disturbance. During [redacted] watching brief will also be maintained (if this is in the breeding season) to ensure there is no disturbance to breeding birds on the loch. To further reduce the risk of disturbance, forest sub-compartment [redacted] un-felled buffer for the duration of construction, adjacent to [redacted] The forest buffers retained to help prevent disturbance to red-throats [redacted]	None	High

Table A11.7: Summary of Information to Inform the Appropriate Assessment: Black-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
				[redacted] would also serve to prevent disturbance to the [redacted] black-throated divers (and any other species). To prevent disturbance to any breeding divers on [redacted] as an additional precaution, there would be a watching brief to ensure there was no disturbance during construction [redacted].		
	Operation	A low risk that maintenance traffic causes disturbance to the breeding divers at the above locations.	Low risk of disturbance and breeding failure at any location.	A strict site induction requirement for all staff coming on to site, which will include briefing on need to adhere to the above traffic control measures during the breeding season. Supplemented by road-side signage. Any non-emergency road maintenance of the [redacted] will be scheduled outside the April to August breeding season. SNH would be notified if any emergency works are required to the track or cables along this section, and a suitable protocol put in place immediately to minimise the risk of any disturbance.	None	High
	Decommission	As for construction, except the extent of disturbance would be reduced, as there would be no widening of tracks	Intermediate risk of disturbance	As for construction.	None	High

Table A11.7: Summary of Information to Inform the Appropriate Assessment: Black-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		required.	and breeding failure.			
3. Population of the species as a viable component of the site is maintained in the long term	Construction	None, as the risk of disturbance and nest failure will be prevented through the disturbance prevention measures for the Conservation Objective above. Consequently, there will be no risk to the viability of the SPA population from construction.	None	None	None	High
	Operation	Collision risk modelling, based on a precautionary 98% avoidance rate, and incorporating a 200 m buffer around the risk area, gives a predicted average collision rate of approximately one bird every 20 years (0.05 collisions a year). This mean is derived from annual rates of predicted collision from 0.00 to 0.12 collisions a year (2003 = 0.00, 2004 = 0.00, 2007 = 0.17, 2010 = 0.00 and 2012 0.10 collisions per year). The highest predicted collision rate was in 2007, when there were higher levels of flight activity to the west of the turbine array than in other survey years. The SNH assessed condition of this qualifying feature is unfavourable declining (2007).	The addition of an average of 1 diver collision over the lifetime of the wind farm is not a significant addition to existing levels of background mortality, and would not threaten the viability of the SPA population being maintained in the long	Whilst mitigation Is not required for this species, provision of diver rafts has been proven to increase breeding success and productivity of black-throated divers, and they would therefore benefit from the rafts provided as mitigation provided for red-throated divers.	None	High

Table A11.7: Summary of Information to Inform the Appropriate Assessment: Black-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
			term.			
	Decommission	None, as the risk of disturbance and nest failure will be prevented. Consequently, there will be no risk of any effect on the viability of the SPA population.	None	None	None	High
4. Distribution of the species within site is maintained in the long term	Construction	None, as the risk of disturbance would be avoided through the measures described above.	None	None	None	High
	Operation	Although there is no comparable examples where black-throated divers are successfully nesting in proximity to an operational wind farm, the consistent presence of successfully breeding red-throated divers in close proximity (within 300m) to the Burgar Hill Wind Farm, in Orkney, does suggest the distribution of breeding black-throated divers will be maintained in the long term. There are no known behavioural differences between the two species that would suggest black-throats cannot nest in equally close proximity to an operational site.	None	Whilst specifically to mitigate effects on red-throated divers, provision of diver rafts would also increase breeding opportunities (and success) for this species. Therefore in the long-term, this would support the distribution of black-throated divers within (and beyond) the SPA.	None	Moderate
	Decommission	None, as the risk of disturbance would be avoided through the measures described above.	None	None	None	High
5. Distribution and extent of	Construction	No effects on the distribution and extent of diver habitat within the SPA.	None	None.	None	High

Table A11.7: Summary of Information to Inform the Appropriate Assessment: Black-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
habitats supporting the species is maintained in the long term	Operation	No effects on the distribution and extent of diver habitat within the SPA.	None	Whilst specifically to mitigate effects on red-throated divers, provision of diver rafts would also increase breeding opportunities (and success) for this species. Therefore in the long-term, this would support the distribution of black-throated divers within (and beyond) the SPA.	None	High
	Decommission	No effects on the distribution and extent of diver habitat within the SPA.	None	None	None	High
6. Structure, function and supporting processes of habitats supporting the species is maintained in the long term	Construction	No effects on the structure, function and supporting processes of habitat supporting divers within the SPA.	None	None	None	High
	Operation	No effects on the structure, function and supporting processes of habitat supporting divers within the SPA.	None	None	None	High
	Decommission	No effects on the structure, function and supporting processes of habitat supporting divers within the SPA.	None	None	None	High
7. No significant disturbance of the species is maintained in the long term	Construction	This is already covered under the 2nd Conservation Objective, above.	See the 2nd Conservation Objective.	See the 2nd Conservation Objective	None	High
	Operation	This is already covered under the 2nd Conservation Objective, above.	See the 2nd Conservation Objective.	See the 2nd Conservation Objective	None	High
	Decommission	This is already covered under the 2nd Conservation Objective, above.	See the 2nd Conservation	See the 2nd Conservation Objective	None	High

Table A11.7: Summary of Information to Inform the Appropriate Assessment: Black-throated Diver						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
			Objective.			

Table A11.8: Summary of Information to Inform the Appropriate Assessment: Hen Harrier						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
1. To avoid deterioration of the habitats of the qualifying species	Construction	No deterioration of habitat within the SPA.	None	None	None	High
	Operation	No deterioration of habitat within the SPA	None	None	None	High
	Decommission	No deterioration of habitat within the SPA	None	None	None	High
2. To avoid significant disturbance to the qualifying species	Construction	There is a risk of disturbance to breeding hen harriers occurs [redacted], where there have been up to three nest locations in close proximity to [redacted]. Although these nesting areas are all outside the SPA, given their proximity, there is clear connectivity and these are SPA-associated birds as a result. The risk of disturbance to these nests comes from construction [redacted]	Risk of disturbance to up to three breeding [redacted]. There is also a risk of disturbance	The presence of hen harriers (and other breeding birds) would be checked by pre-construction surveys, and depending on results, bridge building, track construction, and track widening, would be timed and managed to avoid any risk of disturbance, In addition, the Breeding Bird Protection Plan will impose strict [redacted] measures throughout the harrier breeding season [redacted]	None	High

Table A11.8: Summary of Information to Inform the Appropriate Assessment: Hen Harrier						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
		[redacted].	to one nest site within [redacted], which is [redacted] Previous nest locations in and adjacent to Strathy South have not been used in recent years.	[redacted]. There will also be a strict site induction requirement for all staff coming on to site, to communicate the need to adhere to the above traffic control measures during the breeding season. This will be reinforced by road-side signage over this period and monitored by the ECoW. The same combined approach would be taken within the site to prevent disturbance to any harriers nesting in [redacted] namely there would be a watching brief during the track widening/construction works to ensure there was no disturbance to breeding birds, and the same [redacted] measures would be applied. To help prevent disturbance to any breeding harriers in this [redacted], a watching brief would be maintained during construction [redacted] if this was during the breeding season. Based on evidence of hen harrier nesting during		

Table A11.8: Summary of Information to Inform the Appropriate Assessment: Hen Harrier						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
				construction at other wind farms this is considered to be sufficient mitigation to prevent disturbance to breeding hen harriers (at the Cruach Mhor Wind Farm in Argyll, during construction it appears nesting took place in 2003 and 2004 within 300 m of turbine locations (Scottish Power Renewables, 2009, Robson 2012). At Paul's Hill Wind Farm in north-east Scotland nesting harrier numbers near the wind farm were higher during construction than post-construction, with one nest at 110 m from construction activities (Forrest *et al*. 2011). The closest nest to a turbine during construction was 61 m (*ibid.*). The proximity of the nearest turbine at this location in Strathy South was approximately [redacted] nest location, [redacted]		
	Operation	A risk that maintenance traffic causes disturbance to the breeding harriers at the above locations.	Risk of disturbance and breeding failure at any location.	A strict site induction requirement for all staff coming on to site, which will include briefing on need to adhere to the above [redacted] measures during the breeding season. Supplemented by [redacted] signage. Any non-emergency road maintenance	None	High

Table A11.8: Summary of Information to Inform the Appropriate Assessment: Hen Harrier						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
				[redacted] within 500 m of [redacted] will be scheduled outside the April to July breeding season. SNH would be notified if any emergency works are required [redacted] and a suitable protocol put in place immediately to minimise the risk of any disturbance.		
	Decommission	As for construction, except the extent of disturbance would be reduced, as there would be no widening or construction of tracks required.	Intermediate risk of disturbance and breeding failure.	As for construction.	None	High
3. Population of the species as a viable component of the site is maintained in the long term	Construction	None, as the risk of disturbance and nest failure will be prevented through the disturbance prevention measures for the Conservation Objective above. Consequently, there will be no risk to the viability of the SPA population.	None	None	None	High
	Operation	Collision risk modelling, based on 99% avoidance rate, and incorporating a 200 m buffer around the risk area, gives a predicted average collision rate of approximately one bird every nine years (0.11 collisions a year). This mean is derived from annual rates of predicted collision from 0.04 to 0.24	The addition of an average of approximately 1 harrier collision every 9 years. This is not judged a significant	None	None	High

Table A11.8: Summary of Information to Inform the Appropriate Assessment: Hen Harrier						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
		collisions a year (2003 = 0.24, 2004 = 0.06, 2007 = 0.07, 2010 = 0.04 and 2012 0.12 collisions per year). The SNH assessed condition of this qualifying feature is favourable maintained (2003).	addition to existing levels of background mortality, and would not threaten the viability of the SPA population being maintained in the long term.			
	Decommission	None, as the risk of disturbance and nest failure will be prevented. Consequently, there will be no risk of any effect on the viability of the SPA population.	None	None	None	High
4. Distribution of the species within site is maintained in the long term	Construction	None, as the risk of disturbance would be avoided through the measures described above.	None	None	None	High
	Operation	From the breeding and flight activity surveys completed over 2003 to 2012 (and including work at Strathy North and Strathy Wood), it is evident that harriers are using [redacted] for nesting and foraging in preference [redacted]. This rather artificial situation is significant in terms of this conservation objective, because it is	None	Removal of plantation forestry at Strathy South using mulching and harvesting (rather than felling trees *in situ*) is aimed at peatland restoration, with the facility to carry out targeted management of vegetation. The aim of this approach is to avoid creating preferential nesting conditions that would risk drawing in nesting harriers from the SPA (since there are none, at least within 2 km). As	None	High

Table A11.8: Summary of Information to Inform the Appropriate Assessment: Hen Harrier						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
		the presence of the forest plantation that is influencing the distribution of the harriers within the SPA. From the 2003 to 2012 survey results, and up-dated information from 2013, all but one of the nest locations recorded at Strathy South were at greater distances from turbines that birds have been recorded elsewhere, nesting in proximity to operational turbines. The exception was the 2003 nest location, which would be approximately [redacted] from the nearest turbine. In light of this evidence and the distances recorded elsewhere of nesting locations from turbines, in general no nest sites used since 2003 are considered likely to be displaced, and on this basis, it is concluded that overall, within the context of the SPA, displacement from one previous (2003) nesting location would not adversely affect the distribution of harriers within the site in the long term. The removal of the conifer plantation may act to ensure a more normalised pattern of distribution on SPA open habitats,		a result, there is not considered to be any risk of preventing the distribution of the species within the site being maintained in the long term.		

Table A11.8: Summary of Information to Inform the Appropriate Assessment: Hen Harrier						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
		however.				
	Decommission	None, as the risk of disturbance would be avoided through the measures described above.	None	None	None	High
5. Distribution and extent of habitats supporting the species is maintained in the long term	Construction	No effects on the distribution and extent of harrier habitat within the SPA.	None	None.	None	High
	Operation	No effects on the distribution and extent of harrier habitat within the SPA.	None	None. Post-construction monitoring from numerous operational sites has shown that harriers continue to actively use habitat within wind farms, so although outside the SPA, the habitat within Strathy South will still be available to this species.	None	High
	Decommission	No effects on the distribution and extent of harrier habitat within the SPA.	None	None	None	High
6. Structure, function and supporting processes of habitats supporting the species is maintained in the long term	Construction	No effects on the structure, function and supporting processes of habitat supporting harriers within the SPA.	None	None	None	High
	Operation	No effects on the structure, function and supporting processes of habitat supporting harriers within the SPA.	None	None	None	High
	Decommission	No effects on the structure, function and supporting processes of habitat supporting harriers within the SPA.	None	None	None	High
7. No significant disturbance	Construction	This is already covered under the 2nd Conservation Objective, above.	See the 2nd Conservation Objective.	See the 2nd Conservation Objective	None	High

Table A11.8: Summary of Information to Inform the Appropriate Assessment: Hen Harrier						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
of the species is maintained in the long term	Operation	This is already covered under the 2nd Conservation Objective, above.	See the 2nd Conservation Objective.	See the 2nd Conservation Objective	None	High
	Decommission	This is already covered under the 2nd Conservation Objective, above.	See the 2nd Conservation Objective.	See the 2nd Conservation Objective	None	High

Table A11.9: Summary of Information to Inform the Appropriate Assessment: Golden Eagle						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
1. To avoid deterioration of the habitats of the qualifying species	Construction	No deterioration of habitat within the SPA.	None	None	None	High
	Operation	No deterioration of habitat within the SPA. PAT modelling has also shown that the site is of relatively low suitability for foraging for these territories, even with the forest removed.	None	None.	None	High
	Decommission	No deterioration of habitat within the SPA	None	None	None	High
2. To avoid significant disturbance to the qualifying species	Construction	The two territories are well over 2 km from the site and beyond the risk of disturbance.	None	None	None	High
	Operation	The two territories are well over 2 km from the site and beyond the risk of disturbance.	None	None	None	High
	Decommission	The two territories are well over 2 km	None	None	None	High

Table A11.9: Summary of Information to Inform the Appropriate Assessment: Golden Eagle						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
		from the site and beyond the risk of disturbance.				
3. Population of the species as a viable component of the site is maintained in the long term	Construction	None, as there is no risk of disturbance.	None	None	None	High
	Operation	Collision risk modelling, based on 99% avoidance rate, and incorporating a 200 m buffer around the risk area, gives a predicted average collision rate of approximately one bird every 71 years (0.014 collisions a year). This mean is derived from annual rates of predicted collision from 0.00 to 0.02 collisions a year (2003 = 0.02, 2004 = 0.01, 2007 = 0.02, 2010 < 0.00 and 2012 0.02 collisions per year). (Collision risk in the non-breeding season is negligible. The SNH assessed condition of this qualifying feature is favourable maintained (2003).	The addition of an average of approximately 1 golden eagle every 71 years is not considered a significant addition to background mortality, and would not threaten the viability of the SPA population being maintained in the long term.	None.	None	High
	Decommission	None, as there is no risk of disturbance.	None	None	None	High
4. Distribution of the	Construction	There will not be any impact on the distribution of the species within the site in the long term.	None	None	None	High

Table A11.9: Summary of Information to Inform the Appropriate Assessment: Golden Eagle						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
species within site is maintained in the long term	Operation	There will not be any impact on the distribution of the species within the site in the long term.	None	None.	None	High
	Decommission	There will not be any impact on the distribution of the species within the site in the long term.	None	None	None	High
5. Distribution and extent of habitats supporting the species is maintained in the long term	Construction	No effects on the distribution and extent of habitat within the SPA.	None	None.	None	High
	Operation	No effects on the distribution and extent of habitat within the SPA. PAT modelling has also shown that the site is of relatively low suitability for foraging for these territories, with the forest removed.	None	None.	None	High
	Decommission	No effects on the distribution and extent of habitat within the SPA.	None	None.	None	High
6. Structure, function and supporting processes of habitats supporting the species is maintained in the long term	Construction	No effects on the structure, function and supporting processes of habitat supporting golden eagles within the SPA.	None	None	None	High
	Operation	No effects on the structure, function and supporting processes of habitat supporting golden eagles within the SPA.	None	None	None	High
	Decommission	No effects on the structure, function and supporting processes of habitat supporting golden eagles within the SPA.	None	None	None	High
7. No significant	Construction	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High

Table A11.9: Summary of Information to Inform the Appropriate Assessment: Golden Eagle						
Conservation Objective	Project Phase	Findings in Relation to This Conservation Objective for the Project Alone and In Combination	Impact Before Mitigation	Mitigation	Impact After Mitigation	Degree of Certainty
disturbance of the species is maintained in the long term	Operation	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High
	Decommission	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High

Table A11.10: Summary of Information to Inform the Appropriate Assessment: Merlin						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
1. To avoid deterioration of the habitats of the qualifying species	Construction	The Modified 2013 Scheme would avoid deterioration of merlin habitat within the SPA.	None	None	None	High
	Operation	The Modified 2013 Scheme would avoid deterioration of merlin habitat within the SPA.	None	None	None	High
	Decommission	The Modified 2013 Scheme would avoid deterioration of merlin habitat within the SPA.	None	None	None	High
2. To avoid significant disturbance to the qualifying species	Construction	One nesting area has been recorded but is over [redacted] km from the site, sufficiently distant for there to be no risk of disturbance. In 2003 and 2007, SPA-associated birds possibly bred on the edge of the site but no breeding activity has been recorded in recent years.	There is a risk of disturbance if birds return to nest in Strathy South,	None. Pre-commencement breeding raptor surveys, together with pre-felling checks by ornithologists and the implementation of the Breeding Bird Protection Plan would ensure there is no disturbance to breeding merlin.	None	High

Table A11.10: Summary of Information to Inform the Appropriate Assessment: Merlin						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
	Operation	Removal of the plantation will reduce the risk of disturbance during operation.	None	None. Breeding raptor monitoring that would be carried out in Year 1, 2, 3, 5, 10 and 15 will help determine whether or not any breeding is taking place on site or within a 2 km buffer. If breeding is confirmed, then an appropriate protocol would be put in place to avoid any disturbance, through the Breeding Bird Protection Plan.	None	High
	Decommission	There are not likely to be nesting merlin on site, and the nearest breeding current territory is over 1 km from the site, sufficiently distant for there to be no risk of disturbance.	None	Pre-decommissioning breeding raptor surveys by ornithologists and the implementation of the Breeding Bird Protection Plan would ensure there is no disturbance to nesting merlin.	None	High
3. Population of the species as a viable component of the site is maintained in the long term	Construction	None, as there is no risk of disturbance, and therefore no risk of an impact on breeding success.	None	None	None	High
	Operation	There was negligible 'at risk' flight activity recorded across the site in any survey year. Even taking into account any risk of under-recording, it is clear that collision risk to breeding merlin from the proposed wind farm would be negligible, and would not have any effect on the population. The SNH assessed condition of this qualifying feature is favourable maintained (2004).	None	None	None	High

Table A11.10: Summary of Information to Inform the Appropriate Assessment: Merlin						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
	Decommission	None, as there is no risk of disturbance.	None	None	None	High
4. Distribution of the species within site is maintained in the long term	Construction	Breeding sites within the SPA are beyond displacement distance from the wind farm so there will not be any impact on the distribution of the species within the site in the long term.	None	None	None	High
	Operation	Breeding sites within the SPA are beyond displacement distance from the wind farm so there so there will not be any impact on the distribution of the species within the site in the long term.	None	None	None	High
	Decommission	The decommissioning process would be relatively short-term, during which measures would be put in place to prevent disturbance to any nesting merlin. There decommissioning will not therefore have any impact on the distribution of the species within the site in the long term.	None	None	None	High
5. Distribution and extent of habitats supporting the species is maintained in the long term	Construction	No effects on the distribution and extent of merlin habitat within the SPA.	None	None.	None	High
	Operation	It is evident from the 2003 to 2012 breeding results that the main merlin nesting locations are distant from the wind farm, and that the birds make minimal use of Strathy South. It is therefore evident that the wind farm would not have any effects on the	None	None.	None	High

Table A11.10: Summary of Information to Inform the Appropriate Assessment: Merlin						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		distribution and extent of merlin habitat within the SPA.				
	Decommission	No effects on the distribution and extent of merlin habitat within the SPA.	None	None	None	High
6. Structure, function and supporting processes of habitats supporting the species is maintained in the long term	Construction	No effects on the structure, function and supporting processes of habitat supporting merlin within the SPA.	None	None	None	High
	Operation	No effects on the structure, function and supporting processes of habitat supporting merlin within the SPA.	None	None	None	High
	Decommission	No effects on the structure, function and supporting processes of habitat supporting merlin within the SPA.	None	None	None	High
7. No significant disturbance of the species is maintained in the long term	Construction	This is already covered under the 2nd Conservation Objective, above.	See the 2nd Conservation Objective.	See the 2nd Conservation Objective	None	High
	Operation	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High
	Decommission	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High

Table A11.11: Summary of Information to Inform the Appropriate Assessment: Golden Plover						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
1. To avoid deterioration of the habitats of the qualifying species	Construction	The Modified 2013 Scheme would avoid deterioration of golden plover habitat within the SPA.	None	No mitigation is required because there is no impact on this conservation objective. However, the removal of the conifer plantation at Strathy South will help reverse deterioration of adjacent SPA (and SAC) habitats caused by forest edge effects, and which currently extend along more than 32km of the adjoining SPA (and SAC) boundary. In addition to the removal of this forest impact on breeding bird distribution, there will be indirect linear localised benefits to peatland hydrology, from the removal of this forest and accompanying blocking of active forest drains and any remaining historic hill grips,	None	High
	Operation	The Modified 2013 Scheme would avoid deterioration of golden plover habitat within the SPA.	None	None	None	High
	Decommission	The Modified 2013 Scheme would avoid deterioration of golden plover habitat within the SPA.	None	None	None	High
2. To avoid significant disturbance to	Construction	No golden plover have been recorded breeding or foraging on site during the 2003 to 2012 survey years. Results	Displacement of up to 2 territories.	None. Pre-commencement breeding bird surveys, together with the Breeding Bird Protection Plan would ensure there	None	High

Table A11.11: Summary of Information to Inform the Appropriate Assessment: Golden Plover						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
the qualifying species		show between 0 – 2 breeding territories within 500 m of turbines.		is no disturbance to breeding golden plover.		
	Operation	The distribution of breeding golden plover will be monitored during Years 1, 2, 3, 5, 10 and 15, and will ensure information is available to site staff on the breeding distribution of this species over the early years of its operation.	None	None. Breeding monitoring that would be carried out in Year 1, 2, 3, 5, 10 and 15 will help determine whether or not any breeding is taking place on site or within a 500 m buffer. If breeding is confirmed, then an appropriate protocol would be put in place to avoid any disturbance. Staff will also be given an annual briefing on the need to comply with wildlife legislation, and provided with training and reference material on this species, to help ensure any breeding activity is recognised and the appropriate Breeding Bird Protection Plan is put in place.	None	High
	Decommission	The distribution of breeding golden plover will be monitored prior to any decommissioning.	None	None. Pre-decommissioning breeding surveys by ornithologists and the implementation of the Breeding Bird Protection Plan would ensure there is no disturbance to breeding golden plover.	None	High
3. Population of the species as a viable component of the site is maintained in the long term	Construction	None, as there is no risk of disturbance and therefore no impact on breeding success.	None	None	None	High
	Operation	There was negligible 'at risk' flight activity recorded across the site in any survey year. Taking account of	None. The negligible collision nor the potential	None required. However, the removal of approximately 32 km of conifer plantation edge, including at least approximately 3 km where the nearest	None	High

Table A11.11: Summary of Information to Inform the Appropriate Assessment: Golden Plover						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		potential under-recording of flight activity, predicted collision rates are still negligible. From these findings, it is concluded that collision risk to this species from the Modified 2013 Scheme would be negligible, and would not have any effect on the population. Based on survey results from 2003 to 2012, between 0 to 2 territories would be displaced, assuming displacement occurred up to 500 m from turbines. It is considered over-precautionary to assume that these will be lost to the SPA population, given the extent of potential habitat and the varying densities recorded by site condition monitoring. It is considered that there is sufficient carrying capacity within the SPA to absorb these birds, if displacement did occur. The SNH assessed condition of this qualifying feature is unfavourable declining (2009).	displacement are not considered to adversely affect the long term viability of the SPA population.	turbine would be at least 500 m away, will improve habitat which has previously been compromised by forest edge effects. One element of this edge effect is potentially from higher predation near to forest edge, so removal of this predation pressure will potentially have benefits for breeding success of wader territories in proximity to the former forest edge.		
	Decommission	None, as there is no risk of disturbance.	None	None	None	High
4. Distribution	Construction	There will not be any impact on the	None	None	None	High

Table A11.11: Summary of Information to Inform the Appropriate Assessment: Golden Plover						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
of the species within site is maintained in the long term		distribution of the species within the site in the long term, as disturbance to breeding birds will be avoided, and also as construction is relatively short-term.				
	Operation	The 2003 to 2012 data, supplemented by records from RSPB over a longer period, show consistent locations of records for this species, from which to determine breeding distribution. Based on these survey results, between 0 to 2 territories would be displaced (depending on the survey year), assuming displacement occurred up to 500 m from turbines. Given that there is evidence of golden plover nesting relatively close to turbines, and the low numbers of golden plover within 500 m of the site, it is concluded there will not be any impact on the distribution of the species within the site in the long term.	None, given the low numbers within potential displacement distance (0 -2 territories within 500 m) and that there is sufficient carrying capacity within the SPA to absorb these birds, if displacement did occur.	None required. However, the removal of approximately 32 km of conifer plantation edge, including at least approximately 3 km where the nearest turbine would be at least 500 m away, will improve habitat which has previously been compromised by forest edge effects. As SNH/RSPB/FCS evidence shows, the removal of forest edge is expected to have benefits for golden plover and potentially increase territory abundance within the SPA.	None	High
	Decommission	There will not be any impact on the distribution of the species within the site in the long term.	None	None	None	High
5. Distribution and extent of	Construction	No effects on distribution and extent of habitat within the SPA.	None	None.	None	High

Table A11.11: Summary of Information to Inform the Appropriate Assessment: Golden Plover						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
habitats supporting the species is maintained in the long term	Operation	No effects on distribution and extent of habitat within the SPA.	None	None. Note the potential beneficial impact that would result for habitat extent, described under the 3rd Conservation Objective above.	None	High
	Decommission	No effects on distribution and extent of habitat within the SPA.	None	None	None	High
6. Structure, function and supporting processes of habitats supporting the species is maintained in the long term	Construction	No effects on the structure, function and supporting processes of habitat supporting golden plover within the SPA.	None	None	None	High
	Operation	No effects on the structure, function and supporting processes of habitat supporting golden plover within the SPA.	None	None. However, the removal of the conifer plantation at Strathy South will help reverse deterioration of adjacent SPA (and SAC) habitats caused by forest edge effects, and which currently extend along more than 32km of the adjoining SPA (and SAC) boundary. In addition to the removal of this forest impact on breeding bird distribution, there will be indirect linear localised benefits to peatland hydrology, from the removal of this forest and accompanying blocking of active forest drains and any remaining historic hill grips,	None	High
	Decommission	No effects on the structure, function and supporting processes of habitat	None	None	None	High

Table A11.11: Summary of Information to Inform the Appropriate Assessment: Golden Plover						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		supporting golden plover within the SPA.				
7. No significant disturbance of the species is maintained in the long term	Construction	Covered under the 2nd Conservation Objective, above.	See the 2nd Conservation Objective.	See the 2nd Conservation Objective	None	High
	Operation	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High
	Decommission	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High

Table A11.12: Summary of Information to Inform the Appropriate Assessment: Greenshank						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
1. To avoid deterioration of the habitats of the qualifying species	Construction	The Modified 2013 Scheme would avoid deterioration of greenshank habitat within the SPA.	None	No mitigation is required because there is no impact on this conservation objective. However, there will be indirect localised benefits to peatland hydrology from the removal of approximately 32 km of forest edge and accompanying blocking of active forest drains and any remaining historic but active hill grips, In addition, as part of peatland mitigation measures, there will be	None	High

Table A11.12: Summary of Information to Inform the Appropriate Assessment: Greenshank						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
				further targeted additional drain blocking on previously un-planted areas that will also benefit this species, by increasing localised water table levels and pools.		
	Operation	The Modified 2013 Scheme would avoid deterioration of greenshank habitat within the SPA.	None	None. The measures above will continue to provide evolving benefits, as the measures take effect.	None	High
	Decommission	The Modified 2013 Scheme would avoid deterioration of greenshank habitat within the SPA.	None	None. The measures above will provide on-going benefits, as the measures continue take effect.	None	High
2. To avoid significant disturbance to the qualifying species	Construction	There were no greenshank nesting or nesting/chick rearing territories identified within 200 m of any turbines in any year surveyed. Only two territories were within [redacted] m over this period, 1 in 2007 (at [redacted] m) and 1 in 2010 (at [redacted] m). This gives a mean of only 1 territory occurring within 350 m of a turbine every two years.	None	None. Pre-commencement breeding surveys, together with open ground checks by ornithologists and the implementation of the Breeding Bird Protection Plan would ensure there is no disturbance to breeding greenshank. Staff will also be given site inductions on the need to comply with wildlife legislation, and provided with training and reference material on this species, to help ensure any breeding activity is recognised and the appropriate actions put in place.	None	High
	Operation	The distribution of breeding greenshank will be monitored during Years 1, 2, 3, 5, 10 and 15 and will ensure information available to site staff on the	None	None. Breeding monitoring that would be carried out in Year 1, 2, 3, 5, 10 and 15 will help determine whether or not any breeding is taking place on site or within a 500 m buffer. If breeding is confirmed, then an appropriate protocol	None	High

Table A11.12: Summary of Information to Inform the Appropriate Assessment: Greenshank						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		breeding distribution of this species over the early years of its operation. The location of activity has been relatively consistent, which helps ensure any potentially disturbing activities can be planned with this information in mind.		would be put in place to avoid any disturbance. Staff will also be given an annual briefing on the need to comply with wildlife legislation, and provided with training and reference material on this species, to help ensure any breeding activity is recognised and the appropriate actions put in place.		
	Decommission	The occurrence of breeding greenshank will be monitored prior to any decommissioning.	None	None. Pre-decommissioning breeding surveys by ornithologists and the implementation of the Breeding Bird Protection Plan would ensure there is no disturbance to breeding greenshank.	None	High
3. Population of the species as a viable component of the site is maintained in the long term	Construction	Results show use of the site as a nesting and nesting/chick rearing territory for up to five to six within [redacted] m of turbines.	There is a risk of inadvertent harm to nests or chicks from trampling or by machinery.	The same measures used as mitigation for the 2nd Conservation Objective above will also apply here.	None	High
	Operation	SNH in their October 2nd response letter, suggested that any territories within 500 m of turbines should be considered lost to the population (from collision). This is considered to be over-precautionary. There was low 'at risk' flight activity recorded across the site. Taking	None, as it is assumed that if the highly precautionary predicted 6 territories were displaced,	Whilst no mitigation is judged to be necessary, it is noteworthy that elements of the modified scheme and its associated mitigation for peatland impacts will benefit this species on the adjacent SPA. Primarily, the removal of the conifer plantation will potentially reduce mammalian predation, and	None	High

Table A11.12: Summary of Information to Inform the Appropriate Assessment: Greenshank						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		account of potential under-recording of flight activity, predicted collision rates are still negligible. In addition, removal of the forest plantation is predicted to reduce average flight height and therefore lower the predicted collision rate even lower. Therefore, if greenshank were not displaced from the site, the risk of collision from these findings, would be negligible, and would certainly not have any effect on the population. In their 2nd October 2007 response SNH propose that all greenshank territories within 200 m of turbines should be considered lost to the population. As noted above, there were no territories recorded within 200 m. Only two nesting or nesting/chick rearing territories have ever been recorded within 350 m but it is not accepted that these birds will be lost to the SPA population. It is considered certain that there is sufficient carrying capacity within the SPA to absorb these birds, if	the SPA has the carrying capacity to support these birds.	increase connectivity between foraging areas. There will also be localised benefits on and adjacent to the site from improvements to peatland hydrology resulting from the removal of approximately 32 km of forest edge and the accompanying blocking of active forest drains and any remaining historic but active hill grips along this SPA/SAC boundary, In addition, as part of peatland mitigation measures, there will be further targeted additional drain blocking on 23.5 ha of previously un-planted areas that will also benefit this species, by increasing localised water table levels and pools. On the basis of its breeding requirements, it is reasonable to infer that these habitat improvement measures will have some benefit to the quality and extent of breeding habitat for this species, and although it would be difficult to predict and quantify at this stage, there is potential that it will counter-balance any potential displacement pressure from the presence of the turbines.		

Table A11.12: Summary of Information to Inform the Appropriate Assessment: Greenshank						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		displacement did occur. The SNH assessed condition of this qualifying feature is favourable maintained (2009).				
	Decommission	None, as there is no risk of disturbance.	None	None	None	High
4. Distribution of the species within site is maintained in the long term	Construction	There will not be any impact on the distribution of the species within the site in the long term, as disturbance will be avoided in order to comply with wildlife legislation.	None	None	None	High
	Operation	There are no nesting or nesting/chick rearing territories within 200m of any turbine, and only two territories have been recorded within 350 m. If a highly precautionary 500 m disturbance buffer was been applied, a peak of up to 5 to 6 nesting or nesting/chick rearing territories would be displaced, based on the greatest number of territories recorded over the 2003 to 2012 period. It is considered that there is sufficient carrying capacity within the SPA to absorb these birds, if displacement did occur.	Displacement of up to 6 territories, based on a highly precautionary 500 m displacement distance from turbines.	Whilst no mitigation is judged to be necessary, the measures for the 3rd Conservation Objective above would benefit this species.	None	High
	Decommission	If displacement had taken place,	None	None	None	High

Table A11.12: Summary of Information to Inform the Appropriate Assessment: Greenshank						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		decommissioning would result in re-establishment of territories in the long term.				
5. Distribution and extent of habitats supporting the species is maintained in the long term	Construction	No effects on the distribution and extent of habitat within the SPA.	None	None.	None	High
	Operation	No effects on the distribution and extent of habitat within the SPA.	None	None. Note the potential beneficial impact that would result for habitat extent, described under the 3rd Conservation Objective above.	None	High
	Decommission	No effects on the distribution and extent of habitat within the SPA.	None	None	None	High
6. Structure, function and supporting processes of habitats supporting the species is maintained in the long term	Construction	Removal of the plantation accompanied by blocking of active forest drains and any active historical hill grips would enhance peatland hydrology along approximately 32 km of the SPA boundary.	None	None. Note the potential beneficial impact that would result for habitat extent, described under the 3rd Conservation Objective above.	None	High
	Operation	Removal of the plantation accompanied by blocking of active forest drains and any active historical hill grips would enhance peatland hydrology along approximately 32 km of the SPA boundary.	None	None. Note the potential beneficial impact that would result for habitat extent, described under the 3rd Conservation Objective above.	None	High
	Decommission	No effects on the structure, function and supporting processes of habitat supporting greenshank within the SPA.	None	None	None	High
7. No significant	Construction	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High

Table A11.12: Summary of Information to Inform the Appropriate Assessment: Greenshank						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
disturbance of the species is maintained in the long term	Operation	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High
	Decommission	Covered under the 2nd Conservation Objective, above.	None.	See the 2nd Conservation Objective	None	High

Table A11.13: Summary of Information to Inform the Appropriate Assessment: Dunlin						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
1. To avoid deterioration of the habitats of the qualifying species	Construction	The Modified 2013 Scheme would avoid deterioration of dunlin habitat within the SPA.	None	No mitigation is required because there is no impact on this conservation objective. However, there will be indirect localised benefits to peatland hydrology from the removal of approximately 32 km of forest edge and accompanying blocking of active forest drains and any remaining historic but active hill grips, In addition, as part of peatland mitigation measures, there will be further targeted additional drain blocking on previously un-planted areas that will also benefit this species, by increasing localised water table levels and pools.	None	High
	Operation	The Modified 2013 Scheme would avoid deterioration of dunlin habitat within the SPA.	None	None. The measures above will continue to provide evolving benefits, as the measures take effect.	None	High
	Decommission	The Modified 2013 Scheme would avoid deterioration of dunlin habitat within the SPA.	None	None. The measures above will provide on-going benefits, as the measures continue take effect.	None	High

Table A11.13: Summary of Information to Inform the Appropriate Assessment: Dunlin						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
2. To avoid significant disturbance to the qualifying species	Construction	No dunlin was recorded breeding on site. Off site, there were from 0 to 3 breeding territories recorded within 500 m of turbines.	None	Pre-commencement breeding surveys, together with open ground checks by ornithologists and the implementation of the Breeding Bird Protection Plan would ensure there is no disturbance to breeding dunlin. Staff will also be given site inductions on the need to comply with wildlife legislation, and provided with training and reference material on this species, to help ensure any breeding activity is recognised and the appropriate Breeding Bird Protection Plan is put in place.	None	High
	Operation	The distribution of breeding dunlin will be monitored during Years 1, 2, 3, 5, 10 and 15 and will ensure information available to site staff on the breeding distribution of this species over the early years of its operation. The location of activity has been relatively consistent, which helps ensure any potentially disturbing activities can be planned with this information in mind.	None	Breeding monitoring that would be carried out in Year 1, 2, 3, 5, 10 and 15 will help determine whether or not any breeding is taking place on site or within a 500 m buffer. If breeding is confirmed, then an appropriate protocol would be put in place to avoid any disturbance. Staff will also be given an annual briefing on the need to comply with wildlife legislation, and provided with training and reference material on this species, to help ensure any breeding activity is recognised and the appropriate Breeding Bird Protection Plan is put in place.	None	High
	Decommission	The distribution of breeding dunlin will be monitored prior to any decommissioning.	None	Pre-decommissioning breeding surveys by ornithologists and the implementation of the Breeding Bird Protection Plan would ensure there is no disturbance to breeding dunlin.	None	High
3. Population of the species as a viable component of the site is	Construction	Results show no breeding on site but up to three pairs within 500 m of turbines.	None	The same measures used as mitigation for the 2nd Conservation Objective above will also apply here.	None	High

Table A11.13: Summary of Information to Inform the Appropriate Assessment: Dunlin						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
maintained in the long term	Operation	There was negligible 'at risk' flight activity recorded across the site. A displacement impact up to 500 m has been applied, in accordance with SNH's response, but it is not accepted that these birds will be lost to the SPA population. It is considered certain that there is sufficient carrying capacity within the SPA to absorb these birds, if displacement did occur. The SNH assessed condition of this qualifying feature is favourable maintained (2009).	None, as it is assumed that if the highly precautionary predicted 3 territories were displaced, the SPA has the carrying capacity to support these birds.	Whilst no mitigation is judged to be necessary, it is noteworthy that elements of the modified scheme and its associated mitigation for peatland impacts will benefit this species on the adjacent SPA. Primarily, the removal of the plantation itself will potentially reduce mammalian predation, and increase connectivity between foraging areas. There will also be localised benefits on and adjacent to the site from improvements to peatland hydrology resulting from the removal of approximately 32 km of forest edge and the accompanying blocking of active forest drains and any remaining historic but active hill grips along this SPA/SAC boundary, In addition, as part of peatland mitigation measures, there will be further targeted additional drain blocking on previously un-planted areas that will also benefit this species, by increasing localised water table levels and pools. On the basis of its breeding requirements, it is reasonable to infer that these habitat improvement measures will have some benefit to the breeding productivity of this species (although it would be difficult to predict and quantify).	None	High
	Decommission	If displacement had taken place, decommissioning would result in re-establishment of territories in the long term.	None	None	None	High
4. Distribution of the species	Construction	There will not be any impact on the distribution of the species within the site in the	None	None	None	High

Table A11.13: Summary of Information to Inform the Appropriate Assessment: Dunlin						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
within site is maintained in the long term		long term, as disturbance will be avoided in order to comply with wildlife legislation.				
	Operation	If displacement from turbines occurred to a precautionary 500 m disturbance, this would mean up to three territories could be displaced. It is considered certain that there is sufficient carrying capacity within the SPA to absorb these birds, if displacement did occur.	Displacement of up to 3 territories, based on a highly precautionary 500 m displacement distance from turbines.	Whilst no mitigation is judged to be necessary, the measures for the 3rd Conservation Objective above would benefit this species.	None	High
	Decommission	If displacement has taken place, decommissioning would result in re-establishment of territories in the long term.	None	None	None	High
5. Distribution and extent of habitats supporting the species is maintained in the long term	Construction	No effects on the distribution and extent of habitat within the SPA.	None	None.	None	High
	Operation	No effects on the distribution and extent of habitat within the SPA.	None	None. Note the potential beneficial impact that would result for habitat extent, described under the 3rd Conservation Objective above.	None	High
	Decommission	No effects on the distribution and extent of habitat within the SPA.	None	None	None	High
6. Structure, function and supporting processes of habitats supporting the species is maintained in the long term	Construction	Removal of the plantation plus blocking of active forest drains and any active historical hill grips would enhance peatland hydrology along approximately 32 km of the SPA boundary.	None	None. Note the potential beneficial impact that would result for habitat extent, described under the 3rd Conservation Objective above.	None	High
	Operation	Removal of the plantation plus blocking of active forest drains and any active historical hill grips would enhance peatland hydrology along approximately 32 km of the SPA	None	None. Note the potential beneficial impact that would result for habitat extent, described under the 3rd Conservation Objective above.	None	High

Table A11.13: Summary of Information to Inform the Appropriate Assessment: Dunlin						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		boundary.				
	Decommission	No effects on the structure, function and supporting processes of habitat supporting dunlin within the SPA.	None	None	None	High
7. No significant disturbance of the species is maintained in the long term	Construction	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High
	Operation	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High
	Decommission	Covered under the 2nd Conservation Objective, above.	None.	See the 2nd Conservation Objective	None	High

Table A11.14: Summary of Information to Inform the Appropriate Assessment: Wood Sandpiper						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
1. To avoid deterioration of the habitats of the qualifying species	Construction	No deterioration of wood sandpiper habitat within the SPA.	None	No mitigation is required because there is no impact on this conservation objective.	None	High
	Operation	No deterioration of wood sandpiper habitat within the SPA.	None	None. The measures above will continue to provide evolving benefits, as the measures take effect.	None	High
	Decommission	No deterioration of wood sandpiper habitat within the SPA.	None	None. The measures above will provide on-going benefits, as the measures continue take effect.	None	High
2. To avoid significant disturbance to the qualifying	Construction	No wood sandpiper was recorded breeding on or off site.	None	None	None	High
	Operation	The distribution of breeding wood sandpiper will be monitored during Years 1, 2, 3, 5, 10	None	Breeding monitoring that would be carried out in Year 1, 2, 3, 5, 10 and 15 will help	None	High

Table A11.14: Summary of Information to Inform the Appropriate Assessment: Wood Sandpiper						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
species		and 15 (see Table A11.4) will ensure information available to site staff on the breeding distribution of this species over the early years of its operation. The location of activity has been relatively consistent, and it not anticipated this species will breed on site as it has been recorded as a transient species only.		determine whether or not any breeding is taking place on site or within a 500 m buffer. If breeding is confirmed, then an appropriate protocol would be put in place to avoid any disturbance. Staff will also be given an annual briefing on the need to comply with wildlife legislation, and provided with training and reference material on this species, to help ensure any breeding activity is recognised and the appropriate Breeding Bird Protection Plan is put in place.		
	Decommission	The distribution of wood sandpiper will be monitored prior to any decommissioning.	None	None	None	High
3. Population of the species as a viable component of the site is maintained in the long term	Construction	Results show no breeding on site or within 500 m of turbines.	None	None	None	High
	Operation	There was no 'at risk' flight activity recorded across the site. The SNH assessed condition of this qualifying feature is favourable maintained (2004).	None	None	None	High
	Decommission	This has no implications..	None	None	None	High
4. Distribution of the species within site is maintained in the long term	Construction	There will not be any impact on the distribution of the species within the site in the long term as it is either absent or extremely infrequent in the Strathy South area.	None	None	None	High
	Operation	There will not be any impact on the distribution of the species within the site in the long term as it is either absent or extremely infrequent in the Strathy South area.	None	None	None	High
	Decommission	There will not be any impact on the distribution of the species within the site in the long term	None	None	None	High

Table A11.14: Summary of Information to Inform the Appropriate Assessment: Wood Sandpiper						
Conservation Objective	**Project Phase**	**Findings in Relation to This Conservation Objective for the Project Alone and In Combination**	**Impact Before Mitigation**	**Mitigation**	**Impact After Mitigation**	**Degree of Certainty**
		as it is either absent or extremely infrequent in the Strathy South area.				
5. Distribution and extent of habitats supporting the species is maintained in the long term	Construction	No effects on distribution and extent of habitat within the SPA.	None	None.	None	High
	Operation	No effects on distribution and extent of habitat within the SPA.	None	None.	None	High
	Decommission	No effects on the distribution and extent of habitat within the SPA.	None	None	None	High
6. Structure, function and supporting processes of habitats supporting the species is maintained in the long term	Construction	No effects on the structure, functioning and supporting processes within the SPA.	None	None.	None	High
	Operation	No effects on the structure, functioning and supporting processes within the SPA.	None	None.	None	High
	Decommission	No effects on the structure, functioning and supporting processes within the SPA.	None	None	None	High
7. No significant disturbance of the species is maintained in the long term	Construction	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High
	Operation	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High
	Decommission	Covered under the 2nd Conservation Objective, above.	None	See the 2nd Conservation Objective	None	High

There are no summary tables for short-eared owl, common scoter or wigeon as these species have not been recorded breeding, or in the cases of these waterfowl, in flight, at Strathy South, over the 2003 to 2012 period. It is therefore self-evident that the Modified 2013 Scheme would have no effect on the SPA's conservation objectives for these species.

A11.11 References

Forrest, J., Robinson, C., Hommel, C. and Craib, J. (2011) Flight Activity and Breeding Success of Hen Harrier at Paul's Hill Wind Farm in Scotland. Poster at the Conference on Wind Energy and Wildlife Impacts, Trondheim, Norway, 2-5 May 2011.

Robson, P. (2012) Hen harrier Activity at Cruach Mhor Wind farm. Review of Monitoring Data 2001-2011. SNH Sharing Good Practice Workshop - Assessing the impact of wind farms on birds, 3 April 2012. http://www.snh.gov.uk/docs/A689039.pdf

ScottishPower Renewables (2009) Cruach Mhor: Ornithological Monitoring Results 2001-2009.

The abbreviations used above are detailed in Table A11.7

Table A11.7: Abbreviations

Abbreviations	
SNH	Scottish Natural Heritage
FCS	Forestry Commission Scotland
RSPB	Royal Society for the Protection of Birds
HMP	Habitat Management Plan
CEMP	Construction and Environment Management Plan

A12 Noise

The noise assessment has been carried out by Hayes McKenzie Partnership Ltd. and considers the operational and construction impact of the Modified 2013 Scheme on the surrounding area. This chapter replaces the noise chapter presented in the 2007 ES in its entirety.

A12.1 Introduction

The assessment has been carried out according to the recommendations of ETSU-R-97, The Assessment and Rating of Noise from Wind Farms, as referred to within web-based guidance provided by the Scottish Government, and the best practice guidance contained with the Institute of Acoustics (IoA) Acoustics Bulletin Vol 34 no. 2 article *Prediction and Assessment of Wind Turbine Noise.*

Predicted turbine noise levels, based on the use of a candidate modelled turbine with an 83 m hub height, have been compared with the noise limits proposed within ETSU-R-97.

Cumulative noise predictions have also been carried out that include the consented Strathy North development and the proposed Strathy Wood development which, although is at pre-application stage, has been included in the cumulative noise predictions using the latest available details for the site, due to proximity to site.

Due to the location of the Modified 2013 Scheme, and the consequent low levels of predicted turbine noise at the nearest residential properties, it is considered that, in accordance with ETSU-R-97, baseline noise measurements are not required for the purposes of this assessment. As such, predicted noise levels associated with the operation of the turbine have been compared with the simplified noise limit proposed within ETSU-R-97.

An assessment has also been made of noise arising from the operation of plant and machinery in connection with the construction of the proposed Strathy South wind farm. The assessment has been carried out following the principles described in BS 5228: *Code of Practice for Noise and Vibration Control on Construction and Open Sites.*

A12.2 Scope of Assessment

A12.2.1 Project Interactions

The noise assessment has been carried out for the Modified 2013 Scheme. The location of the site is such that noise was not a significant factor in the evolution of the layout. It can be seen in the (superseded) noise chapter of the 2007 ES that predicted noise levels for the Original 2007 Scheme were significantly below the ETSU-R-97 simplified noise limit of 35 dB L_{A90} for 10 m-height wind speeds of up to 10 m/s.

A12.2.2 Study Area

The noise assessment focuses on the residential properties that fall within the 35 dB L_{A90} cumulative noise contour (for the wind speed with the highest noise output for the modelled turbines for standardised 10 m-height wind speeds up to 12m/s) that includes the site, the consented Strathy North wind farm, and the proposed Strathy Wood wind farm currently at scoping.

It should be noted that there are only two residential properties, Dallangwell and Braerathy Lodge, where worst case cumulative predicted noise levels from Strathy North, Strathy South, and Strathy Wood are above 35 dB L_{A90}. Dallangwell is owned by SSE and therefore can be considered to be financially involved with Strathy North and Strathy South, and Braerathy is financially involved with the proposed Strathy Wood Development. Additionally, there are no residential properties within 3 km of any Strathy South wind turbine.

A12.2.3 Scoping and Consultation

Table 12.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
Environmental Health department of Highland Council **November/December 2012**	**Letter sent detailing noise assessment methodology**	
	Noise limits were proposed that the Strathy South site would be acceptable if predicted cumulative noise levels at residential properties were below 35 dB L_{A90}, or if predicted noise levels from Strathy South alone were below 30 dB L_{A90}, or if Strathy South adds less than 1 dB to the cumulative noise level (excluding Strathy South)	The Environmental Health Officer (EHO) stated that they would require as much information as possible regarding predicted noise levels, including cumulative noise levels, at residential properties in order to assess the impact of the scheme. Advised that generally The Highland Council (THC) are looking for cumulative noise levels to be below 35 dB L_{A90}. The EHO supplied THC document, *Noise Assessment Guidance for Wind Farms*, which details THC's required information to be included with an application.
	Background noise measurements would not be required as the site would be assessed against the noise limits described above.	The EHO confirmed that at this stage they did not require background noise measurements, but that they may ask for them at a later stage,
	Cumulative noise predictions would be carried out on the basis of the worst case turbine selected, or the turbine being considered for the site.	The EHO advised that the consented noise limits should be taken into account in the noise assessment. It should be noted, however, that SSE would be operating both the Strathy North and Strathy South wind farm sites, and would therefore have control over both sites.

A12.2.4 Impacts to be Assessed

The operational and construction noise impact of the Modified 2013 Scheme, including tonal noise and amplitude modulation is assessed within this noise chapter.

A12.2.5 Impacts Scoped out of Assessment

Infrasound, low frequency noise and vibration have been scoped out of the assessment and are discussed in more detail below.

(a) Infra-sound

Infra-sound is noise occurring at frequencies below that at which sound is normally audible, i.e. at less than about 20 Hz, due to the significantly reduced sensitivity of the ear at such frequencies. In this frequency range, for sound to be perceptible, it has to be at a very high amplitude and it is generally considered that when such sounds are perceptible then they can cause considerable annoyance.

Wind turbines have been cited by some as producers of infra-sound. This has, however, been due to the high levels of such noise, as well as audible low frequency thumping noise, occurring on older 'downwind' turbines of which many were installed in the USA prior to the large scale take up of wind power production in the UK. Downwind turbines are configured with the blades downwind of the tower such that the blades pass through the wake left in the wind stream by the tower resulting in a regular audible thump, with infra-sonic components, each time a blade passes the tower. Virtually all modern larger turbines are of the upwind design; that is with the blades upwind of the tower, such that this effect is eliminated.

The DTI Report W/45/00656/00/00, The Measurement of Low Frequency Noise at Three UK Wind Farms concluded that "infrasound noise emissions from wind turbines are significantly below the recognised threshold of perception for acoustic energy within this frequency range. Even assuming that the most sensitive members of the population have a hearing threshold which is 12 dB lower than the median hearing threshold, measured infrasound levels are well below this criterion." It goes on to state that, based on information from the World Health Organisation, "there is no reliable evidence that infrasound below the hearing threshold produce physiological or psychological effects" and that "it may therefore be concluded that infrasound associated with modern wind turbines is not a source which may be injurious to the health of a wind farm neighbour."

(b) Low Frequency Noise

Noise from modern wind turbines is essentially broad band in nature in that it contains similar amounts of noise energy in all frequency bands from low to high frequency. As distance from a wind farm site increases the noise level decreases as a result of the spreading out of the sound energy and also due to air absorption which increases with increasing frequency. This means that, although the energy across the whole frequency range is reduced, higher frequencies are reduced more than lower frequencies with the effect that, as distance from the site increases, the ratio of low to high frequencies also increases. This effect may be observed with road traffic noise or natural sources, such as the sea, where higher frequency components are diminished relative to lower frequency components at long distances. At such distances, however, the overall noise level is so low, such that any bias in the frequency spectrum is insignificant.

(c) Vibration

A study of low frequency noise and vibration around a modern wind farm was carried out for ETSU and reported in ETSU W/13/00392/REP, *Low Frequency Noise and Vibrations Measurement at a Modern Wind farm.* This study found that vibration from wind turbines, as measured at 100m from the nearest machine, was well below criteria recommended for human exposure in critical working areas such as precision laboratories. At greater distances from turbines vibration levels will be even lower.

The findings of ETSU W/13/00392/REP were confirmed more recently in a study conducted by the Applied and Environmental Geophysics Group of the School of Physical and Geographical Sciences at Keele University. This study, published in 2005 as *Microseismic and Infrasound Monitoring of Low Frequency Noise and Vibrations from Wind farms,* showed measured vibration levels of around 10^{-8} $m.s^{-2}$ at a distance of 2.4 km from the Dun Law Wind Farm under high wind conditions; orders of magnitude below the human level of perception. In a letter to the press, two of the authors of this report stated that "*to put the level of vibration into context, they are ground vibrations with amplitudes of about one millionth of a millimetre. There is no possibility of humans sensing the vibration and absolutely no risk to human health."*

A12.3 Policy and Legislative Context

A12.3.1 Operational Noise

(a) Planning Advice Note PAN1/2011, Planning and Noise

PAN1/2011, Planning and Noise, identifies two sources of noise from wind turbines; mechanical noise and aerodynamic noise. It states that "*good acoustical design and siting of*

turbines is essential to minimise the potential to generate noise." It refers to the web-based planning advice on renewables technologies for onshore wind turbines.

PAN1/2011 states that "For noise of a similar character, a change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving and doubling the loudness of a sound." Table A12.2 is an extract from PAN1/2011 and it shows the general context of noise in the environment.

Table A12.2: Examples of Indicative Noise Levels

Source/Activity	Indicative noise level, dB (A)
Unsilenced pneumatic drill (at 7 m distance)	95
Heavy diesel lorry (40 km/h at 7 m distance)	83
Modern twin-engine jet (at take-off at 152 m distance)	81
Passenger car (60 km/h at 7 m distance)	70
Office environment	60
Ordinary conversation	50
Quiet bedroom	35

(b) Scottish Government 2011, Web Based Planning Advice, Onshore Wind Turbines

The web-based planning advice for onshore wind turbines re-iterates the sources of noise as "the mechanical noise produced by the gearbox, generator and other parts of the drive train and the aerodynamic noise produced by the passage of the blades through the air" and that "there has been significant reduction in the mechanical noise generated by wind turbines through improved turbine design."

It states that "the Report, 'The Assessment and Rating of Noise from Wind Farms' (Final Report, Sept 1996, DTI), (ETSU-R-97), describes a framework for the measurement of wind farm noise, which should be followed by applicants and consultees, and used by planning authorities to assess and rate noise from wind energy developments, until such time as an update is available."

It notes that "this gives indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable burdens on wind farm developers, and suggests appropriate noise conditions."

(c) ETSU-R-97, The Assessment and Rating of Noise from Wind Farms

ETSU-R-97, The Assessment and Rating of Noise from Wind Farms, presents the recommendations of the Working Group on Noise from Wind Turbines. The working group was set up in 1993 by the Department of Trade and Industry (DTI) as a result of difficulties experienced in applying the noise guidelines existing at the time to wind farm noise assessments. The group comprised independent experts on wind turbine noise, wind farm developers, DTI personnel and local authority Environmental Health Officers. In September 1996, the Working Group published its findings by way of report ETSU-R-97. This document describes a framework for the measurement of wind farm noise and contains suggested noise limits, which were derived with reference to existing standards and guidance relating to noise emission from various sources.

ETSU-R-97 recommends that, although noise limits should be set relative to existing background and should reflect the variation of both turbine and background noise with wind speed; this can imply very low noise limits in particularly quiet areas, in which case *"it is not necessary to use a margin above background in such low-noise environments. This would be unduly restrictive on developments which are recognised as having wider global benefits. Such low limits are, in any event, not necessary in order to offer a reasonable degree of protection to the wind farm neighbour."*

For daytime periods, the noise limit is 35-40 dB(A) or 5 dB(A) above the 'quiet day-time hours' prevailing background noise, whichever is the greater. The actual value within the 35-

40 dB(A) range depends on the number of dwellings in the vicinity; the impact of the limit on the number of kWh generated; and the duration of the level of exposure.
For night-time periods the noise limit is 43 dB(A) or 5 dB(A) above the prevailing night-time hours background noise, whichever is the greater. The 43 dB(A) lower limit is based on a sleep disturbance criteria of 35 dB(A) with an allowance of 10 dB(A) for attenuation through an open window and 2 dB(A) subtracted to account for the use of L_{A90} rather the L_{Aeq}.
Where predicted noise levels are low at the nearest residential properties a simplified noise limit can be applied, such that noise is restricted to the minimum ETSU-R-97 level of 35 dB L_{A90} for wind speeds up to 10 m/s at 10 m height. This removes the need for extensive background noise measurements for smaller or more remote schemes.

It is stated that the $_{LA90,10min}$ noise descriptor should be adopted for both background and wind farm noise levels and that, for the wind farm noise, this is likely to be between 1.5 and 2.5 dB less than the L_{Aeq} measured over the same period. The $L_{Aeq,t}$ is the equivalent continuous 'A' weighted sound pressure level occurring over the measurement period t. It is often used as a description of the average noise level. Use of the L_{A90} descriptor for wind farm noise allows reliable measurements to be made without corruption from relatively loud, transitory noise events from other sources.

ETSU-R-97 also specifies that a penalty should be added to the predicted noise levels, where any tonal component is present. The level of this penalty is described and is related to the level by which any tonal components exceed audibility.

With regard to multiple wind farms in a given area, ETSU-R-97 specifies that the absolute noise limits and margins above background should relate to the cumulative impact of all wind turbines in the area contributing to the noise received at the properties in question. Existing wind farms should therefore be included in cumulative predictions of noise level for proposed wind turbines and not considered as part of the prevailing background noise.

(d) IoA Bulletin Article, Prediction and Assessment of Wind Turbine Noise

The Institute of Acoustics Bulletin Vol 34, No. 2, contains an article with an agreement (jointly authored by a number of consultants working in the wind turbine sector for developers, local authorities and third parties) on an agreed methodology for addressing issues not covered by ETSU-R-97. This includes an agreed method for noise predictions and a statement on vibration and low frequency noise. These will be referred to in the relevant sections below.

(e) Highland Renewable Energy Strategy and Planning Guidelines

The Highland Council's 'Highland Renewable Energy Strategy and Planning Guidelines', dated May 2006, presents the following table relating to noise impact from wind farm (reproduced from page 52 of the aforementioned document) (Table A12.3).

Table A12.3: Noise Guidance

Planning Requirement	Guidance
For local, major or national projects, evidence must also be provided for no significant mechanical and aerodynamic noise impact across all wind conditions to other dwellings outside the 1000 m proximity distance; this includes low frequency noise and infrasound effects.	Actual background noise measurements at nearest noise sensitive properties should be made unless otherwise agreed. Noise levels assessment should be based on the ETSU-R-97 guidelines adapted from BS4142 and set out in PAN45. Further planning guidance is available in SODD Circular 10/1999 and PAN 56

(Source: Table G4.2.3: Specific planning requirements and guidance for onshore wind development)

It should be noted that PAN 1/2011, Planning and Noise supersedes Circular 10/1999 Planning and Noise and PAN 56 Planning and Noise, which are now revoked.

(f) Planning Policy and Guidance for Onshore Wind Energy

The Highland Council has produced Supplementary Guidance for Onshore Wind Energy, dated 14th March 2012, which has a section *on 'amenity at sensitive locations'* that covers noise from wind farms. The document states that *"the Council will continue to apply the standards of noise arising from wind turbines not exceeding 35 dB at any noise sensitive location."* It goes on to state that *"a technical appendix is being developed for the guidance which will outline the standards the Council will expect to be met and any assessments that will be required to accompany a planning application."* This technical appendix is believed to be the document supplied by THC, *Noise Assessment Guidance for Wind Farms*, a copy of which is included in Technical Appendix 12.3.

A12.3.2 Construction Noise

(a) The Control of Noise (Codes of Practice for Construction and Open Sites) (Scotland) Order 2002

The Control of Noise (Codes of Practice for Construction and Open Sites (Scotland) Order 2002 still refers to BS 5228 in the 1997 version, although The Technical Advice Note Assessment of Noise states that "under Environmental Impact Assessment and for planning purposes, i.e. not in regard to the Control of Pollution Act 1974, the 2009 version of BS 5228 is applicable."

(b) BS 5228: Code of Practice for Noise and Vibration Control on Construction and Open Sites

The 1997 version of BS5228 was updated in early 2009. This document provides example criteria for the assessment of the significance of construction noise effects and a method for the prediction of noise levels from construction activities. Two example methods are provided for assessing significance.

The first is based on the use of criteria defined in Department of the Environment Advisory Leaflet (AL) 72, *Noise Control On Building Sites* (DoE 1969) which sets a fixed limit of 70 dB(A) in rural suburban and urban areas away from main roads and traffic. Noise levels are generally taken as façade L_{Aeq} values with free-field levels taken to be 3 dB lower, giving an equivalent noise criterion of 67 dB L_{Aeq}.

The second is based on noise change, with a 5 dB increase in overall noise considered to be significant. However, when existing noise levels are low, such as at this site, and continue for more than one month, minimum criteria are applicable. These are 45, 55 and 65 dB L_{Aeq}, for night-time (2300-0700), evening and weekends, and daytime (0700-1900) including Saturdays (0700-1300) respectively.

It is proposed that construction noise will be assessed against this daytime noise limit of 65 dB LAeq, as this is when construction noise will be generated.

A12.4 Methodology

A12.4.1 Operational Noise Assessment Methodology

For a detailed technical prediction methodology refer to Technical Appendix A12.1: Noise Prediction Methodology.

Noise predictions have been carried out using International Standard ISO 9613, *Acoustics – Attenuation of Sound During Propagation Outdoors.* The propagation model described in Part 2 of this standard provides for the prediction of sound pressure levels based on either short-term downwind (i.e. worst case) conditions or long term overall averages. Only the worst-case downwind condition has been considered in this assessment, that is – for wind blowing from each proposed turbine towards the nearby houses. When the wind is blowing in the opposite direction noise levels will be significantly lower, especially where there is any shielding between the turbine and the houses.

The ISO propagation model calculates the predicted sound pressure level by taking the source sound power level for each turbine in separate octave bands and subtracting a number of attenuation factors according to the following:

Predicted Octave Band Noise Level = $L_W + D - A_{geo} - A_{atm} - A_{gr} - A_{bar} – A_{misc}$

- L_W – Source Sound Power Level
- D – Directivity Factor
- A_{geo} – Geometrical Divergence
- A_{atm} – Atmospheric Attenuation
- A_{gr} – Ground Effect
- A_{bar} - Barrier Attenuation
- A_{misc} – Miscellaneous Other Effects

These factors are discussed in detail within Technical Appendix A12.1: Noise Prediction Methodology. The predicted octave band levels from the turbines are summed together to give the overall 'A' weighted predicted sound level.

The sound power level (L_W) of a noise source is expressed in dB (relative to1 pW). Noise predictions are based on the declared apparent sound power levels (L_{wd}) for REpower 3.4M104 wind turbines at Strathy South with hub heights of 83 m and rotor of 104 m. This turbine was selected as the modelled turbine to fit the proposed dimensions for the scheme for a maximum tip height of up to 135 m. The Vestas V90 3 MW turbine with a hub height of 80 m has been used for the cumulative predictions that include Strathy Wood. It should be noted that the scoping report for Strathy Wood specifies a tip height of up to 145 m, but the Vestas V90 on an 80 m hub has been used as a worst case, as the declared apparent sound power levels for the Vestas V90 3WM turbine are relatively high. Predictions for the turbines to be built at Strathy North have been carried out based on the REpower MM82 turbine, with a hub height of 68 m, as it is one of the turbines under consideration for the scheme.

It should be noted that the predictions are based on candidate turbines, and that the actual turbines constructed may differ. For each turbine type the declared apparent sound power level has been calculated by adding the confidence level to the stated noise levels provided within reports associated with each turbine type provided by the respective turbine manufacturers and in accordance with the methodology detailed in Technical Appendix A12.2: Best Practice Guide for the use of Wind Turbine Noise Data, with the resultant declared apparent sound power levels shown in Table A12.4. In this case the noise data for each of the turbines used in the predictions is based on warranted noise data, and therefore 2 dB has been added to the warranted levels to obtain the declared apparent sound power levels.

Table A12.4: Declared Apparent Sound Power Levels Used in the Predictions (L_{wd})

Wind Farm and Wind Turbine	**Standardised 10m-height Wind Speed (m/s)**									
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Strathy South REpower 3.4M104 83m hub	98.0	99.1	102.1	105.5	107.2	107.6	107.1	106.8	106.8	106.8
Strathy North REpower MM82 68m hub	-	-	103.5	106.3	107.0	107.0	107.0	107.0	107.0	107.0
Strathy Wood Vestas V90 3MW 80m hub	-	99.9	102.9	106.2	108.1	109.0	108.9	107.6	107.2	107.3

The octave band noise spectra used for the predictions are shown in Table A12.5. These predictions are based on measured data for the proposed turbine for installation and normalised to the declared apparent sound power level at the wind speeds for which the turbines are loudest (8 m/s at a standardised 10 m height).

Table A12.5: Octave Band Noise Levels Used in the Predictions (dB L_{WA})

	Octave Band Centre Frequency (Hz)								
Wind Turbine	**Overall**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
REpower 3.4M104	107.6	86.8	96.0	100.5	102.7	102.1	97.8	89.4	73.7
REpower MM82	107.0	85.9	92.3	97.8	101.9	102.9	98.1	88.8	74.1
Vestas V90 3MW	109.0	95.8	98.2	101.6	102.7	103.6	99.7	95.4	87.8

The ETSU-R-97 noise limits assume that the wind turbine noise contains no audible tones. Where tones are present, a correction should be added to the measured or predicted noise level before comparison with the recommended limits. The audibility of any tones can be assessed by comparing the narrow band level of such tones with the masking level contained in a band of frequencies around the tone called the critical band. The ETSU-R-97 recommendations suggest a tone correction, which depends on the amount by which the tone exceeds the audibility threshold. It has been assumed that the proposed turbines assessed in this report do not require a tonal penalty as it would be ensured that the turbines selected for the site would not contain tonal content that is likely to result in a tonal penalty.

Ground effect (A_{gr}) is the interaction of sound reflected by the ground interfering with the sound propagating directly from source to receiver. The prediction of ground effects are inherently complex and depend on the source height, receiver height, propagation height between the source and receiver and the ground conditions. The ground conditions are described according to a variable G which varies between 0 for 'hard' ground (includes paving, water, ice, concrete and any sites with low porosity) and 1 for 'soft' ground (includes ground covered by grass, trees or other vegetation). The IoA Acoustics Bulletin article agreement states that use of G = 0.5 and a receptor height of 4 m will generally result in realistic estimates of noise emission levels at receptor locations downwind of wind turbines where predictions are based on manufacturers warranted noise data.

Predictions in this report are based on G = 0.5 with a receptor height of 4 m. Due to the additional margin for uncertainty in using the declared apparent sound power level for the proposed and consented turbines, this approach provides additional confidence in the predicted noise levels.

A12.4.2 Baseline Assessment

Due to the location of the Modified 2013 Scheme, and the consequent low levels of predicted turbine noise at the nearest residential properties, it is considered that baseline noise measurements are not required for the purposes of this assessment (see section A12.2.1). Predicted noise levels associated with the operation of the turbines have been compared with the simplified noise limit proposed within ETSU-R-97 at a number of nearby dwellings, listed in Table A12.6).

A12.5 Effects Evaluation

A12.5.1 Construction Effects

Noise during the construction phase would arise from the construction of the turbine foundations, the erection of the turbines, the excavation of trenches for cables, excavation (and blasting if required) of borrow pits, and the construction of associated hard standings, access tracks, construction compound and switching station.

Noise from vehicles on local roads and access tracks would also result from the delivery of the turbine components and construction materials, notably aggregates, concrete and steel reinforcement.

(a) Predicted Construction Activity Effects

Detailed noise predictions have not been carried out because the specific plant and schedule for construction activities is not known at this stage. All construction and decommissioning work would be carried out in accordance with BS 5228:2009 *Code of practice for noise and vibration control on construction and open sites.*

Given the large separation distances between the construction activities and residential properties, noise levels from construction would be significantly below the 65 dB L_{Aeq} daytime significance criterion. However, there could be periods when noise generated by track works, or other construction activities, could be audible at properties closest to the associated construction activity.

(b) Predicted Construction Traffic Effects

Noise would be generated by road traffic associated with the construction phase of the development. Details of these activities can be found in Chapter 15: Roads and Traffic of the 2007 ES. Data presented in Tables A15.7 and A15.8 together with the Calculation of Road Traffic Noise, has been used to calculate the increase in road traffic due to construction vehicles, with the results presented below in Table A12.6.

Table A12.6: Existing and Predicted HGV Flows Change in Noise Levels

Location	2000 AADF	2000 HGV	Predicted total average daily Construction HGV	Predicted total average daily Construction Light Vehicles	Predicted Relative Change in Noise Level (dB)	Significance
A836 Strathy	596	48	22	100	1.2	Not significant
A836 Bridge of Foss	2,651	188	1226	100	0.3	Not significant

Table A12.6 shows that road traffic accessing the site along with A836 would cause an insignificant increase road traffic noise levels due to existing road traffic levels on the A836.

There would be a potentially significant increase in road traffic noise levels at the properties Bowside Cottage, Bowside Lodge, and Dallangwell (all of which are under the control of the applicant) along the access track due to the existing very low levels of road traffic on this road. The noise impact at these locations is not considered to be significant as construction traffic accessing the site would only occur during the construction phase of the development and during the agreed construction hours.

A12.5.2 Operational Effects

Noise predictions have been carried out for a wind speed of 8 m/s, which is the wind speed at which all of the turbines operate at their highest noise level for wind speeds up to 10 m/s. The results of the predictions for the Modified 2013 Scheme, described in section A12.4, are presented in the form of noise contours in Figure A12.1. Noise prediction results are provided for a number of the nearest residential locations to the Modified 2013 Scheme and are presented in Table A12.7 below, this represents the same locations that were included in the noise chapter for the 2007 ES. Table A12.7 also details the distance of each property to its nearest Strathy South wind turbine.

Table A12.7: Results of Noise Predictions at Nearest Residential Locations				
Location	**Easting**	**Northing**	**Distance to nearest Strathy South Wind Turbine (km)**	**Predicted Noise Level for standardised 10 m-height wind speed of 8 m/s (dB L_{A90})**
Braerathy Lodge	282335	956155	3.6	29.5
Dallangwell	282525	959903	6.9	22.3
Bowside Cottage	283050	960898	8.0	20.5
Bowside Lodge	282917	960980	8.0	20.5

It can be seen in Figure A12.1 and Table A12.7 that predicted noise levels from the Modified 2013 Scheme at the nearest residential properties to the site would be significantly below the ETSU-R-97 simplified noise limit of 35 dB L_{A90} for wind speeds up to 10m/s. Furthermore, predicted noise levels would be below THC's recommended noise limit of 35 dB for onshore wind farm developments.

Table A12.8 shows the variation of predicted noise level with wind speed at the nearest residential properties to the site.

Table A12.8: Variation of Predicted Noise Level with Wind Speed for Strathy South alone at Nearest Residential Locations										
Property	**Standardised 10 m-height wind speed (m/s)**									
	3	4	5	6	7	8	9	10	11	12
Braerathy Lodge	19.9	21.0	24.0	27.4	29.1	29.5	29.0	28.7	28.7	28.7
Dallangwell	12.7	13.8	16.8	20.2	21.9	22.3	21.8	21.5	21.5	21.5
Bowside Cottage	10.9	12.0	15.0	18.4	20.1	20.5	20.0	19.7	19.7	19.7
Bowside Lodge	10.9	12.0	15.0	18.4	20.1	20.5	20.0	19.7	19.7	19.7

A12.5.3 Cumulative Effects

Cumulative noise predictions have been carried out that include the consented (but yet to be built) Strathy North wind farm and the proposed Strathy Wood wind farm (currently at scoping). As described in section A12.4, predictions have been based on REpower MM82 2 MW turbines (with a hub height of 68 m) at Strathy North and Vestas V90 3 MW turbines (with a hub height of 80 m) at Strathy Wood. It should be noted that predicted noise levels for Strathy North presented here are lower than those presented in the Strathy North 2007 ES noise chapter because the layout has changed (a number of turbines have been dropped) and a different turbine type has been used to that presented in the original ES.

The results of the cumulative noise predictions are shown in Figure A12.2 for a wind speed of 8 m/s, with the results presented for the nearest residential properties in Table A12.9. It should be noted that the cumulative noise predictions assume downwind noise propagation from all wind turbines simultaneously, which clearly would not occur in practice.

Table A12.9: Results of Cumulative Noise Predictions at Nearest Residential Locations

Location	Easting	Northing	Predicted Noise Level for standardised 10 m-height wind speed of 8 m/s (dB L_{A90})				
			Total Predicted Noise Level	Strathy South	Strathy North	Strathy Wood	Strathy North and Strathy South
Braerathy Lodge	282335	956155	54.4	29.5	40.8	54.2	41.1
Dallangwell	282525	959903	38.2	22.3	36.6	32.6	36.8
Bowside Cottage	283050	960898	33.9	20.5	31.3	30.1	31.6
Bowside Lodge	282917	960980	33.9	20.5	31.3	29.9	31.6

The results of the cumulative noise predictions show that there are two residential locations where predicted noise levels are above the ETSU-R-97 simplified noise limit of 35 dB L_{A90}: Braerathy Lodge and Dallangwell.

Table A12.10 shows the variation of cumulative predicted noise level with wind speed at the nearest residential properties to the site. It should be noted that noise data for the REpower MM82 is only available for wind speeds above 5 m/s, but it can be assumed that at lower wind speeds noise levels would be lower.

Table A12.10: Variation of Cumulative Predicted Noise Level with Wind Speed at Nearest Residential Locations

Property	Standardised 10 m-height wind speed (m/s)							
	5	6	7	8	9	10	11	12
Braerathy Lodge	48.5	51.7	53.6	54.4	54.3	53.1	52.7	52.8
Dallangwell	34.1	37.0	38.0	38.2	38.2	37.8	37.7	37.8
Bowside Cottage	29.5	32.4	33.6	33.9	33.9	33.4	33.2	33.3
Bowside Lodge	29.4	32.4	33.5	33.9	33.8	33.3	33.2	33.2

It can be seen that the predicted noise level at Braerathy Lodge from the Strathy Wood development is significantly above the ETSU-R-97 simplified noise limit, and is significantly above noise limits derived from background noise measurements at this property presented in the Strathy North ES. It is understood that if the Strathy Wood development is granted planning permission, Braerathy Lodge (located within Strathy Wood) would be vacated and would therefore not be a noise sensitive location. In the event that the Strathy Wood wind farm does not go ahead (assuming downwind propagation from both wind farms) the addition of Strathy South wind farm to the noise experienced at Braerathy Lodge from Strathy North wind farm would add less than 0.5 dB to the overall noise level. This increase is insignificant, as discussed at section A12.3.1(a) which states that the minimum difference generally detectable is a 3 dB change. Furthermore this location cannot be downwind of both wind farms simultaneously and therefore in practice there are no significant effects predicted.

At Dallangwell, the maximum cumulative predicted noise level is above the ETSU-R-97 simplified noise limit, but this property is owned by SSE and therefore would qualify for the financially involved noise limit of 45 dB L_{A90}, which would be easily met.

The results of the assessment show that no significant cumulative noise effects are predicted.

(a) Additional Predictions Including Wind Direction

Additional predictions have been carried out for Braerathy Lodge to show how predicted noise levels vary with wind direction. Directionality has been included in the noise predictions by adding a supplementary term to the ISO9613-2 methodology to allow for the effects of wind direction based on methodology taken from Wyle Research Report WR 88-19. For any given wind direction, each nearby property is classified as being either downwind, crosswind, or upwind of each of the turbines. If the house is downwind (+/-75°) of the turbine no correction is required to the predicted turbine noise level. If it is crosswind (+/-15°) of the turbine a 2dB reduction is made to the predicted turbine noise level based on observations of reduced noise output under these conditions. If the property is upwind (+/-75°) of the turbine a reduction is made to the predicted turbine noise level due to wind shadow effects, which increase linearly from zero, at distances up to 5.25 x hub height, to 20 log (f) – 30, at a distance of 15.75 x hub height. Hayes McKenzie has modified the original Wyle methodology to include a term to scale the upwind attenuation according to the cosine of the difference between the wind direction angle and the angle corresponding to completely upwind propagation. Calculations have been carried out for wind directions in increments of 15° around the site. Once these corrections have been made, the overall noise level from all the turbines is calculated at each property for each wind direction.

The results of the noise predictions, including wind direction for Braerathy Lodge, are shown in Table A12.11, and show the cumulative noise levels for all three wind farm sites as well as for Strathy North and South, as well as the individual contribution from each site.

Table A12.11: Variation of Cumulative Predicted Noise Level at Braerathy Lodge with Wind Direction for 8 m/s wind speed

Wind Direction	Wind Farm					
	Total	Strathy South	Strathy North	Strathy Wood	Strathy North and South	Strathy South additional to Strathy North[1]
0	53.8	18.9	40.5	53.6	40.6	0.0
15	53.7	17.3	40.0	53.5	40.0	0.0
30	53.5	16.6	39.3	53.3	39.3	0.0
45	53.5	16.7	37.8	53.3	37.8	0.0
60	53.5	17.7	36.3	53.5	36.3	0.1
75	53.6	19.5	34.5	53.5	34.6	0.1
90	53.7	22.7	31.2	53.7	31.8	0.6
105	52.8	25.7	26.4	52.8	29.1	2.7
120	52.9	26.8	24.6	52.9	28.8	4.2
135	53.7	28.5	24.4	53.7	29.9	5.6
150	53.7	29.0	25.7	53.7	30.6	4.9
165	53.8	29.4	28.7	53.8	32.0	3.3
180	53.9	29.5	33.4	53.9	34.8	1.5
195	53.9	29.5	36.2	53.8	37.0	0.8
210	53.7	29.5	37.6	53.6	38.2	0.6
225	53.8	29.5	39.1	53.6	39.5	0.5
240	53.9	29.5	39.9	53.7	40.2	0.4
255	53.9	29.5	40.3	53.7	40.7	0.3
270	54.0	29.3	40.7	53.8	41.0	0.3
285	53.1	28.5	40.8	52.8	41.1	0.2
300	53.0	28.0	40.8	52.7	41.1	0.2
315	53.9	25.9	40.8	53.6	41.0	0.1
330	53.7	24.2	40.8	53.5	40.9	0.1
345	53.8	21.6	40.8	53.5	40.9	0.1

[1] Note that the calculations are carried out prior to rounding to 1 decimal place, and therefore there may be some small rounding differences.

The results of the predictions, including wind direction, show that the cumulative predicted noise levels of Strathy North and South are either below the simplified ETSU-R-97 noise limit, or that Strathy South adds insignificantly (i.e. less than 1 dB) to the predicted noise levels from Strathy North alone. It should be noted that if Strathy Wood is consented Braerathy Lodge would be vacated, and therefore would no longer be a noise sensitive property.

A12.5.4 Road Traffic Noise During Operational Phase

During the operational phase of the Modified 2013 Scheme, vehicles accessing the site would cause an insignificant increase in road traffic noise levels, on the basis that the increase in traffic flow on existing roads would be negligible and the noise impact is therefore considered to be negligible.

A12.6 Mitigation

A12.6.1 Construction Noise

Construction works for the site would be sufficiently distant from residential dwellings such that there would be no significant effects predicted. There would be a short-term effect at Bowside Cottage, Bowside Lodge, and Dallangwell due to the increase in road traffic movements past these residential locations. However, as mentioned previously, all of these properties have financial involvement in one of the proposed wind farm schemes (Strathy North or Strathy South). The noise impact for construction works traffic would be mitigated by generally restricting movements along these routes to the standard working hours and exclude Sundays, unless specifically agreed otherwise.

BS 5228 states that the 'attitude of the contractor' is important in minimising the likelihood of complaints and therefore consultation with the local authority would be required along with letter drops to inform residents of intended activity.

The construction and decommissioning works on site would be carried out in accordance with:

- Relevant EU Directives and UK Statutory Instruments that limit noise emissions from a variety of construction plant;
- The guidance set out in PAN1/2011 and BS5228: 2009; and
- Section 61 of the Control of Pollution Act 1974 and Section 80 of the Environmental Protection Act.

Contractors would be required to assess noise impacts during the construction phase and a noise control plan would be produced that includes:

- procedures for ensuring compliance with statutory or other identified noise control limits;
- procedures for minimising noise from construction related traffic on the existing road network;
- procedures for ensuring that all works are carried out in accordance with the principle of "Best Practicable Means" as defined in the Control of Pollution Act 1974;
- general induction training for site operatives, and specific training for staff having responsibility for particular aspects of controlling noise from the site;
- a noise monitoring/auditing programme; and
- liaison with the local authority and the community.

Agreement on working hours will be sought from the local planning authority. Working hours would be generally 0700-1900 hours Monday to Friday, and Saturdays from 0700-1200 hours on Saturday and Sunday (Chapter 4: Development Description, 2007 ES). However, to ensure that optimal use is made of fair weather windows, or at critical periods within the programme, it could occasionally be necessary to work outwith these hours.

A12.6.2 Operational Noise

No specific mitigation is required to the turbines to ensure that they would meet the ETSU-R-97 simplified noise limit of 35 dB L_{A90} for wind speeds up to 10 m/s. If the Modified 2013 Scheme meets the ETSU-R-97 simplified noise limit, no significant cumulative noise effects are predicted that would require mitigation to reduce the operational noise levels.

A12.7 Summary & Conclusion

The operational noise assessment has been carried out by comparing operational predicted noise levels for a candidate turbine under consideration for the Modified 2013 Scheme, with acceptable noise limits in accordance with ETSU-R-97, *The Assessment and Rating of Wind Farm Noise,* as specified in Scottish Government web-based planning advice for onshore wind turbines as referred to in PAN 1/2011, *Planning and Noise*.

The operational noise assessment shows that the predicted noise levels would be below the ETSU-R-97 simplified noise limit, of 35 dB L_{A90} for wind speeds up to 10 m/s, for all residential properties under all wind speed and direction conditions. There would be no predicted significant cumulative operational noise effects for the Strathy South and Strathy North wind farms operating in combination. In the event that Strathy South, Strathy North and Strathy Wood wind farms all operated in combination there would still be no predicted significant cumulative operational noise effects, based on the understanding that the Braerathy Lodge would be vacated in the event that the Strathy Wood wind farm was approved.

An assessment has been made of construction noise arising from the operation of plant and machinery in connection with the construction of the wind farm following the principles described in BS5228, *Code of Practice for Construction and Open Sites*. It would be ensured that all construction activities would be below the adopted 65 dB L_{Aeq} noise limit and, in practice, noise from construction would be controlled through the Control of Pollution Act 1974 and the Pollution and Prevention Control Act 1999.

The results of the noise assessments are summarised in Table A12.12 below.

Table A12.12: Summary of Potential Impacts of the proposed wind farm, Mitigation and Residual Impacts

Likely Significant Impact	Mitigation Proposed	Means of Implementation	Outcome/Residual Impact
Construction			
Noise at residential properties from construction within the Site Boundary	No specific mitigation proposed	N/A	No significant impact
Noise at residential properties from road traffic generated by construction traffic	No construction traffic outside pre-agreed times	Agreement with LPA and implementation of Construction Method Statements	No significant residual impact
Operation			
Noise at residential properties from the operation of the wind farm	Not required	N/A	No significant residual impact

A12.8 References

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Table A12.12.: Glossary and Abbreviations

Glossary

Term	Definition
A-weighting	A filter applied to represent the frequency response of the human ear base on the equal loudness curve.
Ambient noise	All-encompassing noise associated with a given environment, usually a composite of sounds from many sources both far and near, often with no particular sound being dominant.
Attenuation	The reduction in level of a sound between the source and a receiver due to any combination of effects including; distance, atmospheric absorption, barriers, etc.
Audible sound	A sound that can be heard above or within all other ambient sounds.
Background Noise	The ambient noise level already present within the environment in the absence of turbine and wind farm operation, often defined by the LA90 parameter
Barrier	Solid walls or partitions, solid fences, earth mounds, buildings, etc that when obstructing the line sight from the source to the receiver may attenuate the sound level at the receiver.
Decibels (dB)	The logarithmic units used to describe sound intensity (or amplitude). The reference condition, p_0, represents the threshold of hearing for a person with normal hearing.
Frequency	Also known as pitch, has frequency which is peculiar to the nature of the sound generator, measured in Hertz (Hz).
Hertz (Hz)	The unit of frequency representing cycles per second.
Hub Height Wind Speed	The wind speed at the hub height of the turbine or the centre of the rotor.
LA10 (18-hour)	The arithmetic average of the values of L10 hourly dB(A) for each of the eighteen one-hour periods between 06:00 – 24:00. This is the parameter used to assess the potential noise impact from road traffic noise.
LAeq,T	The equivalent continuous A-weighted sound pressure level. This is the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T (in this case 10 minutes), has the same mean-squared sound pressure as a sound that varies with time. It is used to identify the average sound pressure level over a given time. It is given by: $L_{Aeq,T} = 10\log_{10}\left\{\frac{1}{T}\int_0^T\left(\frac{p_A(t)}{p_0}\right)^2 dt\right\}$ dB where: $p_A(t)$ is the A-weighted instantaneous acoustic pressure p_0 is the reference acoustic pressure (2.10-5 Pa)

Table A12.12.: Glossary and Abbreviations	
Lnn,T	The level of noise exceeded for nn-percent of the specified time interval, T. For example, LA90,10min, also known as the background level, is the A-weighted sound pressure level exceeded for 90% of the 10 minute measurement period. This is measured in decibels (dB).
LWA	The fundamental measure of sound power. Sound power is the total sound energy radiated by a source per unit time. The subscript 'A' refers to an A-weighted sound power level. The sound power level is defined as: $L_{WA} = 10\log_{10}\left(\frac{P}{P_0}\right)$ dB where: P is the r.m.s. value of sound power in Watts P_0 is the reference acoustic power (1.10-12 W)
Noise emission	The noise emitted by a source of sound.
Noise Imission	The noise received at a location.
Octave band	A range of frequency where the highest frequency of the band is double the lowest frequency of the band. The band is usually specified by the centre frequency f_c. The upper and lower limits of this band are than defined as: $f_{upp} = f_c \cdot 10^{0.15}$ $f_{low} = f_c \cdot 10^{-0.15}$
Percentile	This is the value below which a certain percentage of the population fall, i.e. when deriving a 10th percentile value, this is the value at which 10% of the observed levels are below.
Rated Power	The maximum steady output power of a wind turbine.
Receiver	A person or property exposed to the noise being considered.
Sound	Energy that is transmitted by pressure waves in air. Commonly called noise if it is unwanted.
Sound Level Meter	An electronic instrument for measuring the RMS level of sound in accordance with an accepted national or international standard.
Sound Pressure	A dynamic variation in atmospheric pressure. The pressure at a point in space minus the static pressure at a point.
Sound Pressure Level	The fundamental measure of sound pressure. This is defined as: $L_p = 20\log_{10}\left(\frac{p}{p_0}\right)$ dB where: p is the r.m.s. value, unless otherwise stated, of sound pressure in Pascals. p_0 is the reference acoustic pressure (2.10-5 Pa)

Table A12.12.: Glossary and Abbreviations	
	for measurements in air.
Spectrum	A description of sound as a function of frequency.
Tones/Tonal Noise	Noise containing a discrete frequency component often of mechanical origin.
Sound Pressure Level	The fundamental measure of sound pressure. This is defined as: $L_p = 20\log_{10}\left(\frac{p}{p_0}\right)$ dB where: p is the r.m.s. value, unless otherwise stated, of sound pressure in Pascals. p_0 is the reference acoustic pressure (2.10-5 Pa) for measurements in air.
Spectrum	A description of sound as a function of frequency.
Tones/Tonal Noise	Noise containing a discrete frequency component often of mechanical origin.

A13 Cultural Heritage

A13.1 Introduction

This chapter considers the likely significant effects on cultural heritage interests arising from the Modified 2013 Scheme. The study has been undertaken by Catherine Dagg (BA, AIfA) and has been informed by an evaluation for the Original 2007 Scheme carried out by CFA Archaeology Ltd (CFA) (included as Chapter 13: Cultural Heritage in the 2007 ES) and correspondence from the Highland Council's Historic Environment Team (HCHET)[1] (refer to Technical Appendix A5.1) in relation to the Original 2007 Scheme.

This ES Addendum chapter returns to the 2007 archaeological survey results and re-evaluates the potential direct impacts on archaeological sites within the study area in the light of scheme changes and changes to national and local planning policy since 2007. Indirect visual impacts , commonly referred to as setting impacts, are also re-evaluated to encompass the Modified 2013 Scheme changes in the form of removal of 30 turbines, some relocation of remaining turbines and the increased tip height up to 135m. Cumulative indirect impacts, incorporating the impacts of other cumulative schemes in the area, are also addressed. This chapter must be read in conjunction with Chapter 13: Cultural Heritage of the 2007 ES. Refer also to ES Addendum Chapter A1: Introduction and ES Addendum Chapter A4: Development Description.

A programme of mitigation, in order to minimise the identified impacts of the Modified 2013 Scheme on cultural heritage is proposed, together with justifications for each proposal and a timetable for actions.

A13.2 Scope of Assessment

A13.2.1 Project Interactions

Any ground disturbance associated with the construction of the Modified 2013 Scheme has the potential to damage or destroy features of cultural heritage interest, both visible features and areas where there is considered to be the potential for sub-surface archaeological remains. This disturbance includes initial tree-felling, temporary lay down areas and borrow pits, as well as permanent built features such as turbines, access roads, cable routes and buildings. This chapter returns to the nine sites of archaeological and cultural heritage sensitivity, identified during the 2007 evaluation and shown in Fig.13.1 of the 2007 ES, and consider more precisely the impacts of the Modified 2013 Scheme elements on each individual feature. It also evaluates the potential for further unidentified features within the site, the need for further survey work and requirements for mitigation before or during the construction phase.

The presence of the Modified 2013 Scheme may also have indirect effects on the setting of sites of cultural heritage interest within the surrounding landscape. In particular, there is potential for the Modified 2013 Scheme to be present in views of and from Scheduled Ancient Monuments (SAMs), Listed Buildings and other cultural heritage features. Although there is a large number of such sites in the vicinity, it was assessed in the Original 2007 Scheme ES that the visual impact on the majority of these receptors would be slight and acceptable. The Highland Council (THC) archaeologist consultation response in July 2012 (refer to Technical Appendix A5.2) concurred with this conclusion, but required that one site, the SAM Ben Griam Beg, be subjected to a more in-depth evaluation of the visual impact and cumulative impact on its setting. This evaluation includes an appraisal of the meaning of setting within the surrounding landscape for this particular site, and the experience of the site by professional and amateur archaeologists and casual visitors. An appraisal of potential increased impacts of elements of the Modified 2013 Scheme, such as increased tip height, is considered within this assessment.

[1] Memorandum from Andrew Puls to Ken McCorquodale: 24/10/2007, Ref: SU-07-263

A13.2.2 Forestry Changes

No changes are required to this section.

A13.2.3 Study Area

The area of study of potential direct impacts on archaeological resources is the entire area within the red line boundary of the site, including the access road linking Strathy South with Strathy North wind farm, the 'Yellow Bog link road'.

Indirect impacts or setting impacts are considered to have been addressed adequately in the Chapter 13: Cultural Heritage of the2007 ES, with the exception of SAM Ben Griam Beg, an important defended hilltop site 7 km south of the southern boundary of Strathy South and occupying the summit of the hill at a height of 580 m OD. Despite the increase in tip height since the 2007 ES, the ZTV for the Modified 2013 Scheme indicates that no new cultural heritage receptors require consideration.

A13.2.4 Updated Scoping and Consultation

The response of HCHET1 to Chapter 13: Cultural Heritage of the 2007 ES is summarised as follows: "Provisional View: In summary we consider that this application will have an adverse impact on a number of known archaeological features and a major impact on the setting of at least one Scheduled Ancient Monument (SAM). On balance, however, it is considered that the threat to both the known and the buried archaeological resource can be successfully mitigated and that the impact on the setting of the SAM, although significant, is not enough on its own to warrant objection, on archaeological grounds, of the application as a whole."

HCHET's response continued with a list of requirements for clarifications or further work, namely "a detailed assessment of the cumulative impacts of the development on the cultural heritage; particular attention should be given to Ben Griam Beg hill fort." More recent discussion with HCHET, carried out in July 2012, resulted in modifications to the requirements for further work and information as set out in Table A13.1.

Table A13.1: Issues Identified during Consultation

Consultee	Issue	Where/How this is Addressed
THC: Memorandum from Andrew Puls, HCHET to Ken McCorquodale (18/07/12)	Inadequacy of evaluation of cumulative impacts. Inadequacy of field survey within forestry areas. Requirement for measured plans. Requirement for watching brief and other mitigation measures.	Section A13.6.4: Cumulative Impacts This section evaluates cumulative impacts of extant or proposed wind farm developments on the key receptor, Ben Griam Beg. Section A13.7: Changes to Mitigation Post-felling field survey will verify obscured cultural heritage features and give opportunity to identify further minor features. No cultural heritage features would be impacted by Modified 2013 Scheme. Section A13.8: Changes to Monitoring Potential for sub-surface features and deposits is considered to be low and no recommendations are made for watching briefs or other mitigation measures.
THC: e-mail from Andrew Puls, HCHET	Requirement for clarification of impact on	Section A13.5 Changes to Baseline

Table A13.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
to C. Dagg (03/08/12)	Site No. 5. Lack of discussion of potential for buried remains and mitigation. Possibility of programme of coring and targeted watching brief.	conditions No direct impact on site No.5 from Modified 2013 Scheme. Section A13.7: Changes to Mitigation Section A13.8: Changes to Monitoring Potential for sub-surface features and deposits is considered low and no recommendations are made for watching briefs or other mitigation measures.

A13.2.5 Effects to be Assessed

This chapter evaluates the potential direct impacts of the Modified 2013 Scheme on the identified cultural heritage features within the Site and the potential for further unidentified features or areas of cultural heritage interest.
The indirect, setting impact and cumulative setting impact on the SAM Ben Griam Beg is also evaluated.

A13.2.6 Impacts Scoped out of Assessment

The indirect, setting impact and cumulative setting impact on other key receptors of cultural heritage interest are not considered in detail within this assessment. Comparison of Figure A13.1 for the Modified 2013 Scheme with Figure 13.3 of the 2007 ES for the Original Scheme indicates that there would be very limited differences in theoretical visibility and no further information on this subject has been requested by THC.

Subsequent to the Original 2007 Scheme, thirty turbines have been removed and the remainder have been re-sited to take account of additional environmental constraint information, access tracks removed or realigned, laydown areas reduced from three to two and borrow pits reduced from eight to four. Only one switching station and associated welfare building is now proposed. Direct impacts of the removed elements need no longer be considered. New elements which do require consideration are the increase in turbine tip height up to 135 m, revised access and underground cable routes including across the Yellow Bog link road

A13.3 Changes to Policy and Legislative Context

A13.3.1 International Legislation and Policy

There are no relevant changes to International legislation and policy. The Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas (adopted in Xi'an, China by the 15th General Assembly of ICOMOS (International Council on Monuments and Sites) on 21 October 2005) is now taken as the international baseline on standards for understanding and preserving setting, and its definition of setting has been used by the IfA Working Group on the Setting of Cultural Heritage Features: Setting Standards: a Review, in April 2008.

The Xi'an Declaration states "The setting of a heritage structure, site or area is defined as the immediate and extended environment that is part of, or contributes to, its significance and distinctive character. Beyond the physical and visual aspects, the setting includes interaction with the natural environment; past or present social or spiritual practices, customs, traditional knowledge, use or activities and other forms of intangible cultural heritage aspects that

created and form the space as well as the current and dynamic cultural, social and economic context."

A13.3.2 National Legislation and Policy

The statutory framework for heritage in Scotland is outlined in the Town and Country Planning (Scotland) Act 1997, as amended in the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 and as modified by the Historic Environment (Amendment) (Scotland) Act 2011.

The implications of The Ancient Monuments and Archaeological Areas Act 1979 with regard to local government planning policy are described within Scottish Planning Policy (SPP), Scottish Historic Environment Policy (SHEP) and Planning Advice Notes (PAN) for Scotland. SPP Paragraphs 110 to 124, SHEP 'Scottish Historic Environment Policy' and PAN2/2011 'Planning and Archaeology' (Scottish Government 2011) deals specifically with planning policy in relation to heritage. The planning guidance expresses a general presumption in favour of preserving heritage remains in situ. Their 'preservation by record' (i.e. excavation and recording, followed by analysis and publication, by qualified archaeologists) is a less desirable alternative. As stated in PAN2/2011, paragraph 4, "Government policy is to protect and preserve archaeological sites and monuments, and their settings, in situ wherever feasible. Where preservation in situ is not possible, planning authorities should consider applying conditions to planning consents, listed building consents and conservation area consents to ensure that an appropriate level of excavation, recording, analysis, publication and archiving is carried out before and/or during development. The interpretation and preservation in situ of archaeological remains should be seen as a positive resource that can contribute to a sense of place in new development."

SHEP (Historic Scotland 2011) sets out the Scottish Government's policy for the sustainable management of the historic environment. Key principles of the policy note that "there should be a presumption in favour of preservation of individual historic assets and also the pattern of the wider historic environment; no historic asset should be lost or radically changed without adequate consideration of its significance and of all the means available to manage and conserve it" (1.14.b).

A13.3.3 Regional Policy

The Highland Wide Local Development Plan (HWLDP) was adopted in April 2012 and updates and replaces the Highland Council Structure Plan 2001 and the Sutherland Local Plan (2010). Policies included in the HWLDP (2012) pertinent to the built and archaeological heritage include:

- Policy 57 Natural, Built and Cultural Heritage: All development proposals will be assessed taking into account the level of importance and type of heritage features, the form and scale of the development, and any impact on the feature and its setting, in the context of the policy framework detailed in Appendix 2. The following criteria will also apply:
- For features of local/regional importance we will allow developments if it can be satisfactorily demonstrated that they will not have an unacceptable impact on the natural environment, amenity and heritage resource.
- For features of national importance we will allow developments that can be shown not to compromise the natural environment, amenity and heritage resource. Where there may be any significant adverse effects, these must be clearly outweighed by social or economic benefits of national importance. It must also be shown that the development will support communities in fragile areas who are having difficulties in keeping their population and services.
- For features of international importance developments likely to have a significant effect on a site, either alone or in combination with other plans or projects, and which are not directly connected with or necessary to the management of the site for nature conservation will be subject to an appropriate assessment. Where we are unable to ascertain that a proposal will not adversely affect the integrity of a site, we will only allow development if there is no alternative solution and there are imperative reasons of

overriding public interest, including those of a social or economic nature. Where a priority habitat or species (as defined in Annex 1 of the Habitats Directive) would be affected, development in such circumstances will only be allowed if the reasons for overriding public interest relate to human health, public safety, beneficial consequences of primary importance for the environment, or other reasons subject to the opinion of the European Commission (via Scottish Ministers). Where we are unable to ascertain that a proposal will not adversely affect the integrity of a site, the proposal will not be in accordance with the development plan within the meaning of Section 25(1) of the Town and Country Planning (Scotland) Act 1997.

- Policy 57 Natural, Built and Cultural Heritage: In due course the Council intends to adopt the Supplementary Guidance on the Highland Historic Environment Strategy [See below]. The main principles of this guidance will ensure that:
- Future developments take account of the historic environment and that they are of a design and quality to enhance the historic environment bringing both economic and social benefits.
- It sets a proactive, consistent approach to the protection of the historic environment.

Policy 67 Renewable Energy Developments of the HWLDP (2012) also notes that, *"taking into account any mitigation measures to be included, the Council will support proposals where it is satisfied that they are located, sited and designed such that they will not be significantly detrimental overall, either individually or cumulatively with other developments…, having regard in particular to any significant effects on the following: natural, built and cultural heritage features…"*

The Highland Historic Environment Strategy (adopted January 2013) states the purpose of the strategy is *"to define Highland Council's approach to the protection of the historic environment through the planning process."* Strategic Aims relevant to the current site include:

- Strategic Aim 1: To ensure that future management strategies, proposals and decisions affecting the historic environment are based on a thorough understanding of the special features of the heritage assets and associated archaeology, history and architecture of the Scottish Highlands.
- Strategic Aim 6: That listed buildings within Highland are protected from harmful developments, including extension and alteration, which may affect their special architectural and historic interest or their setting and that there is a presumption against the demolition of listed buildings.
- Strategic Aim 13: That scheduled monuments - and their setting - within Highland are protected from harmful developments which may affect their national importance.
- Strategic Aim 16: To ensure that the importance of non-designated archaeological sites and landscapes and their settings are understood and wherever possible are protected from harmful developments.
- Strategic Aim 17: To ensure no asset or its setting is lost or altered without adequate consideration of its significance and of the means available to preserve, record and interpret it in line with national and local policy and Highland Council's Standards for Archaeological Work.

Highland Council's Standards for Archaeological Work (March 2012) seeks to set practical Standards for a consistent approach to the management of the historic environment in Highland. The document details a range of archaeological procedures that may be required as part of the planning process and sets the minimum standards required by the Planning Authority for all fieldwork, reporting and post-excavation procedures.

The Standards are intended for use by all those involved in the planning process and land management – to inform planners and developers of the specific requirements of a particular piece of archaeological work and to ensure historic environment practitioners conduct fieldwork to an acceptable and consistent standard. The document states precisely THC's requirements for a walk-over survey and other specialist archaeological work, evaluation of setting and cumulative impact and reporting.

A13.4 Changes to Methodology

A13.4.1 Overview

The approach to this re-evaluation is informed by the requirements of THC for further information as set out in Section A13.2, as agreed during consultation with HCHET
No significant change in methodology has been applied to this appraisal. Fieldwork carried out subsequent to the Original 2007 scheme ES has informed the evaluation of potential direct impacts

A13.4.2 Baseline Assessment

(a) Desk Surveys

One desk-based survey has been carried out since 2007 which has relevance to the present evaluation: Strathy North Proposed Wind Farm, Farr, Sutherland, Planning Ref. 07/00020/S36SU: Archaeological Desk-Based Evaluation and Walk-Over Survey C. Dagg 2012.

The desk-based element of this report, while intended to inform mitigation proposals for Strathy North, was a broad appraisal of historic settlement and land-use along the Strathy River, based on all available archive sources and is therefore of equal relevance to the Modified 2012 Scheme. The overview of settlement patterns included the area of Strathy South.

In advance of preparing this revised Cultural Heritage chapter, a review of the 2007 ES included an independent desk-based assessment of cultural heritage resources and historical framework within the study area. The proposed access track and link road across the yellow bog, not assessed in the 2007 ES, were subject to a separate desk-based evaluation (C. Dagg, 10.10.12)

(b) Field Surveys

A field survey, carried out on 18.2.13 by C. Dagg revisited some of the sites recorded in 2007 where there was some doubt as to their nature and extent, in order to clarify the potential for direct impacts. Sections of the proposed access road route where there was considered potential for unrecorded archaeological features, notably along the River Strathy, were investigated. One new archaeological feature within the site boundary and three archaeological features adjacent to the access road were recorded. Details are given in Table A13.2. In addition, a site visit was carried out to the Scheduled site, Ben Griam Beg, in order to inform the evaluation of the potential indirect effects and cumulative impacts.

(c) Identification of External Receptors

Although HCHET had stated a requirement only for the setting impact on SAM Ben Griam Beg to be re-evaluated, it was noted that the increased tip height of turbines may alter the results of the 2007 evaluation and therefore this chapter re-evaluates the setting impact on external receptors, using the same criteria and methodology as in the 2007 evaluation.

The settings of sites with statutory and non-statutory designations (e.g. SAMs, Listed Buildings, Historic Gardens and Designed Landscapes and Conservation Areas) are protected under national legislation (1979 Act, 1997 Act, 1992 Order) and by government guidance (Memorandum). . As stated in Section 13.3 above, the principle that underlies planning decision making is that protected sites should be preserved within an appropriate setting.

Given their heights, turbines and meteorological masts may be visible over a wide area thereby potentially affecting the wider landscape settings of cultural heritage sites and monuments. Planning Advice Note 45 (PAN 45; Revised 2002): Renewable Energy Technologies has been revoked and is replaced by online renewable advice, provides a useful framework for evaluating the visual effect of a development. It notes that: Visual effect will be dependent on the distance over which a wind farm may be viewed. It is also dependant on whether the turbines can be viewed adjacent to other features, their visibility in

different weather conditions, the character of the development and the landscape it sits within, and the nature of the visibility.

Figure 8 in PAN 45 provides an assessment of the general perception of a wind farm in an open landscape as follows:

- at distances greater than 15 km a wind farm will generally only be seen in very clear
- visibility as a minor element in the landscape;
- between 5-15 km it will only be prominent in clear visibility – seen as part of the wider landscape;
- between 2-5 km it will be relatively prominent; and
- at distances of less than 2 km it is likely to be prominent.

Taking account of these factors and the effects scoped out as described in Section 13.2, sites with statutory protection in the wider landscape were assessed in the Original 2007 Scheme ES within the following maximum radii:

- 0-15 km - Scheduled Ancient Monuments, Category A, B and C(s) Listed Buildings, and Conservation Areas.
- 0-30 km - Historic Gardens and Designed Landscapes.

A ZTV map, generated for the Modified 2013 Scheme (Figure A9.2), was used to identify those historic environment assets within 30 km of the site from where there is theoretical intervisibility with one or more wind turbines.

The baseline setting of each relevant asset or related group of assets was then characterised on a case-by-case basis. Characterisation of the setting of an asset was based upon its properties and location, and took into account the factors identified in guidance issued by Historic Scotland (2009[2]). The baseline setting of each asset was characterised principally in terms of:

- Archaeological / historical context of the receptor;
- Current landscape and visual surroundings of the receptor; and
- Social value (actual or potential) of the receptor as a recreational / leisure or educational resource.

A13.4.3 Effects Evaluation

(a) Effect Classification

The types of effects of the Modified 2013 Scheme on cultural heritage interests are assessed in the following categories:

- Direct: where there would be a physical effect on a site caused by the Modified 2013 Scheme. Direct effects may be caused by a range of activities associated with the construction of proposed development features. Construction activities may include ground-disturbing excavations for turbine foundations, cable trenches, access roads and borrow pits. In addition, above ground disturbance, such as that caused by vehicle movement, and soil and overburden storage, may produce irreversible effects upon archaeological features. Direct effects on cultural heritage features are normally adverse, permanent and irreversible.
- Indirect: where the setting of a site may be affected. Indirect effects may relate to new development reducing views to or from cultural heritage features with important landscape settings, may result from increased noise or vibration, or may cause increased fragmentation of the historic landscape and the loss of connection between its component parts. Such effects are likely to occur during the construction phase of the development and persist throughout the operational phase.

[2] Historic Scotland (2009). Assessment of Impact on the Setting of the Historic Environment Resource – Some General Considerations, Scoping of Development Proposals, Annex.

- Secondary impacts: impacts that arise as a result of an initial impact of the scheme e.g. changes to the setting affecting tourism as regards heritage sites.
- Uncertain: where there is a risk that the works may impinge on a site, for example where it is not clear where the location or boundaries of a site lie, or where the baseline condition of a site cannot be established satisfactorily. This can occur where a site is recorded as a documentary reference but there is no physical manifestation of the site above ground, or where a documentary source is imprecise as to the location of a site (e.g. where recorded only on maps pre-dating the Ordnance Survey 1st Edition).

Potential effects, direct and indirect, have been assessed in terms of their longevity (permanent /temporary (long or short term)), reversibility and nature (beneficial / neutral / adverse), which allowed the magnitude of effect to be predicted for each receptor.

- Beneficial effects are those that contribute to the value of a cultural heritage site through enhancement of desirable characteristics or the introduction of new, positive attributes. In terms of cultural heritage, beneficial effects include those that add to an appreciation of the cultural heritage site and/or its setting.
- Neutral effects occur where the development can be accommodated comfortably by the receiving environment while neither contributing to nor detracting from the value of the cultural heritage site. In terms of cultural heritage, neutral effects arise from the fact that in general wind farms are permeable developments that do not significantly disrupt an appreciation of the landscape and skylines, particularly with regard to the views from cultural heritage sites that lie at some distance from the Site.. All neutral effects are considered to be not significant.
- Adverse effects are those that detract from the value of a receptor through a reduction in, or disruption of, valuable characterising components or patterns, or the introduction of new inappropriate characteristics. In terms of cultural heritage, adverse effects include those that detract from an appreciation of a cultural heritage site and/or its setting, or compromise important views to or from the site.

(b) Receptor Importance

The assessment of sensitivity of archaeological and heritage assets has been determined from the relative weight given to them in SPP and SHEP. Table A13.2 summarises the relative sensitivity of key historic environment resources. The sensitivity of the individual site is based on a combination of its importance and its status.

Table A13.2: Sensitivity of Historic Environment Assets

Sensitivity	Definition / Criteria
High	Sites of national or international importance, including: ▪ World Heritage Sites ▪ Scheduled Monuments and sites proposed for scheduling (including Non-Statutory Register Sites (NSR Sites)) ▪ Undesignated archaeological sites and areas of likely national importance identified in the Historic Environment Records (HER) ▪ Category A Listed Buildings ▪ Inventory Gardens and Designed Landscapes ▪ Outstanding Conservation Areas
Medium	Sites of regional importance, including: ▪ Archaeological sites and areas of distinctive regional importance ▪ Archaeological Sensitive Areas (ASA) ▪ Category B Listed Buildings ▪ Conservation Areas

Table A13.2: Sensitivity of Historic Environment Assets	
Sensitivity	**Definition / Criteria**
Low	Sites of local importance, including: ▪ Archaeological sites of local importance ▪ Category C(S) Listed Buildings ▪ Non-Inventory Designed Landscapes (NIDLs) ▪ Unlisted historic buildings and townscapes with local (vernacular) characteristics

(c) Assessment of Direct Impacts (Physical Impacts)

Criteria for assessing magnitude of direct impacts, which measures the degree of change to the baseline condition of a feature that would result from the construction of one or more elements of the proposed development, are presented in Table A13.3.

Table A13.3: Magnitude of Direct Impacts	
Level of Magnitude	**Definition**
High	A fundamental change to the baseline condition of the receptor, leading to total or major alteration of character.
Medium	A material, partial alteration of character.
Low	Slight, detectable alteration of the baseline condition of the receptor.
Imperceptible	A barely distinguishable change from baseline conditions.

The sensitivity of the receptor and magnitude of impact of the predicted impacts are used to inform the professional judgement of the likely significance of the direct impact. Table A13.4 summarises the criteria for assigning significance of a direct impact. Major and moderate direct impacts are considered significant in terms of the EIA regulations. Where a direct impact on a feature is likely, the assessment will contain a summary statement of the 'cultural significance' of that feature (following the guidance defined in Annex 1 SHEP).

Table A13.4: Significance of Direct Impacts				
Magnitude of Impact ▼	**Sensitivity of Asset ►**			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Imperceptible	Minor	Negligible	Negligible	Negligible

(d) Assessment of Impacts on Setting (Indirect Impacts)

For each receptor where a potential impact on setting has been identified, the assessment of possible impacts adopts a four-stage approach:

- Identification of the characteristics of the setting of the receptor (see above).
- Assessment of the sensitivity of that setting.

- Identification of how the presence of the proposed development would affect that setting (magnitude of impact).
- Assessment of significance of impact.

(e) Criteria for Assessing Sensitivity of Setting

Sensitivity of setting has been assessed by considering two factors:

- The relative weight which statute and policy attach to the receptor and its setting; and
- The degree to which the baseline setting contributes to the understanding and / or appreciation, and hence value, of the receptor.

The relative weight that statute and policy attach to the receptor and its setting is determined using the sensitivity of archaeological and heritage resources set out in Table A13.2. The degree to which the baseline setting contributes to the understanding and / or appreciation of the receptor has been assessed according to the criteria set out in Table A13.5.

Table A13.5: Contribution of Setting to the understanding and appreciation of a Historic Environment Receptor

Contribution	Definition
High	A setting which makes a strong positive contribution to the understanding and/or appreciation of the siting and/or historical/archaeological/architectural context of a receptor. (E.g. a prominent topographic location; surroundings that include related monuments in close association; surroundings that are believed to be little changed from those when the receptor was created).
Moderate	A setting which makes some positive contribution to the understanding and/or appreciation of the siting and/or historical/archaeological/architectural context of a receptor. (E.g. surroundings that complement the siting and appearance of a receptor, such as the presence of a feature of the rural past within a more recent farming landscape containing little or no urban or industrial development).
Low	A setting which makes little positive contribution to the understanding and/or appreciation of the siting and/or historical/archaeological/architectural context of a receptor. (E.g. where surroundings only partially complement the siting and appearance of a receptor, such as the presence of a feature of the rural past within a partly urbanised or industrialised landscape).
Negligible	A setting which does not contribute positively to the understanding and/or appreciation of the siting and/or historical/archaeological/architectural context of a receptor. (E.g. immediate surroundings, such as commercial coniferous single species woodland or an industrial development, that is not relevant to understanding the context of the receptor).

These two criteria (sensitivity of receptor and contribution to setting) are combined to assess the overall sensitivity of a setting, as set out in Table A13.6.

Table A13.6: Sensitivity of Setting of a Receptor				
Sensitivity of Asset ▼	**Contribution of setting to value►**			
	High	**Medium**	**Low**	**Negligible**
High	High	High	Medium	Low
Medium	High	Medium	Low	Low
Low	Medium	Low	Low	Low

(f) Identification of Magnitude of Impact on Setting

For the remaining sites, the magnitude of impact on setting has been assessed according to the thresholds presented in Table A13.7.

Table A13.7: Magnitude of Impacts on Setting	
Level of Magnitude	**Definition**
High	Fundamental effects obviously changing the surroundings of a receptor, such that its baseline setting is substantially or totally altered.
Medium	Effects discernibly changing the surroundings of a receptor, such that its baseline setting is partly altered.
Low	Slight, but detectable effects that do not alter the baseline setting of the receptor materially.
Imperceptible	A very slight and barely distinguishable change from baseline conditions

(g) Assessment of Impact Significance

The significance of an impact on setting depends on both the magnitude of impact and the sensitivity of the setting of the receptor. Table A13.8 presents the matrix that will be used to inform the determination of the significance of impacts on setting.

Table A13.8: Significance of Impacts on Setting			
Magnitude of Impact ▼	**Sensitivity of Setting ►**		
	High	**Medium**	**Low**
High	Major	Major	Minor
Medium	Major	Moderate	Minor
Low	Minor	Minor	Negligible
Imperceptible	Negligible	Negligible	Negligible

(h) Significance Criteria

The significance of impacts is classified as Major, Moderate, Slight or Negligible, as defined in Table A13.9. Major and moderate impacts are considered to be significant in terms of the EIA Regulations.

Table A13.9: Significance Criteria	
Level of Significance	**Definition**
Major	A change to the fabric or setting that leads to a substantial effect on the character, quality or context of a receptor.
Moderate	Changes to the fabric or setting that lead to a material effect on the character, quality or context of a receptor.
Minor	Changes to the fabric or setting that lead to a detectable but non-material change effect on the character, quality or context of a receptor.
Negligible	Changes to a setting that lead to, at most, a negligible effect on the character, quality or context of a receptor.

A13.4.4 Limitations of Assessment

The field survey, carried out by CFA for the 2007 ES, was limited by the inaccessibility of the forestry and by weather conditions during the field visits. A further survey in Strathy North (C. Dagg 7.5.2012) reached the same conclusion as the 2007 evaluation that afforested areas were effectively unsurveyable, that archaeological survival within the forest would be very poor and that no further work would be possible until the forest cover had been removed. In addition, as the area is covered in blanket bog, with archaeological features more likely to lie under the accumulated peat layer, these would be more likely to be identified by methodology such as coring or controlled strip during ground-breaking work, which can only be carried out after consent has been gained. Therefore, this work has been included as a proposed mitigation measure. However, this statement is not intended to imply that there is a probability of archaeological in afforested or peat-covered areas.

A13.5 Changes to Baseline Conditions

A13.5.1 Context

The 2007 ES identified nine archaeological sites within the site's red line boundary. These sites comprise: a shieling (1), three mileposts (2, 6, 8), two buildings probably related to hunting (3, 5), two sheepfolds (4, 7), and farmstead / hunting lodge at Lochstrathy (9) as presented on Figure 13.1 of the 2007 ES.

Thirty-five archaeological sites were identified within the originally proposed access route corridor and these are shown on Figure 13.2 of the 2007 ES. They comprise two farmsteads (A1, A33), field clearance (A2), seven tracks (A3, A5, A8, A10, A15, A16, A31), areas of peat cutting (A4), a structure (A6), a well (A7), several enclosures (A9, A30, A34), five field boundaries (A11, A13, A14, A22, A35), a pre-Clearance township (A12), three mileposts (A17, A23, A28), areas of cultivation (A18), several buildings (A19, A20, A27), numerous quarries (A21, A32), a bridge (A24), small cairns (A25), a clearance heap (A26), and a group of hut circles (A29).

The sites identified along the proposed access corridor from Strathy village to Strathy North wind farm are not included in this re-evaluation, as the access is subject to separate consent for the Strathy North wind farm, and is covered by archaeological mitigation as a condition of the consent.

A13.5.2 Designations

The 2007 ES evaluation identified 135 SAMs (several with multiple components), 71 Listed Buildings (6 Category A, 41 Category B, 24 Category C(s)), and two Historic Gardens and Designed Landscapes within 30 km of the centre of the Site. Based upon analysis of the locations of these sites against the ZTV, both for the original 2007 Scheme and the Modified 2013 Scheme , elements of the proposed development would be intervisible with 12 SAMs

and 5 Listed Buildings (one Category B, four Category C(s)). The ZTV for the Modified 2013 Scheme was reviewed and it was confirmed that no new cultural heritage receptors would be intervisible with the scheme.

Following consultation with Andrew Puls of THC on 3.7.12, it was agreed that only one of these SAMs, Ben Griam Beg hill fort, required further analysis of visual and cumulative impacts.

A13.5.3 Proposed Wind Farm Area

Direct impacts on archaeological features are only considered in relation to sites within the red line boundary of the Modified 2013 Scheme and along the preferred and alternative access route corridors revised or added since the 2007 ES.

The status of the nine archaeological features within the site is considered unchanged since 2007.

Fieldwork carried out in 2013 identified four further archaeological features, including one located within the site boundary, namely a constructed ford (10). Site visits to features 2,3, 5, 8 and 9 allowed a more accurate evaluation of their survival, extent and function. Site 9, Lochstrathy, for example, is now considered likely to be a remote settlement pre-dating the clearances of 1818-19. It is becoming increasingly evident that Roy's Military Survey of the 1750s is not comprehensive and omits many of the more remote settlements, so omission from Roy's map cannot be taken as evidence for establishment of this settlement post-dating this survey. Site 5, building can now be seen to be effectively identical to the newly recorded site 11, and both are interpreted as the surviving stonework of temporary, probably wooden, bothies probably associated with road construction around 1875. Sites 2 3 and 8, milestones, would, by comparison with similar milestones on the Sutherland estates, have been roughly shaped and uninscribed, and therefore easily lost when the access road was widened.

A re-evaluation of potential for further archaeological features to be located within the afforested areas is informed by fieldwork carried out in advance of felling for Strathy North wind farm (C. Dagg 2012) which concluded that survival of sites within the forestry was poor to non-existent, and that the probability of the existence within the forestry areas of further archaeological features, not identifiable through desk-based research or fieldwork, was low.

A13.5.4Access Route and Underground Cable Corridor

The revised evaluation area of the Modified 2013 Scheme extends to include a revised access road alignment between Turbine 34 of Strathy North and the existing access road south of the River Strathy, of which there is a preferred route and an alternative route, as shown on Figure A4.1, both crossing the river at the southern boundary of Strathy North wind farm, a 1 km section of existing forestry track linking the two north spurs of Strathy South to be used for underground cables, (Yellow Bog link road) and the preferred and alternative cable routes which run up to the Dallangwell substation in Strathy North wind farm.

Fieldwork carried out in 2013 identified three archaeological sites adjacent to, but not within, the revised access route corridor between Strathy North and Strathy South, comprising a building probably related to road construction (11) shieling huts and enclosure north of the River Strathy (12) and shieling huts south of the River Strathy (13) as presented on Figure A13.1.

No archaeological features were noted along the corridor of the Yellow Bog link road.

A13.5.5External Receptors

As clarified above, HCHET has stated a requirement only for the setting impact on SAM Ben Griam Beg to be re-evaluated. It was however noted that the increased tip height of up to 135 m may alter the results of the 2007 evaluation and therefore this chapter re-evaluates

the setting impact on external receptors, using the same criteria and methodology as in the 2007 evaluation.

A ZTV for the Modified 2013 Scheme indicates that no additional SAMs, Listed buildings or gardens and designed landscapes will be intervisible with the development.

A13.5.6 Modifying Influences

There is no change to this section from the 2007 ES.

A13.6 Changes to Effect Evaluation

A13.6.1 Basis of Assessment

(a) Development Characteristics

The Modified 2013 Scheme (shown on Figure A4.1) would consist of 47 turbines, 4 permanent anemometer masts, connecting access roads, a temporary construction compound / two laydown areas and a switching station and four borrow pits.. A detailed description of the Modified 2013 Scheme is provided in Chapter A4: Development Description.

(b) Assumed Design, Management and Mitigation Measures

Chapter 13: Cultural Heritage of the 2007 ES stated:

The preferred mitigation strategy is to preserve in situ and in an appropriate setting all cultural heritage resources. However, where this is not possible a Written Scheme of Investigation (WSI) for archaeological mitigation works to reduce or offset effects would be prepared prior to the enabling works for the proposed wind farm, for approval by the local planning authority.

Mitigation was proposed only in the case of Site No. 9, Lochstrathy. However, design changes including removal of turbine 33 and re-siting of a laydown area to west of Braestrathy now indicate that there will be no direct impact on this feature.

Other significant sites located close to infrastructure, e.g. Site No. 1, would be fenced off to protect them from disturbance during construction operations. The strategy for this work would be agreed with THC's Archaeology Unit.

An archaeological watching brief and/or monitoring would be carried out in areas of archaeological sensitivity to a strategy to be agreed with THC's Archaeology Unit.

Provision would be made for the excavation and recording of any archaeological remains identified either during watching briefs, or by construction contractors in areas not subject to archaeological monitoring. This provision would include the consequent production of written reports on the findings of the archaeological work conducted, with post-excavation analyses and publication of the results of the work where appropriate.

A13.6.2 Construction Effects

The removal and re-alignment of certain elements from Original 2007 Scheme has reduced the potential direct impact of construction activities on certain cultural heritage features. Examples of this include: deletion of borrow pit B5, and laydown area 3, both adjacent to site 5; and re-location of turbine 33, with track access to turbine 33 now approaching from the north therefore no longer necessitating access through site No. 9.

Table A13.10 shows the nine sites identified within site from the 2007 ES evaluation and four additional sites identified during fieldwork in 2013. This is considered to be a comprehensive reflection of the cultural heritage resource surviving within the site. Importance (National, Regional, or Local) differ slightly from those afforded by CFA in the 2007 ES, who categorised sites as of International/National, Regional, Local or Lesser importance. The sensitivity of the individual site is based on a combination of its importance and its status, as

categorised in Table A13.2. In addition, a site of local importance but in a good state of survival would be afforded a greater sensitivity to the impact of the scheme than a site of regional importance but poor to non-existent survival.

Details of the nine previously identified sites have already been given in the 2007 evaluation and are not repeated here, although relevant status updates provided by recent field study are added.

Table A13.10 Summary of identified cultural heritage features

Site no.	NGR	Site type	Value	Status	Sensitivity
1.	NC 7749 5315	shieling	local	Very denuded remains within an unplanted strip following the burn.	Low
2.	NC 8079 5257	milestone	local	Field survey found no trace of this feature, which can be taken as no longer extant	Low
3	NC 8065 5250	building	local	Field survey detected no trace of this structure, its site now in dense plantation.	Low
4	NC 8055 5168	sheepfold	local	Field survey detected no physical remains of this structure within an unplanted corridor along the Allt Badain.	Low
5	NC 80902 51332	building	local	Recent field survey found that this is the freestanding mortared stone fireplace and chimney to a former temporary wooden bothy probably associated with road building c. 1875. No associated features would be expected	Low
6	NC 8075 5104	milestone	local	Field survey found no trace of this feature, which can be taken as no longer extant	Low
7	NC 7980 5008	sheepfold	local	Field survey detected no trace of this structure, its site now in dense plantation.	Low
8	NC 7996 4969	milestone	local	Field survey found no trace of this feature, which was probably disturbed when the access track was upgraded to a forest road.	Low
9	NC 793 489	settlement	regional	Field survey has now clarified that this is a multi-period site, probably occupied in the 18th century and then re-occupied around 1875 as a shooting lodge and kennels. No additional features apart from peat cuttings were noted to the north and west, with all former enclosed and cultivated fields	Medium

Table A13.10 Summary of identified cultural heritage features					
Site no.	**NGR**	**Site type**	**Value**	**Status**	**Sensitivity**
				immediately south of the lodge and south of the access road, defined by visible low earth banks.	
10	NC 7968 4915	ford	local	Laid cobble road surface below river	Low
11	NC 8118 5526	bothy	local	Mortared stone fireplace and flue of former probably wooden bothy	Medium
12	NC 8120 5552	shielings	local	Two oval turf-walled huts and banked enclosure	Medium
13	NC 8120 5548	shielings	local	Two oval turf-walled huts truncated by forestry	Medium

Of the thirteen sites, eight have been assessed as being of local significance. Five of the nine sites, identified on early maps have been found to no longer survive, whilst two only survive in a very denuded state. Six sites, 5, 9, 10, 11 and 12, survive as visible features in the landscape. . Site No. 9: Lochstrathy multi-period site, has now been given a regional significance, although seen as of local significance by the 2007 evaluation. This change is based on stronger evidence for this being a multi-period site. The destroyed, removed or lost sites have been afforded low sensitivity; those which survive in denuded or damaged state have medium sensitivity; whilst the extant features have high sensitivity to direct impacts.

Table A13.11 shows the potential impact magnitude of temporary or permanent development or construction features on the cultural heritage resource.

Table A13.11: Impact and magnitude				
Site no.	**NGR**	**Site type**	**Impact**	**Magnitude**
1	NC 7749 5315	shieling	This small feature is north of the small stream flowing east from Loch nan Clach, and east of the existing forestry track. Widening of the track at this point should be far enough from the feature to avoid any direct impacts. Removal of the forest cover will reveal whether this feature survives	Low
2	NC 8079 5257	milestone	The milestone is assumed to have been removed and possibly even broken up for aggregate during track improvements. As these milestones were roughly shaped from local stone and uninscribed, retrieval of all or part of the original stone during ground disturbance seems highly unlikely	Imperceptible
3	NC 8065 5250	building	The site of this building, as shown on the 2nd edition OS map, is west of	Low

Table A13.11: Impact and magnitude				
Site no.	**NGR**	**Site type**	**Impact**	**Magnitude**
			the track by possibly as much as 50 m. Tree felling along the corridor of the track may extend to the site, but actual track widening is unlikely to extend this far.	
4	NC 8055 5168	sheepfold	Circular feature shown north of the stream on the 2nd edition OS map, where the existing track runs south of the watercourse. Upgrade of the track will not extend north of the stream. The feature is within open ground, so will be unaffected by tree felling	Low
5	NC 8090 5133	building	This building is shown on the 2nd edition OS map as north of the stream just to the west of its confluence, and east of the existing access track. New cut tracks will divert further away from this feature. The borrow pit site proposed in the vicinity in the Original 2007 Scheme has now been removed from the Modified 2013 Scheme. The feature stands within open ground and should be unaffected by felling	Low
6	NC 8075 5104	milestone	The milestone is assumed to have been removed and possibly even broken up for aggregate during track improvements. As these marker were roughly shaped from local stone and uninscribed, retrieval of all or part of the original stone during ground disturbance seems highly unlikely	Imperceptible
7	NC 7980 5008	sheepfold	The site of this feature, shown on the 1st but not the 2nd edition OS map, is north of the confluence of the streams, of which the west stream forms the site boundary. It is some distance from any built or construction phase feature of the scheme, but may be affected by clear felling of the forestry.	Low
8	NC 7996 4969	milestone	The milestone is assumed to have been removed and possibly even broken up for aggregate during track improvements. As these milestones were roughly shaped from local stone and uninscribed, retrieval of all or part of the original stone during ground disturbance seems highly unlikely	Imperceptible

Table A13.11: Impact and magnitude				
Site no.	**NGR**	**Site type**	**Impact**	**Magnitude**
9	NC 793 489	settlement	The existing track passes through this site, with features recorded on the 1st edition OS map to the south of the track and the lodge, shown on the 2nd edition OS map, to the north. Removal of turbine 34 and a laydown area to west of the site and relocation north of turbine 33 reduces the potential for direct impact. Fieldwork has clarified that no minor associated features lie beyond the recorded features of this site.	Imperceptible
10	NC 7968 4915	ford	Access to features of the development will not include this section of existing track, so no upgrade will be required	Imperceptible
11	NC 8118 5526	bothy	Adjacent to, but not directly within the corridor of the preferred access and cable route and would only be affected directly if the access route moved eastwards	Low
12	NC 8120 5552	shielings	Adjacent to, but not directly within the corridor of the preferred access and cable route and would only be affected directly if the access route moved eastwards	Low
13	NC 8120 5548	shielings	Adjacent to, but not directly within the corridor of the revised access route and should only be affected directly if the access route moved eastwards	Low

Direct impacts on the thirteen archaeological features are assessed as either of low or imperceptible magnitude. The imperceptible magnitude of impact would be on those sites considered to no longer survive or those which survive in denuded state but at some distance from any construction features of the scheme, in open ground which would not be affected by tree felling. The impact of tree felling on sites within the existing forestry cannot be evaluated fully at this stage, as the sites have not been fully located.

Table A13.12 gives the significance of impact on individual sites.

Table A13.12 Significance of Impact			
Site no.	**Sensitivity**	**Magnitude**	**Significance**
1	low	low	negligible
2	low	imperceptible	negligible
3	low	low	negligible
4	low	low	negligible
5	low	low	negligible

Table A13.12 Significance of Impact			
Site no.	**Sensitivity**	**Magnitude**	**Significance**
6	low	imperceptible	negligible
7	low	low	negligible
8	low	imperceptible	negligible
9	medium	imperceptible	negligible
10	low	Imperceptible	negligible
11	high	Low	negligible
12	high	Low	negligible
13	moderate	Low	negligible

A13.6.3 Operational Effects (Effects on Key External Receptors)

(a) Ben Griam Beg: Indirect Visual Impacts

Ben Griam Beg Scheduled Ancient Monument (SAM) is a complex site centred on a defensive feature at the summit of the hill, which has been defined as a Hill Fort and presumed to be of prehistoric date. It is an unusual monument type in the north of Scotland, and as such, it is difficult with certainty to place it within its chronological context and make presumptions about its function and setting. More typical defensive sites dating to the Iron Age, notably brochs, forts and promontory forts, are located both at the entrance to and along the heavily settled Strathnaver and Strath Halladale, both of them important through-routes from the coast. It is possibly significant that no such defensive sites have been located along the Strathy River, not a through-route, although promontory forts are known near the mouth of the river.

It has been suggested (A. Coombs, pers.com) that this site is not a hill fort per se, but a gathering place; its prominent location being a point of contact between several clan areas. If this were the case, it would increase the significance of the relationship of the monument with settlements down the Strathy River and on the coast.

Magnitude of impact is calculated with reference to Table A13.7.

(b) Obstruction or distraction from key views:

Key views from a defensive feature could involve:

- Intervisibility with contemporary settlements: In the case of Ben Griam Beg, if it can be taken to be Iron Age in date, the most obvious contemporary settlements lie to the south and east on the lower slopes of the hill. No Iron Age settlement has been identified along the upper reaches of the River Strathy, the nearest known sites along the river being at Reidhean a Bhainne, some 16 km to the north. The Modified 2013 Scheme would have no impact on the intervisibility with features to the south and east.
- Intervisibility with contemporary but distant defensive sites: There are nine brochs in Strathnaver, five brochs one fort and one promontory fort in Strath Halladale, a broch on the Armadale Burn, and two possible promontory forts at Baligill on the north coast. Some, or all of these may be contemporary with Ben Griam Beg. Most are relatively low-lying, although they stand on locally prominent points, and along each individual strath, most will be intervisible with its neighbour. The natural feature of Ben Griam Beg will undoubtedly be visible from some of these defensive sites, but the sites on the north coast and at the mouth of Strathnaver are at a distance at which this intervisibility can have had no practical application. It is too speculative to suggest that signalling between defensive sites took place, even were there evidence for contemporary occupation of sites. The Modified 2013 Scheme would intervene between Ben Griam Beg and

defensive sites to the northwest, but cannot be considered to impact on a relationship which may not have existed.

- Magnitude of effect in terms of obstruction or distraction from key views is considered medium.

(c) Relationship with landscape features:

- Ben Griam Beg commands views in all directions and functions well as a look-out for potential threats. Writers have noted particularly its command of Strath Halladale and the head of the Strath of Kildonan, and it is these routes running north and south east which are most likely to have been protected by any defensive aspect of the site. The Strathy River basin is not a through-route, nor does it hold resources or settlements which could be considered vulnerable to raids and requiring protection from a site such as Ben Griam Beg. The Modified 2013 Scheme will not impact on the relationship between the site and the natural routes by which potential threats might arrive.
- Magnitude of effect in terms of relationship with landscape features is considered low.

(d) Changes in Prominence:

- The structure on the summit of Ben Griam Beg is undoubtedly a prominent feature, and visibility from key viewpoints, as a statement of power and control of the landscape, its population and resources, will have been a primary consideration in selection of the site. Key viewpoints in the prehistoric period are primarily to the north east and south, along Strath Halladale and Strathnaver. Viewpoints on the north coast and down Strathnaver are distant and the monument is unlikely to have stood out from the natural skyline. The Modified 2013 Scheme would not intervene between Ben Griam Beg and its key viewpoints, and whilst it lies between the SAM and distant viewpoints to the north, it would not obscure the SAM.
- Magnitude of effect in terms of changes in prominence is therefore considered to be low.

(e) Changes in Landscape Character:

- With the exception of large blocks of coniferous plantation, there is probably little difference between the landscape now and that of 2,000 years ago. The hill fort, although now remote and relatively inaccessible, was originally placed in close relationship to the settlements it protected, with a patchwork landscape of woodland and cultivation. Over time, additional anthropogenic elements, including increasing occupation and enclosure with roads and reduction of natural woodland cover, would have been in keeping with the function of the SAM, and the present depopulated landscape is the more unnatural, leaving the SAM surrounded by virtually no signs of settlement and land use. The Modified 2013 Scheme would introduce an obviously modern feature, but there is a beneficial effect from the removal of the present forestry block, restoring this section of the landscape to a more open nature and removing the artificially straight boundaries between open ground and plantations.
- Magnitude of effect in terms of changes in landscape character is considered to be medium.

(f) Duration and Reversibility of Effect

The visual impact of the Modified 2013 Scheme would only last for the fixed duration of the running of the wind farm. The legacy may include some beneficial impact in the form of reduction of forestry cover.

- Magnitude of effect in terms of duration and reversibility of effect is considered to be low.

(g) Appreciation of the Ben Griam Beg SAM

The SAM is approached from the south-east, with no view to the north possible until the summit is reached. The greater part of the monument occupies the steep south west flank, with no view to the north. A small enclosed area on the ridge just west of the summit is the only vantage point from which the northern landscape can be viewed, and it provides an uninteresting patchwork of coniferous planting. The eye is drawn to the angular outlines of the nearest coniferous block. The Modified 2013 Scheme would become one of several modern elements of a modified, semi-natural setting to the north and east. The remote,

wilderness setting of the monument is enhanced by views to the hills to the south and west, which provide a more dominant setting.

The impact of the Modified 2013 Scheme on the appreciation of the hill fort by visitors depends on the subjective attitude of the visitor. The turbines will form a noticeable but distant element in the landscape to the north which, to anyone seeking the experience of unspoilt wilderness, would be seen as adverse, but is only one element in an already modified landscape. Visitors who have primarily climbed the hill to investigate the archaeological remains are unlikely to see the addition of the wind farm development as adverse and, as described above, alteration to the setting of the feature in terms of its relationship to contemporary settlement and landscape features would be to an acceptable level.

- The magnitude of effect in terms of appreciation of the monument is therefore considered to be low.

(h) Magnitude of the Indirect Impact on Ben Griam Beg

Ben Griam Beg is a SAM of National importance and High sensitivity (Table A13.2). The contribution of its setting to the understanding and appreciation of this receptor is High (Table A13.5) and therefore the Sensitivity of the setting is High (Table A13.6).

Table A13.13 summarises the magnitude of the effect of the Modified 2013 Scheme on different aspects of setting of Ben Griam Beg.

Table A13.13: Magnitude of impact on setting of Ben Griam Beg

Evaluation criteria	Magnitude of impact
Obstruction or distraction from key views	Medium
Relationship with landscape features	Low
Changes in prominence	Low
Changes in landscape character	Medium
Duration and Reversibility of Effect	Low
Appreciation of Ben Griam Beg	Low

Ben Griam Beg, by the criteria laid out in Table A13.6, is a receptor of high sensitivity. The significance of the magnitude of impacts, by the criteria of Table A13.8, is shown below in Table A13.14

Table A13.14: Significance

Evaluation criteria	Magnitude of Impact	Significance
Obstruction or distraction from key views	medium	Major
Relationship with landscape features	low	Minor
Changes in prominence	low	Minor
Changes in landscape character	medium	Major
Duration and Reversibility of Effect	low	Minor
Appreciation of Ben Griam Beg	low	Minor

In summary, there would be an indirect visual impact on the setting of Ben Griam Beg. The magnitude of this impact would be predominantly low to medium, and the significance of the setting impact is balanced between minor and major. Overall, the significance of the setting impact can be taken to be minor, as the Modified 2013 Scheme does not distract from or obstruct key views from the monument to contemporary cultural features or significant

landscape features and would effect only a minor change in landscape character and whilst it would be a visible feature in the landscape, this is only from a small part of the Scheduled Area.

A13.6.4 Cumulative Effects

The potential for cumulative effects resulting from the Modified 2013 Scheme and other wind farm developments has been considered. The distance from Ben Griam Beg at which wind farms are visible in clear weather conditions could be up to 60 km to the east, where high ground does not intervene to block views across Caithness. To the south and southwest intervening high ground screens views of wind farms in the Lairg area, but wind farms above Strath Brora, approximately 26 km distant to Ben Griam Beg will be partially visible.

Table A13.15 shows the wind farms included in consideration of cumulative visual impacts.

Table A13.15: Wind Farm Developments in the Planning System

Status	Reference & Name	Location	No. of Turbines	Turbine Geometry
Operational	Forss I	Near Thurso	2	H=62 D=94
	Forss II	Near Thurso	4	H=62 D=94
	Buolfruich	Dunbeath	15	H=44 D=52
	Causeymire	Westerdale	21	H=60 D=80
	Kilbraur	Strath Brora	19	H=70 D=90
	Kilbraur Extension	Strath Brora	8	H=80 D=90
	Flex Hill	Bilbster	3	H=60 D=80
	Achairn	Wick	3	H=60 D=80
	Achany	Lairg	19	H=67 D=70
	Gordonbush	Brora	35	H=67 D=80
	Lairg	Lairg	3	H=59.5 D=80
	Bettyhill	Bettyhill	2	H=80 D=90
Under Construction	Rosehall	Lairg	19	H=55 D=70
	Baillie Hill	Westfield	21	H=70 D=80
	Camster	Bilbster	25	H=80 D=80

Table A13.15: Wind Farm Developments in the Planning System				
Status	**Reference & Name**	**Location**	**No. of Turbines**	**Turbine Geometry**
	Wathegar	Bilbster	5	H=60 D=80
Approved	Causeymire Extension	Westerdale	3	H=60 D=80
	Stroupster	Nybster	12	H=60 D=104
	Burn of Whilk	East Clyth	9	H=70 D=92
	Melness	Tongue	3	H=49 D=52
	Strathy North	Strathy	33	H=70 D=80
	Wathegar 2	Bilbster	9	H=60 D=80
Submitted	Halsary	Mybster	18	H=60 D=80
	Dunbeath	Dunbeath	17	H=80 D=90
	Sallachy	Lairg	22	H=74.5 D=101
	Dalnessie	Lairg	27	H=73.5 D=95
	Braemore	Lairg	24	H=80 D=93
	Limekiln	Dounreay	24	H=98.4 D=52
	Glencassley	Lairg	26	H=80 D=91.2
	Bad A Cheo	Westermire	13	H=65 D=80
	Rumster	Lybster	3	H=50 D=50
Appeal	Forss III	Near Thurso	5	H=55 D=52
Scoping	Strathy Wood	Strathy	28	H=100 D=93

Figure 8 in PAN 45 provides an assessment of the general perception of a wind farm in an open landscape as follows:

- at distances greater than 15 km a wind farm will generally only be seen in very clear visibility as a minor element in the landscape;
- between 5-15 km it will only be prominent in clear visibility – seen as part of the wider landscape;
- between 2-5 km it will be relatively prominent; and
- at distances of less than 2 km it is likely to be prominent.

If these perceived setting impacts are taken as negligible, minor, moderate and major, then only Strathy Wood (Scoping) comes within the 15 km limit as prominent in clear visibility, while all the other schemes, most of which are over 30 km distant, will only be seen in clear visibility as minor elements in the landscape. They do, however, form clusters, which will increase the perception of the setting impact. A cumulative wireline from Ben Griam Beg is presented in Figure A13.3 and cumulative ZTVs and cumulative wirelines (Figures A9.27-A69) illustrate the visual impact of these clusters.

The Caithness wind farms, occasionally visible from the summit of Ben Griam Beg behind the ridge of high ground separating Sutherland from Caithness, are all at a distance of 30 km or over. Intervisibility with the greater part of the hill fort is blocked by the summit of Ben Griam Beg, with only a small enclosure on the ridge having a clear view to the north east. At the distance of 30 km the wind farms have no impact on the setting of the hill fort, although they may be perceived as intrusive modern elements. Equally, Gordonbush and Kilbraur to the south, over 25 km distant, are visible at two points on the south horizon, only in clear weather conditions.

Strathy North (consented wind farm with 33 turbines) and Strathy Wood (at the scoping stage with 28 turbines) form a dense group with Strathy South, extending the area filled with turbines eastwards from Strathy South. This would not greatly increase the impact of the Modified 2013 Scheme on the setting of the Ben Griam Beg (as evaluated above). It has been concluded that Ben Griam Beg's relationship with landscape and settlement features to the south and east formed the most important elements of setting, and that alterations to the landscape to the north, whilst providing an intrusive modern element which would detract from appreciation of the monument by some visitors, would not detract from understanding of the monument in its setting.

Melness, Tongue, (with three turbines), and Bettyhill, Farr (with two turbines)[3], would be visible on the horizon to the west of the Modified 2013 Scheme. Again, landscape and settlement features to the north west of Ben Griam Beg are not considered important elements to its setting and these schemes cannot be considered to detract from an understanding and appreciation of the site in its setting.

The approach to the hill fort on Ben Griam Beg is from the south east, climbing steeply up the south east flank of the hill and passing through a landscape containing elements of a prehistoric landscape probably contemporary with the hill fort. The Modified 2013 Scheme and neighbouring proposed Strathy Wood and consented Strathy North wind farms, would only become apparent once the summit has been reached. The vista of predominantly turbine-free hills and moors to the west and south, except in very clear weather conditions, should allow an appreciation of the scatter of built features to the south of the summit free of the visual distraction of wind turbines.

Using the same methodology and criteria to assess the cumulative setting impacts as the individual impacts of Strathy South, Table A13.16 gives the magnitude of cumulative impacts on Ben Griam Beg.

[3] Bettyhill is now an operational wind farm.

Table A13.16: Magnitude of Cumulative Impacts on setting of Ben Griam Beg	
Evaluation criteria	**Magnitude of impact**
Obstruction or distraction from key views	Medium
Relationship with landscape features	Low
Changes in prominence	Low
Changes in landscape character	Medium
Duration and Reversibility of Effect	Low
Appreciation of Ben Griam Beg	Medium

The significance of the magnitude of cumulative impacts, by the criteria of Table A13.8, is shown below in Table A13.17.

Table A13.17: Significance		
Evaluation criteria	**Magnitude of Impact**	**Significance**
Obstruction or distraction from key views	medium	Major
Relationship with landscape features	low	Minor
Changes in prominence	low	Minor
Changes in landscape character	medium	Major
Duration and Reversibility of Effect	low	Minor
Appreciation of Ben Griam Beg	medium	Major

In summary, the magnitude of cumulative impact would be low for three of the six evaluation criteria and medium in three. The significance of the setting impact would be minor in three cases and major in three. This is mitigated by the main cluster of wind farm developments, including Strathy South, only being visible from a small part of Ben Griam Beg, which does effectively reduce the significance of setting impact to moderate. Overall, the magnitude of cumulative impact would be low to medium, and the significance of setting impact minor to major.

A13.7 Changes to Mitigation

The 2007 ES stated, with reference to mitigation:

The preferred mitigation strategy is to preserve *in situ* and in an appropriate setting all cultural heritage resources. However, where this is not possible a Written Scheme of Investigation (WSI) for archaeological mitigation works to reduce or offset effects would be prepared for approval prior to the enabling works for the Modified 2013 Scheme.

Specific mitigation was outlined for Site No. 9, Lochstrathy in the 2007 ES. This is now considered unnecessary, following design changes which reduce the potential direct impacts of the scheme on this site, and more detailed fieldwork which has clarified the boundary of this receptor.

No new mitigation is advised for the protection of the known cultural heritage sites. On the recommendation of THC, a post-felling field survey is advised in order to identify features previously obscured by trees. This would also provide an opportunity to re-examine the Sites No. 3 and No. 7, known from early mapping but not located during fieldwork for the 2007 ES

A13.8 Changes to Monitoring

The original minimum requirement for monitoring, intimated by THC, was for an archaeological watching brief on all ground breaking work. More recent consultation with THC indicates that targeted watching briefs, together with a programme of peat coring, is likely to be more informative. With reference to the latter, the following extract from the 2007 ES should be considered: "Blanket peat acts as a repository of palaeoenvironmental information. Several palaeoenvironmental studies examining peat core samples taken from the landscape around the proposed development area have examined Holocene vegetation development and/or the date of blanket bog initiation. These include studies of samples taken within the proposed development area at Cnoc a Broillich (NC 810 530; Durno 1958) and Lochstrathy (Gear and Huntley 1991), and other samples taken outside it at Strathy Bogs (NC 800 525; Pearsall 1956) and Cross Lochs (Charman 1992, 1994). In forested areas within the [site], ploughing, planting and drainage will have diminished the value of the blanket bog as a repository of palaeoenvironmental information, whereas better quality sample locations remain in the undisturbed areas of blanket bog within and surrounding the[site]."

This previous work would indicate that further peat coring within the Site is unlikely to produce significantly new information.

Concern was raised by THC that the potential for further features of cultural heritage interest, obscured by the forest cover, may lie within the Site boundary. The conclusion of this evaluation is that the potential is low, that settlement and land use has always been sparse in both the prehistoric and post-mediaeval periods, and that minor features have probably not survived ploughing and planting of conifers. Therefore, no recommendations can be made for specific areas to be targeted by a watching brief.

A13.9 Changes to Summary & Conclusion (Inc. Residual Impacts)

Thirteen sites of cultural heritage significance have been identified by the assessment within the study area boundary using a range of desk-based sources, consultations and field reconnaissance survey. Additional buried and unrecorded remains of archaeological significance may survive across the Site, and are considered more likely to occur in land bordering the River Strathy and minor tributaries where known sites are concentrated.

One site, No.9, located within the site boundary, is defined as a feature of high sensitivity, but predicted to receive a low to negligible impact from the Modified 2013 Scheme, after removal from the design of one turbine, re-location of a laydown area and removal of need for track widening through the archaeological site.

One external receptor, Ben Griam Beg SAM, is predicted to receive residual indirect effects of predominantly low magnitude, with the overall significance of the setting impact predicted to be minor from the Modified 2013 Scheme.

Overall, the magnitude of cumulative impact would be low to medium, and the significance of setting impact minor to major.

Table A13.14: Summary of Potential Impacts of the Modified 2013 Scheme, Mitigation and Residual Impacts

Likely Significant Impact	Mitigation Proposed	Means of Implementation	Significance of Residual Impact
Construction			
Accidental damage to previously unrecorded	A post-felling field survey would be undertaken in advance of	Written Scheme of Investigation (WSI) to be agreed with THC Archaeologist prior to	Negligible

Table A13.14: Summary of Potential Impacts of the Modified 2013 Scheme, Mitigation and Residual Impacts			
Likely Significant Impact	**Mitigation Proposed**	**Means of Implementation**	**Significance of Residual Impact**
archaeological features	construction and a targeted watching brief would be implemented.	commencement of ground works and incorporated into the CEMP. WSI to be communicated to by the construction contractor to all relevant staff, subcontractors and plant operators via the induction and toolbox talks prior to commencement of any ground works.	
Operation			
Low impact on setting of one Scheduled Monument, Ben Griam Beg SAM	None	None	Minor Adverse
Cumulative impact on Ben Griam Beg SAM	None	None	Minor to Major Adverse

A13.10 References

Dagg, C. 2012: Strathy North Proposed Wind Farm Farr, Sutherland 07/00020/S36SU Archaeological Desk-Based Evaluation and Walk-Over Survey

Ralston and Smith, I and J S. 1982: *'Ben Griam Beg (Kildonan p) fort, settlement',* in Discovery and Excavation in Scotland 1982, p.16.

Ralston and Smith, I and J S. 1984: *'High altitude settlement on Ben Griam Beg, Sutherland'*, in Proc Soc Antiq Scot Vol. 113 1983, p.638-8

Table A13.15: Abbreviations Table	
Abbreviations	
THC	The Highland Council
HCHET	Highland Council Historic Environment Team
SAM	Scheduled Ancient Monument
ES	Environmental statement
OS	Ordnance Survey

A14 Soil and Water

A14.1 Introduction

This ES Addendum chapter assesses the effects of the proposed Modified 2013 Scheme on soil and water in light of recent baseline studies in relation to peat, hydrology and hydrochemistry. This ES Addendum chapter compares the 2007 ES Chapter 14: Soil and Water with the new baseline information gathered in these recent studies. Where no additional studies have been undertaken then the original information presented in the 2007 ES Chapter may be considered to remain valid.

A number of technical appendices were prepared to accompany the 2007 ES Chapter 14: Soil and Water. Some of these appendices have now been superseded as explained Table A14.1.

Table A14.1: Technical Appendices Review

2007 ES Technical Appendix	Status
Appendix 14.1: Strathy South Peat Slide Risk Assessment	This appendix has been superseded by Technical Appendix A14.1: Peat Landslide and Hazard Risk Assessment
Appendix 14.2: Borrow Pit Assessment	This appendix remains applicable; however, there have been some name changes to the borrow pit areas for the Modified 2013 Scheme as follows: ▪ Borrow pits B1 and B2 have been amalgamated and are referred to on Figure A4.1 as Borrow Pit A; ▪ Borrow pit B3, B5, B6 and B8 have been removed from the scheme; ▪ Borrow pit B4 is referred to on Figure A4.1 as Borrow Pit B; ▪ Borrow pit B7 is referred to on Figure A4.1 as Borrow Pit C; and ▪ Borrow pit B9 is referred to on Figure A4.1 as Borrow Pit D.
Appendix 14.3: Stream Crossing Guidelines	This appendix has been superseded by Technical Appendix A14.2: Watercourse Crossing Assessment
Appendix 14.4: Environmental Management and Pollution Prevention Plan	This appendix has been superseded by Technical Appendix A4.1: Construction Environmental Management Plan
Appendix 14.5: Access Track Peat Slide Risk Assessment	This appendix has been superseded by Technical Appendix A14.1: Peat Slide and Hazard Risk Assessment
Appendix 14.6: Strathy North Peat Slide Risk Assessment	This appendix remains applicable to the Modified 2013 Scheme.

In addition to the technical appendices outlined in Table A14.1, an additional technical appendix has been prepared for the Modified 2013 Scheme: Technical Appendix A14.3: South Wind Farm Baseline Hydrochemical Monitoring.

A14.2 Scope of Assessment

A14.2.1 Project Interactions

The overall project interactions will remain the same as originally stated in the 2007 ES

A14.2.2 Study Area

The study area for peat and watercourse crossings has been modified slightly from the Original 2007 Scheme layout to include the link road across the Yellow Bog and the revised site access route. Figure A14.1 shows the peat probing locations and Figure A14.2 shows the watercourse crossings.

The study area for the hydrochemical monitoring incorporates sample locations both within and outwith the redline boundary for the site. Eleven water sample locations are collected within the River Strathy catchment, one from the Armadale Burn catchment and one from the River Halladale at Forsinard (Figure A14.3).

A14.2.3 Updated Scoping and Consultation

Following submission of the application for Section 36 Consent for the Original 2007 Scheme, a number of objections were received. Specific issues in relation to the soil and water environment were raised by SEPA in their consultation response (07.08.07). A summary of the issues raised in relation to the 2007 ES, as well as a subsequent consultation response from SEPA, is presented in Table A14.2.

Table A14.2: Issues Identified during Consultation

Consultee	Issue	Where/How this is Addressed
Consultee Responses to the 2007 ES		
Northern District Salmon Fisheries Board (NDSFB) (08/08/07)	Concerned with the 2007 ES regarding the lack of baseline information on the River Strathy's hydrochemistry.	The Applicant commissioned PlantEcol to collect and produce a report on detailed hydrochemical baseline condition data associated with the River Strathy catchment. The results of hydrochemical monitoring are included as Technical Appendix A14.3 and are summarised in this chapter.
Halcrow (on behalf of Scottish Government) 17/08/07	Halcrow raised concerns to the Scottish Government regarding the quality of the Peat Stability Assessment Report prepared by MouchelParkman and submitted with the 2007 ES.	SEPA raised concerns over the site layout in relation to peatland, particularly the proposal to microsite some turbines and access track within 90 m of the locations shown on the site layout plan for the Original 2007 Scheme. SNH raised concerns over the potential effect of peat slide on Atlantic Salmon and freshwater pearl mussel. The Applicant commissioned SLR Consulting Ltd to undertake a Peat Landslide and Hazard Risk Assessment. New peat probing data has supplemented the existing peat depth data-set and informed a refined track layout for the Modified 2013 Scheme. The results of this assessment are summarised in this ES Addendum chapter and the full report is presented in Technical Appendix A14.1.

Table A14.2: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
SEPA (07/08/07)	SEPA raised a number of objections in relation to the 2007 ES and the layout of the Original 2007 Scheme. Objections included: Layout in relation to peatland. Some tracks and turbines are located in areas of deep peat; Further work was required in relation to the peat slide risk assessment; Insufficient information was provided in the watercourse crossing assessment to enable SEPA to make an assessment of the environmental acceptability of the proposed crossings; A plan needs to be provided showing the location of the concrete batching plant; A water abstraction is proposed for the concrete batching plant. Further details are required in relation to volume of extraction and location.	The Modified 2013 Scheme has been informed by additional peat probing in order to avoid areas of deep peat, where possible. The results of the peat probing have been used to inform an updated Peat Landslide and Hazard Risk Assessment, prepared by SLR, which is included as Technical Appendix A14.1 of this ES Addendum. A watercourse crossing assessment has been undertaken by SLR and is included Technical Appendix A14.2 of this ES Addendum. Figure A4.1: Site Layout presents the location of the concrete batching plant and water abstraction point. The volume of water required for the water abstraction is presented in Chapter A4: Development Description.
SNH (25/09/07)	SNH raised concerns over the potential effect of peat slide on Atlantic Salmon and freshwater pearl mussel.	As above, the Applicant commissioned SLR Consulting Ltd to undertake a Peat Landslide and Hazard Risk Assessment. The results of this assessment are summarised in this ES Addendum chapter and the full report is presented in Technical Appendix A14.1.
Updated Consultation Responses		
SEPA (17/09/12)	Disturbance and re-use of excavated peat. It is essential that the scope for minimising the extraction of peat is explored and alternative options identified that minimise the risk in terms of carbon release, human health and environmental impact.	A Peat Management Plan has been prepared and is included in this ES Addendum as Technical Appendix A4.3. A Carbon Calculator has also been prepared for the Modified 2013 Scheme and is included as Technical Appendix A4.4 of this ES Addendum.
SEPA (17/09/12)	Engineering activities in the water environment: In order to meet the objectives of the Water Framework Directive	A Watercourse Crossing Assessment has been completed (Technical Appendix 14.2) which has been used to address the issues

Table A14.2: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	of preventing any deterioration and improving the water environment, developments should be designed to avoid engineering activities in the water environment wherever possible. The water environment includes burns, rivers, lochs, wetlands, groundwater and reservoirs. SEPA requires it to be demonstrated that every effort has been made to leave the water environment in its natural state. Engineering activities such as culverts, bridges, watercourse diversions, bank modifications or dams should be avoided unless there is no practicable alternative.	identified by SEPA.

A14.2.4 Impacts to be Assessed

There are no significant changes from the impacts to be assessed in the 2007 ES.

A14.2.5 Impacts Scoped out of Assessment

There are no significant changes from the 2007 ES and, as a consequence, there is no opportunity to scope out impacts. The design changes (e.g. reduction in turbine numbers and reduced length of access tracks, as well as revised layout) reduce the risk of potential impacts on sensitive receptors (such as peat and watercourses). For example, deeper peat areas are avoided, where practical, to minimise disturbance to peatlands.

A14.3 Changes to Policy and Legislative Context

A14.3.1 International Legislation and Policy

There are no significant changes from the 2007 ES.

A14.3.2 National Legislation and Policy

While assessing the studies included as part of the ES Addendum the following legislation and policy introduced since 2007 includes:

- The Water Environment (Controlled Activities) (Scotland) Regulations (2011);
- Scottish Planning Policy (2010);
- Development of Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste (Scottish Renewables & SEPA, 2012),
- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste Regulatory Position Statement - Developments on Peat
- Floating Roads on Peat (FCE & SNH, 2010),
- Good Practice during Wind Farm Construction (Scottish Renewables, SNH, SEPA & FCS, (2010)

- Engineering in the Water Environment, Good Practice Guide, Construction of River Crossings (WAT-SG-25: SEPA, 2008, Version 1)

A14.3.3 Regional Policy

Since the 2007, THC has adopted the Highland Wide Local Development Plan (April 2012). In relation to this section the Modified 2013 Scheme the following policies are relevant:

- Policy 55 Peat and Soils states that *"development proposals should demonstrate how they have avoided unnecessary disturbance, degradation or erosion of peat and soils".*
- Policy 65 Flood Risk states that *"development proposals should avoid areas susceptible to flooding and promote sustainable flood management."*

A14.4 Changes to Methodology

A14.4.1 Overview

The key changes to this section relate to the undertaking of a new Peat Landslide and Hazard Risk Assessment, a Watercourse Crossing Assessment and the Baseline Hydrochemical Monitoring. These studies were undertaken following the consultation responses received from SEPA, SNH, the Scottish Government and NDSFB, respectively, as presented in Table A14.1.

A14.4.2 Baseline Assessment

(a) Peat Landslide and Hazard Risk Assessment

Peat probing has been undertaken in line with current Scottish Executive (now Scottish Government) guidelines for undertaking a Peat Hazard Landslide Risk Assessment (December 2006). This has involved detailed field and desk studies to determine baseline conditions. The Peat Landslide Hazard Risk Assessment (included as Technical Appendix A14.1 of the ES Addendum) addresses the entire site, limited only by access issues related to forestry. However, over 2400 data points have been used to address peat risk at the site (as compared to 763 data points for the 2007 ES) (Figure A14.1). Fieldwork was undertaken in June, August 2012 and May 2013.

Refer to Technical Appendix A14.1 for further details of the methodology used.

(b) Watercourse Crossing Assessment

A watercourse crossing survey was undertaken for the track layout of the Modified 2013 Scheme. This work included a review of 1:50,000 mapping and aerial photographs for the area to identify the likely watercourse crossings required to be established for the proposed track layout.

Eighteen watercourse crossings were identified (which included existing and new crossings) and comprise both large river crossings and small surface watercourse crossings (Figure A14.2). All watercourse crossings would be permanent and be used to access the site for construction and maintenance purposes during the life of the Modified 2013 Scheme.

Site visits were undertaken in May, August 2012 and May 2013. The site visit and inspection of each of the identified crossings was undertaken to obtain information specific to each watercourse. Photographs and detailed field notes were taken, reporting the dimensions of the watercourse channel and the existing crossing type (if applicable). The inspection recorded upgradient and downgradient positions (photographs), channel width and depth. An assessment was undertaken on possible crossing solutions and drawings were prepared detailing the watercourse crossing survey at each point. Refer to Technical Appendix A14.2 for further details.

(c) Baseline Hydrochemical Monitoring

The key objectives of the survey are to provide a baseline against which any potential changes in the hydrochemistry of the receiving waters can be assessed against. The monitoring of the hydrochemistry is not just an end itself, but has been designed to help identify any sources of impact on the biota within the watercourses that may arise from the

construction of a wind farm. Therefore, wherever possible, sampling sites have been harmonised with macroinvertebrate and fish surveys, described in Chapter A10: Ecology. The sample sites are presented on Figure A14.3.

Water samples were collected from eleven locations within the Strathy catchment, one from the Armadale Burn catchment and one from the River Halladale at Forsinard that were collected mostly between 26th September 2011 and 27th September 2012. Some preliminary sampling of the Yellowbog Burn, Allt nan Clach tributaries as well as the River Strathy were carried out in 2007 and 2008. These samples were analysed for the following:

- pH (a measure of acidity)
- electrical conductivity (an indirect measure of the total quantity of dissolved salts)
- Gran alkalinity (a measure of the ability of the water to buffer acids)
- Dissolved organic carbon (important in potentially neutralising aluminium toxicity)
- Suspended solids (potentially could silt-up spawning areas for salmonid fish)
- Turbidity (an indirect measure of the quantity of suspended solids)
- Ammonium and nitrate nitrogen (contribute to nutrient enrichment)
- Soluble reactive phosphate (a major contributor to eutrophication)
- Total and dissolved calcium, aluminium and zinc (the latter two elements are potentially very toxic to fish)

The pH, electrical conductivity, temperature and turbidity of the watercourses were also measured in the field at the same sample locations at the same time as the collection of the water samples. The suite of determinands and sampling locations was agreed by SEPA on 23rd September 2009.

The quality of the water will be evaluated against the SEPA river classification criteria and the Water Quality Standards (statutory and guideline standards) for compliance with the EC Freshwater Fisheries Directive (2006).

Further details of the sampling and analysis methodology are presented in Technical Appendix A14.3: Strathy South Wind Farm: Baseline Hydrochemical Monitoring.

A14.4.3 Limitations of Assessment

It was not possible to gain access to two of the sample of sites 6th May and 17th July 2012 due to problems associated with access permission. The two sample sites affected were on the River Uair (U1) and one on the River Strathy (RSM6) (refer to Technical Appendix 14.3, Figure 2).

A14.5 Changes to Baseline Conditions

A14.5.1 Context

The following sections provide an update on the peat, watercourse crossings and hydrochemistry baseline data. With regard to the individual topic areas, Geology, Soils, Climate, Hydrogeology, Hydrology and Water Resources, there have been no changes from the 2007 ES.

A14.5.2 Peat

In relation to peat, there are no significant changes from the 2007 ES; however the Technical Appendix A14.1: Peat Slide Hazard and Risk Report has significantly raised confidence in the assessment of peat extent on the site, which has resulted in avoidance of the major areas of thick peat. This in turn has aided in improving the design of the site and avoiding areas of concern, where practical.

A review of the peat coverage found peaty soil and peat deposits cover most of the site and variously overly glacially derived soils such as glacial till comprising, sand and gravels and in places bedrock. There are exposures of bedrock and where exposed is seen to be metasedimentary rocks over the entire site.

The peat has been subject to limited erosion from fluvial activity and localised erosion, causing minor hagging and ponding on the peat. The peat on-site is generally a blanket type peat overlying the underlying strata, dissected by distinct watercourses, with thicker peat (deeper isolated peat) at the stream head of the River Strathy, to the south of the site.

The ground conditions have been assessed from the peat probing exercise, sample descriptions and descriptions of in situ peat observed in streams and drainage ditches. A summary of the peat conditions is provided below, for further details refer to Technical Appendix A14.1: Peat Slide Hazard and Risk Report.

The peat was found to vary across the site in terms of thickness, surface slopes and apparent characteristics. Peat thickness varies from zero to 5.0 m in the application area. Accumulations of peat up to 0.5 m thick are considered to be too thin to be classified as true peat deposits and are often classified as organic soils or peaty soils. The geomorphology of the peat areas varies between large, flat expanses of apparently thick peat with high moisture content and smaller areas of thinner drier deposits blanketing the moderate undulating slopes.

The peat thickness at each location was recorded and the data used to draw the interpreted peat thickness map, presented in Figure A14.4. A total of 2,462 probe holes were undertaken and the results are presented in Table A14.3.

Table A14.3: Peat Thickness

Number of Probes	Peat Thickness (m)
163	>3.0
720	1.5 – 3.0
1,068	0.5 - 1.5
511	<0.5

A14.5.3Watercourse Crossings

A watercourse crossing survey, based on the proposed road layout for the Modified 2013 Scheme was undertaken. The locations for the assessed crossings are provided in Figure A14.2 with details and photographs of each watercourse crossing presented in Technical Appendix A14.2: Watercourse Crossing Assessment.

The Modified 2013 Scheme would require 18 watercourse crossings which comprise a mixture of both large river crossings and small surface watercourse crossings. All watercourse crossings would be permanent and used to access the site for construction and maintenance purposes during the life of the Modified 2013 Scheme.

The watercourse crossings were all identified on the OS 1:50,000 scale digital mapping and are therefore CAR-applicable (known as regulated crossings). The watercourse crossing locations are presented in Table A14.4.

Table A14.4: Watercourse Crossing Locations

Water Crossing ID	Co-ordinates	Existing Crossing Type	Proposed Crossing Type	CAR Authorisation
1	281146 955508	None	Permanent Bridging	Registration or Simple licence depending on design of bridge

Table A14.4: Watercourse Crossing Locations				
Water Crossing ID	**Co-ordinates**	**Existing Crossing Type**	**Proposed Crossing Type**	**CAR Authorisation**
2	281304 953931	None	Arch Culvert	Registration
3	281878 955835	None	Permanent Bridging	Registration or Simple licence depending on design of bridge
4	280739 952708	Closed culvert	Upgrade existing culvert*	Registration
5	280178 952030	Bridge	Upgrade existing bridge*	Registration
6	280432 949494	None	Arch Culvert	Registration
7	280807 951395	Closed culvert	Upgrade existing culvert*	Registration
8	279176 949171	None	Arch Culvert	Registration
9	280171 950019	Closed culvert	Upgrade existing culvert*	Registration
10	279722 949723	None	Arch Culvert	Registration
11	279101 949512	None	Arch Culvert	Registration
12	278929 950103	None	Arch Culvert	Registration
13	278505 949620	None	Arch culvert	Registration
14	277693 949210	None	Arch Culvert	Registration
15	278763 950282	None	Arch Culvert	Registration
16	279354 952339	Closed culvert	Upgrade existing culvert*	Registration
17	277791 952663	Closed culvert	Upgrade existing culvert*	Registration
18	277459 953184	Closed culvert	Upgrade existing culvert*	Registration

*Subject to inspection.

The CAR authorisation categories are defined as follows, based on pages 25 and 26 of SEPA's CAR practical guide[1]:

- General Binding Rules (GBR's)
  - Minor Bridges with no construction on bed or banks;
  - Temporary Bridges in rivers <5 m wide.
- Registration Activities:
  - Bridges across rivers and lochs where no part of the structure encroaches on the bed (e.g. no piers or in-channel supports). In addition, the total length of the structures on both banks should not be more than 20 m. This category includes bottomless arch culverts; and

[1] The Water Environment (Controlled Activities) (Scotland) Regulations 2011, A Practical Guide, SEPA, v6, August 2011

- Pipe and box culverts used for single-track roads, footpaths and/or cycle routes, where the affected river is not more than 2 m wide.

- Simple License Activities:
  - All other bridges, fords or causeways. This category would include bridges affecting more than 20 m total bank lengths, or bridges with in-stream supports.

A14.5.4 Hydrochemistry

Full details of the survey results are presented in Technical Appendix A14.3: Strathy South Wind Farm Baseline Hydrochemical Monitoring and a summary of the results are provided in the following sub-sections of this chapter.

The results of the baseline monitoring cover at least a year for all but two sample locations. The maximum of 30 sampling occasions cover a wide range of flow conditions in the River Strathy and its tributaries when river levels were very low to being at the top end of moderate flows according to the SEPA monitoring station at Strathy Bridge. As a consequence of these variations in flows there are a wide range of physico-chemical conditions. The most outstanding features of the hydrochemistry of the various watercourses are as follows:

- the pH is highly variable between sample dates (4.5 to 6.9 on Allt na Dubh-chlaise) depending on the flow;
- there are naturally high concentrations of dissolved and total aluminium in all the watercourses sampled, but they are particularly high in the Allt na Dubh-chlaise where they often exceed 100 µg L-1;
- as with the aluminium, there are significant levels of dissolved and total zinc in the rivers which increase during high flows; and
- the concentrations of major nutrients are very low or undetectable.

(a) pH and Acid Neutralising Capacity (ANC)

The pH of the River Strathy and its tributaries is between 6.4 and 7.0 during low flows but they become more acidic as flows increase. This is not surprising as the more mineral rich and consequently higher pH water coming from the underlying bedrock will be quickly diluted and overwhelmed by surface runoff from the dominant highly acidic peats and peaty gleys of the catchment when there is any significant quantity of rain. Although much of the upper part of the catchment of the River Strathy drains from or through the Strathy South conifer plantation the pH of the waters in this watercourse is not significantly different from its tributaries. The few measurements taken from the Yellowbog Burn and Allt nan Clach show that the pH of these watercourses is in the same range as that of the River Strathy and its other tributaries (Technical Appendix 14.3, Table 4).

Despite the pH of the River Strathy falling below 5.0 on at least four out of the 29 sampling occasions, there are healthy populations of salmon and trout in these watercourses. Even though there is very little ANC present in the water on these occasions when flows are relatively high in the River Strathy there is no evidence to suggest that the fish populations are severely affected by these conditions. This is possibly due to the moderately high concentrations of dissolved organic matter in the waters neutralising any toxins that are associated with acidic waters.

(b) Field and Laboratory Measurements of pH and Electrical Conductivity

The measurement of the pH of stream waters in situ gives a wider range of values than those measured in the laboratory. The laboratory measurements of pH are on average 0.32 of a pH unit lower, but the differences between the field and laboratory measurements of pH are highly variable. The maximum difference between the field and laboratory pH measurements is 2.2 units. This large discrepancy is not likely to be due to poor calibration of the meter as the differences vary by different amounts and in different directions on the same day. On several occasions the differences in pH occurred when there were higher levels of turbidity measured in the laboratory than in the field and this was associated with higher levels of

suspended solids than would normally have been expected. This might suggest that there was some change in chemistry of the samples during storage and transportation that resulted in some material precipitating out.

The laboratory measurements of electrical conductivity are on average 19 µS cm-1 higher than the field measurements. This again suggests that there has been some release of electrolytes between sample collection and analysis in the laboratories. This is despite all the samples being refrigerated between collection in the field and transportation to the laboratory there has probably been some decomposition of organic matter by psychrophilic micro-organisms or lysis of cells in the samples and consequent release of electrically charged ions (Gounot 1996). This would result in some cases a reduction in pH through the production of organic acids and the release of electrolytes resulting in a small increase in electrical conductivity.

(c) Nutrients

The concentrations of all the nutrients are very low and in the majority of cases for soluble reactive phosphate (SRP) they are below the level of detection. On the basis of the concentration of nutrients the water quality in all the watercourses should be regarded as Excellent using SEPA's criteria. Unfortunately, the naturally low pH values would reduce the classification of the watercourses to Fair. Although the measurement of total phosphorus is more likely to give detectable concentrations on each sampling occasion than the measurement of SRP it has been shown that the measurement of SRP is a better predictor than total phosphorus of carbon export from catchments affected by the Whitelee Wind Farm development near Glasgow (Waldron et al. 2009).

(d) Aluminium

Although the concentrations of dissolved aluminium went above 100 µg L-1 on four occasions on the lower stretch of the River Strathy and were above this level on 18 of the 26 samples at location DCM2 on the Allt na Dubh-chlaise, it does not appear to have an adverse impact on breeding salmon and trout populations that are present in these same watercourses. This is almost certainly due to the aluminium being bound up as organo-aluminium complexes, even at pH values of less than 5.0 (Lien et al. 1996; Roy & Campbell 1997). Humic acids typically have cation exchange capacities of 1 meq g^{-1} whilst for Sphagnum peat they can be as high as 3 meq g^{-1}. This means that there is plenty of capacity in the Dissolved Organic Carbon (DOC) present in the waters to adsorb all of the dissolved aluminium measured in the samples by about 5 to 16 times. It therefore seems that in this river system that adsorption of aluminium to the high concentrations of organic acids coming from the surrounding peatlands is the most likely explanation for there being healthy populations of salmon and trout in the River Strathy and some of its tributaries despite there being moderately high concentrations of aluminium.

(e) Zinc

Concentrations of total zinc exceeded the imperative standards for salmonid rivers (30 µg L-1) at all sample locations in at least 25% of the samples that were taken (Technical Appendix A14.3, Table 16b). Some of the samples had concentrations well over 100 µg L-1, but as with aluminium, much of this zinc may be in an unavailable form, i.e. forming organo-zinc chelates. Concentrations of zinc increased during periods of high flow which is when the acidity of the streams increased. This could be a result of an increased solubilisation of zinc from bedrocks enriched with zinc, such as granites which do occur in this catchment, as well as washing in of DOC with zinc attached or particulates containing zinc from the catchment (Aubert & Pinta 1977). Again the presence of healthy macroinvertebrate populations and breeding populations of trout and salmon suggest that the zinc is not having an adverse effect (refer to Chapter A10: Ecology for further information on macroinvertebrates and fisheries).

(f) Monitoring Suspended Solids

The concentrations of suspended solids in the watercourses remained low, even at moderately high flows and only exceeded the guideline standard of 25 mg l-1 in five out of the 296 samples analysed. On one of the occasions, when there were particularly elevated

concentrations of suspended solids, it appears to be linked to the first heavy frosts and snow of the autumn. The other occasion was in late July and early August 2012.

The measurement of turbidity in the field shows a positive and strong correlation with the laboratory measurements of suspended solids above concentrations of 5 mg l-1 (Technical Appendix A14.3, Figure 9) and it can therefore provide a rapid confirmation of potentially high concentrations of suspended solids in receiving waters at this remote location long before the results of laboratory analysis can be produced.

(g) Control Sites

This baseline monitoring demonstrates the comparability of the control sampling locations against which the other sampling locations can be compared. The control site on the Uair (U1) is the most similar in chemistry, especially for pH, to the Yellowbog Burn and Allt Dhònuill Ghuinne and where possible this control should also be retained for monitoring any potential changes in these watercourses. The control site on the River Halladale is the closest in composition to the Allt na Dubh-chlaise and should therefore be retained as a control for the Allt na Dubh-chlaise.

(h) Monitoring Frequency

The frequency of monitoring to date has been once every two weeks. It has included samples taken when flows were low to occasions when flows were moderately high. However, using the depth of the River Strathy at Strathy Bridge at the time of sampling as a guide to flows, the depth of the River Strathy varied between 0.21 m and 0.93 m throughout the whole of the monitoring period. According to the SEPA website, this covers the lower half of Moderate flows for this river.

From an examination of the data for individual determinands the samples appear to cover the full range of pH conditions one would normally expect to occur, with laboratory measurements ranging from 4.5 to 7.1 and field measurements varying from 3.9 to 7.9. It therefore seems plausible to suggest that an adequate range of conditions within the watercourses has largely been characterised by this baseline set of data. The Freshwater Fisheries Directive only requires the calculation of mean concentrations or other statistics on samples taken monthly over a year. Given this the baseline has more than adequately characterised the baseline hydrochemical conditions of the River Strathy against which any potential changes in chemistry that could arise from the Modified 2013 Scheme. Although there has been minimal sampling of the waters of the Allt nan Clach and Yellowbog Burn in the upper part of the Strathy catchment, they are not anticipated to differ much in their hydrochemistry from the other tributaries of the River Strathy.

(i) Determination of Aluminium Toxicity

Assuming that the current populations of fish and macroinvertebrate in these watercourses are largely stable, and then the observed ranges of dissolved and total aluminium and zinc in the water samples are typical for the River Strathy and its tributaries and can therefore not be in a toxic form.

(ii) Summary

The following conclusions can be drawn from the baseline hydrochemical monitoring:

- There are very large fluctuations in pH between sampling occasions, which are almost certainly natural, reflecting the changes in the main source of water entering the watercourses;
- Due to the differences found between the laboratory measurements of both pH and electrical conductivity and those taken in the field measurements, it is suggested that field measurements of pH and conductivity are taken in conjunction with laboratory measurements of these same parameters;
- There are moderately high concentrations of DOC in all the watercourses;
- Most of the significant quantities of aluminium and zinc in nearly all of the samples must be bound to the dissolved and/or particulate organic matter in the water;

- The monitoring of the aluminium species present in the waters would not prevent an acid flush from killing the populations of fish and macroinvertebrate populations and could only provide a post hoc diagnosis of such an event. Therefore, appropriate felling and construction activities to prevent acidification events coupled with on-site monitoring of pH to provide an early warning of such an event would provide the best approach to protecting the biota in the watercourses draining from the development site and into the River Strathy;
- There are very low concentrations of inorganic nitrogen and SRP in all the samples;
- The calculated ANC levels are always positive, but close to zero during periods of high flow;
- The baseline set of data is considered to be more than adequate to characterise the hydrochemistry of the River Strathy that drains the whole of the proposed Strathy South Wind Farm development; and
- The present suite of determinands is considered to be adequate to satisfy the water quality standards covered by the EC Freshwater Fisheries Directive and SEPA's monitoring requirements.

A14.6 Changes to Effect Evaluation

A14.6.1 Basis of Assessment

There are a number of changes from the 2007 ES. The most significant changes are: a reduction in turbines (which has been part of on-going process), from 77 to 68 and to 47; the number of borrow pits has reduced from nine to four; the number of watercourse crossings has fallen from 26 to 18 and a 70 m watercourse buffer has been applied. However, the assessment process has not significantly changed. The layout has been modified to accommodate changes from recent studies, including the peat assessment.

A14.6.2 Construction Effects

There are no significant changes from the 2007 ES, regarding construction effects. The modifications to the design alter the overall requirements of the project but would not influence the potential effects from the construction process.

Design alterations have been included to avoid, where possible, sensitive issues such as watercourses (with a 70 m watercourse buffer applied), deep peat and sensitive ecological habitats. Additional studies have been undertaken to address these. In response to a request from SEPA, the location of the concrete batching plant is presented on Figure A4.1.

(a) Peat

The potential impact throughout construction has been assessed as mainly negligible to low risk, where medium risks have been identified these have been mitigated by micrositing or design elements. The actual risk of a peat slide occurring based on the Modified 2013 Scheme is summarised as below and the stability risk rating is presented on Figure A14.5:

- 30 turbine locations have a stability risk rating of negligible;
- 17 turbine locations have a stability risk rating of low;
- Nine area of high peat instability risk were identified. These are all in thick areas of flat lying peat and have all been avoided through design. Neither turbines, infrastructure or tracks are located in proximity to these high risk areas;
- Six areas of medium risk were considered to have the potential to impact the wind farm infrastructure or could have an impact on the local watercourses. However, micrositing could mitigate this risk to reduce the hazard ranking to insignificant.

The overall conclusion regarding peat stability is that there is a negligible to low risk of peat instability over most of the site although some limited areas of medium risk were identified.

As noted above, a hazard impact assessment of the medium risk areas concluded that, subject to the employment of appropriate mitigation measures, all of these areas could be considered as an insignificant risk (Figure A14.5).

(b) Watercourse Crossings

It is proposed that each watercourse crossing would have sufficient capacity to pass the 1:200 year flood level, and include an allowance for potential partial blockage and / or potential effects of climate change. Inevitably, there would be some disturbance in the vicinity of the crossing during the construction period. Technical Appendix A4.1: Construction Environmental Management Plan (CEMP) would address risk minimisation and mitigation, particularly during the construction period. However, in addition to engineering, the reinstatement of vegetation would be integral to the design to provide 'rest/cover' areas.

A14.6.3 Operational Effects

There are no significant changes from the 2007 ES, regarding predicted operational effects. The modifications to the design alter the overall requirements of the project; however they would not influence the significance of the predicted operational effects.

A14.6.4 Cumulative Effects

No cumulative assessment was carried out for Chapter 14: Soil and Water 2007 ES. It is considered that there is no requirement to review the cumulative effects in relation to the soil. However, given the overlapping hydrological catchments of the proposed wind farms at Strathy North, Strathy South and Strathy Wood, the following has been considered:

- The construction programme for these three projects would be co-ordinated co-operatively by the respective developers to minimise the potential for cumulative construction impacts; and
- A consistent minimum standard of Construction Environmental Management would be required for all three schemes, to minimise the potential impacts on the water environment.

Based on these assumptions it is concluded that there would be no significant cumulative effects. In addition, ongoing water quality monitoring would be used to provide early identification of any potential water pollution issues.

A14.7 Changes to Mitigation

There are no significant changes from the 2007 ES. The design layout has been modified from the Original 2007 Scheme, which reduces the extent of mitigation, by improving road layouts, reducing total track length and improving turbine positions to lessen overall impact on sensitive receptors.

A14.8 Changes to Monitoring

A14.8.1 Peat

As a consequence of more detailed awareness of peat and its potential impact throughout the construction process, a geotechnical risk register would be required as part of the construction and post-construction monitoring. In addition, suitable guidance, which would be contained in a construction method statement, would be established before any work commences to ensure that poor construction practices do not precipitate instability.

More detailed ground investigation work would be required to facilitate the geotechnical design of the various foundations and access track, particularly the vertical and horizontal alignment and the design of river/stream crossings. These results would be used to inform the construction method statement, mentioned above, which would be submitted to the Planning Authority for approval as part of the condition compliance prior to work commencing on site.

A14.8.2 Hydrochemical Monitoring

Hydrochemical monitoring is ongoing as part of the planning condition for the consented Strathy North Wind Farm. The baseline set of data is considered to be more than adequate to characterise the hydrochemistry of the River Strathy that drains the whole of the site at Strathy South.

The present suite of determinands (listed above) is considered adequate to satisfy the water quality standards covered by the EC Freshwater Fisheries Directive and SEPA's monitoring requirements.

A Water Quality Monitoring Plan (WQMP) was prepared for Strathy North in consultation with THC, SEPA, NDSFB and Marine Scotland Sciences. It is proposed that a similar WQMP is prepared for Strathy South to cover the following phases: pre-construction, construction, post-construction and decommissioning.

A14.9 Changes to Summary & Conclusion (Inc. Residual Impacts)

Table A14.5: Summary of Potential Impacts of the proposed wind farm, Mitigation and Residual Impacts

Likely Significant Impact	Mitigation Proposed	Means of Implementation	Outcome/ Residual Impact
Construction			
Detrimental impacts on water quality on-site and downstream Detrimental impacts to fisheries on-site and downstream as a result of changes to water quality Increase to on-site and downstream flood risk as a result of poor construction practices (including poor construction of watercourse crossings)	Appropriate drainage design that incorporates measures to attenuate and treat runoff from access tracks, hard standing areas, construction compound and turbine areas. The CEMP will include details of measures to prevent pollution and all work would be completed in compliance with the CEMP. The CEMP will include measures (but not be limited) regarding: ▪ Appropriate storage and handling of potential pollutants; ▪ Refuelling of construction plan in designated areas; ▪ Restrictions on certain construction activities during periods of prolonged and/or intense wet weather; ▪ Adoption and agreement on emergency measures should significant effects occur; ▪ Appropriate design of watercourse crossings to maintain hydraulic connectivity; ▪ Drainage Management	CEMP to be submitted for the written approval of the planning authority, SNH and SEPA prior to construction commencing.	Minor Adverse to No Significance

Table A14.5: Summary of Potential Impacts of the proposed wind farm, Mitigation and Residual Impacts

Likely Significant Impact	Mitigation Proposed	Means of Implementation	Outcome/ Residual Impact
	Plan; ▪ Watercourse crossing assessment (detailed design prior to construction); and ▪ Water quality monitoring programme (prior to and during construction. ▪ Watercourse crossings designed to accommodate the 1 in 200 year flood. Locations of any temporary peat or soil storage areas would be carefully selected so that erosion and runoff is limited, leachate from the stored material is controlled and stability of the existing ground, particularly in peatland areas, is not affected.		
Increase risk of peat slide risk as a result of poor construction and management of peat stockpiles.	Adoption of appropriate storage and re-use of peat in line with best practice guidelines and site conditions. For example, locations of any temporary peat or soil storage areas would be carefully selected so that erosion and runoff is limited, leachate from the stored material is controlled and stability of the existing ground, particularly in peatland areas, is not affected.	Adoption of a geotechnical risk register. Implementation of the Peat Management Plan (PMP). ECoW to oversee the appropriate storage of peat.	Minor Adverse to No Significance
Increase risk of peat slide as a result of desiccation or wetting of peat.	Appropriate drainage design that incorporates sediment management measures to attenuate and treat runoff from wind farm infrastructure. Turves would be stored turf side up and would be wetted to minimise risk of desiccation. Peat stockpiles would be a minimum of 50 m from watercourses.	Adoption of a geotechnical risk register. The condition of stored turves to be monitored by the ECoW.	Minor Adverse to No Significance
Long-term degradation of peat as a result of	Appropriate drainage design that incorporates sediment	Implementation of the Peat	Minor Adverse to

Table A14.5: Summary of Potential Impacts of the proposed wind farm, Mitigation and Residual Impacts

Likely Significant Impact	Mitigation Proposed	Means of Implementation	Outcome/ Residual Impact
interrupting surface and sub-surface drainage pathways. Disruption of drainage patterns can cause pooling and / or desiccation of peat.	management measures to attenuate and treat runoff from wind farm infrastructure. Drainage measures could include interceptor ditches, down slope drainage collection systems, containment berms (embedded where appropriate). Appropriate reuse and management of waste peat in line with principles of best practice guidance and site conditions.	Management Plan (PMP).	No Significance
Peat slide hazard rating of access tracks	Six areas of access track are located in areas of medium hazard. However, through micrositing the impact would be reduced to insignificant.	Micrositing of access tracks	No Significant Impact
Operation			
Peat slide hazard rating of access tracks	As above	As above	As above
Detrimental impacts to on-site and downstream water quality through degradation of site infrastructure and poor storage of materials	Appropriate drainage design that incorporates sediment management measures to attenuate and treat runoff from wind farm infrastructure. Appropriate storage and handling of potential pollutants. Adoption of a long-term operational drainage and monitoring programme to monitor degradation of infrastructure (including the removal of blockages from watercourse crossings). Operational drainage and monitoring plan (designed prior to construction). Plan can detail the appropriate monitoring methods, including: ▪ Visual monitoring and completion of checklists signed off by SEPA; ▪ Regular water quality	CEMP to be submitted for the written approval of the planning authority, SNH and SEPA prior to construction commencing. The CEMP would include details of a Water Quality Monitoring Plan the details of which would be agreed with SEPA, Marine Scotland and the Northern District Salmon Fishery Board.	Minor Adverse to No Significance
Detrimental effects to on-site and downstream fisheries as a result of changes to water quality (as described above)			
Increases to on-site and downstream flood risk as a result of degradation of infrastructure and/or poor maintenance/monitoring of infrastructure			

Table A14.5: Summary of Potential Impacts of the proposed wind farm, Mitigation and Residual Impacts			
Likely Significant Impact	**Mitigation Proposed**	**Means of Implementation**	**Outcome/ Residual Impact**
	monitoring for a period post construction to determine potential long terms effects of wind farm on water quality.		

A14.10 References

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Table A14.6: Glossary and Abbreviations

Abbreviations	
ANC	Acid Neutralising Capacity
DOC	Dissolved Organic Carbon
NDSFB	Northern District Salmon Fishery Board
SEPA	Scottish Environmental Protection Agency
SNH	Scottish Natural Heritage
SRP	Soluble reactive phosphate
THC	The Highland Council
WQMP	Water Quality Monitoring Plan

A15 Roads and Traffic

A15.1 Introduction

This ES Addendum chapter provides an updated assessment of the potential road and traffic impacts of the Modified 2013 Scheme following changes to the project parameters as described in Chapter A4: Development Description. The assessment was undertaken by Halcrow Group Limited.

This chapter refers to and should be read in association with Chapter 15: Roads and Traffic of the 2007 ES, Technical Appendix A15.1: Transport Statement and Technical Appendix A15.2: Abnormal Load Route Survey Report.

A15.2 Scope of Assessment

This ES Addendum chapter identifies and assesses the potential for significant impacts as a result of changes to the Original 2007 Scheme. The changes are detailed in Chapter A4: Development Description. Of particular relevance to determining the Roads and Traffic impacts is the removal of thirty turbines from the Original 2007 Scheme; from 77 turbines to 47 turbines.

Additionally, the turbine parameters have changed since the assessment of the Original 2007 Scheme. As a result of these changes it has been necessary to undertake swept path assessments based on turbines with a maximum blade tip height of up to 135 m, with a rotor diameter of up to 104 m and a hub height of up to 83 m. The results of the swept path assessments can be reviewed in Technical Appendix 15.2: Abnormal Load Route Survey Report.

There has also been a change in approach from the Original 2007 Scheme with respect to forestry clearance. The Original 2007 Scheme assumed that the required forestry clearance would be felled and mulched on-site, while the Modified 2013 Scheme allows for a mixture of mulching and timber extraction as explained in Chapter A4: Development Description. The additional traffic movements associated with the timber extraction are considered in this chapter. Whilst forestry traffic is shown to occur during the construction period, to allow for a worst case assessment, the applicant may delay the removal of wood from the site if drying becomes a requirement for subsequent biomass opportunities. Therefore final timing of forestry traffic would be confirmed as part of the Traffic Management Plan.

A15.2.1 Project Interactions

Project interactions remain as outlined in Chapter 15: Roads and Traffic, Section 15.2.1 in the 2007 ES, with the exception of the approach to forestry clearance, as described above.

A15.2.2 Study Area

The study area remains as defined in Chapter 15: Roads and Traffic, Section 15.2.2 in the 2007 ES.

A15.2.3 Updated Scoping and Consultation

Reference should be made to Chapter 15, Section 15.2.3 in the 2007 ES for details on the original scoping and pre-application consultation. Details of consultation responses received since the 2007 ES submission are presented in Table A15.1.

Table A15.1: Post-Application Consultation Responses

Consultee	Issue	Where/How this is Addressed
The Highland Council Transport,	A response was received following submission of the Original 2007 Scheme application and	As requested the assessments undertaken assume that only the

Table A15.1: Post-Application Consultation Responses		
Consultee	**Issue**	**Where/How this is Addressed**
Environmental and Community Service (TECS) (26 October 2008)	included the following comments: ▪ Only the A836 east of the site access shall be used for abnormal and Heavy Goods Vehicle (HGV) movements; ▪ Prior to construction, details of any works on the public road are to be submitted for approval; Surveys of all culverts and bridges to be undertaken and any improvements submitted to TECS; ▪ A suitable bond is to be lodged to ensure damage to the adopted road or associated infrastructure is made good; ▪ Surveys to record all defects on the public roads forming part of the access routes to the site to be undertaken before and after construction; ▪ Access junction to be constructed to a standard as described; ▪ Wheel wash facilities to be provided and any debris to be removed from the public road; ▪ A Transport Management Plan to be prepared and agreed; ▪ Baseline survey of residents to record damages to properties; and ▪ A836 to be sprayed with water during dry spells to suppress dust.	A836 east of the site access will be used for HGV and abnormal load traffic. The remaining comments refer to requirements that will need to be considered by the Applicant, post-submission of the planning application.
Transport Scotland (4 October 2012)	Transport Scotland noted that "given that the delivery of turbine components would be via the A9(T) before accessing the site, Transport Scotland will need to be satisfied that the existing A9(T)/A836 is of an appropriate standard in order to accommodate conventional HGV traffic and the movement of abnormal loads accessing the site." It was confirmed that as the development is reducing in size there would be no need to re-visit the traffic impacts from the development. Transport Scotland confirmed their previous view that there will be no significant trunk road impacts with regard to Noise and Air Quality associated with additional traffic on the trunk road network.	Technical Appendix A15.2: Abnormal Load Route Survey Report, which highlights the impacts at the A9(T)/A836 junction. The Abnormal Load Route Survey Report also highlights the measures required to accommodate the abnormal loads associated with Modified 2013 Scheme.

A15.2.4 Impacts to be Assessed

The impacts to be assessed remain the same as those outlined in Chapter 15: Roads and Traffic, Section 15.2.4 in the 2007 ES. No new impacts have been identified.

A15.2.5 Impacts Scoped out of Assessment

The impacts scoped out of the assessment remain the same as those outlined in Chapter 15: Roads and Traffic, Section 15.2.5 in the 2007 ES.

The assessment will exclude operational and decommissioning impacts because the limited extent of traffic during operation means that significant impacts, due to traffic, would be unlikely to arise. Once the site is operational, it is envisaged that the amount of traffic associated with the Modified 2013 Scheme would be minimal. Occasional visits could be made for maintenance checks. The type of vehicle used for these visits would be likely to be Light Goods Vehicles (LGVs). There could be an occasional need for an HGV to access the site for maintenance and repairs.

Impacts arising from the process of decommissioning have been scoped out of the assessment because they are of a similar nature to construction impacts, but of a smaller scale and shorter duration. At the end of the Modified 2013 Scheme's operational life there could be an impact on the local highway network due to the movements of HGVs associated with the removal of equipment and materials. However, the number of vehicle movements is anticipated to be lower than that predicted for construction, and any baseline data collected for the purposes of this assessment would not be relevant so far in the future.

No cumulative impacts were considered in the 2007 ES and this remains unaltered for the Modified 2013 Scheme. There is not proposed to be any temporal overlap with the proposed Strathy North Wind Farm construction and the Strathy Wood proposal is not a committed development, therefore would not conventionally be assessed in transport terms.

A15.3 Changes to Policy and Legislative Context

Since the 2007 ES national, regional and local transport policy has changed and therefore a revised summary of transport policy is presented in the following sub-sections.

A15.3.1 National Legislation and Policy

'Scotland's Transport Future', published by the Scottish Government (formerly the Scottish Executive) in June 2004, outlines the Scottish Government's vision for transport at national and regional levels across Scotland and states that its overall aim is *"to promote economic growth, social inclusion, health and protection of our environment through a safe, integrated, effective and efficient transport system."* The publication observes that *"the vast bulk of freight traffic will continue to be carried by road".*

Scottish Planning Policy (SPP) is a statement of Scottish Government policy on land use planning. SPP states that a Transport Assessment should be carried out where a new development is likely to result in a significant increase in the number of trips as well as identifying potential cumulative effects of development. Providing for the safe and efficient movement of traffic on the strategic road network requires the implications of development proposals on traffic and road safety to be taken into account. SPP refers specifically to wind farm developments, with reference made to the potential constraint of site access. SPP also refers to the haulage of minerals. It states that *"where there are significant transport effects on local communities, routes which avoid settlements as far as possible should be identified."*

A15.3.2 Regional Policy

The Highlands and Islands Transport Partnership (HITRANS) Regional Transport Strategy (RTS), published in 2008, states how *"continued investment in the region's infrastructure and services will allow the region to make a full and effective contribution to national economic life."* In particular, this continued investment is expected to *"support the development of key and emerging sectors"* such as renewable energy. The RTS also confirms that road transport is the dominant mode for freight transport in the region; however, it also acknowledges that existing road traffic flows are such that present levels of HGV volumes on the region's roads do not have significant negative environmental effects. The RTS states that the relatively high level of freight movement has the potential to damage infrastructure.

The Highland Council (THC) Local Transport Strategy (LTS), published in 2010, refers to the road network across rural areas being characterised by 'winding single carriageway roads with passing places'. Reference is also made to the additional pressure that can be placed on sub-standard roads. The LTS also notes that in terms of timber transport, there are initiatives such as tyre pressure moderation which are reducing the damaging effect of

forestry lorries on rural roads. The LTS also mentions the many bridges which are subject to weight restrictions in the local authority area. The LTS states that *"where possible, the Council, through its Lifeline Bridges programme will invest in the bridges to maintain access either by removing weight restrictions or reducing the weight restriction effect of HGV vehicles."* The aim of the Lifeline Bridges programme is to assist the economy of the area by allowing the efficient transport of essential goods and services and also providing for industries that are heavily dependent on large vehicle transport.

A15.4 Changes to Methodology

The methodology and approach of this assessment follows that outlined in Chapter 15: Roads and Traffic, Section 15.4 in the 2007 ES.

No further baseline traffic surveys are considered necessary as it is not anticipated that baseline traffic has changed significantly since the preparation of the 2007 ES.

A15.5 Changes to Baseline Conditions

The 2007 ES considered three principal route options for traffic accessing the site (a site visit was undertaken to visually assess the general nature and condition of the routes being considered) and these are summarised in Table A15.2. The 2007 ES concluded that Route Option 1 was the preferred route for construction traffic. Route Option 2 was not considered suitable due to the absence of a port for materials delivery and reliance on single track roads with passing places, and Route 3 was considered possible for light vehicles but was not preferred for HGVs.

The Section 15.5.4: Field Studies of the 2007 ES refers to the single track nature of the A836 west of Melvich and Section 15.5.5: Modifying Influences of the 2007 ES refers to the failed attempts to fund its upgrade to two lanes. This section of the A836 forms part of Route Options 1 and 3 (see Figure 15.4 of 2007 ES) and was highlighted as a network constraint on these two routes in the 2007 ES. However, this section of the A836 has been subsequently upgraded to two lanes in the intervening period and therefore a revised Route Option Summary is provided in Table A15.2.

Table A15.2: Route Option Summary

Route Option	Length from	Length of A-class Road	Sensitive Locations	Network Constraints
Route 1	Scrabster: 32.0 km	100%	Scrabster; Bridge of Forss; Reay/Isauld; Melvich; Strathy	No network constraints identified.
Route 2	Tongue: 37.3 km	100%	Bettyhill; Strathy	Single track road with passing places
Route 3	Helmsdale: 68.4 km	100%	Kinbrace	No network constraints identified.

The proposed site access has changed from the Original 2007 Scheme which proposed to use an existing junction located approximately 1 km east of the entry to Strathy village, leading south from the junction with the unclassified road leading to Baligill. The Modified 2013 Scheme proposes to use the consented, but currently undeveloped, Strathy village bypass which is proposed for the Strathy North Wind Farm that leaves the A836 at NGR 285247, 965160. From this access the construction traffic would use the consented, but as yet undeveloped, Strathy North access track and subsequently use a proposed new track between Strathy North and Strathy South (Figure A4.1).

No further updates to the baseline conditions are necessary and they remain as outlined in Chapter 15: Roads and Traffic, Section 15.5 in the 2007 ES.

A15.6 Changes to Impacts Evaluation

A15.6.1 Basis of Assessment

The basis of assessment generally follows that outlined in Chapter 15: Roads and Traffic, Section 15.6.1 in the 2007 ES. However, the Modified 2013 Scheme has thirty less, although bigger, turbines than proposed in the Original 2007 Scheme. As a result of the changes the following should be noted:

- The Original 2007 Scheme assumed that the required forestry clearance would be felled and mulched on site, while the Modified 2013 Scheme allows for a mixture of mulching and timber extraction. The additional traffic movements associated with the timber extraction are considered in this chapter although as previously stated this is to allow for a worst case assessment. The applicant may delay the removal of wood from the site if drying becomes a requirement for subsequent biomass opportunities. Therefore final timing of forestry traffic would be confirmed as part of the Traffic Management Plan;
- The Original 2007 Scheme assumed that all stone for track construction would be sourced from borrow pits on-site. It has now been determined that some stone may have to be imported to site for the initial enabling works i.e. top dressing of the existing road until such time that the track is widened, construction of the new access track linking the consented Strathy North Wind Farm to the Strathy South Wind Farm, the associated new bridge across the River Strathy and the establishment of a temporary construction compound;
- The concrete volumes are proposed to be less due to the reduced number of turbines, but an increase in foundation volume has been considered as a result of using a larger turbine;
- The Original 2007 Scheme assumed that water would be tankered onto site for the concrete batching. Water is now proposed to be abstracted on-site. Figure A4.1 shows the proposed locations of the surface water abstractions;
- The cable run length is assumed to be the same;
- The balance of deliveries (i.e. cabling, control room equipment, reinforcing steel, plant fuel, balance of switching station plant, culvert pipes, geotextile membrane and transformers etc.) is assumed to be the same as those calculated for the Original 2007 Scheme; and
- The number of movements associated with turbine delivery and erection is significantly less than the Original 2007 Scheme due to reduction in number of turbines. However these numbers were not included in the impact assessment of the 2007 ES (an abnormal load assessment has been undertaken which proposes that the route is suitable for the movement of the anticipated loads, although careful manoeuvring would be required at several key locations with mitigation required to accommodate the anticipated abnormal load movements at some).

Therefore, the assessment is based upon the following assumptions and the revised construction traffic requirements as summarised in Table A15.3:

- Forestry clearance would be undertaken by felling and a mixture of mulching and timber extraction;
- Stone for track construction would be a mixture of imported stone and stone sourced from borrow pits on-site
- Concrete would be batched on-site
- Water for concrete batching would be abstracted from on-site sources
- Due to the nature of materials and plant required on-site, the majority of vehicles utilised would be HGVs.
- The construction programme is estimated to be 24 months, with construction deliveries phased in accordance with Table A15.4

- Construction personnel/deliveries have been estimated from previous projects as an average of fifty vehicles accessing the site per day.
- Construction traffic is expected to access the site via Route 1. Light traffic may use Route 3.

Table A15.3: Estimated Goods Vehicle Traffic Deliveries

Movement	Total number	Delivery days	Average per day
Forestry Equipment (in)	8	7	2
Forestry Equipment (out)	8	7	2
Construction Plant (in)	44	7	7
Construction Plant (out)	44	7	7
Stone Import	1,572	52	31
Concrete - Aggregate	869	234	4
Concrete – Cement	263	234	2
Concrete – Sand	869	234	4
Concrete – Water	0	-	-
Cabling Sand	896	130	7
Balance of Deliveries	397	624	1
Turbine Delivery	423	156	3
Forestry Extraction	1,086	416	3
Total Vehicles	6,479	624	11

Table A15.4: Construction Deliveries Phasing (HGV and Abnormal Loads)																								
Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**Total**
Forestry Plant	6	2																					4	4	8
Construction Plant	5	3	5	28	3														1	5	5	18	10	5	44
Forestry Clearance	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	1086
Stone Import	786	786																							1572
Concrete Materials					177	221	230	235	257	257	257	195	178												2001
Cabling Sand												180	180	180	180	176									896
Other	1	1	1	1	1	19	44	23	23	23	21	19	19	19	23	23	23	25	21	20	19	13	9	6	397
Turbine Delivery														71	71	71	71	71	71						423
Totals	843	837	51	74	226	285	319	303	325	325	323	439	422	315	319	315	139	141	138	70	69	76	68	60	6482
Working Days	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	624
Daily Average	33	33	2	3	9	11	13	12	13	13	13	17	17	13	13	13	6	6	6	3	3	3	3	3	11

A15.6.2 Receptor Sensitivity

Table 15.9: Receptor Sensitivity included in the 2007 ES considered the single track section of the A836 west of Melvich as a sensitive receptor. However, since this route been upgraded to a two-lane carriageway, a revised summary of the sensitive receptors is provided in Table A15.5.

Table A15.5: Receptor Sensitivity

Receptor	Low	Medium	High	Comments
Scrabster	X			Existing Port of Entry for construction equipment and materials for Dounreay
Bridge of Forss	X			Small rural settlement, few community or public facilities and services
Reay/Isauld		X		Intermediate sized rural settlement, containing some community or public facilities and services
Melvich	X			Small rural settlement, few community or public facilities or services
Strathy	X			Not on preferred route
Bettyhill	X			Not on preferred route
Kinbrace	X			Not on preferred route for HGV vehicles

A15.6.3 Construction Impacts

As a result of the changes in HGV construction traffic movements introduced in A15.6.1, the impact of construction traffic on the local roads network has been assessed at the two relevant sites for which Automated Traffic Count (ATC) data is available on Route 1, the preferred delivery route. The flows at these locations are shown in Table A15.6 along with the predicted increase in HGV traffic at those locations attributable to construction traffic. For each ATC site, the full Daily Average number of vehicles has been loaded to that link, whereas in practice, particularly for non-HGV vehicles, there would be a potential routing choice, reducing the number of vehicles passing any individual counter site.

Table A15.6: Existing and Predicted HGV Flows

Location	2000 AADF	2000 HGV	Predicted average daily increase of HGV (2-way movements)	Percentage increase in HGV (2-way movements)
A836 Strathy	596	48	22	45.8%
A836 Bridge of Foss	2,651	188	22	11.7%

The increase in HGV traffic is greater than the 30% 'trigger' stated in Rule 1 in the "Guidelines for the Environmental Assessment of Road Traffic"[1], at the A836 at Strathy ATC location. This monitoring site is to the west of the proposed access junction, and HGV traffic from the east would not pass through the village of Strathy. It is evident however, that the base flows and the added flows due to construction are all very low. An average

[1] Institute of Environmental Assessment, 1993

construction day would create approximately one to two additional HGV movements per hour in each direction over the course of the working day. The predicted increase in HGV movements is based upon the relevant ATC sites for which HGV content is available. The impact would be temporary, and moderated to a certain extent by the best practice measures identified in Chapter 15: Roads and Traffic, Section 15.6.1(a) in the 2007 ES.

No update to the magnitude of the non-HGV congestion impact is necessary and remains as outlined in Chapter 15: Roads and Traffic, Section 15.6.3(a) in 2007 ES.

As a result of the changes in HGV construction traffic movements, the cumulative impact of HGV and staff traffic at the relevant ATC recording sites has been reassessed and is summarised in Table A15.7.

Table A15.7: Existing and Predicted HGV Flows

Location	2000 AADF	Predicted total average daily increase in vehicles (2-way movements)	Percentage increase – all vehicles (2-way movements)
A836 Strathy	596	122	20.5%
A836 Bridge of Foss	2,651	122	4.6%

The predicted additional number of vehicles of all types during the construction phase is moderate, and falls below the 30% 'trigger' stated in Rule 1 in the "Guidelines for the Environmental Assessment of Road Traffic". However, on the A836 at Strathy, the increase in HGV flow is greater than the 10% 'trigger' cited in Rule 2. This is classified as a 'slight' change to traffic volumes.

In summary, although the percentage increase in HGV trips is assessed as being high, in percentage terms at the A836 Strathy count location, the additional traffic is low in actual volumes. Therefore, professional judgement has been used to determine that the magnitude of the congestion impact would be medium. As stated above, only low numbers of light vehicles are expected to use the A897. The magnitude of the Congestion Impact is summarised in Table A15.8.

Table A15.8: Magnitude of Congestion Impact

Impact	Low	Med	High	Comment
Increase in HGV movements		X		Low average daily number of movements over phased construction period
Increase in non-HGV movements	X			Peaked flows at start/end of working day

Table 15.14: Effects Significance – Congestion of the 2007 ES associated with the congestion impact of additional HGV movements during the construction phase, considered the A836 west of Melvich as a sensitive receptor. This section of the A836 is no longer considered to be a sensitive receptor and therefore has been excluded from the revised summary of the congestion impacts, of additional HGV movements during the construction phase assuming that HGV's use Route 1. Also, Reay/Isauld is assessed in the 2007 ES as being of medium sensitivity and therefore applying the Impacts Significance methodology the significance of the construction congestion should have been assessed as being of moderate significance and therefore, this error has been corrected in this chapter. Additionally, considering that the HGV movements are to use Route 1, the impacts of HGV congestion at Strathy, Bettyhill and Kinbrace have been excluded from the revised summary of the congestion impacts. The revised impacts significance for the Modified 2013 Scheme is provided in Table A15.9.

Table A15.9: Impacts Significance – Congestion	
Receptor	**Significance of Construction Congestion Impacts**
Scrabster	Low Significance
Bridge of Forss	Low Significance
Reay/Isauld	Moderate Significance
Melvich	Low Significance

Table 15.15: Effects Significance – Wear and Tear of the 2007 ES associated with wear and tear impacts of additional HGV movements during the construction phase, considered the A836 west of Melvich as a sensitive receptor. This was because this section of the A836 was single track and there was the potential for wear and tear due to the probability of vehicle over-run onto the soft verge and the possibility of structural damage to the road pavement. However, as discussed above, this section of road is no longer considered to be a sensitive receptor and therefore has been excluded from the revised summary of the wear and tear impacts. Also, Melvich is assessed in the 2007 ES as being of low sensitivity and therefore applying the Impacts Significance methodology the significance of wear and tear should have been assessed as being of low significance and therefore, this error has been corrected in this chapter. Also considering that the HGV movements are to use Route 1, the impacts of HGV wear and tear at Strathy, Bettyhill and Kinbrace have also been excluded from the revised summary of the wear and tear impacts. Applying the methodology introduced in the 2007 ES, Table A15.10 shows the revised significance of the Wear and Tear Impact of additional HGV movements during the construction phase.

Table A15.10: Impacts Significance – Wear and Tear	
Receptor	**Significance of Construction Wear and Tear Impacts**
Scrabster	Low Significance
Bridge of Forss	Low Significance
Reay/Isauld	Moderate Significance
Melvich	Low Significance

A15.6.4 Operational Impacts

The predicted operational impacts were scoped out of the 2007 ES and this remains unaltered for the Modified 2013 Scheme.

A15.6.5 Cumulative Impacts

No cumulative impacts were considered in the 2007 ES and this remains unaltered in the Modified 2013 Scheme.

A15.7 Changes to Mitigation

A few changes are proposed to the mitigation measures as defined in Chapter 15: Roads and Traffic, Section 15.6 in the 2007 ES and updated sections on concrete batching, forestry clearance and haulage by rail follow that supersede those in the 2007 ES.

A15.7.1 Concrete Batching

It is assumed that the concrete works will be carried out by installing a batching plant on-site, and to deliver aggregate and cement in tippers and tankers. By batching on-site, the number of vehicle loads required is significantly reduced over the duration of the construction phase.

A15.7.2 Forestry Clearance Activity

There has been a change in approach from the Original 2007 Scheme with respect to forestry clearance. The Original 2007 Scheme assumed that the required forestry clearance would be felled and mulched on-site, while the Modified 2013 Scheme allows for a mixture of mulching and timber extraction as explained in Chapter A4: Development Description. The additional traffic movements associated with the timber extraction are considered in this chapter.

A15.7.3 Potential for haulage of bulk materials by Rail

The potential for haulage of bulk materials by Rail is no longer considered as a mitigation measure.

A15.8 Changes to Monitoring

No monitoring was defined in Chapter 15: Roads and Traffic, Section 15.6 in the 2007 ES.

A15.9 Changes to Summary & Conclusion

This ES Addendum chapter has updated the assessment of the potential roads and traffic impacts of the Modified 2013 Scheme. This has resulted in the removal of the A836 between Melvich and Strathy as a sensitive receptor due to road upgrades since 2007 and the removal of the settlements of Strathy, Bettyhill and Kinbrace from the assessment of congestion impacts considering that the HGV movements are to use Route 1 i.e. HGV traffic will not pass these settlements. Also, applying the methodology as described in the 2007 ES and to be consistent with the assessments provided in Table A15.9 and Table A15.10 a revised summary of the roads and traffic impacts is provided in Table A15.11.

Table A15.11: Summary of Roads and Traffic Impacts

Construction Impacts	Impact	Potential Impacts on Receptors	Specific Receptor Identified in Scoping	Sensitivity	Impact Magnitude	Impact Significance
Traffic	Increase in HGV Traffic	Traffic Congestion on Local Roads	Scrabster	Low	Medium	Low Significance
			Bridge of Forss	Low	Medium	Low Significance
			Reay/Isauld	Medium	Medium	Moderate Significance
			Melvich	Low	Medium	Low Significance
	Increase in non-HGV Traffic	Traffic Congestion on Local Roads	Scrabster	Low	Low	Insignificant
			Bridge of Forss	Low	Low	Insignificant
			Reay/Isauld	Medium	Low	Low Significance
			Melvich	Low	Low	Insignificant
			Strathy	Low	Low	Insignificant
			Bettyhill	Low	Low	Insignificant
			Kinbrace	Low	Low	Insignificant
	Increase in HGV	Wear and	Scrabster	Low	Medium	Low Significance

Table A15.11: Summary of Roads and Traffic Impacts						
Construction Impacts	**Impact**	**Potential Impacts on Receptors**	**Specific Receptor Identified in Scoping**	**Sensitivity**	**Impact Magnitude**	**Impact Significance**
	Traffic	Tear	Bridge of Forss	Low	Medium	Low Significance
			Reay/Isauld	Medium	Medium	Moderate Significance
			Melvich	Low	Medium	Low Significance

No updates are required to Table 15.17: Potential Construction Impacts on Roads and Traffic or Table 15.18: Potential Ongoing Impacts on Roads and Traffic from the 2007 ES.

Table A15.12 summarises the potential traffic impacts of the proposed wind farm, the mitigation proposed and the potential significant residual impact.

Table A15.12: Summary of Potential Impacts of the proposed wind farm, Mitigation and Residual Impacts			
Likely Significant Impact	**Mitigation Proposed**	**Means of Implementation**	**Outcome/Residual Impact**
Construction			
Increase in HGV Traffic	Traffic Management Measures and Route Selection	Creation of a Traffic Management Plan	Management of increased traffic/No Significant Impact
Increase in non-HGV Traffic	Traffic Management Measures and Route Selection	Creation of a Traffic Management Plan	Management of increased traffic/No Significant Impact
Operation			
None – Nominal associated increase in traffic.	-	-	-

A17 Summary

The purpose of this chapter is to summarise the mitigation measures which are proposed in each of the technical chapters, to avoid, reduce or offset residual environmental effects. The effects and mitigation measures are presented in Table 17.1.

Environmental effects and associated mitigation measures are presented in the order in which they appear within this ES:

- Landscape;
- Visual;
- Ecology;
- Birds;
- Noise;
- Cultural Heritage;
- Soil and Water;
- Roads and Traffic;
- Other Issues.

The ES Addendum presents the consultation responses from the 2007 ES and the updated consultation following further design iterations and shows how the design of the Modified 2013 Scheme has responded and addressed the objections that were raised in relation to the Original 2007 Scheme.

The design process for the site layout included the consideration of additional environmental information that has been gathered since the 2007 ES was submitted. The Modified 2013 Scheme has been designed to reduce effects and, where possible, to avoid areas of environmental constraints, e.g. in relation to areas of deep peat, archaeological assets, birds and sensitive habitats.

This chapter covers the mitigation measures proposed to avoid, reduce or off-set design, construction, operation and decommissioning phase residual environmental effects of the Modified 2013 Scheme. This chapter does not summarise 'mitigation by design'.

Most of the pre-construction and construction phase mitigation would be delivered through a Construction Environmental Management Plan (CEMP). The content of the CEMP is described in Chapter A4: Development Description, with a CEMP provided in Technical Appendix A4.1.

Table A17.1: Schedule of Mitigation and Monitoring Measures

Topic	Issue	Mitigation Proposed	Means of Implementation	Outcome/ Residual Impact	Timing
Landscape and Visual	Short term, construction temporary land take and ground disturbance for the temporary construction compound, material stock piles; concrete batching plant, borrow pits; access tracks; crane pads; and groundworks for cable infrastructure on the following: ▪ Physical landscape features, e.g. coniferous woodland plantation. ▪ Landscape character receptors – landscape character types/units, designated landscapes, WLSAs. ▪ Views experienced by different receptors, e.g. residents, road users, stalkers, walkers. ▪ Short term, reversible cumulative landscape and visual effects.	The majority of mitigation has been achieved through design and through careful siting of the infrastructure. A CEMP would be prepared and submitted for the written approval of the planning authority, SNH and SEPA prior to construction commencing. The CEMP would include an Excavated Materials and Reinstatement Plan, which would set out the land reinstatement and landscaping proposals for the restoration of temporary land take areas, borrow pits and other areas of ground disturbance.	All works to be undertaken in accordance with the CEMP. The Environmental Clerk of Works on site would ensure reinstatement measures set out in the CEMP are followed.	Impacts range from Negligible to Moderate Adverse across a range of landscapes	Pre-Construction/ Construction
Ecology	Temporary loss or disturbance to non-designated habitats as a result of underground cable grid connection installation and machinery movement during the construction phase.	▪ Demarcation of working zones to limit the potential area of damage and disturbance. ▪ Use of micro-siting where necessary and appropriate under advisement by	▪ Detail to be provided in CEMP (Technical Appendix A4.1). ▪ Contractors to provide construction	Minor Adverse	Construction

Table A17.1: Schedule of Mitigation and Monitoring Measures					
Topic	**Issue**	**Mitigation Proposed**	**Means of Implementation**	**Outcome/ Residual Impact**	**Timing**
	Temporary loss or disturbance to SAC-designated habitat as a result of underground cable grid connection installation and machinery movement during the construction phase.	ECoW. ▪ Periodic checks of vehicles for leaks and implementation of best practice as outlined by method statements. ▪ Timings of works to avoid periods of heavy rainfall.	method statements. ▪ All works to be supervised by an ECoW. ▪ Watercourse crossings would be designed to allow continued movement of otter and water vole.	Minor Adverse	Construction
	Disruption to protected fauna from noise, habitat fragmentation, road related mortality, decrease in prey resources, and habitat loss/change and disturbance during arising from construction and operational activities.	▪ Underground cable installation adjacent to the access route through between Strathy North and Strathy South would use cable ploughing technique and machinery operating from the upgraded track or bog mats to minimise disruption to peat and surface vegetation. ▪ Reinstatement of areas of disturbance as soon as feasibly possible using existing previously removed vegetation. ▪ Restrictions on vehicle speeds to reduce mortality risk. ▪ Restrictions of works in/near waterbodies and riparian zones. ▪ Watercourse crossings designed to avoid water vole habitat; ▪ Ensure no restriction on otter/water vole movement along water features.		Impacts range from Neutral to Minor Adverse	Construction / Operation / Ongoing
	Direct and indirect impact on SAC-designated habitat through upgrading of the access track and installation of	▪ Habitat restoration activities will be undertaken in order to compensate for habitat impacts as outlined in A10.5.3.	CEMP, Habitat Management Plan and Deer Management Plan	Neutral/ Minor Beneficial	Operation / Ongoing

Table A17.1: Schedule of Mitigation and Monitoring Measures

Topic	Issue	Mitigation Proposed	Means of Implementation	Outcome/ Residual Impact	Timing
	cable jointing areas along the grid connection between Strathy South Wind Farm and Strathy Wood.	▪ Specific vegetation monitoring programme will be implemented to ensure no further unforeseen degradation to SAC habitats occurs. ▪ Monitoring of potential large herbivore impacts within the SAC caused by displacement from afforested areas will be implemented. A programme of culling would be agreed where required.	documents.		
	Direct and indirect impact on non-designated protected habitats through installation of wind farm infrastructure (this includes all aspects of the Modified 2013 Scheme).			Likely Moderate Beneficial	Operation / Ongoing
	Temporary loss or disturbance to SAC designated habitats through ongoing operational and maintenance activities e.g. track maintenance between Strathy South and Strathy Wood.			Negligible	Operation / Ongoing
	Indirect impact on SAC-designated habitat by displaced deer from Strathy South Forest.			Minor Adverse	Operation / Ongoing
	Direct and indirect impact on non-designated habitats through ongoing operational and maintenance activities within Strathy South Forest and Strathy North Forest e.g. upgrading tracks, drainage works.			Negligible	Operation / Ongoing
Birds	Disturbance to breeding birds	Pre-commencement breeding bird surveys (covering the site and standard buffers	An ECoW would be appointed to oversee	Negligible	Construction

Table A17.1: Schedule of Mitigation and Monitoring Measures					
Topic	**Issue**	**Mitigation Proposed**	**Means of Implementation**	**Outcome/ Residual Impact**	**Timing**
		around it, for moorland breeding birds, raptors and divers) The deployment of a suitably qualified ECoW team to carry out pre-clearance checks ahead of forest or open habitat removal; Retention of selected forest blocks for screening, the use of additional screening bunds if required (along the access track (for red-throated divers and possibly hen harriers); Traffic management measures (no horns sounded, no stop zones, no personnel out of vehicles etc.), On-going monitoring for all breeding birds on and adjacent to the site through the construction period, and the implementation of strict activity-free buffers to prevent disturbance, where breeding birds occur. The above measures would be incorporated into a Breeding Bird Protection Plan which would form part of the CEMP. The CEMP would be agreed in consultation with SNH and SEPA prior to the commencement of construction works. All works would be completed in compliance with the CEMP.	works are undertaken in accordance with CEMP.		

Table A17.1: Schedule of Mitigation and Monitoring Measures					
Topic	**Issue**	**Mitigation Proposed**	**Means of Implementation**	**Outcome/ Residual Impact**	**Timing**
	Collision Risk to red-throated diver	In consultation with SNH, dual approach of diverting red-throated diver breeding from within identified lochan, and provision of diver rafts off-site. The lochan within Strathy South is relatively small, and a combination of buoys, floats and flags is an example of how this could be delivered to ensure any prospecting birds were diverted from on-site lochans. The provision and maintenance of diver rafts would be for the duration of the wind-farm's operational life, at locations to be agreed with SNH.	Outline HMP to be finalised into a Detailed HMP as a condition of consent.	Minor Adverse	Operation
	Collision Risk to black-throated diver	Diver rafts provision off-site, at locations to be agreed with SNH. The provision and maintenance of diver rafts would be for the duration of the wind-farm's operational life.	Outline HMP to be finalised into a Detailed HMP, as a condition of consent.	Negligible	Operation
	Collision Risk to other species	Outline Habitat Management Plan that has been proposed as part of the overall mitigation package, which includes measures (vegetation and bird monitoring, control of conifer regeneration, provision for mechanical vegetation control and grazing, and drain blocking) that would all combine to reduce the extent of suitable nesting habitat on-site to reduce the risk of this risk of attracting additional breeding or foraging activity for other species.	Outline HMP to be finalised into Detailed HMP as a condition of consent.	Negligible	Operation

Table A17.1: Schedule of Mitigation and Monitoring Measures					
Topic	**Issue**	**Mitigation Proposed**	**Means of Implementation**	**Outcome/ Residual Impact**	**Timing**
	Displacement of breeding birds	Removal of forest plantation (with restoration of underlying peatland), combined with enhancement of non-forested peatland.	Outline HMP to be finalised into a Detailed HMP, as a condition of consent.	Minor Adverse	Operation
Noise	Noise at residential properties from road traffic generated by construction traffic.	No construction traffic outside pre-agreed times.	Agreement with LPA and implementation of Construction Method Statements	No significant residual impact	Construction
Cultural Heritage	Accidental damage to previously unrecorded archaeological features	A post-felling field survey would be undertaken in advance of construction and a targeted watching brief would be implemented.	Written Scheme of Investigation (WSI) to be agreed with THC Archaeologist prior to commencement of ground works and incorporated into the CEMP. WSI to be communicated to by the construction contractor to all relevant staff, subcontractors and plant operators via the induction and toolbox talks prior to commencement of any ground works.	Negligible	Construction
Soil and Water	Detrimental impacts on water quality on-site and downstream	Appropriate drainage design that incorporates measures to attenuate and treat runoff from access tracks, hard standing areas, construction compound	CEMP to be submitted for the written approval of the planning authority, SNH and SEPA prior to	Minor Adverse to No Significance	Pre-construction / Construction / Operation
	Detrimental impacts to fisheries on-site and downstream as a				

Table A17.1: Schedule of Mitigation and Monitoring Measures					
Topic	**Issue**	**Mitigation Proposed**	**Means of Implementation**	**Outcome/ Residual Impact**	**Timing**
	result of changes to water quality Increase to on-site and downstream flood risk as a result of poor construction practices (including poor construction of watercourse crossings)	and turbine areas. The CEMP will include details of measures to prevent pollution and all work would be completed in compliance with the CEMP. The CEMP will include measures (but not be limited) regarding: ▪ Appropriate storage and handling of potential pollutants; ▪ Refuelling of construction plan in designated areas; ▪ Restrictions on certain construction activities during periods of prolonged and/or intense wet weather; ▪ Adoption and agreement on emergency measures should significant effects occur; ▪ Appropriate design of watercourse crossings to maintain hydraulic connectivity; ▪ Drainage Management Plan; ▪ Watercourse crossing assessment (detailed design prior to construction); and ▪ Water quality monitoring programme (prior to and during construction. ▪ Watercourse crossings designed to accommodate the 1 in 200 year flood. Locations of any temporary peat or soil storage areas would be carefully selected so that erosion and runoff is limited,	construction commencing.		

Table A17.1: Schedule of Mitigation and Monitoring Measures					
Topic	**Issue**	**Mitigation Proposed**	**Means of Implementation**	**Outcome/ Residual Impact**	**Timing**
		leachate from the stored material is controlled and stability of the existing ground, particularly in peatland areas, is not affected.			
	Increase risk of peat slide risk as a result of poor construction and management of peat stockpiles.	Adoption of appropriate storage and re-use of peat in line with best practice guidelines and site conditions. For example, locations of any temporary peat or soil storage areas would be carefully selected so that erosion and runoff is limited, leachate from the stored material is controlled and stability of the existing ground, particularly in peatland areas, is not affected.	Adoption of a geotechnical risk register. Implementation of the Peat Management Plan (PMP). ECoW to oversee the appropriate storage of peat.	Minor Adverse to No Significance	Construction
	Increase risk of peat slide as a result of desiccation or wetting of peat.	Appropriate drainage design that incorporates sediment management measures to attenuate and treat runoff from wind farm infrastructure. Turves would be stored turf side up and would be wetted to minimise risk of desiccation. Peat stockpiles would be a minimum of 50 m from watercourses.	Adoption of a geotechnical risk register. The condition of stored turves to be monitored by the ECoW.	Minor Adverse to No Significance	Construction

Table A17.1: Schedule of Mitigation and Monitoring Measures					
Topic	**Issue**	**Mitigation Proposed**	**Means of Implementation**	**Outcome/ Residual Impact**	**Timing**
	Long-term degradation of peat as a result of interrupting surface and sub-surface drainage pathways. Disruption of drainage patterns can cause pooling and / or desiccation of peat.	Appropriate drainage design that incorporates sediment management measures to attenuate and treat runoff from wind farm infrastructure. Drainage measures could include interceptor ditches, down slope drainage collection systems, containment berms (embedded where appropriate). Appropriate reuse and management of waste peat in line with principles of best practice guidance and site conditions.	Implementation of the Peat Management Plan (PMP).	Minor Adverse to No Significance	Construction
	Peat slide hazard rating of access tracks	Six areas of access track are located in areas of medium hazard. However, through micrositing the impact would be reduced to insignificant.	Micrositing of access tracks	No Significant Impact	Construction / Operation
	Detrimental impacts to on-site and downstream water quality through degradation of site infrastructure and poor storage of materials	Appropriate drainage design that incorporates sediment management measures to attenuate and treat runoff from wind farm infrastructure. Appropriate storage and handling of potential pollutants. Adoption of a long-term operational drainage and monitoring programme to monitor degradation of infrastructure (including the removal of blockages from watercourse crossings). Operational drainage and monitoring plan (designed prior to construction).	CEMP to be submitted for the written approval of the planning authority, SNH and SEPA prior to construction commencing. The CEMP would include details of a Water Quality Monitoring Plan the details of which would be agreed with SEPA, Marine Scotland and the Northern District	Minor Adverse to No Significance	Operation
	Detrimental effects to on-site and downstream fisheries as a result of changes to water quality (as described above)				
	Increases to on-site and downstream flood risk as a				

Table A17.1: Schedule of Mitigation and Monitoring Measures					
Topic	**Issue**	**Mitigation Proposed**	**Means of Implementation**	**Outcome/ Residual Impact**	**Timing**
	result of degradation of infrastructure and/or poor maintenance/monitoring of infrastructure	Plan can detail the appropriate monitoring methods, including: ▪ Visual monitoring and completion of checklists signed off by SEPA; ▪ Regular water quality monitoring for a period post construction to determine potential long terms effects of wind farm on water quality.	Salmon Fishery Board.		
Roads and Traffic	Increase in HGV Traffic during construction.	Road condition survey to be undertaken relating to the condition of the A836 from its junction with the A9(T) at Scrabster to the Site Access junction prior to the commencement of works on site and a repeat survey to be undertaken on completion of the construction period. All work to comply with a Traffic Management Plan (TMP) which would include (but not be limited to): establishment of a management co-ordination group to include THC, BEAR Scotland, Northern Constabulary and the haulage contractor; police escort for abnormal loads from the docks to the site; timing of delivery of escorted loads to be during daylight hours for safety reasons; regulated site working hours; driver inductions; additional, temporary warning and speed control signs, where appropriate.	Road condition survey to be implemented through a planning condition. TMP to be submitted for approval by the THC.	No Significant Impact	Construction

Table A17.1: Schedule of Mitigation and Monitoring Measures					
Topic	**Issue**	**Mitigation Proposed**	**Means of Implementation**	**Outcome/ Residual Impact**	**Timing**
	Increase in non-HGV Traffic during construction.	As above.	As above	No Significant Impact	Construction
Other Issues	MOD Low Flying Aircraft	An aviation lighting scheme would be submitted for the written approval of the planning authority (in consultation with the MOD).	Aviation Lighting Scheme	No Significant Impact	Pre-construction, Construction and Operation Phases
		The Applicant is working with MOD to agree a mitigation solution in relation to low flying.	Condition of consent.	No Significant Impact	Pre-construction, Construction and Operation Phases

A2 Background

A2.1 Introduction

This chapter presents the rationale for the proposed wind farm development and provides updates to the 2007 ES on the following areas:

- The climate change context;
- Renewable energy policy; and
- Alternative technologies considered to meet the Applicant's renewable obligation.

A2.2 Climate Change

A2.2.1 Causes and Effects

No updates are required to this section.

A2.2.2 Climate Change Programme

In January 2008, the European Commission published the "three 20 targets" package. This included proposals for reducing the European Union's greenhouse gas emissions by 20% and increasing the proportion of final energy consumption from renewable sources to 20%. Both targets are to be achieved by 2020, as set out in the Renewable Energy Directive from the European Commission (Directive 2009/28/EC), which was published in its final form in March 2009.

The EU aims to see 20% of all energy consumed to be from renewable sources. The 20% is split between Member States. For the UK, the European Commission's proposals include 16% reduction in UK greenhouse gas emissions by 2020 and for 15% of all energy consumed in the UK to come from renewable sources by 2020[1].

The UK Government retains control of the overall direction of energy policy including the attainment of UK national targets on renewable energy generation. Since devolution in 1999, some energy policy issues have been devolved to Scotland such as energy efficiency and renewable energy (including consents for generating plants covered by the Electricity Act 1989). Encouraging more electricity generation from renewable sources is an important element of both the UK and Scottish Climate Change Programmes.

A2.3 Renewable Energy Policy

A2.3.1 UK Renewable Energy Strategy (2009)

The UK Renewable Energy Strategy (UKRES) states that the UK needs to radically increase the use of renewable electricity. The document sets out the means by which the UK can meet the legally binding target of 15% of all energy consumption from renewable sources by 2020. This will mean a very substantial increase in the share of renewables within about a decade.

The UKRES contains a 'lead scenario', which suggests that more than 30% of electricity should be generated from renewables in the UK by 2020, which would be up from approximately 5.5% in 2009. The majority of this is expected to come from wind power, both on and offshore. The UKRES states (paragraph 2.38) that the earliest interim target (2011 - 2012) *"will be most challenging".*

The document makes it clear that the UKRES is an integral part of the Government's overall UK Low Carbon Transition Plan and that the Devolved Administrations have a leadership role to undertake. The Strategy was published by the UK Government and the policies to

[1] This 15% figure compares to only 3% in 2009, as confirmed in the National Renewable Energy Action Plan for the UK, page 5, July 2010

meet the 2020 targets will be taken forward in England, Scotland and Wales, Great Britain or on a UK-wide basis as appropriate and in accordance with each devolution arrangement. The document makes it clear that each of the Devolved Administrations are setting out their own plans to increase renewable energy use and that *"the UK Government and the Devolved Administrations are working together to ensure that our plans are aligned" (*UKRES, paragraph 8.18).

A2.3.2 UK Low Carbon Transition Plan (2009)

Along with the UKRES, the UK Government published the UK Low Carbon Transition Plan as a White Paper in July 2009. The plan seeks to deliver greenhouse gas emission cuts of 18% on 2008 levels by 2020 (and over a third reduction on 1990 levels), and emphasises that the UK will need to drive major changes to the way energy is used and supplied.

It seeks to ensure that the UK will get 40% of electricity from low carbon sources by 2020, with policies to produce approximately 30% of UK electricity from renewables by 2020, by substantially increasing the requirement for electricity suppliers to sell renewable electricity.

The White Paper explains that the UK Government has put in place the world's first legally binding target to cut emissions by 80% by 2050 and it has set five year 'carbon budgets' to 2022 to 'keep the UK on track' and which provide a clear pathway for reducing emissions in the future (page 6). The White Paper for the first time sets out how these budgets will be met.

Overall, the White Paper sets out the specific proposals and policies for meeting the UK's carbon budgets. The White Paper also makes the point that the introduction of carbon budgets introduces a new imperative: they are legally binding and must be met.

A2.3.3 The UK Energy Roadmap (July 2011)

The Department of Energy and Climate Change (DECC) issued the 'UK Renewable Energy Roadmap' in July 2011, alongside the Government's Electricity Market Reform White Paper. The foreword explains that the document is "the UK's first Renewable Energy Roadmap" and that it "sets out our shared approach to unlocking our renewable energy potential".
The introduction explains that the goal is to ensure that 15% of UK energy demand is met from renewable sources by 2020. As stated in paragraph 1.3 of the Roadmap, the Government's ambition extends beyond 2020 and the Committee on Climate Change (CCC) has *"concluded that there is scope for the penetration of renewable energy to reach 30 – 45% of all energy consumed in the UK by 2020"* (page 9). The Roadmap sets out a delivery plan to achieve the UK's renewable energy target over the next decade, based upon potential deployment levels and current constraints. In paragraph 3.13, the document makes it clear that there is still a need to tackle challenges to deployment and that new proposals will also be required to come forward to meet the 2020 ambition, as well as longer term decarbonisation objectives.

A2.3.4 The Electricity Market Reform White Paper (July 2011) and the draft Energy Bill (May 2012)

In July 2011 the Government published 'Planning our electric future: a White Paper for secure, affordable and low-carbon electricity'. The White Paper sets out key measures to attract investment, reduce the impact on consumer bills, and create a secure mix of electricity sources including gas, new nuclear, renewables, and carbon capture and storage.
Following on from the publication of this White Paper, the Government published the draft Energy Bill in May 2012. The draft Bill includes measures necessary to reform the electricity market to deliver secure, clean and affordable electricity.

A2.3.5 The Climate Change (Scotland) Act 2009

Part 1 of the Act sets the statutory framework for greenhouse gas emission reductions in Scotland by setting an interim (world leading) 42% reduction target for 2020 and an 80% reduction target for 2050, from the baseline, which for CO2 is based on 1990 emission levels. Part 1 of the Act also requires The Scottish Ministers to set annual targets in secondary

legislation, for Scottish emissions from 2010 to 2050 to ensure that the 2050 target is attained. Part 1 of the Act also requires the Scottish Government to publish a land use strategy by 31 March 2011 setting out land use objectives to aid the achievement of the 2020 and 2050 targets.

Reductions in greenhouse gas emissions for energy generation are a key component to achieve the above targets. The Act places a statutory requirement on The Scottish Ministers to set appropriate levels for energy generation to contribute to meeting the targets.

A2.3.6 The Scottish Renewables Action Plan (2009)

The Scottish Government issued the Renewables Action Plan (RAP) in June 2009. This identifies what needs to happen in the renewables sector in order to achieve Government objectives.
Key objectives of the RAP are summarised as follows:

- To establish Scotland as a UK and EU leader in the field;
- To ensure maximum returns for the Scottish domestic economy; and
- To meet targets for energy from renewables, and for emissions reductions, to 2020 and beyond (RAP, Executive Summary, page 5).

In terms of energy consents and planning, this matter is addressed in section 8 of the RAP and regarding specific actions, there is reference to planning. Actions include the need to:

- Create a supportive planning landscape; and
- Ensure the planning and consenting regimes better support investment in renewables in Scotland.

The document (page 77) explains that onshore wind is expected to provide the majority of capacity in the timeframe for the Government's interim and 2020 renewable electricity targets.

A2.3.7 The 2020 Routemap for Renewable Energy in Scotland (2011)

The Scottish Government published the above document in July 2011 (hereafter referred to as 'the Routemap'). The Executive Summary of the Routemap states that: "The Routemap for Renewable Energy in Scotland 2011 is an update and extension to the Scottish Renewables Action Plan 2009. This updated and expanded Routemap reflects the challenge of our new target to meet an equivalent of 100% demand for electricity from renewable energy by 2020" (page 3).

Chapter 1 of the Routemap is entitled 'Scotland's renewables ambition and paths to delivery'. It is noted that the new renewables target of 100% equates to the equivalent of, circa, 16 GW of installed capacity, which *"is based on the fundamental wealth of renewables resource available, our analysis of deployment trajectories on the onshore side…and our concerted efforts to ensure a supportive policy framework for growth"* (page 17). The Routemap also provides an increase in the Scottish Governments overall renewable energy target to 30% by 2020.

The Routemap specifically recognises the 'scale of the challenge' that requires to be addressed to meet the revised 2020 targets. It is noted that meeting the challenge *"will be heavily dependent on regulatory processes, which we will seek to influence but over which we do not currently have control"* (page 19).

The Routemap provides a 'synopsis of the main challenges' that require to be addressed to meet the 2020 renewables targets, one of which is 'consents and planning'. With respect to consents and planning, the Routemap identifies that a *"Further increase in consenting/deployment rates [is] required…"* (page 19).

Chapter 3 of the Routemap provides a specific routemap for 'Onshore Wind' and is entitled 'Sectoral Routemaps'. The introduction states that: "The Government is committed to the continued expansion of portfolio of onshore wind farms to help meet renewables targets, with

a robust planning system providing spatial guidance, a clear policy framework and together with a timely and efficient processing of Section 36 Electricity Act and planning applications…Onshore wind turbines can make a very large contribution to the progress to Scotland's renewable electricity target, and help establish Scotland's reputation as rapidly becoming the green powerhouse of Europe thanks to its underlying political commitment to make it happen" (page 66).

A2.3.8 Draft Electricity Generation Policy Statement 2012, Scotland - A Low Carbon Society

The Scottish Government issued a Draft Electricity Generation Policy Statement for consultation in early 2012. The consultation period ran until 4th June 2012. It states at paragraph 1 of the Executive Summary that electricity generation and the economic and environmental benefits which could arise from a shift from fossil fuel generation to a portfolio comprising renewable and cleaner thermal generation are matters of considerable importance to the Scottish Government.

The Draft Statement examines the changes necessary to meet the targets which the Scottish Government has established for electricity generation.

In summary, the Government's policy is that Scotland's generation mix should be largely decarbonised by 2030. The Statement sets a number of targets including delivering the equivalent of at least 100% of gross electricity consumption from renewables by 2020 as part of a wider, balanced electricity mix. Achieving the target will require the market to deliver an estimated 14-16 GW of installed capacity (paragraph 27, page 10).

A2.3.9 The Scottish Renewable Energy Routemap Update

On 30th October 2012 the Scottish Government issued an update to the Routemap entitled '2020 Renewable Routemap for Scotland – Update' ("The Update"). The Update contains a Ministerial Foreword which states that the document summarises the progress made in the renewable energy sector, but it also sets out what still needs to be done and the ways in which these tasks are being approached.

(a) New Interim Target for 2015

The Foreword refers to a new interim pre-2020 target that renewable electricity generation should account for the equivalent of 50% of Scottish demand by 2015. It adds that "the vast majority of this new target will still be met by hydro and onshore wind."

Paragraph 1.2 states that given there is a positive trajectory towards the 2020 target: "*the time is now right to set another ambitious but achievable interim target to help map the way towards 2020."* This is set as the equivalent of 50% of Scottish demand for electricity by the end of 2015. Paragraph 1.4 of the Update states that the Government is formally adopting this new interim target *"as the next vital milestone in our journey towards the 2020 target of 100%."*

It further adds that *"the success of onshore wind, coupled with hydro and other renewables, remains a necessary precursor to our developing Scotland's huge offshore renewable potential. Without that success, without the 3GW plus of onshore renewables, we would not have succeeded as we have and would not be where we are poised to play the lead role in Europe in taking forward new forms of renewable energy as a world leader"* (page 3).

The Foreword also makes reference to the Government's intention to update the Electricity Generation Policy Statement (EGPS).

(b) Deployment Update

The Update states that the Government estimates that approximately 35% of Scotland's electricity needs are likely to have come from renewables in 2011, exceeding the 2011 interim target of 31%.

The Update provides estimates on the deployment rates of renewables to achieve installed capacity to 2017, but also sets out projections to 2020. The projections to 2020 are based on various scenarios described at paragraph 1.10 of the document.

Figure 2 in the document illustrates these scenarios. Scenario C is described as a straight-line extrapolation between current installed capacity and the estimated levels of capacity required to achieve 100% of gross consumption from renewables by 2020. It adds that *"this hypothetical line is incorporated to identify and acknowledge the scale of the challenge."*

In contrast to this, Scenario A sets out an extrapolation of the annual deployment levels experienced between 2009 and 2011, adjusted for the improvements in the planning / consent system introduced in recent years (but which have not yet impacted upon actual deployment rates). This shows that in this scenario, less than 11GW of installed capacity is attained by 2020 which is well short of the 14 - 16GW target which needs to be attained by 2020.

The trajectories forecast also make it clear (see section 1.7 of the Update) that there is an expectation that new projects that are consented and completed between November 2012 and 2017 will contribute to the attainment of targets (i.e. the interim 2015 and the 2020 targets) over and above those schemes which are under construction and those which are consented and awaiting construction. It is recognised that not all schemes which are consented will necessarily proceed, and furthermore, construction programmes for some schemes may be delayed.

A2.3.10 Progress to the Scottish 2020 Target

The Routemap states that the 2020 target of delivering the equivalent of 100% of Scottish electricity consumption will demand a significant and sustained improvement over the deployment levels seen historically. The target equates to 16GW. The Routemap explains progress to date, and states on page 3 that in terms of current installed capacity, capacity under construction and capacity consented, the figure amounts to only 7.5GW.

The draft EGPS of 2012 refers to the 2020 target as 14-16GW and to an installed capacity of 4.4GW and a consented but not built capacity, of some 3.3MW, giving a total of 7.7MW.

The 2020 Renewable Energy Routemap Update was published in October 2012. The Update refers to a new interim pre-2020 target; renewable electricity generation should account for the equivalent of 50% of Scottish demand by 2015. It adds that *"the vast majority of this new target will still be met by hydro and onshore wind."*

Figures released from DECC, show that as at December 2012, Scotland had 5.9GW of installed renewable electricity generation capacity, with an additional 4.3GW of capacity either under construction or consented, most of which is expected to come from wind generation, particularly offshore. This equates to 10.2GW of future operational capacity.

Therefore, it remains the case that in light of the latest data released from DECC, there is a significant shortfall against the 2020 renewable electricity generation target. There also remains a significant shortfall against the UK target for 2020 in terms of electricity generation from renewable sources.

A2.4 Alternative Technologies Considered

No updates are required to this section.

A2.5 Summary

This chapter has provided an update to the renewable energy policy and legislative context and the revised renewable energy targets that the UK and Scottish Government has committed to deliver. SSE plc's renewable energy strategy is diverse. In all, SSE plc now has a portfolio of 3,240 MW of renewable energy capacity (onshore wind, offshore wind, hydro and dedicated biomass) in operation, in the UK and the Republic of Ireland. SSE plc

has also invested in emerging renewable energy technology and now has interests in companies developing and promoting tidal energy devices and domestic scale wind turbines and solar energy.

SSE plc is one of several partners in the International Technology & Renewable Energy Research hub led by the University of Strathclyde. SSE plc is further committed to investment in training and skills in the Highlands, with a partnership to the University of Highlands and Islands to collaborate and work together to maximise the benefits to the people of the Highlands from Low carbon energy.

SSE plc also provides a unique facility at its Glasgow base for Electric Vehicle charging offering to the public two charging stations and acts as a base for hiring electric cars along with an electric bicycle hire.

The Modified 2013 Scheme therefore forms part of a broader renewable energy strategy being implemented by the SSE plc in response to UK and Scottish Government policy on renewable energy and climate change and is in line with the vision and ambitions set out in the Routemap Update.

A3 Site Selection

A3.1 Introduction

The 2007 ES identified the process leading to the selection of the Strathy South wind farm site. The design of the Original 2007 Scheme has been modified following comments on the 2007 ES; however there have been no change to the site location of the wind farm. Therefore this ES Addendum chapter does not discuss the site selection process, which remains as described in Chapter 3: Site Selection of the 2007 ES.

A3.2 Site Selection Process

A3.2.1 Selection Criteria

Section 3.2.1: Selection Criteria of Chapter 3: Site Selection in the 2007 ES detailed the criteria and guidance that influenced the siting of Strathy South wind farm. It was stated that this process was based on British Wind Energy Association (BWEA) guidelines and was in accordance with factors included by SNH in its Strategic Locational Guidance for Onshore Wind Farms 2002 (as updated in 2005).

SNH published an updated version of the 2002 Strategic Locational Guidance in 2009 that takes into consideration RSPB bird sensitivity data. Integration of this guidance has resulted in adjustment of natural heritage sensitivity zones within Scotland, resulting in a re-classification of the Strathy South wind farm site from Zone 1 (Low Sensitivity) as recorded in the 2007 ES, to Zone 2 (Medium Sensitivity). Details of the ornithological interest and proposed mitigation relevant to the site are presented in Chapter A11: Birds of this ES Addendum.

A3.2.2 Stage 1: Site Search and Initial Evaluation

The site location identified in the 2007 ES remains valid for the Modified 2013 Scheme and is shown in Figure A1.1.

A3.2.3 Stage 2: Feasibility

No changes are required to this section.

A3.2.4 Stage 3: Design and Environmental Assessment

No changes are required to this section.

A4 Development Description

A4.1 Introduction

Chapter 4: Development Description of the 2007 ES described the Original 2007 Scheme for the proposed Strathy South wind farm. Since 2007, a number of changes have been made to the proposed design, and details of these modifications can be found in Section A4.11: Design Alternatives.

This ES Addendum describes the Modified 2013 Scheme comprising 47, three-bladed, horizontal axis wind turbines, each up to a maximum height of 135 m. The Original 2007 Scheme proposed to use a 2.3 MW wind turbine machine which would have given the site a generation capacity of 177 MW. The Modified 2013 Scheme has been modelled on a 3.4 MW wind turbine machine, which has a higher generation capacity than the 2.3 MW machine. With the reduction in turbine numbers from 77 to 47, the generation capacity for the site would be 160 MW (i.e. 17 MW less than that proposed for the Original 2007 Scheme).

This chapter provides a description of the physical characteristics of the Modified 2013 Scheme, for the purpose of identifying and assessing the main environmental impacts of the modifications, relative to the Original 2007 Scheme. A description of the physical layout of the proposed Strathy South wind farm, and the associated infrastructure is given, in accordance with the requirements of the EIA regulations. A general description of the site is provided in Chapter 1: Introduction, with more detailed descriptions provided in the relevant technical chapters.

This chapter should be read in parallel with Chapter 4: Development Description of the 2007 ES. Where there have been no changes to the Original 2007 Scheme, the information contained within the 2007 ES remains valid. Where modifications have been made, this chapter provides information relating to the Modified 2013 Scheme.

A detailed plan of the site showing the modified turbine and infrastructure layout is shown in Figure A4.1. The turbine layout was influenced by a constraints mapping exercise and in response to stakeholder consultation. The environmental constraints are presented in Figure A4.2. The design evolution from the Original 2007 Scheme to the Modified 2013 Scheme is outlined in Section A4.11 of this chapter.

A4.2 Core Development Components

The proposed Strathy South wind farm consists of the following key elements:

- Wind turbines;
- Foundations and hard standing;
- Access track and site tracks;
- Stream crossings;
- Cabling;
- Anemometer masts;
- Switching station;
- Welfare building
- Lay down areas; and
- Borrow pits.

A4.2.1 Turbines

The Original 2007 Scheme for the proposed Strathy South wind farm comprised 77 turbines (the turbines were numbered from 1 to 77 and this numbering remains unchanged in the Modified 2013 Scheme to show transparency in the evolution of the scheme's design).

The Original 2007 Scheme would have had a generating capacity of 177 MW and the Modified 2013 Scheme would have a generating capacity of up to 160 MW.

The turbine dimensions for the Original 2007 Scheme and the Modified 2013 Scheme are presented in Table A4.1. A typical turbine elevation is presented in Figure A4.3, with a maximum overall tip height of 135 m. The modelled hub and rotor combination below are considered worst case scenarios. Final turbine choice may differ, though maximum tip height will be up to a 135 m.

Table A4.1: Turbine Parameters

Wind Farm Element	Original 2007 Scheme	Modified 2013 Scheme
Number of Turbines	77	47 (Removal of 30 turbines from the Original 2007 Scheme including turbines 3, 5, 7, 12, 14, 16, 21, 23, 25, 27, 31, 32, 34, 37, 38, 40, 44, 48, 53, 54, 58, 59, 60, 64, 65, 66, 67 and 71, 75 & 77).
Maximum Tip Height (metres)	110	135
Maximum modelled Rotor Diameter (metres)	80	104
Maximum modelled Hub Height	70	83

Since the Original 2007 Scheme, the Applicant has undertaken further ornithological, ecological and peat survey work, in addition to further consultation with stakeholders. The results of further information and consultation have been used to develop the site layout and have led to the removal of a number of turbines primarily due to ornithological, sensitivities, whilst also minimising impacts on peatlands (see Section A4.11).

In addition, the Original 2007 Scheme proposed using a 2.3 MW machine. However, a 3.4 MW machine has now been modelled. This has allowed development of the layout to reduce the turbine density on site whilst still delivering the required energy output.

The revised layout is presented in Figure A4.1. The turbine relocations from the Original 2007 Scheme to the Modified 2013 Scheme are presented in Table A4.2.

Table A4.2: Turbine Relocations

Turbine Number	NGR of New Turbine Location for Modified 2013 Scheme		Distance Moved from Original Location in the 2007 ES (m)	Direction Moved (Grid Bearing from original position in 2007 ES)
	X Coordinate	Y Coordinate		
1	280619	953031	165	27°
2	281155	952737	216	86°
4	280687	952437	180	68°
6	281205	952237	93	208°
8	280675	951871	86	250°
9	281141	951618	208	208°

Table A4.2: Turbine Relocations				
Turbine Number	NGR of New Turbine Location for Modified 2013 Scheme		Distance Moved from Original Location in the 2007 ES (m)	Direction Moved (Grid Bearing from original position in 2007 ES)
	X Coordinate	Y Coordinate		
10	280139	951650	196	272°
11	280653	951295	97	191°
13	280144	951050	187	223°
15	281058	950872	81	46°
17	280598	950707	151	39°
18	281049	950334	218	203°
19	280030	950461	262	4°
20	280413	950162	102	36°
22	279973	949829	93	160°
24	280781	949792	94	71°
26	280279	949361	126	7°
28	279786	949085	77	275°
29	279022	950112	227	319°
30	279413	949703	155	222°
33	279165	949159	389	58°
35	277397	949254	245	323°
36	278217	949225	183	55°
39	277866	949638	128	350°
41	277431	949983	248	279°
42	278375	949964	198	30°
43	278763	949581	146	145
45	278263	950529	163	327°
46	278855	950613	141	19°
47	278555	951001	228	26°
49	277856	951064	117	269°
50	278264	951400	329	308°
51	279071	951197	121	110°
52	277806	951652	94	289°
55	277821	952164	41	332°
56	278297	951962	68	106°
57	278737	951687	189	126°
61	279119	952086	74	77°
62	277539	952985	27	318°

Table A4.2: Turbine Relocations				
Turbine Number	NGR of New Turbine Location for Modified 2013 Scheme		Distance Moved from Original Location in the 2007 ES (m)	Direction Moved (Grid Bearing from original position in 2007 ES)
	X Coordinate	Y Coordinate		
63	278086	952935	138	52°
68	277537	953569	204	354°
69	278372	953507	297	27°
70	278683	953059	202	277°
72	279165	953538	137	11°
73	277299	954098	198	340°
74	277764	954011	200	352°
76	278825	954085	133	213°

The design and colour of the wind turbines in the Modified 2013 Scheme would remain the same as described in the 2007 ES. As stated in the 2007 ES, final colour schemes will be agreed with the planning authority. The speed of rotation would be 4-15 rpm and would generate electricity between 3-25 m/s, with a maximum output typically above 13-14 m/s.
All other information remains unchanged, thus the information provided in Section 4.2.1: Turbines, Chapter 4 of the 2007 ES remains valid.

A4.2.2 Turbine Foundations

The main difference between the Original 2007 Scheme and the Modified 2013 Scheme is the reduction in the number of turbines from 77 to 47; thereby reducing the overall landtake associated with the turbine foundations.

Each turbine would have a reinforced concrete foundation, typically of dimensions 16 – 20 m in diameter by 2 m to 3 m deep. A ring of bolts or tubular can would be cast into the foundation, and would form the connection to the base tower section. A typical turbine foundation and hardstanding is presented in Figure A4.4.

The foundation would be formed as follows:

- Any peat turfs and peat would be excavated and stored separately. The remaining overburden would then be excavated down to formation level, as determined by geotechnical studies. The excavation typically would be 2 m to 3 m deep by approximately 20 m diameter;
- A temporary drainage system would be established according to the local gradient of either a pump or a temporary ditch;
- The required level would be made up as required with compacted crushed rock placed in the base of the excavation to provide the necessary bearing capacity;
- A layer of blinding concrete would be laid;
- A reinforcing steel 'cage' would be assembled;
- Shuttering would be assembled;
- Concrete (nominally 300 – 400 m^3 per foundation) would typically be in two pours, the first pour being the main base, which is approximately 90% of the foundation; the second and remaining 10% forming the plinth section which sits on the top of the main base.
- Once the concrete has cured sufficiently, the shuttering would be removed and an electrical earthing mat installed;

- Approximately 1 – 2 m of rock, or soil would be placed over the concrete foundation to provide additional bulk weight to the foundation; and
- Following erection of the turbine, suitable overburden and turves would be used to landscape and reinstate those areas not required for maintenance.

A4.2.3 Tracks

In the Original 2007 Scheme, access to the proposed Strathy South wind farm was via an existing forestry track which branches from the A836 at Strathy village (Figure 4.5 of the 2007 ES). Traffic would travel southeast from the A836, along the Strathy Bypass (to be constructed as part of the consented Strathy North wind farm) before travelling southwest through the Strathy North wind farm site and finally across the 'Cnoc Meala' route which crosses the Caithness and Sutherland Peatlands SAC, SPA and Ramsar site. The access was proposed to enter the northwest area of the Strathy South site.

Following the 2007 ES, SNH, SEPA and RSPB raised concerns regarding the use of the Cnoc Meala route and its potential impacts on the Caithness and Sutherland Peatlands SAC, SPA and Ramsar site.

In response to these concerns, the Applicant commissioned an Access Route Review[1], which is discussed further in Section A4.11.4 of this chapter.

The route assessment process led to the identification of a provisional preferred route, which minimises new track construction within the Caithness and Sutherland Peatlands SAC, SPA and Ramsar site and so causing the least impact, reducing the potential for associated environmental impacts. In the Modified 2013 Scheme, traffic would still access the site via the A836 and Strathy Bypass; however, the access route would then travel south and would reach Strathy South wind farm via a potential route option as shown on Figure A4.5.

A section of the main 'access' track route, between the A836 public road and the most southerly part of the Strathy North wind farm (NGR NC794 569, consented and awaiting construction) is common to both the proposed Strathy South wind farm and the consented Strathy North wind farm. However, the access route for the Modified 2013 Scheme then diverts from that identified in the 2007 ES, travelling south. From this point, two bridge route crossing options of the River Strathy have been considered. The shorter route heads in a southerly direction and crosses the River Strathy at approximate NGR 812 555. The route continues in a southerly direction where it meets up with an existing track in Strathy Wood at approximate NGR 813 551. This is currently the preferred access route (Figure A4.5).

The alternative access route leaves the consented Strathy North track at NGR 813 564 and travels in a roughly easterly then southerly direction, crossing the River Strathy in Strathy Wood at approximate NGR 818 558. Shortly after the river crossing, the route reaches the existing track and continues in an southwesterly direction where it reaches the same point as the preferred access route at approximate NGR 813 551. From this point where the preferred and alternative access routes meet, the access route is referred to as the common access route, because both routes share the same alignment south towards the site (Figure A4.5).

For the purpose of this ES Addendum, only the new access tracks required for the Modified 2013 Scheme, and not those common to both the Strathy South wind farm and consented Strathy North wind farm, are included as part of the Section 36 application. It is anticipated that the potential disturbance effects of construction traffic using the consented route through Strathy North wind farm would be covered by the Construction Environmental Management Plan (CEMP) and Transport Management Plan. Therefore, the potential impacts associated with this section of track have been scoped out of the assessment.

[1] ENVIRON (2013) Strathy South Wind Farm Access Route Review (ref: UK12-17180)

An existing interlink road between the two sides of Strathy South wind farm (crossing Yellow Bog) has been included within the redline boundary, as shown in Figure A4.1.

Table A4.3 distinguishes between 'cut' and 'float' track construction methods based on the assumption that tracks would be constructed using the 'cut' method where underlying peat is up to 1 m deep and would be constructed using the 'floating' method where peat is deeper. Figure A4.6 presents the typical access track floating and cut track cross sections.

Table A4.3: Access Track and on-site Track Lengths

Track Description	Cut or Floating Track	Length of Track Section (km)
Access Track (including preferred bridge crossing of the River Strathy	Cut	0.311
	Existing/Upgrade	2.225
	Floating	1.175
Access Track (including alternative bridge crossing of the River Strathy	Cut	0.311
	Existing/Upgrade	3.168
	Floating	1.575
Site Track (i.e. tracks within the redline site boundary)	Cut	12.226
	Floating	9.611
	Existing/Upgrade	10.954
Total Track Length:		
Preferred		**36.502**
Alternative		**37.845**

Of the total access track length, 9.2 km of cut track and 3.8 km of floating track is also common to both the Strathy South and Strathy North Schemes; this section of access track formed part of the application for the Strathy North Scheme which is now consented and awaiting construction.

The preferred access route for the Modified 2013 Scheme would comprise 36.502 km. This breaks down as: 12.537 km of cut track (preferred access route plus site track); 10.786 km of floating track (preferred access route plus site track); and 13.179 km of existing/upgrade track ((preferred access route plus site track).

A4.2.4 Micrositing

It is proposed that an allowance of up to 50 m would be permissible. In addition, if there is a need for the micrositing for greater than 50 m this would be only permitted following written approval from the Planning Authority, following consultation with SEPA and SNH.

A4.2.5 Strategy for Stream Crossing

An updated Watercourse Crossing Assessment has been undertaken and is included as Technical Appendix A14.3. Due to the realignment of on-site tracks, the total number of stream crossings required has fallen from 26 to 18 from the Original 2007 Scheme to the Modified 2013 Scheme. Stream crossings are further discussed in Chapter A14: Soil and Water - Technical Appendix A14.3: Watercourse Crossing Assessment.

A4.2.6 Control Building/Switching Station

All wind turbines associated with the Modified 2013 Scheme would be connected electrically to a single switching station located in the east of the Strathy South site (Figure A4.1). This switching station would be connected to the proposed Strathy North wind farm substation via four underground 33 kV cable circuits.

33kV switchgear would be housed indoors at the switching station building and an outdoor compound would be required to house equipment such as reactive compensation, auxiliary transformer, stand by generator. An indicative layout of the switching station and welfare building is presented in Figure A4.7. Large 132/33kV grid transformers would not be required at this location; these are being installed at the Strathy North substation. The dimensions and appearance of the switching station are shown in Figure A4.8.

A4.2.7 Anemometers

(a) Permanent Masts

Four permanent anemometry masts would be required for control purposes and to ensure the efficient operation of the proposed Strathy South wind farm. The location of the four masts has been adjusted slightly from the Original 2007 Scheme to provide where possible a greater distance from the designated habitats surrounding the site. The location of the permanent anemometry masts are presented on Figure A4.1. Due to the increase in tip height, the proposed anemometry mast would be up to 90 m, depending on final turbine choice, within the maximum tip height of up to 135 m (Figure A4.9).

(b) Temporary Masts

The temporary masts remain the same as presented in the 2007 ES.

A4.3 Associated Development

A4.3.1 Sub-station, Grid Connection Route and Off-site Supergrid Substation

The 2007 ES proposed a new 132/33 kV substation at approximate location NC 808 515 in the Strathy South area, including three 90 MVA 132/33 kV transformers.

The 132kV connection to the existing Scottish Hydro Electric Transmission Limited (SHETL) 275kV overhead line is now proposed from the Strathy North 132/33kV substation to a proposed SHETL 275/132kV substation instead of across the designated land to the south.

This proposal is reflected in the latest updated contract with National Grid Electricity Transmission (NGET). The proposed 132kV wood pole overhead lines are the subject of a separate 'Section 37' consent application.

The grid connection between Strathy South and Strathy North would be via underground 33kV cabling. All cabling within the Strathy South site boundary and within the Strathy North consented boundary connecting Strathy South is subject to permitted development rights. However, in response to SNH's request for further information, details on cabling methods and cable trench dimensions are provided in this section.

The estimated total length of cabling trenches on-site will remain at approximately 41.8 km. It is proposed that open cut trenching would be used in certain areas where cable ploughing techniques are not possible. Within the Strathy South wind farm, these would tend to be installed adjacent to roads. Figures A4.10-A4.13 present typical cable trench cross-sections. Subject to initial forestry removal to allow the necessary infrastructure work and ground investigation to take place, it will be possible to determine the level of ploughing that can be employed.

Immediately north of Strathy South, the access track lies within designated land (SPA/SAC). Following consultation with SNH, it is proposed that the required grid connection between Strathy South switching station and Strathy North substation would run immediately adjacent to the west of the route between Strathy Wood and Strathy South Forest. Wherever possible, this would be restricted to disturbed habitat, to minimise the length of cable passing through qualifying habitats. The grid connection would comprise four underground 33kV cable circuits, installed 1.5 m apart as shown in Figure A4.14. Each cable would be buried, using a mole plough, into the peat soils to minimise disturbance to the qualifying habitats. Most of the work would be undertaken using machinery working on the adjacent track. It is anticipated that only the tracked winch unit and the cable plough would traverse the route of

the cables. An Appropriate Assessment has been carried out, where cabling is proposed between Strathy North and South, through areas of SPA/SAC designation. This is presented in Chapter A10: Ecology and under Technical Appendix: A10.6: Assessment of Impacts of Access Track Construction on the SAC. Figure A4.14 shows the proposed cable route through Strathy North.

The 2007 ES proposed that a switching station would be sited at approximate location NC 790 523 in the western half of the Strathy South area, connecting approximately half of the Strathy South turbines to the Strathy South 132/33kV substation. This switching station in the western half of Strathy South is no longer required and has been removed from the Modified 2013 Scheme.

Instead, a switching station would be located in the eastern half of the Strathy South site. Some of the turbines in the western half of the Strathy South site would be connected to the proposed Strathy South 33kV switching station via two underground 33kV cable circuits crossing the 'yellow bog' area . In order to minimise any impact on the 'yellow bog' SPA, the proposed cabling method is to run two cable circuits within the existing track i.e. it is not proposed that there would be any direct installation within the 'yellow bog' area. Cable trenches would be backfilled with the original material excavated (or material of similar porosity) in order to ensure there is no potential disruption to groundwater flow.

Turbines in the south western area of Strathy South would be connected to the Strathy South switching station via circuits running down the eastern half of the Strathy South area.

A4.3.2 Borrow Pits

The number of borrow pits has been reduced from eight in the Original 2007 Scheme, to four in the Modified 2013 Scheme. All information relating to borrow pit construction, as provided in the 2007 ES remains valid for the Modified 2013 Scheme.

An updated drawing of the location of the four proposed borrow pit sites are identified in Figure A4.1. The borrow pits A-D are presented in Figures A4.15-A4.18.

A4.3.3 Modifications to Public Roads

Chapter 4: Development Description of the 2007 ES described changes which would be made to the public road network to allow turbine components to be delivered to the site. As part of the Modified 2013 Scheme, an Abnormal Load Assessment has been undertaken by Halcrow and the results are presented in Chapter A15: Roads and Traffic.

A4.4 Construction Details

A4.4.1 Construction Activities and Programme

Although the proposed wind farm would have a reduced number of turbines relative to the 2007 Scheme, it is not anticipated that any significant change would be made to the methods of construction. The 2007 ES stated the on-site construction works would be completed within 22 months; this has been revised to 24 months (refer to Table A15.4 of Chapter A15: Roads and Traffic). The additional two months on the programme allows for new bridge crossing of the River Strathy (Figure A4.1).

A4.4.2 Construction Workforce

It is still estimated that the on-site construction workforce would total approximately 140 individuals: approximately 21 foresters, 78 civil contractors, 16 turbine contractors, 19 electrical contractors and six project management staff.

A4.4.3 Working Hours

This section remains unchanged from the 2007 ES.

A4.4.4 Construction Infrastructure Requirements

All information provided in Chapter 4: Development Description of the 2007 ES remains valid, with the exception of the changes described in the following sections below.

(a) Enabling Works

Initial enabling works would consist of the construction of the preferred access route linking the consented Strathy North wind farm to the Modified 2013 Scheme and the associated new bridge across the River Strathy.

In undertaking these works, a satellite, temporary construction compound would be required. It is proposed that this would be established at/adjacent to the proposed Strathy North construction compound or operations building with a secondary temporary welfare unit being located closer to the bridge crossing which would be in place until the bridge was constructed across the River Strathy and the construction compound within the site having been established.

(b) Site Compound

The 2007 ES proposed three construction compounds and this number has been revised for the Modified 2013 Scheme to one construction compound located in the eastern area of the site (Figure A4.1). A typical layout of a construction compound is presented in Figure A4.19.

(c) Lay Down Areas

The 2007 ES proposed three lay down areas numbered 1 to 3. The Modified 2013 Scheme would see the removal of Laydown Area 1 and the relocation of Laydown Area 3 to the northwest of its original position. The location of Laydown Area 2 remains unchanged. The proposed location of the lay down areas is shown in Figure A4.1.

(d) Crane Pads

Due to the removal of 30 turbines, the Modified 2013 Scheme would require 30 fewer crane pads than the Original 2007 Scheme. A typical area of crane hardstanding is presented in Figure A4.4. The construction method and approximate size of the crane pads described in the 2007 ES remain valid.

(e) Concrete Batching Plant

As stated in the 2007 ES, it is likely that concrete would be batched on-site, rather than delivered in readymix wagons. The batching plant would comprise aggregate and cement hoppers, water bowsers/tanks, a mixer, and control cubicle. Aggregates would be stockpiled adjacent to the plant. The concrete batching plant would have dimensions of approximately 100 m x 100 m. The proposed location for the Concrete Batching Plant is shown in Figure A4.1. Water abstraction would be required to supply the batching plant. The location of the three surface water abstractions are presented on Figure A4.1 and it is estimated that up to 50 m3 of water from each extraction point would be required each day when the concrete batching plant is operational. The concrete batching plant will be operational prior to and during each turbine foundation pour. Details of the abstraction registration would be discussed and approved by SEPA.

A4.4.5 Reinstatement

All information provided in Section 4.4.5: Reinstatement, Chapter 4: Development Description of the 2007 ES remains valid.

A4.4.6 Construction Traffic

The estimated construction and forestry traffic volumes are presented in Chapter A15: Roads and Traffic.

A4.5 Operation

The 2007 ES states that each turbine would be subject to approximately eight man-days of maintenance per year. With the reduction in turbine numbers in the Modified 2013 Scheme, the total number of man-days per year required for routine maintenance would decrease from

616 to 376 man-days. With this exception, all information regarding the operational life of the wind farm and its maintenance provided in Chapter 4: Development Description of the 2007 ES, remains valid.

A4.6 Decommissioning

All information regarding the decommissioning of the Strathy South wind farm provided in Chapter 4: Development Description of the 2007 ES remains valid.

A4.7 Safety Management

The Construction (Design and Management) Regulations 2007 (CDM) replace the 1994 CDM regulations that were quoted in the 2007 ES. Therefore, construction activity would be undertaken to comply with the requirements of CDM 2007.

A4.8 Design and Management Best Practice

All information provided in Chapter 4: Development Description of the 2007 ES remains valid with the exception of Technical Appendix 4.2: Best Practice Guidelines. Since the 2007 ES was submitted, the Applicant has prepared an outline Construction Environmental Management Plan (CEMP). The CEMP outlines good practice guidance in relation to a range of issues including pollution prevention and mitigation, waste management and archaeological protection. An outline CEMP is included as Technical Appendix A4.1 of this ES Addendum and supersedes Technical Appendix 4.2 of the 2007 ES.

A4.8.1 Waste Management

In accordance with industry best practice, the Applicant requires a Site Waste Management Plan (SWMP) and would be implemented by the contractor using one of the Waste Management Plan templates e.g. SMART Waste or WRAP waste management plans[2], or similar (Technical Appendix A4.1: CEMP).

The SWMP would provide details on how waste reduction would be implemented at the site and also how this is would be monitored throughout the construction phase. The contractor nominates a site representative who would take responsibility for implementation and monitoring of the SWMP.

The contractor would provide details of their proposed waste contractors (carriers, transfer station, waste recipient etc) as part of the SWMP, according to the provisions of the contract.

The requirements of the SWMP would be communicated to all site operatives during their induction. Furthermore, all operatives on site would attend waste reduction toolbox talks on a monthly basis to increase awareness of recycling/waste reduction.

The contractor would provide adequate numbers of separate bins (e.g. for paper, cans/plastic, kitchen waste etc) and skips / waste containers (e.g. for wood, metal, hazardous waste, general waste) to facilitate waste segregation and recycling. The contractor would also provide a site plan showing all waste disposal and recycling locations.

The contractor's environmental site representative would be responsible for regular checks on compliance with the SWMP and highlight any non-compliance.

(i) Anticipated Waste Streams

A number of different waste streams would be likely to arise during construction of the Modified 2013 Scheme. The contractor would identify all waste streams and provide an estimate of expected waste volumes for each waste type generated within the waste stream. Possible waste streams arising from the site could include: food waste, paper, plastics, glass and other typically domestic refuse and sewage, concrete, waste chemicals, fuel and oils,

[2] Information on WRAP and SMART SWMPs can be found on http://www.wrap.org.uk/content/site-waste-management-plans-1 and http://www.smartwaste.co.uk/page.jsp?id=97

packaging, e.g. paper, plastics and wood, waste metals, polluted water from plant, vehicle and wheel washes.

The contractor would ensure that all relevant information would be taken into account in preparing the SWMP (for example intrusive ground investigation data, supply chain assessments, options appraisals etc).

A4.8.2 Peat Management

A Peat Management Plan (PMP) has been prepared to support the ES Addendum and is included as Technical Appendix A4.3. The PMP provides details of the predicted volumes of peat that would be excavated on the site, the characteristics of the peat that would be excavated and how the excavated peat would be reused and managed.

A Peat Balance has been prepared and is included in this ES Addendum in Technical Appendix A4.4. The site is currently forested; however, whether or not the Modified 2013 Scheme achieves planning consent, all forestry would eventually be removed from the site. The Forestry Commission Scotland confirmed that it would not propose to replant the site post-felling. Therefore, through consultation with SEPA[3] it was agreed that the carbon calculator did not need to include an assessment of the forestry in the calculations.

A4.8.3 Forest Removal

The site at Strathy South is predominantly covered in coniferous woodland which is underlain by peat. A Habitat Management Plan (HMP) has been prepared in consultation with SNH (as discussed in Section A4.9.2 below) and with due regard to the Scottish Government's Policy on the Control of Woodland Removal (Forestry Commission Scotland, 2009). The forest removal would be undertaken to assist in fulfilling the objectives of the HMP.

The forestry on site has been categorised into yield classes. It is proposed that the following approach is taken to the forest resource on site following consultation with SEPA and based upon the recent SEPA guidance on Management of Forestry Waste (February, 2013):

- YC 10 and above would be harvested (which covers approximately 230 ha and is spread across the site);
- YC 8 and below would be mulched (which covers approximately 903 ha).
- a small area of YC 8 is included as a potential harvesting site
- The Strathy South Forest Yield data is tabulated in greater detail within the HMP (Technical Appendix A11.2).

A4.9 Mitigation

A4.9.1 Introduction

Details of the mitigation measures associated with the Original 2007 Scheme were identified in Chapter 4 and individual technical chapters of the 2007 ES. Modifications made have concentrated on further avoidance of effects (the preferred method of reducing impacts), by removing or making modifications to turbines and associated infrastructure included in the Original 2007 Scheme. Further information on modifications to mitigation measures, in response to changes to environmental effect resulting from the modifications to the Original 2007 Scheme have also been identified in individual technical chapters. Chapter A17: Summary presents a schedule of mitigation and monitoring measures.

A4.9.2 Habitat Reinstatement

The introduction of the Strathy South wind farm provides an opportunity to improve habitats on site. The HMP has been developed in consultation with SNH and is presented in detail in Technical Appendix A11.2. The key aims of the HMP include:

[3] Email from Susana Sebastian to ENVIRON dated 08/07/13

- To encourage at appropriate locations active peat-forming vegetation, to contribute to the restoration of blanket bog and wet heath habitats.
- To maintain and improve peatland habitats within non-forested land units adjacent to the wind farm.
- Within the wind farm envelope, reduce collision risk to breeding and foraging divers, raptors and waders associated with the Caithness and Sutherland Peatlands SPA (specifically red-throated divers, hen harrier, short-eared owl and greenshank).
- To mitigate collision risk for breeding divers by provision of diver rafts at suitable locations off site, in consultation with SNH.

The habitat management measures would include:

- Peatland Restoration: identification of comparatively wetter areas (generally corresponding to, but not limited to, deep peat areas) outwith the turbine envelope. The map identifies areas where peatland restoration is considered to have an earlier likelihood of success. Areas are also identified which are adjacent to pool systems on the neighbouring open moorland with the aim of placing particular emphasis on assisting to re-establish the hydrological links and integrity of these wetlands.
- Peat Restoration, with Option for Targeted Vegetation Control to Reduce Suitability for Nesting by Key Species: peat restoration would remain the priority within the turbine envelope. However, where required, and in response to site vegetation monitoring, targeted control of vegetation would be undertaken, where deemed necessary, to reduce the suitability for nesting within the turbine envelope by key bird species.

Finalisation of the extent of these areas and methods used to maintain them in an optimal condition would be achieved through consultation with SNH, RSPB and other relevant parties. Consultation would be informed by targeted site surveys both prior to and following forest removal.

A4.10 Design Strategy

The planning and design of the development has been informed by combining the technical requirements and environmental constraints together with input from consultees. A Design Statement was included as Appendix 4.3 of the 2007 ES and this appendix has been revised and updated following the changes to the Modified 2013 Scheme and is included as Technical Appendix A4.2.

A4.11 Design Alternatives

A4.11.1 Introduction

The Original 2007 Scheme for Strathy South wind farm comprised 77 turbines with associated infrastructure. This application was subject to an EIA and an Environmental Statement was originally submitted to accompany the application in 2007. The Scottish Ministers consulted with The Highland Council (THC) and other consultees on the application. During this consultation process matters were raised and, as a result, the application currently remains undetermined pending receipt of further environmental information.

In order to progress the matters raised, the Applicant has consulted during 2011 and 2012, via direct meetings and/or correspondence, with key statutory and non-statutory consultees (as outlined in Chapter A5: Environmental Impact Assessment).

It should also be noted that as part of the Original 2007 Scheme a number of layouts were considered prior to submission of the ES and these are summarised in Table 4.4 of the 2007 ES. This ES Addendum chapter presents the further layout iterations to the Original 2007 Scheme, discussed in Section A4.11.3: Turbine Layout.

A4.11.2 Turbine Size

Both SNH and RSPB expressed concerns regarding the potential effect of the wind farm on the adjacent Caithness and Sutherland SPA, SAC and Ramsar site including potential impacts on qualifying species. Further details of the additional bird survey work and collision

risk modelling are presented in Chapter A11: Ornithology. The results of this work were used to inform revisions to the turbine size which resulted in taller turbines and reductions to the number of turbines.

A4.11.3 Turbine Layout

The layout presented for the Original 2007 Scheme has undergone two principal stages of iterations:

- Reconsultation layout (68 turbines) and
- Final layout (47 turbines).

These principal design stages have been arrived at via an iterative process during which the consultant team has been invited to comment on whether the amended layout would be considered an improvement or otherwise, on what changes to predicted impacts are likely to arise and on how the scheme might be further adjusted.
Potential visual impacts have been reviewed regularly during this process, with wireline visualisations generated from identified viewpoints, comparing emerging layouts against the 2007 ES Scheme and previous design iterations. Comments have then been fed back to the design team through regular discussions and reporting.

(a) Reconsultation Layout

In response to consultation responses on the Original 2007 Scheme, recent 2010 and 2012 bird data sets and a collision risk assessment, the number of turbines was initially reduced from 77 to 68 turbines with an increased tip to height up to 135 m, presented to consultees in September 2012[4] (Figure A4.20). Further turbines were relocated due to spacing constraints. A review of ornithological constraints led to the removal of the following turbines: T58, T59, T60, T64, T65, T66, T67 and T70 to create a bird corridor on-site. Six of the turbines removed were those identified with a collision risk of 'very high' and 3 as 'high'.
T34 was removed due to its proximity to Loch Strathy Bothy and the peat depths in the vicinity of the proposed turbine.

Following the 2007 ES, the Applicant undertook further wind modelling. The result of this modelling led to the slight re-positioning of five turbines (T4, T17, T19, T29 and T33) to optimise their location and allow micrositing of other turbines.

(b) Final Layout

Following consultation feedback and further site survey work, a number of changes were made to the 2012 68 turbine scheme which resulted in the final layout (Figure A4.1). The key changes are as follows:

- The decision to use a larger machine to enable a significant further reduction to the number of turbines, to further reduce environmental impacts, but still remaining within the 2012 proposed tip height of up to 135 m. The proposed turbine machine size is from 2.3 MW up to 3.4 MW which resulted in all turbine locations being reviewed to enable suitable spacing whilst still considering the environmental constraints on-site.
- A review of ornithological constraints was considered in the revisions to the site layout. This review included a review of the predicted displacement effects on key qualifying birds from the SPA as a result of turbine locations. Turbines with the greatest collision risk were also identified. Finally turbines were identified where their removal from the scheme would most enhance the conservation objectives of the SPA, whilst also taking into account recent findings on forest edge effects on breeding wader from RSPB/SNH/Forestry Commission Scotland[5]. The results of this review led to the removal of 21 turbines (T3, T5, T7, T12, T14, T16, T21, T23, T25, T27, T31, T32, T37, T38, T40, T44, T48, T53, T54, T75 and T77) and the mircositing of 35 turbines (T6, T8-T11, T13, T15, T18, T20, T22, T24, T26, T28, T30, T35, T36, T39, T41-T43, T49-T52,

[4] Letter to Robert Logan at ECDU from ENVIRON dated 4th September 2012 (ref: NS/KL/LUK1217181_Strathy South Reconsultation Letter_4.docx)

[5] FCS Scotland (May 2011) Guidance to Forest Managers Preparing Forest Plans within the Caithness and Sutherland Peatlands SAC/SPA

T55-T57, T61-T63, T68, T69, T71, T72 and T76). T45 and T46 were repositioned to increase the distance between the turbine location and the adjacent SPA. Further details of the ornithological constraints on-site are covered in Chapter A11: Ornithology;

- Following further bird survey analysis revisions were made to the bird constraints which enabled T70 to be reintroduced to the scheme;
- A peat slide risk assessment (Technical Appendix A14.1) was undertaken for the site and the results from this together with the application of 70 m water buffer as well as ornithological constraints (mentioned above) led to the repositioning of the following turbines: T1, T2, T6, T9, T13, T19, T22, T24, T35, T39, T41, T42, T49, T50, T57, T68 and T70. (A copy of the peat slide risk assessment is include as Technical Appendix A14.1 of this ES Addendum); and

A4.11.4Infrastructure Layout

(a) Reconsultation Layout

(i) Access Track

Following the submission of the Section 36 application for the proposed Strathy South wind farm in 2007, there has been ongoing dialogue with various consultees, in relation to certain aspects of the proposals. One particular area of concern related to the proposed access route, on account of the surrounding ecological designations including the Caithness and Sutherlands SAC, SPAC and Ramsar, together with their component Sites of Special Scientific Interest (SSSI), which lie adjacent to the Strathy South forest boundary.

Current established forestry access to Strathy North and Strathy South wind farm sites is via the track from Strathy Village to Lochstrathy Bothy along Lochstrathy Track. An alternative route was proposed from Dallangwell through Strathy North Wind Farm, then via Cnoc Meala track which was used by off-road vehicles during forest planting (1980s), but was never surfaced and is now within the SAC. However, SNH responded to this route option by stating that it can envisage “no conceivable mitigation” for re-opening of the Cnoc Meala ATV track. In their consultation letter (ref: letter CNS/REN/WF/Strathy South dated 25 September 2007) SNH expressed concerns about the likely adverse impacts of the proposed access track on the qualifying interests of the European designated sites.

The Conservation of Habitats and Species Regulations 2010[6]require competent authorities to undertake Appropriate Assessments (AA) in certain circumstances where a plan or project affects a Natura (European) site.

AA is required when a plan or project affecting a Natura site:

- is not connected with management of the site for nature conservation, and
- is likely to have a significant effect on the site (either alone or in combination with other plans or projects).

In response to the concerns raised by SNH, the Applicant undertook an assessment of various route options in an Access Route Review[7] which is included as a separate document with the application package for Strathy South Wind Farm. The overall aim of this routing study was to identify the optimal access route for Strathy South wind farm, taking account of environmental, engineering, local and planning constraints and to satisfy the Appropriate Assessment requirements under the Habitat Regulations. The results of the Access Route Review identified a preferred route which is presented on Figure A4.1 and results in the least impact in terms of land take within the Caithness and Sutherland SAC, SPA and Ramsar.

[6] Conservation of Habitats and Species Regulations 2010 consolidates habitat regulations for England & Wales. However, it also applies to Scotland for specific activities affecting Natura 2000 sites, including Section 36 applications under the electricity act 1989. Apart from these specific activities, the Habitats & Birds Directive are implemented in Scotland through the Habitats Regulations 1994 (as amended)

[7] ENVIRON (2013) Strathy South Access Route Review (ref: UK12-17180)

(ii) Site Tracks

Following the deletion of the nine turbines from the 2007 Scheme, the site tracks were reviewed and their locations amended to minimise the amount of permanent land take from 388,800 m^2 to 336,995 m^2 (Figure A4.20).

(iii) Borrow Pit Locations

As a result of ornithological issues and additional changes to the overall scheme (turbine deletions), and after further assessment, Borrow Pits 3, 5 and 6 from the 2007 ES have been removed and Borrow Pit 1 and 2 merged. Therefore, it is anticipated that four borrow pits would be required in the Modified 2013 Scheme (Figure A4.1) compared to eight in the 2007 ES.

(iv) Redline Boundary

The redline boundary was extended to include the access track to the point where it reaches the consented Strathy North access track and also includes the track crossing Yellow Bog.

(b) Final Layout

(i) Access Track

Following identification of the preferred access route between Strathy South and Strathy Wood the proposed crossing of the River Strathy has been moved further eastwards to avoid crossing an area of open habitat to the south of the river. A further bridge crossing option has been considered (Figure A4.1) to the east of the preferred bridge crossing.

(ii) Site Tracks

A similar exercise was then undertaken following the removal of a further 21 turbines for the Modified 2013 Scheme. This led to a further reduction in permanent land take for tracks from 336,995 m^2 to 278,349 m^2 (including preferred access track).

(iii) Laydown Area

Following the removal of a number of turbines in the southern area of the site, Laydown Area (Laydown Area 3 on the 2007 Scheme) has been relocated to the north and is sited near T43 and adjacent to the concrete batching plant.

(iv) Redline Boundary

The redline boundary was extended to include the two bridge crossing options of the River Strathy and the cable route to the point where it reaches the Strathy North sub-station.

(v) Water Abstraction Locations

The water abstraction location to the west of the concrete batching plant remains the same as shown in the Reconsultation Layout. However, the water abstraction to the east has been brought closer to the batching plant and a further abstraction point has been added near T29. All abstractions would be from tributaries of the Yellowbog Burn.

A5 Environmental Impact Assessment

A5.1 Introduction

This chapter provides an update to the consultation that has been undertaken since the Original 2007 Scheme was submitted and explains how and where the Modified 2013 Scheme and associated ES Addendum respond to this consultation feedback.

A5.2 The EIA Regulations

Chapter 5 of the 2007 ES described the requirement for Environmental Impact Assessment (EIA) for the proposed Strathy South wind farm under the EIA Regulations and detailed the information which was required to be included within the 2007 ES to comply with the EIA Regulations. No update is required in relation to this section.

A5.3 The EIA Process

A5.3.1 Introduction

This ES Addendum has been prepared following a systematic approach to EIA and project design. Since submission of the Section 36 application for the Original 2007 Scheme, the additional key elements are:

- Consultation on the application and 2007 ES;
- Additional environmental studies;
- Modifications to the Original 2007 Scheme with input from EIA team;
- Further consultation on Modified 2013 Scheme;
- Environmental Assessments of the Modified 2013 Scheme;
- Preparation of the ES Addendum for the Modified 2013 Scheme; and
- Submission of the ES Addendum, including publicity.

A5.3.2 EIA Scoping

EIA Scoping was undertaken as part of the Original 2007 ES and has not been formally repeated for the Modified 2013 Scheme. However, consultation has been ongoing since the Original 2007 application was submitted and is detailed in Section A5.4 below.

A5.3.3 Consultation

The Scottish Ministers consulted with The Highland Council (THC) and other consultees on the Original 2007 application. During this consultation process matters were raised and, as a result, the application currently remains undetermined pending receipt of additional environmental information. In order to progress the matters raised, the Applicant has consulted during 2011-2013, via direct meetings or correspondence, with key statutory and non-statutory consultees listed below:

- Energy Consents and Deployment Unit (ECDU), Scottish Government;
- THC;
- Scottish Natural Heritage (SNH);
- Scottish Environment Protection Agency (SEPA);
- Forestry Commission Scotland;
- Marine Scotland;
- Northern District Salmon Fishery Board (NDFSB);
- RSPB Scotland; and
- Defence Estates.

Where relevant, details of the 2011-2013consultations are provided within the respective ES Addendum Technical Chapters: A8: Landscape to A16: Other Issues.

Following discussions with the above listed organisations, the Applicant made modifications to the Original 2007 Scheme to address specific concerns and to further reduce environmental impact. Copies of the consultee correspondence to the Original 2007 application where objections were raised are included as Technical Appendix A5.1.

Table A5.1 presents a summary of the consultation responses to the Original 2007 application and how these have been addressed according to each technical area.

Table A5.1: 2007 Consultation Responses and Actions

Topic	Description	Action
Ornithology and Ecology	RSPB expressed concern regarding the potential effect of the wind farm on the adjacent SPA and SAC; impact on qualifying species (including collision risk), habitat loss due to development on blanket bog, and cumulative impacts. SNH raised concerns over the potential impacts on Caithness and Sutherland SPA, SAC and Ramsar site, and its qualifying species. SNH requested that additional bird survey work be carried out for a number of qualifying species and an assessment into the effect of forest clearance on the bird population.	The Applicant commissioned a specialist consultancy to undertake additional survey work with regard to ornithology, peatland, ecology and forestry (Chapter A10: Ecology and Chapter A11: Birds). 30 turbines have been removed and the remainder have been relocated reducing ornithological impacts associated with the Modified 2013 Scheme.
Watercourse Crossings and Water Abstractions	SEPA expressed concern over the clarity of the mapping showing the proposed watercourse crossings, and highlighted a lack of information relating to water abstraction and the location of the concrete batching plant.	The Applicant commissioned SLR Consulting Ltd to undertake a watercourse crossing assessment to include photographs of proposed crossings and a site layout showing clearly all proposed watercourse crossing locations (refer to Chapter A14: Soil and Water and Technical Appendix A14.2). Abstraction and concrete batching plant information is included in Chapter A4: Development Description and the locations are presented on Figure A4.1.
Waste Management	SEPA requested that further clarification is provided in relation to the waste management principles for the site including the handling of surplus peat and soils. SEPA requested that individual waste streams are identified and that proposals are provided for minimising the production of waste, storage, use and disposal.	The Applicant has prepared a Construction Environmental Management Plan (CEMP) (refer to Technical Appendix A4.1) and a Peat Management Plan (Technical Appendix A4.3). The waste streams are identified in Chapter A4: Development Description and the approach to waste management are described in Technical Appendix A4.1: CEMP.

Table A5.1: 2007 Consultation Responses and Actions		
Topic	**Description**	**Action**
Water Quality and Fisheries	NDFSB raised concerns over a lack of baseline information on the River Strathy's salmonid population, hydrochemistry and macro-invertebrates.	The Applicant commissioned Waterside Ecology and PlantEcol to collect and produce reports on detailed baseline condition data associated with the River Strathy; these reports consider fisheries, macro-invertebrates (Technical Appendix A10.4 and A10.5) and water quality (Technical Appendix A14.3).
Peat	Halcrow (on behalf of Scottish Government) objected in relation to the quality of the Peat Stability Assessment Report. SEPA raised concerns over the site layout in relation to peatland, particular the proposal to microsite some turbines and access track within 90 m of the locations shown on the site layout plan. SNH raised concerns over the potential effect of peat slide on Atlantic Salmon and freshwater pearl mussel. SNH also had concerns over the locations of certain turbines located in deep peat.	The Applicant commissioned SLR Consulting Ltd to undertake a Peat Stability Assessment Report (Technical Appendix A14.1). New peat probing data has supplemented the existing peat depth data-set and informed a refined infrastructure layout. The infrastructure layout has therefore been modified as shown in the Modified 2013 Scheme (Figure A4.1).
Archaeology and Cultural Heritage	THC indicated additional information should be provided in relation to cumulative impacts on cultural heritage assets.	The Applicant commissioned Catherine Dagg (independent consultant) to undertake assessments on cultural heritage assets, to include a cumulative impact assessment, as well as updating the baseline information in relation to external cultural heritage assets, reflecting any changes since 2007 (Chapter A13: Cultural Heritage).
Access Track	SNH raised concern over the impact of the proposed access track between Strathy North and Strathy South, indicating that it would object to any route which crossed the Caithness and Sutherland Peatlands SAC.. SEPA also objected to the access track proposed based on impacts to the SAC.	The Applicant commissioned ENVIRON to undertake an Access Route Review to identify feasible alternative access routes to that proposed in the Original 2007 Scheme. As part of this process a preferred route was identified and is discussed in more detail in Chapter A4: Development Description.
	SNH requested additional information	The link road is an existing

Table A5.1: 2007 Consultation Responses and Actions		
Topic	**Description**	**Action**
	for the track linking areas of Strathy South ('link road') across the Yellow Bog, and an assessment of impacts of the existing track where upgraded for use.	track, previously included within the Original 2007 Scheme. An assessment of this route is included in this ES Addendum, along with proposals to off-set any habitat loss against enhancement (Chapter A10: Ecology).
Turbines	In July 2007 the Defence Infrastructure Organisation, on behalf of the Ministry of Defence (MOD), originally objected due to low flying concerns with the Original 2007 Scheme (110 m blade tip). However, following a meeting with SSE in 2008, the objection was removed.	The MOD requested that it was informed of any changes to the scheme. The MOD was provided with details of the revised layout and their response is provided in Table A5.2.
Grid	SNH requested more information on the grid connection and cable routes as it had concerns of the potential effect of the route on the blanket bog habitats.	Chapter A4: Development Description provides information on the proposed 33 kV underground cable route between Strathy South and Strathy North wind farms (Figure A4.1) and grid connection from Strathy North to the main grid network. An assessment of the proposed underground cable route is included in Chapter A10: Ecology. The connection to the main grid network will be subject to a separate Section 37 application which is anticipated to be submitted by Scottish Hydro-Electric Transmission Limited (SHETL) in the Summer of 2013.
Access & Recreation	The Sutherland Access Officer identified the 'Lochstrathy Bothy' and Hill Track 332' as being sensitive receptors.	Chapter A16: Other Issues addresses both the Lochstrathy Bothy and the Hill Track 332.

In September 2012 the Applicant prepared a re-consultation letter setting out how the concerns raised by consultees, as summarised above, would be addressed by the ES Addendum. This letter was sent to the ECDU (4th September 2012) and further copies were sent to the organisations presented in Table A5.2.

The re-consultation letter also explained the changes between the Original 2007 Scheme and the 68 turbine scheme, which was the design layout iteration under consideration at that time (the design layout iterations are detailed in Chapter A4: Development Description and presented on Figure A4.20: Further Layout Iterations). A summary of the consultation comments in response to the re-consultation letter are presented in Table A5.2 and copies of their responses are provided in Technical Appendix A5.2.

Table A5.2: Responses to the Re-consultation Letter		
Consultee	**Consultee Comment**	**Action**
Statutory Consultee		
The Highland Council (THC)	No comments at this stage, will respond when the ES Addendum is submitted.	No action required.
SEPA	SEPA requested that the ES Addendum includes the following information: ▪ Peat management plan and peat balance ▪ Details of how forest residues will be managed ▪ Information on wetlands if relevant ▪ Details of private water supply mitigation ▪ Details of watercourse crossings and consideration of any flood risk ▪ Details of proposed watercourse buffers ▪ Details of proposed water abstractions ▪ Details on borrow pits; and ▪ Updated construction environmental management principles	These information requirements are addressed as follows: ▪ A Peat Management Plan and a Peat Balance is presented in Technical Appendix A4.3 and A4.4; ▪ Forestry residues are discussed in the Habitat Management Plan (Technical Appendix A11.2); ▪ Issues relating to wetlands are discussed in Chapter A10: Ecology; ▪ Private Water Supply mitigation is included in Technical Appendix A14.2; ▪ Watercourse crossings and flood risk are addressed in Technical Appendix A14.2; ▪ Details of abstractions and borrow pits are presented in Chapter A4: Development Description; ▪ The construction environmental management principles are presented in Technical Appendix A4.1. Further consultation has been undertaken with SEPA following receipt of the reconsultation letter in 2012 (refer to Table A5.3 for details).
SNH	No comments at this stage, will respond when the ES Addendum is submitted.	Further consultation has been undertaken with SNH following the provision of the reconsultation letter in 2012 (refer to Table A5.3).
Non-statutory Consultees		
Forestry Commission Scotland (FCS)	FCS does not object to the application. FCS noted that the site sits in and is completely surrounded by the Caithness and Sutherland SAC and SPA. Consequently the removal of woodland and site restoration is seen as having wider environmental benefit.	Forestry removal is considered in Chapter A10: Ecology and the in Technical Appendix A10.xx: HMP. Consultation has been undertaken with both SEPA and SNH as detailed in Table A5.1-A5.3.

Table A5.2: Responses to the Re-consultation Letter		
Consultee	**Consultee Comment**	**Action**
	In consideration with the Scottish Government Woodland Removal Policy, FCS confirmed that woodland removal would not require compensatory planting. FCS stated that its comments should be considered alongside the responses from SNH and SEPA, and should not be considered in isolation. In addition, there are still a number of points of detail that FCS would wish to be taken into account: ▪ Timber recovery: the recovery of timber for off-site use and or processing must be maximised. ▪ Harvesting operations should be staged to avoid flooding timber markets. It would be helpful to consider the scale and rate of removal. It would be helpful to state the work processes and how impacts on the site will be minimised. There may be opportunities to assist local renewable projects. FCS Recommendations: ▪ The woodland removal has to be considered in the context of the proposed wind farm and the overall impact on the environment. ▪ Prepare a forest plan: this should include harvesting plans, timber utilisation proposals, show retained woodland and restocking options.	Further consultation has been undertaken with FCS following the provision of the reconsultation letter in 2012.
Historic Scotland	No comments at this stage, will respond when the ES Addendum is submitted.	No action required.
Marine Scotland Sciences	No comments at this stage, will respond when the ES Addendum is submitted.	No action required.
Transport Scotland	Requested that an Abnormal Load Assessment and a Swept Path Analysis are undertaken.	These reports are summarised in Chapter A15: Roads and Traffic and included as Technical Appendices A15.1 and A15.2 respectively.
NDSFB	No response.	No action required.
BT	No comments at this stage, will respond when the ES Addendum is submitted.	No action required.

Table A5.2: Responses to the Re-consultation Letter		
Consultee	**Consultee Comment**	**Action**
Civil Aviation Authority	Recommends that if the proposed development is approved, the Defence Geographic should be informed of the locations, heights and lighting status of the turbines and meteorological masts, the estimated and actual dates of construction and the maximum height of any construction equipment to be used, prior to the start of construction, to allow for the appropriate inclusion on Aviation Charts, for safety purposes. Owing to the height of the proposed turbines there is no CAA requirement for the turbines to be lit.	No action required at this stage.
The Crown Estate	The Crown Estates confirmed that as the 68 turbine layout would not affect any of its current interests it will not be providing any comments.	No action required.
MOD	In response to the 68 turbine scheme, the MOD raised concerns that the turbines would be within the Highlands Restricted Area, and would unacceptably affect military activities. It also requested that all turbines should be fitted with either 25 candela omni-directional red lighting or infrared lighting with an optimised flash pattern of 60 flashes per minute of 200 ms to 500 ms duration at the highest practicable point.	The Applicant is working with the MOD to agree a mitigation solution in relation to operational low flying Refer to Table A5.3. A suitable lighting strategy would be agreed in consultation with MOD and HIAL.
Joint Radio Company	Confirmed no links would be affected by the proposed development.	No action required.
NATS Safeguarding	The proposed development has been examined from a technical safeguarding aspect and does not conflict with NATS' safeguarding criteria. Accordingly, NATS (En Route) Public Limited Company ("NERL") has no safeguarding objection to the proposal. If any changes are proposed to the information supplied to NERL in regard to this application which become the basis of a revised, amended or further application for approval, then as a statutory consultee NERL requires that it be further consulted on any such changes prior to any planning permission or any consent being granted.	No further action required.

Table A5.2: Responses to the Re-consultation Letter		
Consultee	**Consultee Comment**	**Action**
RSPB Scotland	No formal response to this letter has been received from RSPB, but SSER has actively engaged in consulting with RSPB during this process.	Refer to Chapter A11: Birds.
OFCOM	No links would be affected by the proposed development.	No action required.
Highlands and Islands Airports (HIAL)	HIAL calculations show that, at the given position and height, this development would not infringe the safeguarding surfaces for Wick Airport. However, due to its height and position, red obstacle lights may be required to be fitted at the hub height of some of the turbines.	A suitable lighting strategy would be agreed in consultation with MOD and HIAL.
British Horse Society	No comments at this stage, will respond when the ES Addendum is submitted.	No action required.
Scottish Rights of Way and Access Society	No comments at this stage, will respond when the ES Addendum is submitted.	No action required.
Nuclear Safety Directorate	No response.	No action required.
Atkins Global[1]	The proposed development has been examined in relation to UHF Radio Scanning Telemetry communications and we are happy to inform you that there is no objection the proposal.	No action required.

Following the submission of the reconsultation letter to ECDU in September 2012 of the 68 turbine scheme, the site layout underwent further design iterations, as described in Section A4.11: Design Alternatives, Chapter A4: Development Description. The final layout is that of the Modified 2013 Scheme (47 turbines), and further consultation on this was undertaken with a number of stakeholders. A summary of this consultation is presented in Table A5.3 and discussed in more detail in the relevant technical chapters.

Table A5.3: Consultation Summary for the Modified 2013 Site Layout		
Consultee	**Summary**	**Where this is addressed**
Statutory Consultee		
SEPA	Following the consultation response from SEPA to the 68 turbine layout a meeting was held between SEPA, SSER and ENVIRON in March 2013. The discussion covered: forestry and	A Forest Clearance and Habitat Management is provided in Technical Appendix A11.2. These plans outline the proposals with respect to forest

[1] Atkins Limited is responsible for providing Wind Farm/Turbine support services to the Telecommunications Association of the UK Water Industry

Table A5.3: Consultation Summary for the Modified 2013 Site Layout		
Consultee	**Summary**	**Where this is addressed**
	the HMP, peat, watercourses and GWDTE.	clearance works and site land management. Further details are covered in Chapter A10: Ecology; this chapter also addresses GWDTE. Peat and hydrology issues are covered in Chapter A14: Soil and Water.
SNH	Visual Impact: The Modified 2013 Scheme was presented to SNH for comment. SNH provided comments in relation to the extent of the study area, consideration of designated landscapes (including wild land), cumulative viewpoints and site layout.	Issues relating to visual impact are addressed in Chapter A9: Visual Assessment.
	Ecology and Ornithology: Ongoing consultation has been undertaken with SNH to cover the proposed access track, cable route, ornithological collision risk/disturbance and the HMP.	Issues relating to ecology and ornithology are addressed in Chapter A10: Ecology and A11: Birds, respectively.
MOD	The MOD raised concerns about the presence of Strathy South Wind Farm within a low fly training zone, referred to as 14 Tango. A meeting was held with the MOD on 4th March 2013 to review the revised layout and discuss any concerns.	The issues are addressed in Chapter A16: Other Issues.

The Applicant has also regularly engaged with the following community councils to present and discuss the proposed development at Strathy South:

- Bettyhill, Strathnaver & Altnaharra Community Council;
- Melvich, Forsinain Community Council; and
- Strathy & Armadale Community Council.

A5.4 Scope of the EIA

A5.4.1 Construction and Ongoing Effects

The potential effects arising from the Modified 2013 Scheme are identified and assessed in each technical chapter. Therefore, Technical Appendix 5.2 of the 2007 ES is superseded.

A5.4.2 Secondary Effects

Secondary effects are addressed in the technical chapters of this ES Addendum. Therefore, Technical Appendix 5.3 of the 2007 ES is superseded.

A5.4.3 Cumulative Effects

The cumulative effects relevant to each technical discipline are addressed in the relevant technical chapters.

A5.4.4 Effects Scoped Out

As with the 2007 ES, the physical process of decommissioning has been excluded from the scope of the assessment on the basis that this would be of a similar nature to construction, but on a smaller scale and over a shorter time period. However, the results of the decommissioning process (e.g. reinstatement) have been taken into account.

A6 Site Context

A6.1 Introduction

This chapter provides an update to the natural and man-made environment in the vicinity of the Modified 2013 Scheme at Strathy South.

A6.2 Location

The location of the Strathy South wind farm site has not changed since the 2007 ES was submitted.

A6.3 Topography

There are no changes to this section.

A6.4 Settlements

There are no changes to this section.

A6.5 Transport Infrastructure

As described in Chapter A4: Development Description, for the Original 2007 Scheme, access to the proposed Strathy South wind farm was via an existing forestry track which branches from the A836 at Strathy village (Figure 4.5 of the 2007 ES). The Original 2007 Scheme proposed that traffic would travel south-east from the A836, along the Strathy Bypass (to be constructed as part of the consented Strathy North wind farm) before travelling south-west through the Strathy North wind farm site and finally across the 'Cnoc Meala' route which crosses the Caithness and Sutherland Peatlands SAC, SPA and Ramsar site. The access was proposed to enter the north-west area of the Strathy South site.

In the Modified 2013 Scheme these access proposals have been amended. Traffic would still access the site via the A836 and Strathy Bypass; and continue through Strathy North but instead of going south west to the 'Cnoc Meala' route, it now alters at grid ref NGR NC794 569, to progress south to Strathy South wind farm (via one of two possible crossing options of the River Strathy shown on Figure A4.1) through Strathy Wood, re-joining an existing track which then meets the north-east site boundary of Strathy South. This site access is shown on Figure A4.1.

It should also be noted that when the Original 2007 ES was submitted, the A836 between Melvich and Strathy was a single track with passing places. This section of the road has subsequently been upgraded to a two-lane road.

No other updates are required to this section of the chapter.

A6.6 Land Use

An application for a wind farm is currently being prepared by Eon for up to 28 wind turbines (145 m to blade tip) immediately to the north of the site. This application is called Strathy Wood Wind Farm.

Approximately 2.4 km to the north of the site is Strathy North wind farm, which achieved planning consent for 33 wind turbines in November 2011. The site will be operated by the SSEG and the pre-construction works for Strathy North are currently underway.

The location of Strathy Wood and Strathy North wind farms in relation to the site are presented on Figure A1.2.

A6.7 Electricity Infrastructure

As described in Section A4.3.1 of Chapter A4: Development Description, Scottish-Hydro Electric Transmission Limited (SHETL) is applying for consent to construct two new parallel 132kV overhead transmission lines (OHLs) to connect the consented Strathy North Wind Farm to the National Grid and construction of a new substation to complete the connection for onward transmission on the Beauly to Dounreay 275 kV transmission line.

Whilst only one line would be required to connect Strathy North wind farm, the consenting of a second parallel line would provide future grid connection opportunities to Strathy South, should it gain consent. The development, called Strath Halladale to Dallangwell 132 kV Connection, is located in the Highlands Local Authority area and consent is being sought by means of an application to the Scottish Ministers under Section 37 of the Electricity Act (1989). It is anticipated that this application will be submitted in the summer of 2013.

The development of an on-site substation at Strathy North Wind Farm to facilitate the connection would be required following a modification to the connection agreement from National Grid. THC planning officer is aware of the new requirement and any changes would be undertaken in agreement and confirmed in writing with THC to accommodate this.

Details of the cable route between Strathy North and Strathy South, and across the Yellow Bog are described in Section A4.3.1 of Chapter A4: Development Description.

A6.8 Wind Farms

There are a number of wind farm developments within the planning system which are either in planning or are consented/operational and these are presented in Table A6.1 and shown on Figure A9.28.

Table A6.1: Wind Farm Developments in the Planning System

Status	Reference & Name	Location	No. of Turbines	Turbine Geometry
Operational	Forss I	Near Thurso	2	H=62 D=94
	Forss II	Near Thurso	4	H=62 D=94
	Buolfruich	Dunbeath	15	H=44 D=52
	Causeymire	Westerdale	21	H=60 D=80
	Kilbraur	Strath Brora	19	H=70 D=90
	Kilbraur Extension	Strath Brora	8	H=80 D=90
	Flex Hill	Bilbster	3	H=60 D=80
	Achairn	Wick	3	H=60 D=80
	Achany	Lairg	19	H=67 D=70
	Gordonbush	Brora	35	H=67 D=80
	Lairg	Lairg	3	H=59.5 D=80
	Bettyhill	Bettyhill	2	H=80 D=90
Under Construction	Rosehall	Lairg	19	H=55 D=70
	Baillie Hill	Westfield	21	H=70 D=80

Table A6.1: Wind Farm Developments in the Planning System				
Status	**Reference & Name**	**Location**	**No. of Turbines**	**Turbine Geometry**
	Camster	Bilbster	25	H=80 D=80
	Wathegar	Bilbster	5	H=60 D=80
Approved	Causeymire Extension	Westerdale	3	H=60 D=80
	Stroupster	Nybster	12	H=60 D=104
	Burn of Whilk	East Clyth	9	H=70 D=92
	Melness	Tongue	3	H=49 D=52
	Strathy North	Strathy	33	H=70 D=80
	Wathegar 2	Bilbster	9	H=60 D=80
Submitted	Halsary	Mybster	18	H=60 D=80
	Dunbeath	Dunbeath	17	H=80 D=90
	Sallachy	Lairg	22	H=74.5 D=101
	Dalnessie	Lairg	27	H=73.5 D=95
	Braemore	Lairg	24	H=80 D=93
	Limekiln	Dounreay	24	H=98.4 D=52
	Glencassley	Lairg	26	H=80 D=91.2
	Bad A Cheo	Westermire	13	H=65 D=80
	Rumster	Lybster	3	H=50 D=50
Appeal	Forss III	Near Thurso	5	H=55 D=52
Scoping	Strathy Wood	Strathy	28	H=100 D=93

A6.9 Nature Conservation Designations

There are no changes to this section.

A6.10 Other Designations

Areas where wild land described in the SNH Policy Statement No. 02/03 'Wildness in Scotland's Countryside' may potentially be found were suggested on the SNH map 'Search Areas for Wild Land' (2002). This policy statement and mapping formed the basis for a Wild Land Assessment in the 2007 ES.

Since the 2007 ES assessment was completed, SNH has published revised mapping, as part of a consultation exercise (Core Areas of Wild Land in Scotland, April 2013). However, SNH advises that the previous mapping should continue to be used until the Scottish Government confirms its approach in the finalised National Planning Framework in 2014. Based on the 2002 SNH map 'Search Areas for Wild Land', the site is not within any of the WLSAs, but it is intervisible with parts of them (Figure A8.2). Further details of the Wild Land Assessment are provided in Chapter A8: Landscape.

A7 Planning Context

A7.1 Introduction

This section sets out the planning policy context relevant to the proposed Strathy South wind farm (the "Modified 2013 Scheme"). The approach focuses upon the policies from the statutory Development Plan, national planning policy and guidance and other material considerations. A detailed examination of policy and its relevance to the Modified 2013 Scheme is provided in the "Planning Statement" which is submitted with this addendum. This Chapter replaces the Chapter 7: Planning Context contained within the 2007 ES.

The application for the Modified 2013 Scheme is, for the maximum proposed electricity generation capacity which would exceed 50 MW, and is therefore submitted under the Electricity Act 1989. In considering the application under Section 36 of the Electricity Act, the Scottish Ministers must also fulfil the requirements of paragraph 3 (1)of Schedule 9 of that Act which states:

"In formulating any relevant proposals, a licence holder or a person authorised by an exemption to generate or supply electricity –

(a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites building and objects of architectural, historic or archaeological interest; and

(b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."

If Section 36 consent is granted, the Scottish Ministers may also direct under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 that planning permission for the development is deemed to be granted.

The Development Plan, national policy and guidance provide the relevant planning policy context. It is important to note that this chapter does not include an assessment of the Modified 2013 Scheme's accordance with the statutory Development Plan and other material considerations. The Applicant has submitted a separate Planning Statement which assesses, in detail, the Modified 2013 Scheme in the context of the relevant Development Plan policies, national planning and renewable energy policy and other material considerations. The Planning Statement does not form part of this ES Addendum.

It should also be noted that since this application is to be considered under section 36 of the Electricity Act 1989, it is not a determination under the Town and Country Planning (Scotland) Act 1997 to which the primacy of the development plan applies under section 25 of that Act. Rather, the Ministers will have regard to all material considerations and the obligations under schedule 9 to the 1989 act when deciding whether to grant section 36 consent.

A7.2 The Development Plan

Under the terms of the Planning Acts and associated Regulations, Councils are required to prepare and keep up to date a statutory Development Plan. The Development Plan provides the land use planning policy framework for their administrative areas. The statutory Development Plan relevant to the application consists of the following:

- The Highland Wide Local Development Plan (hereinafter referred to as the "HwLDP"); and
- The Sutherland Local Plan (June 2010) (Retained Sections).

Having assessed the parts of the Sutherland Local Plan which remain in force it is considered that there are no sections which are relevant to the Modified 2013 Scheme; therefore no detailed assessment of this plan is required.

A7.3 The Highland Wide Local Development Plan

The HwLDP was adopted on 5 April 2012 and supersedes the previous Development Plan covering the Modified 2013 Scheme at Strathy South which was the Highland Structure Plan and the Sutherland Local Plan (2010)[1].

Section 4 of the HwLDP sets out the spatial strategy for the area. Paragraph 4.1 states *"…it is important to ensure that development is, in the first instance, directed to places with sufficient existing or planned infrastructure and facilities to support sustainable development"* (page 10). In line with Scottish Planning Policy (SPP), it emphasises that the national context is one of support for sustainable economic growth.

Section 5 of the HwLDP sets out the vision for the Highland Council Area as follows: - *"by 2020, Highland will be one of Europe's leading regions. We will have created sustainable communities, balancing population growths, economic development and the safeguarding of the environment across the area, and have built a fairer and healthier Highlands"* (page 13).

The Council has translated the decision into what this means in land use planning terms and this also includes *"ensuring that development of renewable energy resources are managed effectively with clear guidance on where renewable energy developments should and should not be located"* (page 13). The Council aims to:

- enable sustainable Highland communities;
- safeguard the environment ;
- support a competitive, sustainable and adaptable Highland economy;
- achieve a healthier Highlands; and
- provide better opportunities for all and a fairer Highland.

Section 6 of the HwLDP specifically refers to the Caithness and Sutherland geographical area, in which the Modified 2013 Scheme is located. The HwLDP states that by 2030 Caithness and Sutherland will:

- be a regenerating place with a network of strong communities;
- be a competitive place connected to the global economy;
- be a connected and accessible place;
- be a place of outstanding heritage: safe in the custody of local people;
- be a centre of excellence for energy and engineering;
- have become an international centre of excellence for marine renewables
- have a high quality tourist industry; and
- have a more diverse economy.

The policy of most relevance to renewable energy developments is Policy 67 "*Renewable Energy Developments".*

The other potentially relevant HwLDP policies are listed in Table A7.1.

Table A7.1: Relevant HwLDP Policies

Policy Ref	Policy Heading	Topic
28	Sustainable Design	General design
30	Physical Constraints	Physical Constraint

[1] With the exception of those parts of the Sutherland Local Plan which remain valid as detailed in The Highland Council (Appendix 7 retention schedule).

Table A7.1: Relevant HwLDP Policies		
Policy Ref	**Policy Heading**	**Topic**
36	Development in the wider countryside	Development in the countryside
53	Minerals	Mineral extraction
55	Peat and Soils	Peat and Soils
57	Natural, Built and Cultural Heritage	Cultural Heritage
58	Protected Species	Ecology
59	Other important species	Ecology
60	Other important Habitats and Article 10 Features	Ecology
61	Landscape	Amenity
64	Flood Risk	Flooding
66	Surface Water Drainage	Drainage
67	**Renewable Energy Developments**	**Renewable Energy**
77	Public Access	Public Access
78	Long Distance Routes	Public Access

(a) Renewable Energy Policy

Policy 67 'Renewable Energy Policy' is the key policy within the HwLDP with respect to onshore wind and encompasses a number of criteria such as cultural heritage, ecology, drainage, tourism and recreation and amenity, which are all addressed under other topic specific policies.

Renewable energy development proposals should be well related to the source of the primary renewable resources that are needed for their operation. The Council will also consider:

- *the contribution of the proposed development towards meeting renewable energy generation targets; and*
- *any positive or negative effects it is likely to have on the local and national economy;*
- *and will assess proposals against other policies of the development plan, the Highland Renewable Energy Strategy and Planning Guidelines and have regard to any other material considerations, including proposals able to demonstrate significant benefits including by making effective use of existing and proposed infrastructure or facilities.*

Subject to balancing with these considerations and taking into account any mitigation measures to be included, the Council will support proposals where it is satisfied that they are located, sited and designed such that they will not be significantly detrimental overall, either individually or cumulatively with other developments (see Glossary), having regard in particular to any significant effects on the following:

- *natural, built and cultural heritage features;*
- *species and habitats;*

- *visual impact and impact on the landscape character of the surrounding area (the design and location of the proposal should reflect the scale and character of the landscape and seek to minimise landscape and visual impact, subject to any other considerations);*
- *amenity at sensitive locations, including residential properties, work places and recognised visitor sites (in or outwith a settlement boundary);*
- *the safety and amenity of any regularly occupied buildings and the grounds that they occupy- having regard to visual intrusion or the likely effect of noise generation and, in the case of wind energy proposals, ice throw in winter conditions, shadow flicker or shadow throw;*
- *ground water, surface water (including water supply), aquatic ecosystems and fisheries;*
- *the safe use of airport, defence or emergency service operations, including flight activity, navigation and surveillance systems and associated infrastructure, or on aircraft flight paths or MoD low-flying areas;*
- *other communications installations or the quality of radio or TV reception;*
- *the amenity of users of any Core Path or other established public access for walking, cycling or horse riding;*
- *tourism and recreation interests;*
- *land and water based traffic and transport interests.*

Proposals for the extension of existing renewable energy facilities will be assessed against the same criteria and material considerations as apply to proposals for new facilities.

In all cases, if consent is granted, the Council will approve appropriate conditions (along with a legal agreement/obligation under section 75 of the Town and Country Planning (Scotland) Act 1997, as amended, where necessary), relating to the removal of the development and associated equipment and to the restoration of the site, whenever the consent expires, other than in circumstances where fresh consent has been secured to extend the life of the project, or the project ceases to operate for a specific period.

The Onshore Wind Energy Supplementary Guidance will replace parts of the Highland Renewable Energy Strategy. It will identify: areas to be afforded protection from wind farms; other areas with constraints; and broad areas of search for wind farms. It will set out criteria for the consideration of proposals. It will ensure that developers are aware of the key constraints to such development and encourage them to take those constraints into account at the outset of the preparation of proposals. It will seek to steer proposals, especially those for larger wind farms, away from the most constrained areas and ideally towards the least constrained areas and areas of particular opportunity. It will also set out criteria which will apply to the consideration of proposals irrespective of size and where they are located, enabling proposals to be considered on their merits. It will seek submission as part of the planning application of key information required for the assessment of proposals and provide certainty for all concerned about how applications will be considered by the Council.

Policy 67 provides support for renewable energy developments where (subject to balancing the impacts of development and assessment against the other policies in the Development Plan) they are located, sited and designed in such a manner that they will not be significantly detrimental overall, either individually or cumulatively with other developments.

The policy also states that onshore wind energy supplementary guidance will replace parts of the Highland Renewable Energy Strategy and set out criteria for the consideration of

proposals. The interim onshore wind energy supplementary guidance is discussed later in this Chapter.

(b) General Policies of the HwLDP

The HwLDP contains a number of general, environmental based, multi-criteria policies spanning a range of topics.

(c) Policy 28 Sustainable Design

The Council will support developments which promote and enhance the social, economic and environmental wellbeing of the people of Highland.

Proposed developments will be assessed on the extent to which they:

- *are compatible with public service provision (water and sewerage, drainage, roads, schools, electricity);*
- *are accessible by public transport, cycling and walking as well as car;*
- *maximise energy efficiency in terms of location, layout and design, including the utilisation of renewable sources of energy and heat;*
- *are affected by physical constraints described in Physical Constraints on Development: Supplementary Guidance*
- *make use of brownfield sites, existing buildings and recycled materials;*
- *demonstrate that they have sought to minimise the generation of waste during the construction and operational phases. (This can be submitted through a Site Waste Management Plan);*
- *impact on individual and community residential amenity;*
- *impact on non-renewable resources such as mineral deposits of potential commercial value, prime quality agricultural land, or approved routes for road and rail links;*
- *impact on the following resources, including pollution and discharges, particularly within designated areas:*

habitats	*freshwater systems*
species	*marine systems*
landscape	*cultural heritage*
scenery	*air quality;*

- *demonstrate sensitive siting and high quality design in keeping with local character and historic and natural environment and in making use of appropriate materials;*
- *promote varied, lively and well-used environments which will enhance community safety and security and reduce any fear of crime;*
- *accommodate the needs of all sectors of the community, including people with disabilities or other special needs and disadvantaged groups; and*
- *contribute to the economic and social development of the community.*

Developments which are judged to be significantly detrimental in terms of the above criteria will not accord with this Local Development Plan. All development proposals must demonstrate compatibility with the Sustainable Design Guide: Supplementary Guidance, which requires that all developments should:

- *conserve and enhance the character of the Highland area*

- *use resources efficiently*
- *minimise the environmental impact of development*
- *enhance the viability of Highland communities.*

Compatibility should be demonstrated through the submission of a Sustainable Design Statement where required to do so by the Guidance.

All developments must comply with the greenhouse gas emissions requirements of the Sustainable Design Guide.

In the relatively rare situation of assessing development proposals where the potential impacts are uncertain, but where there are scientific grounds for believing that severe damage could occur either to the environment or the wellbeing of communities, the Council will apply the precautionary principle.

Where environmental and/or socio-economic impacts of a proposed development are likely to be significant by virtue of nature, size or location, The Council will require the preparation by developers of appropriate impact assessments. Developments that will have significant adverse effects will only be supported if no reasonable alternatives exist, if there is demonstrable over-riding strategic benefit or if satisfactory overall mitigating measures are incorporated.

Policy 28 is a general sustainability policy providing support to proposals which are considered to promote and enhance the social, economic and environmental wellbeing of the people of Highland.

(d) Policy 30 Physical Constraints

Developers must consider whether their proposals would be located within areas of constraints as set out in Physical Constraints: Supplementary Guidance. The main principles of the guidance are:

- *to provide developers with up to date information regarding physical constraints to development in Highland; and*
- *to ensure proposed developments do not adversely affect human health and safety or pose risk to safeguarded sites.*

Where a proposed development is affected by any of the constraints detailed within the guidance, developers must demonstrate compatibility with the constraint or outline appropriate mitigation measures to be provided.

Policy 30 requires developers to consider whether proposed development will be located within areas of constraint as set out within Supplementary Guidance.

(e) Policy 36 Development in the Wider Countryside

Outwith Settlement Development Areas, development proposals will be assessed for the extent to which they:

- *are acceptable in terms of siting and design;*
- *are sympathetic to existing patterns of development in the area;*
- *are compatible with landscape character and capacity;*
- *avoid incremental expansion of one particular development type within a landscape whose distinct character relies on an intrinsic mix/distribution of a range of characteristics;*
- *avoid, where possible, the loss of locally important croft land; and*

- *would address drainage constraints and can otherwise be adequately serviced, particularly in terms of foul drainage, road access and water supply, without involving undue public expenditure or infrastructure that would be out of keeping with the rural character of the area.*

Development proposals may be supported if they are judged to be not significantly detrimental under the terms of this policy. In considering proposals, regard will also be had to the extent to which they would help, if at all, to support communities in Fragile Areas (as defined by Highlands & Islands Enterprise) in maintaining their population and services by helping to re-populate communities and strengthen services.

Within Fragile Areas, proposals that will lead to the change of use or loss of a lifeline rural facility such as a village shop, whether or not that facility is outwith the settlement development area, will be required to provide information as why the facility/use is no longer feasible including evidence that it has been marketed for that purpose at a reasonable price/rent for a minimum period of 3 months.

Renewable energy development proposals will be assessed against the Renewable Energy Policies, the non-statutory Highland Renewable Energy Strategy and where appropriate, Onshore Wind Energy: Supplementary Guidance.

All proposals should still accord with the other general policies of the plan. Development proposals for housing in the wider countryside will be determined against the relevant sections of the Housing in the Countryside and Siting and Design: Supplementary Guidance.

Policy 36 concerns development in the wider countryside. The policy is not framed to deal with onshore wind which is addressed more specifically within Policy 67.

(f) Policy 53 Minerals

The Council will support the following areas for mineral extraction:

- *Extension of an existing operation/site*
- *Re-opening of a dormant quarry*
- *A reserve underlying a proposed development where it would be desirable to extract prior to development.*

Before a new site for minerals development will be given permission, it must be shown that other existing reserves have been exhausted or are no longer viable or, for construction aggregates, amount to less than a ten-year supply of permitted reserves.

The Council will support borrow pits which are near to or on the site of the associated development if it can be demonstrated that they are the most suitable source of material, are time limited and appropriate environmental safeguards are in place for the workings and the reclamation.

Geodiversity will also be considered when assessing proposals; the Council may set out conditions covering working methods, restoration and after use to safeguard the geodiversity value. Geodiversity value may occur outwith designated sites. The Council will encourage opportunities to enhance geodiversity in all relevant development proposals including the potential to create, extend or restore geodiversity interests e.g. during mineral working and restoration.

The Council will safeguard all existing economically significant, workable minerals reserves/operations from incompatible development which is likely to sterilise it unless:

- *there is no alternative site for the development; and*

- *the extraction of mineral resources will be completed before the development commences.*

All minerals developments will have to provide information on pollution prevention, restoration and mitigation proposals. Restoration should be carried out in parallel with excavation where possible. Otherwise it should be completed in the shortest time practicable. Planning conditions will be applied to ensure that adequate provision is made for the restoration of workings. The Council will expect all minerals developments to avoid or satisfactorily mitigate any impacts on residential amenity, the natural, built and cultural heritage, and infrastructure capacities. After uses should result in environmental improvement rather than just restoring a site to its original state. After uses should add to the cultural, recreational or environmental assets of an area. A financial guarantee may be sought.

Policy 53 concerns mineral extraction and has limited relevance to the development of wind farms, with the exception of the third paragraph which states that borrow pits will be supported where near to, or on the site of, the associated development if it can be demonstrated that they are the most suitable source of material, are time limited and appropriate environmental safeguards are in place for the workings and the reclamation.

(g) Policy 55 Peat and Soils

Development proposals should demonstrate how they have avoided unnecessary disturbance, degradation or erosion of peat and soils.

Unacceptable disturbance of peat will not be permitted unless it is shown that the adverse effects of such disturbance are clearly outweighed by social, environmental or economic benefits arising from the development proposal.

Where development on peat is clearly demonstrated to be unavoidable then The Council may ask for a peatland management plan to be submitted which clearly demonstrates how impacts have been minimised and mitigated.

New areas of commercial peat extraction will not be supported unless it can be shown that it is an area of degraded peatland which is clearly demonstrated to have been significantly damaged by human activity and has low conservation value and as a result restoration is not possible.

Proposals must also demonstrate to the Council's satisfaction that extraction would not adversely affect the integrity of nearby Natura sites containing areas of peatland.

Policy 55 seeks that development proposals demonstrate how they avoid unnecessary disturbance, degradation or erosion of peat and soils.

(h) Policy 57 Natural, Built and Cultural Heritage

All development proposals will be assessed taking into account the level of importance and type of heritage features, the form and scale of the development, and any impact on the feature and its setting, in the context of the policy framework detailed in Appendix 2. The following criteria will also apply:

*1. For features of **local/regional importance** we will allow developments if it can be satisfactorily demonstrated that they will not have an unacceptable impact on the natural environment, amenity and heritage resource.*

*2. For features of **national importance** we will allow developments that can be shown not to compromise the natural environment, amenity and heritage resource. Where there may be any significant adverse effects, these must be clearly outweighed by social or economic benefits of national importance. It must also be shown that the development will support communities in fragile areas who are having difficulties in keeping their population and services.*

*3. For features of **international importance** developments likely to have a significant effect on a site, either alone or in combination with other plans or projects, and which are not directly connected with or necessary to the management of the site for nature conservation will be subject to an appropriate assessment. Where we are unable to ascertain that a proposal will not adversely affect the integrity of a site, we will only allow development if there is no alternative solution and there are imperative reasons of overriding public interest, including those of a social or economic nature. Where a priority habitat or species (as defined in Annex 1 of the Habitats Directive) would be affected, development in such circumstances will only be allowed if the reasons for overriding public interest relate to human health, public safety, beneficial consequences of primary importance for the environment, or other reasons subject to the opinion of the European Commission (via Scottish Ministers). Where we are unable to ascertain that a proposal will not adversely affect the integrity of a site, the proposal will not be in accordance with the development plan within the meaning of Section 25(1) of the Town and Country Planning (Scotland) Act 1997.*

Note: Whilst Appendix 2 groups features under the headings international, national and local/regional importance, this does not suggest that the relevant policy framework will be any less rigorously applied. This policy should also be read in conjunction with the Proposal map.

The Council intends to adopt the Supplementary Guidance on Wild Areas in due course. The main principles of this guidance will be:

- *to provide mapping of wild areas;*
- *to give advice on how best to accommodate change within wild areas whilst safeguarding their qualities;*
- *to give advice on what an unacceptable impact is; and*
- *to give guidance on how wild areas could be adversely affected by development close to but not within the wild area itself.*

In due course the Council also intends to adopt the Supplementary Guidance on the Highland Historic Environment Strategy. The main principles of this guidance will ensure that:

- *Future developments take account of the historic environment and that they are of a design and quality to enhance the historic environment bringing both economic and social benefits.*
- *It sets a proactive, consistent approach to the protection of the historic environment.*

Policy 57 requires that all development proposals are assessed to take into account the level of importance and type of heritage features, and any impact on identified features and their setting.

(i) Policy 58 Protected Species

Where there is good reason to believe that a protected species may be present on site or may be affected by a proposed development, we will require a survey to be carried out to establish any such presence and if necessary a mitigation plan to avoid or minimise any impacts on the species, before determining the application.

Development that is likely to have an adverse effect, individually and/or cumulatively, on European Protected Species (see Glossary) will only be permitted where:

- *There is no satisfactory alternative;*

- *The development is required for preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment; and*
- *The development will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.*

Development that is likely to have an adverse effect, individually and/or cumulatively, on protected bird species (see Glossary) will only be permitted where:

- *There is no other satisfactory solution; and*
- *The development is required in the interests of public health or public safety.*

This will include but is not limited to avoiding adverse effects, individually and/or cumulatively, on the populations of the following priority protected bird species:

- *Species listed in Annex 1 of the EC Birds Directive*
- *Regularly occurring migratory species listed in Annex II of the Birds Directive*
- *Species listed in Schedule 1 of the Wildlife and Countryside Act 1981 as amended*
- *Birds of conservation concern*

Development that is likely to have an adverse effect, individually and/or cumulatively (see glossary), on other protected animals and plants (see Glossary) will only be permitted where the development is required for preserving public health or public safety.

Development proposals should avoid adverse disturbance, including cumulatively, to badgers and badger setts, protected under the Protection of Badgers Act 1992 (as amended by the Nature Conservation (Scotland) Act 2004.

(j) Policy 59 Other Important Species

The Council will have regard to the presence of and any adverse effects of development proposals, either individually and/or cumulatively, on the Other Important Species which are included in the lists below, if these are not already protected by other legislation or by nature conservation site designations:

- *Species listed in Annexes II and V of the EC Habitats Directive*
- *Priority species listed in the UK and Local Biodiversity Action Plans*
- *Species included on the Scottish Biodiversity List*

We will use conditions and agreements to ensure detrimental effect on these species is avoided.

(k) Policy 60 Other Important Habitats and Article 10 Features

The Council will seek to safeguard the integrity of features of the landscape which are of major importance because of their linear and continuous structure or combination as habitat "stepping stones" for the movement of wild fauna and flora. (Article 10 Features). The Council will also seek to create new habitats which are supportive of this concept. The Council will have regard to the value of the following Other Important Habitats, where not protected by nature conservation site designations (such as natural water courses), in the assessment of any development proposals which may affect them either individually and/or cumulatively:

- *Habitats listed in Annex I of the EC Habitats Directive*
- *Habitats of priority and protected bird species (see Glossary)*

- *Priority habitats listed in the UK and Local Biodiversity Action Plans*
- *Habitats included on the Scottish Biodiversity List*

The Council will use conditions and agreements to ensure that significant harm to the ecological function and integrity of Article 10 Features and Other Important Habitats is avoided. Where it is judged that the reasons in favour of a development clearly outweigh the desirability of retaining those important habitats, the Council will seek to put in place satisfactory mitigation measures, including where appropriate consideration of compensatory habitat creation.

Policies 58, 59 and 60 relate to ecology and habitats and require developers to consider the presence of protected species and habitats and provide mitigation to avoid or minimise any impacts as appropriate. Policies 59 and 60 are commitments upon the Council.

(l) Policy 61 Landscape

New developments should be designed to reflect the landscape characteristics and special qualities identified in the Landscape Character Assessment of the area in which they are proposed. This will include consideration of the appropriate scale, form, pattern and construction materials, as well as the potential cumulative effect of developments where this may be an issue. The Council would wish to encourage those undertaking development to include measures to enhance the landscape characteristics of the area. This will apply particularly where the condition of the landscape characteristics has deteriorated to such an extent that there has been a loss of landscape quality or distinctive sense of place. In the assessment of new developments, the Council will take account of Landscape Character Assessments, Landscape Capacity Studies and its supplementary guidance on Siting and Design and Sustainable Design, together with any other relevant design guidance.

Note: The principles and justification underpinning the Council's approach to sustainable developments are contained in the supplementary guidance: "Sustainable Design". The key principles underlying this guidance are set out in Policy 28: Sustainable Design.

Policy 61 seeks that new developments are designed to reflect the landscape characteristics and special qualities identified in the Landscape Character Assessment of the area in which they are proposed.

(m) Policy 64 'Flood Risk'

Development proposals should avoid areas susceptible to flooding and promote sustainable flood management.

Development proposals within or bordering medium to high flood risk areas, will need to demonstrate compliance with Scottish Planning Policy through the submission of suitable information which may take the form of a Flood Risk Assessment.

Development proposals outwith indicative medium to high flood risk areas may be acceptable. However, where:

- *better local flood risk information is available and suggests a higher risk;*
- *a sensitive land use (as specified in the risk framework of Scottish Planning Policy) is proposed, and/or;*
- *the development borders the coast and therefore may be at risk from climate change;*

A Flood Risk Assessment or other suitable information which demonstrates compliance with SPP will be required.

Developments may also be possible where they are in accord with the flood prevention or management measures as specified within a local (development) plan allocation or a development brief. Any developments, particularly those on the flood plain, should not compromise the objectives of the EU Water Framework Directive.

Where flood management measures are required, natural methods such as restoration of floodplains, wetlands and water bodies should be incorporated, or adequate justification should be provided as to why they are impracticable.

Policy 64 concerns flooding and seeks to that development complies with Scottish Planning Policy with regard to flood risk.

(n) Policy 66 Surface Water Drainage

All proposed development must be drained by Sustainable Drainage Systems (SuDS) designed in accordance with The SuDS Manual (CIRIA C697)and, where appropriate, the Sewers for Scotland Manual 2nd Edition. Planning applications should be submitted with information in accordance with Planning Advice Note *69: Planning and Building Standards Advice on Flooding paragraphs 23 and 24. Each drainage scheme design must be accompanied by particulars of proposals for ensuring long-term maintenance of the scheme.*

Policy 66 concerns surface water drainage and requires that all development must be drained by Sustainable Drainage Systems (SuDS) designed in accordance with The SuDS Manual (CIRIA C697).

(o) Policy 77 'Public Access'

Where a proposal affects a route included in a Core Paths Plan or an access point to water, or significantly affects wider access rights, then The Council will require it to either;

- *retain the existing path or water access point while maintaining or enhancing its amenity value; or*
- *ensure alternative access provision that is no less attractive, is safe and convenient for public use, and does not damage or disturb species or habitats.*

For a proposal classified as a Major Development, the Council will require the developer to submit an Access Plan. This should show the existing public, non- motorised public access footpaths, bridleways and cycleways on the site, together with proposed public access provision, both during construction and after completion of the development (including links to existing path networks and to the surrounding area, and access point to water).

(p) Policy 78 'Long Distance Routes'

The Council, with its partners, will safeguard and seek to enhance long distance routes (as indicated on Figure 11), and their settings. Consideration will be given to developing/improving further strategic multi user routes both inland and along the coast with due regard to the impact on the Natural Heritage features along these routes.

Policies 77 & 78 seek to safeguard public access, core footpaths and long distance footpaths.

A7.4 National Planning Policy

Statements of Scottish Government policy on planning matters are provided through Scottish Planning Policy (SPP).

In addition to the noted policy above are Planning Advice Notes (PANs). They are published by the Scottish Government and provide advice on good practice and information on technical planning matters.

The relevant planning policy guidance and advice relating to the Modified 2013 Scheme is addressed in the following sections.

A7.4.1 The National Planning Framework 2

The NPF 2 was issued in its final form on 25 June 2009. NPF 2 guides Scotland's development to 2030 and sets out strategic development priorities to support the Scottish Government's central purpose – sustainable economic growth. The Planning etc. (Scotland) Act 2006 puts this and future iterations of the NPF on a statutory footing. The document therefore carries considerable weight as a material consideration.

NPF 2 is concerned with Scotland in its wider context and addresses major challenges including climate change. It contains targets for energy supply and the reduction of greenhouse gas emissions (paragraph 3). NPF 2 takes forward the spatial aspects of the Scottish Government's policy commitments on sustainable economic growth and climate change, which paragraph 5 of the document notes *"will see Scotland move towards a low carbon economy".*

The NPF refers to sustainable development (page 6) and notes that *"The Scottish Government's commitment to sustainable development is reflected in its policies on matters such as climate change, transport, renewable energy…."*

Climate change is specifically referred to in paragraph 16 and it notes that substantial reductions in greenhouse gas emission will be necessary to minimise the impact of climate change. Paragraph 19 notes that the UK and Scottish Governments are taking an international lead by introducing ambitious statutory emission reduction targets through, respectively, the UK Climate Change Act and the Scottish Climate Change Bill (now enacted).

Energy is specifically referred to in paragraph 25 in NPF 2. It notes that *"tackling climate change and reducing dependence on finite fossil fuels are two of the major global challenges of our time...addressing these challenges will demand profound changes in the way we produce distribute and use energy over the coming decades".*

Paragraph 26 notes that the EU has now set a commitment to derive 20% of its energy use from renewable sources by 2020. Reference is also made to the Scottish Government support for this objective and Scotland's own, higher target for electricity generated from renewable sources, which is now 100% by 2020.

NPF 2 also refers to a development strategy in paragraph 53 and notes that the main elements of the spatial strategy to 2030 are to inter alia *"realise the potential of Scotland's renewable energy resources and facilitate the generation of power and heat from all clean, low carbon sources".*

In terms of sustainable growth, paragraph 65 notes that energy is a major resource for rural areas and it states that *"the Government is committed to realising the power generating potential of renewable sources of energy."*

It should also be noted that paragraph 145 in NPF 2, with regard to energy, notes that the Government is committed to establishing Scotland as a leading location for the development of renewable energy technology and an energy exporter over the long term. It notes that *"the aim of national planning policy is to develop Scotland's renewable energy potential while safeguarding the environment and communities."*

Overall therefore, the NPF 2 sets out the Government's commitment to the further development of renewable energy in Scotland and confirms the importance of this resource as a key element of achieving the spatial strategy for the country up to 2030 and indeed, as a key element to attaining the Government's central purpose of increasing sustainable economic growth.

A7.4.2 National Planning Framework 3 Main Issues Report – 2013.

In April 2013 the Main Issues Report (MIR) for the National Planning Framework 3 (NPF 3) was published for consultation purposes. The MIR provides a discussion of the main issues facing the development of Scotland and the key planning issues that will be taken forward to the proposed NPF 3 document.

In terms of onshore wind this is discussed at pages 13 and 15 of NPF 3. The Scottish Government has made it clear that the extant NPF2 will continue to apply and decision makers should not rely upon the provisions of NPF3 whilst it remains the subject of consultation.

A7.4.3 Scottish Planning Policy

On the 4 February 2010, the Scottish Ministers issued 'Scottish Planning Policy' (SPP). This consolidated SPP provides a shorter, clearer and more focused statement of the Scottish Government's planning policy on land use matters. The SPP supersedes all previous statements of national planning policy.

The SPP identifies that the Scottish Government's planning policy is now provided within the NPF, Designing Places, Designing Streets, Circulars and the SPP. The SPP sets out

- The Scottish Government's view of the purpose of planning;
- The 'core principles' for the operation of the system and the objectives for the key parts of the system;
- Statutory guidance on sustainable development and planning under Section 3E of the Planning etc. (Scotland) Act 2006;
- Concise subject planning policies, including the implications for development planning and development management; and
- The Scottish Government's expectations of the intended outcomes of the planning system.

The SPP provides an overview of the purpose of the planning system and states that the Scottish Government's view is that *"a properly functioning planning system is essential to achieving its central purpose of increasing sustainable economic growth"* (paragraph 4).

The Scottish Government advocates that the planning system should be structured and operated with the purpose of increasing sustainable economic growth and to support the Scottish Government's five strategic objectives and fifteen national outcomes.

The SPP also recognises that whilst the planning system should be genuinely "plan-led". It states the system: "*has a critical balancing role to play when competing interests emerge in the consideration of future development. It is essential to recognise that planning issues, by their very nature, will often bring differing interests into opposition and disagreement and the resolution of those issues will inevitably disappoint some parties"* (paragraph 6).

Development Management policy advice is set out in paragraph 22 et seq of the SPP. It is stated that Development Management is a key part of the planning system and *"should operate in support of the Government's central purpose of increasing sustainable economic growth. This means providing greater certainty and speed of decision making…"*

The SPP notes that increasing sustainable economic growth and sustainable development is an overarching principle of the Scottish Government and that the *"planning system should promote development that supports the move towards a more economically, socially and environmentally sustainable society".*

Paragraph 37 states that the decision making process within the planning system should *"contribute to the reduction of greenhouse gas emissions in line with the commitment to reduce emissions by 42% by 2020 and 80% by 2050, contribute to reducing energy consumption and to the development of renewable energy generation opportunities".*

Climate Change, and the need to reduce greenhouse gas emissions, is prominent within the SPP and reaffirms the position of Section 44 of the Climate Change (Scotland) Act 2009 which places a statutory duty on all public bodies to act:

- In the way best calculated to contribute to the delivery of the emissions targets in the Act;
- In the best way calculated to help deliver the Government's climate change adaptation programme; and
- In a way that it considers is most sustainable.

The 2020 and 2050 greenhouse gas reduction targets are noted and it is stated in paragraph 42 of the SPP that:

"the causes of climate change and the need to adapt to its short and long terms impacts should be taken into account in all decisions throughout the planning system".

In addition to the policy advice summarised above, the SPP provides more detailed planning policy advice with regard to specific subject areas. A summary of the specific policy advice within SPP relevant to the Modified 2013 Scheme is provided in Table A7.2 of the SPP.

Table A7.2: Relevant SPP Subject Policies

Subject Policy	Summary
Renewable Energy	Sets out the Government's policy in relation to renewable energy addressed by local authorities in Development Plan policies and Development Management decisions.
Economic Development	Highlights the emphasis on business development contributing to economic prosperity. Development Plans should provide positive support for a range of economic development opportunities and must respond to market forces and the pace of economic change.
Historic Environment	Provides guidance on the role of the planning system with respect to the preservation of the historic environment.
Landscape and Natural Heritage	Sets out national planning policy considerations in relation to Scotland's natural heritage and summarises the main statutory obligations in relation to the conservation of natural heritage. The guidance describes the role of the planning system in safeguarding sites of national and international importance, and draws attention to the importance of the safeguarding and enhancing the natural heritage beyond the confines of designated areas.
Rural Development	Provides guidance to local authorities on developments located in a rural setting. The policy highlights that there should be greater scope for more innovative planning polices for rural development.
Transport	Promotes an integrated approach to land use planning, economic development, transport and the environment. Seeks to ensure that developments likely to affect trunk and other strategic roads should be managed so as not to adversely impact on the safe and efficient flow of traffic. Includes guidance on planning for different transport modes, the use of transport assessment methodology and travel plans.

The SPP policies of most relevance to the Modified 2013 Scheme are addressed below.

(a) Renewable Energy

The SPP outlines the Scottish Government's commitment to increase the amount of electricity generated from renewable sources to meet statutory obligations and states that *"the commitment to increase the amount of electricity generated from renewable sources is a vital part of the response to climate change*" (paragraph 182).

The Scottish Government had, at the time of the publication of the SPP, a policy that 50% of Scotland's electricity consumption should be generated from renewable sources by 2020 (but without proposing any cap on renewable electricity generation). The SPP states that Planning Authorities should *"support the development of a diverse range of renewable energy technologies, guide development to appropriate locations..."* (paragraph 184). It is also stated that onshore wind farms will continue to be the main source of renewable energy. The Scottish Government has, since the publication of the SPP, now declared a policy that 50% of Scotland's energy consumption should be generated by renewable sources by 2015 and 100% of Scotland's electricity consumption should be generated from renewable sources by 2020.

The SPP states that Planning Authorities should support the development of wind farms: *"in locations where the technology can operate efficiently and environmental and cumulative impacts can be satisfactorily addressed"* (paragraph 187).

The SPP sets out the criteria that should be considered in deciding applications for all wind farm developments and requires that Development Plans or Supplementary Planning Guidance (SPG) set out those matters clearly at the local level. The SPP advises that the assessment criteria is likely to include:

- Landscape and visual impact;
- Effects on the natural heritage and historic environment;
- Contribution to the development to renewable energy generation targets;
- Effect on the local and national economy and tourism and recreational interests;
- Benefits and disbenefits for communities;
- Aviation and telecommunications;
- Noise and shadow flicker; and
- Cumulative impact

The SPP also requires Planning Authorities to set out, within Development Plans, a spatial framework for wind farms of over 20 MW and a spatial framework for wind farms under 20 MW if considered appropriate. It is advised that *"Spatial frameworks should not be used to put in place a sequential approach to determining applications which requires applicants proposing developments out with an area of search to show that there is no capacity within areas of search"* (paragraph 189). It is also stated that with regard to the development constraints that require to be considered in developing a spatial framework "*that the existence of these constraints does not impose a blanket restriction on development"* (paragraph 190).

(b) Historic Environment

The SPP sets out the Scottish Government's policy on the protection, conservation and enhancement of the historic environment and the role of the planning system.

The SPP states that the historic environment includes ancient monuments, archaeological sites and landscapes, historic buildings, townscapes, parks, gardens and designed landscapes and other features. Non-designated sites, as well as designated sites, are considered by the SPP as an important element of Scotland's heritage which contribute to national identity.

Paragraph 111 notes that *"In most cases, the historic environment (excluding archaeology) can accommodate change which is informed and sensitively managed, and can be adapted to accommodate new uses whilst retaining its special character".*

The SPP makes reference to the need to take into account Historic Scotland policy in the determination of applications affecting the historic environment; which include Scottish Historic Environment Policy (SHEP) and the 'Managing Change in the Historic Environment' guidance note series.

(c) Landscape and Natural Heritage

The SPP provides policy guidance for the conservation, enhancement and sustainable use of Scotland's landscape and natural heritage. Paragraph 125 et seq Natural heritage is identified as including flora, fauna, geological and physiographical features, its natural beauty and amenity (Natural Heritage (Scotland) Act 1991).

Planning Authorities are directed to take a broader approach to landscape and natural heritage than just conserving designated sites and species. The SPP also states that the *"Landscape in both the countryside and urban areas is constantly changing and the aim is to facilitate positive change whilst maintaining and enhancing distinctive character".* It is also stated that *"Different landscapes will have a different capacity to accommodate new development, and the siting and design of development should be informed by the local landscape character"* (paragraph 127).

Paragraph 131 of the SPP states that "*While the protection of the landscape and natural heritage may sometimes impose constraints on development, with careful planning and design the potential for conflict can be minimised and the potential for enhancement maximised".*

On designated sites, the SPP provides guidance that "*Statutory natural heritage designations are important considerations where they are directly or indirectly affected by a development proposal. However, designation does not necessarily imply a prohibition on development"* (paragraph 131).

The SPP states that Planning Authorities should only apply the precautionary principle where the impacts of a proposed development are uncertain and where there is "sound evidence" that irreversible damage could occur. In line with this, paragraph 132 is clear in th*at "The precautionary principle should not be used to impede development unnecessarily. Where development is constrained on the grounds of uncertainty, the potential for research, surveys or assessments to remove or reduce uncertainty should be considered".*

The SPP provides detailed guidance on natural heritage resources and classifies those under five key headings, namely:

- International Designations;
- National Designations;
- Local Designations;
- Protected Species; and
- Trees and Woodland.

Sites with international designations, such as Natura 2000 sites, must be subject to appropriate assessment by Planning Authorities on its conservation objectives where developments are likely to result in significant adverse effects on the designation. Development which could have a significant effect on a Natura site will only be permitted where:

- An appropriate assessment has demonstrated that it will not adversely affect the integrity of the site;
- There are no alternative solutions; or
- There are imperative reasons of overriding public interest, including those of a social or economic nature.

Nationally designated sites, such as NSAs, SSSIs, National Parks and NNRs are noted as important planning considerations in the assessment of applications, and development proposals should only be permitted where:

- It will not adversely affect the integrity of the area or the qualities for which it has been designated; or
- Any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance.

International and national natural heritage designations can be complemented by local designations which*" seek to protect, enhance and encourage the enjoyment and understanding of locally important landscapes and natural heritage"* (paragraph 139). Local designations can be both statutory and non-statutory. Local Nature Reserves are non-statutory designations and for non-statutory designations, the SPP seeks to limit local designations to two types; namely, Local Landscape Areas and Local Nature Conservation Sites.

Although local designations should be taken into account in the assessment of development proposals, paragraph 139 of the SPP states that *"The level of protection given to local designations through the development plan should not be as high as the level of protection given to international or national designations".*

Paragraph 142 provides guidance on protected species and notes that the presence of legally protected species is an important material consideration in the assessment of planning applications. Although the presence of protected species rarely imposes an absolute block on development, a Planning Authority has to be clear that suitable mitigation measures have been adopted. Where a proposed development is likely to have an adverse effect on European Protected Species, planning permission cannot be granted unless the Authority can be satisfied that:

- There is no satisfactory alternative; and
- The development is required for preserving public health or public safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance to the environment.

(d) Rural Environment

The SPP provides the Scottish Government's planning guidance on rural development at paragraphs 92-96. Significant emphasis is placed on supporting sustainable economic growth within rural areas and it is identified that the planning system has a large role to play in achieving this. It is recommended that the Development Plan should reflect the *"overarching aim of supporting diversification and growth in the rural economy"* (paragraph 93).

Good quality design and high environmental standards are required for rural development and paragraph 95 states that "All new development should respond to the specific local character of the location, fit in with the landscape and seek to achieve high design and environmental standards, particularly in relation to energy efficiency".

The SPP also seeks to provide protection to 'prime quality agricultural land' from inappropriate developments, but with regard to renewable energy developments notes that *"Renewable energy generation or minerals extraction may be acceptable where restoration proposals will return the land to its former status*" (paragraph 97).

(e) Transport

Reducing emissions from transportation sources is identified as providing a contribution to the Scottish Government's greenhouse gas reduction targets. Tackling emission levels and congestion will support economic growth and Planning Authorities require to give consideration to the relationship between transport and land use in order to achieve sustainable patterns of development.

Paragraph 167 notes that Planning Authorities should take into account existing transport, environmental and operational constraints, proposed or committed transport projects and demand management schemes, and that "*development should be supported in locations that are accessible by walking, cycling and public transport, making best use of or adding to the existing network and creating new networks".*

Development proposals that have a potential to affect the strategic transport network should be appraised to determine their effects and the SPP requires Planning Authorities to consult Transport Scotland on the proposal, including any potential mitigation.

A7.4.4 Scottish Planning Policy Consultation Draft – May 2013

The consultation draft of Scottish Planning Policy (SPP) was published for consultation on 30 April 2013. The consultation follows from an open consultation towards the end of 2012 which requested views on what should change within a revised SPP.

The 2013 consultation draft of the SPP provides the Scottish Governments Planning Policy in a different structure to the existing draft, with a focus on principal policies and subject policies. In terms of the proposed policy changes with respect to renewable energy development, the SPP proposes significant changes to the way in which the Scottish Government expects Local Authorities to prepare their spatial framework for onshore wind energy development.

The Scottish Government has made it clear that the extant SPP should be used in the assessment of applications and it should be noted that the SPP consultation draft may well change significantly prior to the formal adoption of the revised SPP by the Scottish Government.

A7.5 Planning Advice Notes (PANs)

Table A7.3 identifies and summarises PANs of relevance to the Modified 2013 Scheme.

Table A7.3: Relevant PAN's

Guidance	Title	Summary
PAN 2/2011	Planning and Archaeology	Provides advice to planning authorities and developers on dealing with archaeological remains. But it does so with a fresh emphasis which is proportionate to the relative value of the remains and of the developments under consideration.
Scottish Government Web Based Guidance	Web Based Renewables Advice – Website Notes	Advises on aspects of 'Onshore Wind Turbines' and on the 'Process for preparing spatial frameworks for wind farms'.
PAN 1/2011	Planning and Noise	Sets out the role of the planning system in preventing and limiting the adverse effects of noise.
PAN 58	Environmental Impact Assessment (1999)	Relates specifically to environmental impact assessment for development projects authorised under planning legislation. It provides information and advice on: the legislative background to EIA, EIAs in Scotland, the process of EIA, environmental studies and statements, the evaluation of environmental information by the planning authority, and implementation through planning decision.
PAN 60	Planning for Natural Heritage (2000)	Gives basic advice in relation to development and natural heritage. It reiterates the Government's Commitment to the protection and enhancement of the natural heritage.

Table A7.3: Relevant PAN's		
Guidance	**Title**	**Summary**
PAN 61	Planning and Sustainable Urban drainage Systems (2001)	Provides good practice advice for planners and the development industry complementing the Sustainable Urban drainage Systems Design Manual for Scotland and Northern Ireland (2000).
PAN 75	Planning for Transport (2005)	Provides advice on the requirement to link transport strategies and development plans and the need to take into account accessibility, location, modal split parking and design.
PAN 3/2010	Community Engagement	Advice to Planning Authorities and developers on how communities should be properly engaged in the planning process.

Scottish Government Web Based Renewables Guidance, which replaces PAN 45, is particularly relevant and this is addressed in further detail below.

A7.6 Scottish Government Web Based Renewables Guidance (Replacement of PAN 45: Renewable Energy)

PAN 45 'Renewable Energy Technologies' (including the Annex 2 document) was replaced in February 2011 by web-based Renewables guidance, which the Scottish Government's website notes will be regularly updated. The first tranche of guidance includes 'Onshore wind turbines' and advice on the 'Process for preparing Spatial Frameworks for Wind farms'. Key points from the guidance is summarised below.

The guidance on Onshore Wind Turbines highlights that when Planning Authorities are preparing their 'evidence base' and planning policy, that they should consider if their spatial frameworks and polices are consistent with SPP and *"determine if they proactively respond to the Renewable Energy Action Plan and current national targets for electricity from renewable sources."*

The guidance provides advice on the typical planning considerations that will arise in determining planning applications for onshore wind farms. In addition, the guidance also provides technical information for onshore wind farms with respect to a number of development matters such as turbine type, turbine power, turbine foundations, connection to the electricity network, power lines, access, wind speed etc. Policies have also to provide "clear guidance for applicants" and should be consistent with the key principle of renewable energy siting as per SPP.

(i) Landscape Impact

The guidance notes that wind turbines can impact upon the landscape due to their number, size and layout and that the ability of the landscape to absorb development often depends on landscape character features such as landform, ridges, hills, valleys and vegetation. It is noted that different turbine layouts may be more or less suited to particular landscape types and matters such as access, landform change, surfacing and vegetation can also influence to what extent development proposals integrate with the landscape.

It is also advised that where particular landscapes are rare or valued, such as National Scenic Areas, a cautious approach is required when considering wind farm applications. The guidance notes that SNH is the Scottish Government's national agency and their statutory advisor on landscape matters. The guidance expects SNH's guidance to be followed with

respect to landscape character appraisal and landscape and visual impact analysis, as well as wind farm design. Importantly the guidance notes that any supplementary information required to deliver local solutions must not conflict with national standards and must be proportionate and reasonable.

(ii) Impacts on Wildlife and Habitat, Ecosystems and Biodiversity

The guidance notes that wind farm development has the potential to affect biodiversity both positively and negatively. Positive benefits include wider climate change and the opportunities to deliver benefits through improved land management, land restoration and habitat creation. Adverse impacts are also noted as being possible due to loss or damage to vulnerable habitats, collision risk with turbine blades, displacement and disturbance.

It is advised that wind farms should not adversely affect the integrity of designated sites protected under EU and UK legislation, such as SPAs, SACs and SSSIs, or the other wider conservation interests outlined in SPP.

(iii) Assessing Impact on Wildlife and Habitat

The guidance notes that many birds and their habitats are largely unaffected by wind farm development, although collision risk, displacement and disturbance risks need to be quantified.

(iv) Buffer Zones

The guidance advises that buffer zones should not be established around areas designated for natural heritage reasons.

(v) Impact on Communities

The guidance advises that there are a number of potential impacts on communities that should be considered, which include shadow flicker, noise, electromagnetic interference to communication systems and ice throw.

With regard to shadow flicker it is advised, as a rule of thumb, that wind farm development proposals, which are more than 10 rotor diameters from a residential property, should not generally result in adverse effects.

In terms of noise, the guidance also advises that the ETSU-R-97 methodology *"should be followed by applicants and consultees, and used by planning authorities to assess and rate noise from wind energy developments, until such time as an update is available".*

It adds that Circular 10/1999 (now superseded) sets out the Government's policy and the role of the planning system in controlling noise. The guidance also refers to low frequency noise and infrasound and in this regard states:

"The most conclusive summary of the implications of low frequency wind farm noise for planning policy is given by the UK Government's statement regarding the findings of the Salford University report into Aerodynamic Modulation of Wind Turbine Noise. The report concludes that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines".

In terms of the matter of ice throw it is advised that this is unlikely to be a problem with wind farm development due to wind turbines having vibration sensors which are likely to detect such imbalances and inhibit the operation of the wind turbines.

(vi) Separation Distances

The guidance refers to paragraph 190 of SPP, which refers to a 2 km separation distance between areas of search for groups of wind turbines on the edges of towns, cities and villages to reduce visual impact. The guidance specifically states, however, that this 2 km separation distance is a guide, not a rule, and that decisions on individual developments should take into account specific circumstances and geography.

(vii) Aviation Matters

The guidance states that planning authorities should take into account the fact that: wind turbines can have implications for aircraft flight paths; that they inform the Civil Aviation Authority regarding consented wind farms; and that planning authorities consult the Ministry of Defence (MOD) and NERL/NATS on wind farm applications. In addition, the guidance identifies that MOD flight paths are more irregular than civilian flight paths and as such the MOD should be consulted on wind farm applications. It is identified that the MOD is a statutory consultee in a number of circumstances and that the MOD may request lighting of turbines when it deems it necessary for military aviation purposes.

(viii) Road Traffic Impacts

The guidance states that it may be advisable to set turbines back from roads and railways of at least the height of the turbine to ensure safety.

(ix) Cumulative Impacts

The guidance states that in considering cumulative impact, particularly with regard to landscape and visual, the scale and pattern of the turbines plus the tracks, power lines and ancillary developments will be relevant considerations, as will the sensitivity and visibility of the landscape and visual receptors. The guidance refers to 'A Guide to Assessing the Cumulative Effects of Wind Energy Development' (ETSU 2000) and the SNH guidance 'Cumulative Effects of Wind Farms' (2005) as relevant guidance to inform the assessment of cumulative impacts.

(x) Decommissioning

The guidance advises that planning authorities should ensure, either via conditions or legal agreement, that site restoration takes place on expiry of the consent or the expiry of the specified period.

(xi) Spatial Frameworks

The guidance also offers advice to Planning Authorities on the production of spatial frameworks for wind farms over 20 MW. The advice predominantly reflects the policy advice within SPP, but also notes that where Planning Authorities have already developed spatial guidance, the focus should now be on developing guidance for wind farms under 20 MW.

In terms of cumulative effects, the guidance states that *"Broad Areas of Search should be planned with the existing pattern of development with the intention of encouraging clusters of wind farms…"*

The guidance highlights that areas designated as 'Areas with Potential Constraints'*, "does not equate to a blanket restriction on development".* Emphasis is placed on the need for criteria based polices. It is stated that with the right design approach, developments could be located *"within the historic environment or within an area designated for landscape value".*

Proposals for the extension of existing renewable energy facilities will be assessed against the same criteria and material considerations as apply to proposals for new facilities.

In all cases, if consent is granted, the Council will approve appropriate conditions (along with a legal agreement under Section 75, where necessary), relating to the removal of the development and associated equipment and to the restoration of the site, whenever the consent expires or the project ceases to operate for a specific period.

A7.7 SPG: The Highland Renewable Energy Strategy & Planning Guidelines

THC approved the Highland Renewable Energy Strategy and Planning Guidelines (HRES) on 4 May 2006 as non-statutory supplementary planning guidance (SPG) to the Structure and Local Plans. The Strategy sets renewable energy targets for The Highland Council region and identified preferred zones for renewable energy developments. The aim of the HRES is to:

"…harness both the energy and economic potential presented by renewable technologies in the Highland area to provide benefit for both the global environment and local communities.

In doing so, the elements of the natural and landscape heritage that define the Highlands area for locals and visitors will be protected. However, it is recognised that change is an integral part of cultural heritage and that the Highland area needs new developments in order for communities and businesses to flourish. Renewable energy projects will, therefore, be developed in ways that protect the integrity of particularly valued sites, maximise local and regional benefits and minimise or avoid negative consequences".

The onshore wind elements of HRES have been the subject of a review and have been replaced by the Highland Council Interim Supplementary Guidance for Onshore Wind Energy (2012) as summarised below.

A7.8 Highland Council Interim Supplementary Guidance for Onshore Wind Energy

The Highland Council Interim Supplementary Guidance (SG) for Onshore Wind Energy was approved by the Planning, Environment and Development Committee on 14 March 2012. The supplementary guidance once finalised will gain development plan status, this will place it on a stronger footing than that which was accorded to the non-statutory guidance in the Highland Renewable Energy Strategy (HRES). In the meantime, the interim SG will be used as a material consideration in the determination of wind energy proposals.

The Council are currently continuing to work on the Landscape and Visual Impact Assessment, particularly with key partners such as SNH. This ongoing work will result in further refinement of the spatial framework and as a result the guidance will need to be reviewed at a later date.

The Interim SG provides:

- a spatial framework to guide the location of large wind farms;
- development guidelines for all locations; and
- additional guidance.

The spatial framework provides a steer in particular to large wind farm proposals by identifying spatial constraints. It should be noted *that "the spatial framework and this guidance in general do not prevent proposals coming forward in any part of Highland and these need to be able to be assessed and considered having regard the constraints"* (paragraph 2.3, page 6).

The Strathy South Wind Farm proposal is categorised as 'very large' wind energy development. The capacity criteria for this category includes over 100 MW and, and groupings of 45 or more turbines.

The Interim Guidance identifies three areas as follows:

- Stage 1 – areas requiring significant protection;
- Stage 2 – areas with potential constraints; and
- Stage 3 – areas of search.

Stage 3 Areas are those areas within which appropriate proposals are likely to be supported subject to detailed consideration against the HwLDP and Interim Guidance. Stage 3 Areas are not covered by the any of the features identified above in the Stage 1 and 2 Areas.

The Modified 2013 Scheme is identified as lying within a broad area of search.

Paragraph 2.16 of the Interim SG identifies that Policy 67 of the HwLDP sets out the Council's overall policy for renewable energy in the Highlands. The Interim Guidance expands on the 11 criteria within Policy 67 in regard to proposals for on-shore wind energy developments. It also provides advice on assessing the degree and significance of impact where there is likely to be some impact or effect on a feature or interests. The assessment of the development against the relevant terms of the interim SG is contained within the Planning Statement submitted with the Modified 2013 Scheme

A7.9 Conclusion

This Chapter has described the relevant planning policy context. As explained above, the accompanying Planning Statement provides an assessment of the Modified 2013 Scheme against the planning policy context set out in this Chapter.

A9 Visual Assessment

A9.1 Introduction

The Modified 2013 Scheme incorporates changes in design which have the potential to alter the impacts assessed and presented in Chapter 9: Visual Impact of the 2007 ES. This chapter is intended to determine the implications of these changes and to describe any updated visual impacts resulting from the Modified 2013 Scheme.

The intention of this chapter is not to present an entirely new assessment of potential visual impacts associated with the Modified 2013 Scheme, nor is it to re-present the 2007 ES chapter and accompanying drawings with amendments. Instead, it is intended to assess the potential significant effects arising from the Modified 2013 Scheme and highlight how the design changes would alter the original findings of the 2007 ES, in accordance with the requirements of Regulation 4, Schedule 4 of the EIA Regulations. For this reason it must be read in conjunction with Chapter 9: Visual Impact of the 2007 ES. Refer also to ES Addendum Chapter A1: Introduction and ES Addendum Chapter A4: Development Description. This approach has been agreed during consultation with The Highland Council (THC) and Scottish Natural Heritage (SNH).

The updated visual impact assessment is based on a selection of key viewpoints from the 2007 ES, as agreed during consultation with THC and SNH. Tables describing the assessment of these are contained in Technical Appendix A9.1.

In order to accurately assess the potential cumulative impacts of the Modified 2013 Scheme, it has been necessary to update the baseline to reflect the current situation. Since the 2007 ES, updated guidance on the assessment of cumulative landscape impacts has been published. To properly reflect this updated guidance and the latest baseline information, a new cumulative assessment has been carried out and is presented in Technical Appendix A9.2 with cumulative visual impact tables included in Technical Appendix A9.3.

A9.2 Scope of Assessment

A9.2.1 Project Interactions

A detailed description of the differences between the Original 2007 Scheme and the Modified 2013 Scheme is provided in Chapter A4: Development Description. However, the changes relevant to this assessment can be summarised as follows:

- Removal of thirty turbines;
- Repositioning of the remaining forty seven turbines;
- Change in geometry of turbines from 70 m hub height, 80 m rotor diameter and a maximum tip height of 110 m to 83 m modelled hub height, 104 m modelled rotor diameter within a maximum tip height of up to 135 m; and
- Revision of the site access track in order to connect with Strathy North's consented layout, starting close to Turbine 34 (of Strathy North wind farm) and connecting with an existing track in order to access Strathy South.

Other elements of the scheme, such as the internal track layout, borrow pits, laydown areas and access were considered as part of the 2007 ES. Alterations to these under the Modified 2013 Scheme would have limited effect on direct impacts assessed.

Alterations to the proposed grid connection would not have a bearing on the viewpoints agreed as part of the scope of this Chapter. They may result in differences at nearby residential receptors but it is not considered that this would have a significant bearing on the wider visual amenity resource.

A9.2.2 Study Area

The study area boundaries adopted for this ES Addendum chapter remain unchanged to those used for Chapter 9: Visual Impact of the 2007 ES. The rationale behind retaining the original areas in relation to the changes to layout and scale of turbines is described further in Section A9.6.1.

For the cumulative impact assessment, a study area based on a standard buffer of between 35 km and 60 km from the development periphery was considered (in line with Scottish Natural Heritage (SNH) guidance[1]. Having examined available information and consulted with SNH, it was decided that an irregular (or variable-distance) study area was appropriate in order to focus on the most significant impacts and sensitive views, including those at locations as far from the scheme as Ben More Assynt (approximately 55 km south-west of the site) and Foinavon (approximately 46 km west of the site). This variable-distance boundary is shown on Figure A9.27: Cumulative Zone of Theoretical Visibility Built and Consented Sites.

A9.2.3 Updated Scoping and Consultation

Following submission of the 2007 ES, no objections specifically relating to visual impact were received.

Since the decision to review the turbine geometry and layout, further informal consultation has been undertaken. A summary of responses from Statutory Consultees relating to the 2007 ES and recent consultation is provided at Table A8.1 of Chapter A8: Landscape.

A9.2.4 Impacts to be Assessed

This chapter considers potential impacts upon views from viewpoints agreed during consultation. These impacts may be temporary (relating to construction and decommissioning) or long-term (operational).

A9.2.5 Impacts Scoped out of Assessment

During the consultation process it was agreed by SNH and THC that it was not necessary to review potential impacts at all receptors included in the 2007 ES. Instead, it is considered that the review of viewpoints selected will be sufficient to allow comparison of potential impacts.

Impacts arising from the process of decommissioning are considered to be of a similar nature and duration to those arising from the construction process and therefore have not been considered separately in this chapter. Where this assessment refers to potential construction impacts, these are also representative of predicted decommissioning impacts.

A9.3 Changes to Policy and Legislative Context

A full description of updated policy and legislation relating to this development is provided in Chapter A7: Planning Context. Listed below is a summary of updates relevant to landscape impacts.

A9.3.1 International Legislation and Policy

No international legislation or policy relevant to this assessment has been updated since the 2007 ES was prepared.

A9.3.2 National Legislation and Policy

Since the 2007 ES was written, the following national policy guidance relating to landscape and wind energy development has been published:

- SNH - Siting and Designing Wind farms in the Landscape (2009);

[1] SNH (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments

- SNH - Strategic Locational Guidance for Onshore Wind Farms in respect of the Natural Heritage (updated 2009);
- SNH - Renewable Energy and the Natural Heritage (2010); and
- SNH - Assessing the Cumulative Impact of Onshore Wind Energy Developments (2012).

These documents set out the position of SNH in relation to developments of the type proposed; being supportive of their potential contribution to addressing climate change, acknowledging that they may result in impacts upon visual amenity and promoting appropriate location and design of developments in order to minimise those impacts. These policy documents have been considered as part of this assessment.

A9.3.3 Regional Policy

THC has published the following updated and relevant regional policy information since the 2007 ES was prepared:

- Visualisation Standards for Wind Energy Developments (2010);
- Highland Wide Local Development Plan (April 2012);
- Onshore Wind Energy: Interim Supplementary Guidance (March 2012); and
- Assessment of Highland Special Landscape Areas (June 2012).

In these documents, THC acknowledges the need to balance the opportunity to create renewable energy against potential impacts upon various considerations, including visual amenity. They also set out a spatial framework for how wind energy development could best achieve this and identify the most sensitive landscape areas within the regional context.

A9.4 Changes to Methodology

The 2007 ES visual impact methodology, as described in Chapter 9: Visual Impact, Section 9.3 of that document, was based upon the Guidelines for Landscape and Visual Impact Assessment (GLVIA), Second Edition, 2002. Although that document has recently been superseded (GLVIA, Third Edition, April 2013), this assessment has been completed as per advice from the Landscape Institute, co-authors of the guidance, stating that assessment started using the Second Edition should be completed using that edition. As the assessment update process for this ES Addendum began in 2012, this is deemed to be appropriate.

As with the 2007 ES assessment, the aim here is to identify those impacts which are significant. This is considered to be those which are Moderate or greater.

During consultation it was agreed that visualisations from a selection of viewpoints would be developed to THC standards, as set out in the guidance document Visualisation Standards for Wind Energy Developments (THC, 2010). In line with the guidance, these are contained in a separate bound volume to other graphics included with the ES Addendum.

In March 2012, SNH published 'Assessing the Cumulative Impacts of Onshore Wind Energy Developments' and so this document has been referred to when carrying out the new Cumulative Visual Impact Assessment (see Technical Appendix A9.2).

A9.5 Changes to Baseline Conditions

A9.5.1 Context

Since publication of the 2007 ES, there have been no changes which would significantly affect the assessment baseline (for changes to the cumulative baseline, please refer to Section A9.5 of Technical Appendix TA9.2: Cumulative Visual Impact Assessment). The outlook from some individual receptors may have altered in the intervening period due to alterations such as hedge planting but it was not possible to identify such cases without carrying out a full reassessment which is not the intention of this Chapter.

A9.5.2 Desk Studies

The Zone of Theoretical Visibility (ZTV) defines the effective boundaries within which views of development could potentially be obtained. ZTVs have been prepared using specialist

computer software, Resoft Wind Farm (Version 4). This produces an analysis of a computer-based model that uses landform as the key determinant of availability or obstruction of view. The landform model is based on contours at 10m intervals derived from 1:50,000 Ordnance Survey Land-Form Panorama tiles. It should be noted that the computer model does not take into account features such as trees or woodland, buildings and other structures or local landform, which can vary the ZTV locally and therefore the ZTV is not representative of visual impact in itself. Nevertheless, the ZTV is a valuable tool in assisting with the identification of areas of potential visual impact.

Wireline diagrams and photomontages have been generated using the same software as the ZTV diagrams. This includes generating a model of the Modified 2013 Scheme from viewpoints highlighted during consultation and has allowed comparison with the Original 2007 Scheme. These are reproduced on Figures A9.4 to A9.24.

A9.5.3 Field Studies

The study area was visited several times between June 2012 and May 2013. During these visits, site notes and photography were used to record the general visual amenity of the area and then compared against descriptions contained in the 2007 ES. It was found that these were broadly unchanged.

A9.6 Changes to Effects Evaluation

A9.6.1 Basis of Assessment

The description of the Modified 2013 Scheme in ES Addendum Chapter A4: Development Description includes a turbine with a maximum tip height of up to 135 m, a modelled hub height of 83 m and a modelled rotor diameter of 104 m. While the constructed turbines may differ within these parameters up to a 135m tip height, these maximum dimensions represent a worst-case scenario and have been used to generate computer modelling on which to base assessment.

When considering the potential change of impacts between the Original 2007 Scheme and the Modified 2013 Scheme, it is important to understand the change in visibility, both in terms of the extent of the area potentially impacted and any alteration of appearance. This is illustrated in Figure A9.3: Comparative ZTV which shows ZTV for the two schemes overlaid and on subsequent figures containing comparative wireline visualisations.

Figure A9.3: Comparative ZTV shows that there are several small areas within the study area which were potentially impacted by the Original 2007 Scheme which would subsequently change to be unaffected by the Modified 2013 Scheme. This is illustrated by yellow areas on the plan. The blue areas on the drawing show that there would be expansion at some of the areas potentially affected as a result of the design changes and that, in some cases, small areas unaffected by the Original 2007 Scheme would be affected by the Modified 2013 Scheme.

Given the small change in extent of potential indirect effect indicated it is considered that the 15 km detailed study area (as used in the 2007 ES) is still relevant for assessing the most significant potential impacts arising from the Modified 2013 Scheme.

A9.6.2 Construction Effects

Under the Modified 2013 Scheme, the proposed changes to elements such as access arrangements, laydown areas and borrow pit locations are such that they would not alter the construction-related visual impacts. However, construction impacts associated with visibility of larger turbine components may alter. Where this is the case, it is deemed that increases in construction impacts will be in line with those associated with the operational impacts described below.

A9.6.3 Operational Effects

Viewpoints requested during consultation have been reviewed for potential changes in impact. Summary tables describing this are contained in Technical Appendix A9.1: Viewpoint Tables.

The review found that, for the majority of viewpoints, while there may be some increase in visibility of turbines and turbine blade tips (either in terms of horizontal spread of the development or overall scale of turbines) as a result of the Modified 2013 Scheme, the context of the view and the distance between development and viewpoint would not result in any change in the significance of effects.

From viewpoints to the west of the site, within and close to Strathnaver, the Modified 2013 Scheme would result in increased impacts when compared to the Original 2007 Scheme. This would occur at two viewpoints:

- VP3 – View from A836 near Borgie (increase from Slight to Slight-Moderate Adverse); and
- VP5 – View from B871 at Achargary (increase from No View to Slight-Moderate Adverse).

In both cases, the increased impacts would result from turbine tips being visible on the horizon (above the enclosing slopes of the valley landscape) to a greater extent than would be the case for the Original 2007 Scheme. These impacts are not considered to be significant.

A9.6.4 Cumulative Effects

The Cumulative Visual Impact Assessment is contained in Technical Appendix TA9.2. It concludes that impacts resulting from addition of the Modified 2013 Scheme into the baseline scenario, from the majority of receptors identified in the study area, would range from Neutral to Slight-Moderate Adverse and are therefore not considered to be significant. However, it is assessed that the View from Ben Griam Beg (CVP1) and View from A836 near Borgie (CVP2) would receive Moderate Adverse, and therefore significant, cumulative impacts.

A9.7 Changes to Mitigation

No mitigation, beyond that developed as part of the design process, was recommended for the Original 2007 Scheme. This remains unchanged for the Modified 2013 Scheme.

A9.8 Changes to Monitoring

No monitoring was recommended for the Original 2007 Scheme and this remains unchanged for the Modified 2013 Scheme.

A9.9 Changes to Summary & Conclusion (Inc. Residual Impacts)

The assessment of potential visual impacts arising from the Modified 2013 Scheme, when compared to the Original 2007 Scheme, has found that impacts would increase at two viewpoints (VP3 – View from A836 near Borgie and VP5 – View from B871 at Achargary). In both cases, these impacts would rise to Slight-Moderate Adverse which is not considered to be significant. Impacts at all other viewpoints considered would be unchanged.

The cumulative visual impact assessment has found that potential significant impacts would occur at two viewpoints (CVP1 – View from Ben Griam Beg and CVP2 – View from A836 near Borgie). Impacts at all other cumulative viewpoints and route receptors would not be significant.

A9.10 References

Strathy South Wind Farm Environmental Statement (2007), Scottish and Southern Energy plc

Renewable Energy and the Natural Heritage (2010), Scottish Natural Heritage

Strategic Locational Guidance for Onshore Wind Farms (updated 2009), Scottish Natural Heritage

Highland Wide Local Development Plan (2012), The Highland Council

Onshore Wind Energy: Interim Supplementary Guidance (2012), The Highland Council

Assessment of Highland Special Landscape Areas (2012), The Highland Council

Sutherland Local Plan (2010), The Highland Council

Guidelines for Landscape and Visual Impact Assessment, Second Edition (2002), Spon Press

Assessing the Cumulative Impacts of Onshore Wind Energy Developments (2012), Scottish Natural Heritage

A16 Other Issues

A16.1 Air and Climate

A16.1.1 Introduction

The 2007 ES covered the effects arising from the Original 2007 Scheme on air and climate, as follows:

- Construction particulate dust; and
- Carbon management:
  - overall reduction of carbon and carbon dioxide emissions by displacement of fossil fuel fire electricity generation; and
  - The potential impact from the reduction in carbon sequestration and subsequent release of carbon dioxide due to land disturbance.

A16.1.2 Scoping and Consultation

No issues were identified in relation to air quality as part of the reconsultation process. Issues relating to peat were raised by both SEPA and SNH, as presented in Table A16.1.

Table A16.1: Issues Identified during Consultation

Consultee	Issue	Where/How this is Addressed
SNH (letter dated 25/09/2007)	SNH raised concerns over the locations of some turbines in areas of deep peat.	New peat probing data has supplemented the existing peat depth data-set and informed a refined track layout. Issues relating to the location of turbines in relation to peat are addressed in Chapter A14: Soil and Water.
SEPA (letter dated 06/08/2007)	SEPA raised concerns over the site layout in relation to peatland, in particular the proposal to microsite some turbines and access track within 90 m of the locations shown on the site layout plan for the Original 2007 Scheme.	As above, new peat probing data has supplemented the existing peat depth data-set and informed a refined track layout. The track layout has therefore been modified in the Modified 2013 Scheme (FigureA4.1).
SEPA (letter dated 17/09/2012)	SEPA requested that the ES Addendum includes information in relation to a Peat Management Plan and peat balance.	In response to this request, a Peat Management Plan and a Peat Balance have been prepared and are included in this ES Addendum in Technical Appendices A4.3 and A4.4, respectively.

A16.1.3 Construction Particulate Dust

Construction dust would be managed using the management practices set out in the CEMP, which is included as Technical Appendix A4.1.

A16.1.4 Carbon Management

A summary of the issues relating to carbon raised during the reconsultation exercise are presented in Table A16.1. A Peat Management Plan and a Peat Balance have been prepared and are included in this ES Addendum in Technical Appendices A4.3 and A4.4,

respectively. The estimated reductions in carbon dioxide that would result if the estimated annual output of the Modified 2013 Scheme displaces coal fired generation together with the grid mix generation are shown in Table A16.2.

Table A16.2: Estimated Reduction to Carbon Dioxide Emissions

	Coal Fired	Grid Mix
Carbon expressed as (tCO2 /yr)	358741.8	174257.3

The results of the peat balance calculations conclude that that carbon payback (based on a fossil fuel mix of electricity generation) would be 1.5 years (Technical Appendix A4.4).

A16.2 Telecommunications and Aviation

The 2007 ES undertook consultation with relevant telecommunications and aviation operators and agencies to cover the following areas:

- Television
- Radio
- Mobile phone networks
- Air traffic control
- Military radar
- Civilian airspace
- Military airspace

The reconsultation exercise provided these organisations with a revised layout (based on the 2012 68 turbine scheme at that time – see Figure A4.20) and turbine dimensions and the updated consultation responses are presented in Table A16.3. Copies of all correspondence referenced below are included in Technical Appendix A5.2.

Table A16.3: Issues Identified during Consultation

Consultee	Issue	Where/How this is Addressed
BT (email 25/10/12)	No comments at this stage, will respond when the ES Addendum is submitted.	No action required.
Joint Radio Company (email 11/09/12)	Confirmed no links would be affected by the proposed development.	No action required.
Civil Aviation Authority (email 12/09/12)	Recommends that if the proposed development is approved, the Defence Geographic should be informed of the locations, heights and lighting status of the turbines and meteorological masts, the estimated and actual dates of construction and the maximum height of any construction equipment to be used, prior to the start of construction, to allow for the appropriate inclusion on Aviation Charts, for safety purposes. Owing to the height of the proposed turbines there is no CAA requirement for the turbines to be lit.	No action required at this stage.
Defence Infrastructure	In July 2007 the MoD originally objected due to low flying concerns with the	The Applicant is working with the MoD to agree a mitigation

Table A16.3: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
Organisation (MoD)	Original 2007 Scheme (110 m blade tip). However, following a meeting with SSE in 2008, the objection was removed. In response to the 68 turbine scheme, the MoD raised concerns that the turbines would be within the Highlands Restricted Area, and would unacceptably affect military activities. It also requested that all turbines should be fitted with 25 candela omni-directional red lighting or infrared lighting with an optimised flash pattern of 60 flashes per minute of 200 ms to 500 ms duration at the highest practicable point.	solution in relation to low flying. In relation to lighting, an aviation lighting scheme would be submitted for the written approval of the planning authority (in consultation with the relevant stakeholder).
NATS Safeguarding (email 06/09/12)	The proposed development has been examined from a technical safeguarding aspect and does not conflict with NATS' safeguarding criteria. Accordingly, NATS (En Route) Public Limited Company ("NERL") has no safeguarding objection to the proposal. If any changes are proposed to the information supplied to NERL in regard to this application which become the basis of a revised, amended or further application for approval, then as a statutory consultee NERL requires that it be further consulted on any such changes prior to any planning permission or any consent being granted.	No further action required.
OFCOM (email 03/10/12)	No links would be affected by the proposed development.	No action required.
Highlands and Islands Airports (HIAL) (email 22/10/12)	HIAL calculations show that, at the given position and height, this development would not infringe the safeguarding surfaces for Wick Airport. However, due to its height and position, red obstacle lights may be required to be fitted at the hub height of some of the turbines.	In relation to lighting, an aviation lighting scheme would be submitted for the written approval of the planning authority (in consultation with the relevant stakeholders).
Atkins Global[1] (email 04/10/12)	The proposed development has been examined in relation to UHF Radio Scanning Telemetry communications and we are happy to inform you that there is no objection the proposal.	No action required.

[1] Atkins Limited is responsible for providing Wind Farm/Turbine support services to the Telecommunications Association of the UK Water Industry

In summary, an aviation lighting strategy would be submitted for the written approval of the planning authority and in consultation with the relevant stakeholders. The MoD has identified some initial concerns and the Applicant is working with MoD to agree a mitigation solution, examining the relationship of the Modified 2013 Scheme with respect to the low flying activity.

A16.3 Recreation and Tourism

The only outstanding issue raised in response to the Original 2007 Scheme related to Loch Strathy Bothy and North Sutherland Track 334 (formerly known as Hill Track 332). Therefore, this section of the chapter will focus on how this issue has been addressed by the Modified 2013 Scheme.

Table A16.4 provides the consultation responses received in relation to recreation.

Table A16.4: Issues Identified during Consultation

Consultee	Issue	Where/How this is Addressed
Sutherland Access Officer (31/07/2007)	The Sutherland Access Officer identified the 'Lochstrathy Bothy' and Hill Track 332' as being sensitive receptors.	Through deletion of elements of proposed wind farm infrastructure, the layout of the Modified 2013 Scheme reduces the impacts on the Lochstrathy Bothy, particularly through the removal of T34, which was originally located close to the Bothy (refer to Figure A4.20). Consultation with the Sutherland Access Office (Matthew Dent)[2] confirmed that the North Sutherland Track 334 is not a designated Public Right of Way but it is a route where access rights apply. Therefore, the track would be closed during the construction phase and reopened for public use afterwards.

A16.4 Social and Economic

A16.4.1 Introduction

The principal changes to this section of Chapter A16: Other Issues relate to:

- Section A16.4.3: Policy Context – the policy context has been revised since the application for Section 36 Consent for the Original 2007 Scheme was submitted;
- Section A16.4.6: Local Economic Benefit during Construction – the proposed workforce numbers have changed since the 2007 ES and the revised details are included in this section;
- Section A16.4.7: Local Economic Benefit during the Operation of the Development – an estimate of the total spend in Highland area has been provided in this revised section;
- Section A16.4.8: Community Benefit – an estimate of the total spend in Highland area has been provided in this revised section; and
- Section A16.4.9: Summary – this section has been updated to reflect the revised impacts of the Modified 2013 Scheme.

[2] Email from Matthew Dent (Sutherland Access Officer, THC) to Alexandra Turner (ENVIRON) dated 6th November 2012

A16.4.2 Scope of Assessment

There are no changes to this section and no new issues relating to socio-economic effects were raised as part of the reconsultation process. Therefore, Section A16.4.2 of the 2007 ES remains valid.

A16.4.3 Policy Context

(a) National Planning Policy

The NPF 2 was issued in its final form on 25 June 2009. NPF 2 guides Scotland's development to 2030 and sets out strategic development priorities to support the Scottish Government's central purpose of sustainable economic growth. The NPF2 takes forward the spatial aspects of the Scottish Government's policy commitments on sustainable economic growth and climate change, which will see Scotland move towards a low carbon economy. There are a number of key priorities which are set out in NPF2, some of which include the following of relevance to the Modified 2013 Scheme:

- promote development which helps to reduce Scotland's carbon footprint and facilitates adaptation to climate change;
- support sustainable growth in the rural economy; and
- realise the potential of Scotland's renewable energy resources and facilitate the generation of power and heat from all clean, low carbon sources.

On the 4 February 2010, the Scottish Ministers issued 'Scottish Planning Policy' (SPP). The SPP supersedes all previous statements of national planning policy. The SPP provides an overview of the purpose of the planning system and states that the Scottish Government's view is that *"a properly functioning planning system is essential to achieving its central purpose of increasing sustainable economic growth"* (paragraph 4).

(b) Regional Planning Policy

The HwLDP was adopted on 5 April 2012 and supersedes the previous Development Plan covering the Modified 2013 Scheme at Strathy South, which was the Highland Structure Plan and the Sutherland Local Plan (2010)[3]. Section 5 of the HwLDP sets out the vision for the Highland Council Area as follows, *"by 2020, Highland will be one of Europe's leading regions*. *We will have created sustainable communities, balancing population growths, economic development and the safeguarding of the environment across the area, and have built a fairer and healthier Highlands"* (page 13).

(c) Local Planning Policies

The Sutherland Local Plan was adopted in 2010. However, the HwLDP (2012) supersedes the General Policies and other related material of this Local Plan. A Parliamentary Order has been made to retain other elements within this Local Plan. None of the retained policies included in Appendix 7 of the HwLDP are relevant to this section.

(d) Draft Electricity Generation Policy Statement (2012)[4]

The Scottish Government identifies in its Draft Electricity Generation Policy Statement that there are major economic benefits and competitive advantage by successfully developing new low carbon energy resources. Over the decade to 2020, renewables alone is anticipated to provide up to 40,000 jobs and £30bn investment to the Scottish economy. The Draft Electricity Generation Policy Statement Scotland anticipates that renewable energy projects could bring in up to £2.4 bn directly to communities in FITS revenues over 20 years.

A16.4.4 Methodology

There are no changes to this section of the 2007 ES.

[3] With the exception of those parts of the Sutherland Local Plan which remain valid as detailed in The Highland Council (Appendix 7 retention schedule).

[4] Available at http://scotland.gov.uk/Resource/0038/00389294.pdf

A16.4.5 Baseline Conditions

There are no changes to this section of the 2007 ES.

A16.4.6 Local Economic Benefit during Construction

The main opportunity for local economic benefit associated with the Modified 2013 Scheme would occur during the construction phase of the development. Suitably qualified local firms may be invited to bid for a significant portion of the construction work. Construction materials would normally be sourced locally and local transport and plant hire companies used.

The capital cost of the Modified 2013 Scheme is estimated to be approximately £1.6 million per megawatt. On this basis, £256 million would be invested in the purchase of plant, equipment and the construction of buildings and other structures. This is split as follows:

- 70% for the purchase and erection of turbine structures including towers;
- 15% for civil engineering works (roads, foundations etc);
- 4% for onsite electrical works; and
- 11% for grid connection and associated site development works.

A significant amount of this work would be open to local tender particularly with regard to civil engineering. The Applicant has demonstrated a high degree of local supply chain procurement in the Highlands in its existing wind farm developments. Based on a recent wind farm assessment project in the Highlands, anticipated spend in Scotland on development and construction is potentially achieving approximately 40% of the total expenditure The Applicant is committed to maximising its anticipated expenditure locally.

There is currently one turbine tower manufacturing plant in Scotland, at Machrihanish in Kintyre, operated by Wind Towers (Scotland) Ltd, an SSE Venture Company. SSE intends to procure of all its turbine towers across all its future construction sites in Scotland. The assembly plant currently employs around 130 people, all locally employed from Cambeltown and the Mull of Kintyre area.

The greatest opportunities for contracts and employment opportunities in the local area are from civil engineering contracts. It is estimated that the on-site construction workforce would total approximately 140 individuals: approximately 21 foresters, 78 civil contractors, 16 turbine contractors, 19 electrical contractors and six project management staff.

Staffing levels would, therefore, vary according to the phase of construction, with the highest levels needed at the point where civil works are nearing completion and the first turbines are being installed. At this point, site staffing may reach approximately 64 individuals. On average, the staffing level would be approximately 32 individuals.

Non-local construction personnel would be accommodated off the site, typically in local hotels and guest houses which may have a short-term positive impact, locally, but is unlikely to be of wider significance.

There would be temporary disturbance to a relatively small proportion of the grouse shooting interests within the site boundary. The construction activities would be timed to minimise this disturbance and on completion of construction activities there would be no material impact on shooting activities on the estate.

The Applicant has a track record of delivering positive economic effects in the Highlands and islands with a strong history, where it already employs around 2000 people. Across its various businesses units, the Applicant's investments in the next ten years could reach £5-10bn in the region.

An example of the actual positive socio-economic effects achieved is at Gordonbush Wind Farm near Brora in Sutherland (TA A16.1). These benefits include: £2 million investment in local transport infrastructure; use of local suppliers for materials (e.g. aggregates from

Dornoch Quarry, Brora and concrete from Achley Concrete in Dornoch); use of Scottish contractors RJ McLeod for construction elements.

The commitment to employment in the Highlands is supported through the creation of the Applicant's initiative, the SSE Open4Business Highlands and Islands online portal. This site facilitates trade and engagement between SSE and local suppliers and service providers. It provides a platform for SSE to promote opportunities originating in the region, and allows local suppliers to view SSE opportunities, register as a supplier and respond to notices free of charge. Users of the site can then also advertise their own opportunities such as sub-contracting work. This will ensure local companies have opportunities to secure large and small scale contracts on all of the Applicant's projects across the Highlands and Islands.

The Applicant is further committed to investment in training and skills in the Highlands, in a partnership with the University of Highlands and Islands to collaborate and work together to maximise the benefits to the people of the Highlands from Low carbon energy. Key areas for collaboration include creating the right training infrastructure and in promoting innovation and research and the applicant is committed to developing opportunities locally for young people.

Overall, the levels of expenditure in the local economy during construction and the impacts on employment generation are considered to have a long and lasting positive impact on communities all over the Highlands.

These commitments continue to provide the local and regional economies with a highly skilled workforce to fill the long term employment opportunities in this sector in this part of Scotland.

Related economic benefits also include investment in facilities such as roads and ports, and the cumulative effect of the creation of a pipeline of projects. This includes the SSE's investment in the supply chain, which will have a significant longer term effect through the support of the renewable sector as a whole.

A16.4.7 Local Economic Benefit during the Operation of the Development

The proposed operational period of the wind farm is 25 years. The wind farm operation may also potentially effect:

- local temporary diversions to facilitate routine operational and emergency maintenance requirements; and
- community investment (which is discussed more detail in refer to Section A16.4.8).

A16.4.8 Community Benefit

The Applicant's policy on community investment, which has been formulated in consultation with a range of stakeholders, amounts to at least £5,000 per MW per year for the duration of the operation of the wind farm. This can be split between a specific local community benefit and a wider sustainable energy fund, equating to £800,000 per year, index linked for 25 years, bringing the total community benefit to £20 million over the 25 year operational period of the wind farm.

The Community Benefit fund provides grants to support charitable activities that enhance quality of life for local residents; contribute to vibrant, healthy, successful and sustainable communities and promote community spirit and encourage community activity. As well as these important social impacts, the Community Benefit fund also has an economic impact where facilities are built or refurbished and as a result of supporting staff and seasonal workers in community projects.

The aim of the Applicant's new Scotland Sustainable Energy fund is to provide long-term support for strategic projects in the area, which includes skills development, community energy schemes, and projects to improve the built and natural environment. The fund is aimed at further enabling local residents and the wider Highland community to have the skills to be able to take advantage of the opportunity of jobs in the development and operation of renewable energy and the wider energy industry across the Highlands.

A16.4.9 Summary

The full effect of the Modified 2013 Scheme arises from the effects from this specific development (residual effect) and the cumulative effects. In particular many of the effects from the Modified 2013 Scheme are short term, whilst the cumulative effects are longer term. In summary:

- the development and construction phase (capital cost) of the infrastructure of the Modified 2013 Scheme is expected to be approximately £256 million. This is expected to create a total of 140 temporary construction jobs to Scotland, mainly during the 24 month construction phase. Local firms would be provided with the opportunity to tender for construction and operational services. Related benefits include offering apprenticeships and training opportunities;
- temporary employment would be created during decommissioning. However, as stated in the limitations to the assessment, it is difficult to predict the effects on the economy in 25 years' time. In general, effects are expected to be similar to those during construction albeit to a lower magnitude;
- related economic benefits include investment in facilities such as roads and ports, and the cumulative effect of the creation of a pipeline of projects. This includes the Applicant's investment in the supply chain which would have a longer term effect through the support of the renewables sector as a whole;
- there would be a lasting legacy from the Applicant's community investment funding which, for the Highland region as a whole, has a value of £20 million over the lifetime of the project. This would affect the economy and the community by supporting and creating employment, supporting schemes such as community energy schemes and local projects which could range from keeping the local shop open or improving community transport. This could have a long term effect beyond the life time of the Modified 2013 Scheme by helping to make the local area a more sustainable place in terms of community and the environment; and

- the Modified 2013 Scheme reduces the impact on Lochstrathy Bothy given the reduction in elements of the proposed wind farm infrastructure, and could result in temporary disruption to paths and hill tracks during construction and decommissioning. However, this impact would be temporary, and is not considered to be significant in terms of The EIA Regulations.

A8 Landscape Character

A8.1 Introduction

The Modified 2013 Scheme incorporates changes in design which have the potential to alter the impacts assessed and presented in Chapter 8: Landscape Character of the 2007 ES. This chapter is intended to determine the implications of these changes and to describe any updated landscape character impacts resulting from the Modified 2013 Scheme.

The intention of this chapter is not to present an entirely new assessment of potential landscape impacts associated with the Modified 2013 Scheme, nor is it to re-present Chapter 8: Landscape Character of the 2007 ES and the accompanying drawings with amendments. Instead, it is intended to assess the potential significant effects arising from the Modified 2013 Scheme and highlight how the design changes would alter the original findings of the 2007 ES. For this reason it must be read in conjunction with Chapter 8: Landscape Character of the 2007 ES, in accordance with the requirements of Regulation 4, Schedule 4 of the EIA Regulations. Refer also to ES Addendum Chapter A1: Introduction and ES Addendum Chapter A4: Development Description. This approach has been agreed during consultation with The Highland Council (THC) and Scottish Natural Heritage (SNH).

A wild land assessment has been carried out to standards set out in appropriate guidance[1]. This is contained in Technical Appendix A8.1.

In order to accurately assess the potential cumulative impacts of the Modified 2013 Scheme, it has been necessary to update the baseline to reflect the current situation. Since the 2007 ES, updated guidance[2] on the assessment of cumulative landscape impacts has been published. To properly reflect this updated guidance and the latest baseline information, a new cumulative assessment has been carried out and is presented in Technical Appendix A8.2. The cumulative landscape character assessment tables are presented in Technical Appendix A8.3.

A8.2 Scope of Assessment

A8.2.1 Project Interactions

A detailed description of the proposed changes to the development is provided in Chapter A4: Development Description. However, the changes relevant to this assessment can be summarised as follows:

- Removal of thirty turbines;
- Repositioning of retained turbines;
- Change in geometry of turbines from 70 m hub height, 80 m rotor diameter and a maximum tip height of 110 m to 83 m modelled hub height, 104 m modelled rotor diameter up to a maximum tip height of 135 m; and
- Revision of the site access track in order to connect with Strathy North Wind Farm consented layout, starting close to Turbine 34 (of Strathy North Wind Farm) and connecting with an existing track in order to access the site (as shown in Figure A4.1 Modified 2013 Scheme).

Other elements of the scheme, such as the internal track layout, borrow pits, laydown areas and access were considered as part of the 2007 ES. Alterations to these under the Modified 2013 Scheme would have limited effect on direct and indirect impacts assessed.

A8.2.2 Study Area

The study area boundaries adopted for this ES Addendum chapter remain unchanged to those used for Chapter 8: Landscape Character of the 2007 ES. The rationale behind retaining the

[1] SNH (2007) Interim Guidance Note: Assessing the Impacts on Wild Land

[2] SNH (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments

original areas in relation to the changes to layout and scale of turbines, is described further in Section A8.6.1.

A study area extending 30 km from the site boundary was reviewed for potential impacts. However, with knowledge of the site and having examined Zone of Theoretical Visibility (ZTV) and wireframe diagrams (as described in Section A9.5.2 of Chapter A9: Visual Impact), an inner 15 km study area was selected as this was considered to encompass all likely significant impacts. This study area boundary is shown on Figure A8.1: Landscape Designations.

For the cumulative impact assessment, a study area based on a standard buffer of between 35 km and 60 km from the development periphery was considered (in line with SNH guidance). Having examined available information and consulted with SNH, it was decided that an irregular (or variable-distance) study area was appropriate in order to focus on the most significant impacts and potentially sensitive areas, including those at locations as far from the scheme as Ben More Assynt (approximately 55 km south-west of the site) and Foinavon (approximately 46 km west of the site). This variable-distance boundary is shown on Figure A8.3: Landscape Designations and Cumulative ZTV.

A8.2.3 Updated Scoping and Consultation

Following submission of the 2007 ES, no objections specifically relating to landscape character were received.

Since the decision to review the turbine geometry, and layout, further informal consultation has been undertaken. Although separate topics with separate chapters, consultation on Landscape Character and Visual Impact has taken place simultaneously. For this reason, a summary of responses to this recent consultation from statutory consultees relating to both chapters is provided at Table A8.1 below.

Table A8.1: Issues Identified during Consultation

Consultee	Issue	Where/How this is Addressed
The Highland Council (THC)	26 March 2012 – Updated photomontages were requested for View Point (VP) 4 Strathy, VP9 Bettyhill and VP13 East of Melvich and are to include Strathy North wind turbines (to THC standards).	Suitable photomontages from these VPs are included. These are contained in a bound volume of THC graphics, separate to the main graphics volume.
	26 March 2012 – Colour wirelines, from the above selected viewpoints, illustrating the relationship between Strathy North and Strathy South should be provided.	Suitable colour wirelines from these VPs are included. These are shown on Figures A9.9, A9.16 and A9.19 of the main graphics volume.
	16 April 2012 - An assessment update is acceptable but additional commentary on cumulative impacts (including sequential impacts for road users) is advised.	The chapter format includes an update to the previous assessment and a renewed cumulative assessment. The assessment update is summarised at Table A8.2 below while the cumulative assessment is included in Technical Appendix A8.2.

Table A8.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	17 May 2013 – The relationship between Strathy North, Strathy South and Strathy Wood should be illustrated by colour wirelines either in the Strathy South ES Addendum or by those assessing Strathy Wood.	Colour wirelines in this ES Addendum (as shown on Figures A9.9, A9.16 and A9.19) focus on the relationship between Strathy North and Strathy South but not Strathy Wood. This is because of the degree of potential change in design at Strathy Wood, a scheme currently at scoping stage, which could result in misleading visualisations.
Scottish Natural Heritage (SNH)	8 June 2012 - Recommended that further additional visualisations for viewpoints 1, 3, 5, 15 & 16 are produced (to SNH standards).	Suitable visualisations from these VPs are included and shown on Figures A9.4-7, A9.11-12 and A9.21-24.
	8 June 2012- Recommended that the 2007 Cumulative LVIA is updated.	The chapter format includes an update to the previous assessment and a renewed cumulative assessment. The assessment update is summarised at Table A8.2 below while the cumulative assessment is included in Technical Appendix A8.2.
	8 June 2012 and 2 May 2013 - Noted that previous advice regarding removal of turbines…does not appear to have received further exploration.	ASH design+assessment explored the removal of turbines (35-39 and 41) and considered the reduction to have only a slight improvement on potential visual impacts. However, the Applicant considered the layout in this locality and modified the number of turbines and layout. These exercises have resulted in the Modified 2013 Scheme layout.
	2 May 2013 – Advised of updated landscape designations which should be included in the assessment update.	The assessment has been carried out with reference to these current landscape designations. A summary of these updates is provided at A8.6.3 below.
	2 May 2013 – Requested that a Wild Land Assessment referencing 2007 SNH Guidance and 2012 SNH Mapping be included.	As per ASH response letters of 16 May and 12 June 2013, a Wild Land Assessment is included with reference to 2007 SNH Guidance, 2002 & 2012 SNH Mapping. This is included in Technical Appendix A8.1.
	2 May 2013 – Requested that the assessment update was carried out to the updated (Third Edition) Guidelines for Landscape and Visual Impact Assessment (GLVIA).	As per ASH response letter of 16 May 2013, the assessment update has been carried out to Second Edition GLVIA, as per guidance from the Landscape Institute. See A8.4.1 below.

Table A8.1: Issues Identified during Consultation		
Consultee	**Issue**	**Where/How this is Addressed**
	2 May 2013 - Request that the cumulative assessment include a VP from the A836, between CVP2 and CVP4, be included and that consideration be given to including a CVP at Forsinard.	These viewpoints have been included in the cumulative assessment with visualisations shown on Figures A9.68 and A9.69 and assessment in Technical Appendices A9.2 and A9.3.

A8.2.4 Impacts to be Assessed

This chapter considers potential impacts upon designated and non-designated landscape within the study area. These impacts may be direct or indirect and temporary (relating to construction and decommissioning) or long-term (operational).

A8.2.5 Impacts Scoped out of Assessment

Impacts arising from the process of decommissioning are considered to be of a similar nature and duration to those arising from the construction process and therefore have not been considered separately in this chapter. Where this assessment refers to potential construction impacts, these are also representative of predicted decommissioning impacts.

A8.3 Changes to Policy and Legislative Context

A full description of updated policy and legislation relating to this development is provided in Chapter A7: Planning Context. Listed below is a summary of updates relevant to landscape impacts.

A8.3.1 International Legislation and Policy

No international legislation or policy relevant to this assessment has been updated since the 2007 ES was prepared.

A8.3.2 National Legislation and Policy

Since the 2007 ES was written, the following national policy guidance relating to landscape and wind energy development has been published:

- SNH - Assessing the Impacts on Wild Land (2007);
- SNH - Siting and Designing Wind farms in the Landscape (2009);
- SNH - Strategic Locational Guidance for Onshore Wind Farms in respect of the Natural Heritage (updated 2009);
- SNH - Renewable Energy and the Natural Heritage (2010); and
- SNH - Assessing the Cumulative Impact of Onshore Wind Energy Developments (2012).

These documents set out the position of SNH in relation to developments of the type proposed; being supportive of their potential contribution to addressing climate change, acknowledging that they may result in impacts upon the landscape and promoting appropriate location and design of developments in order to minimise those impacts. These policy documents have been considered as part of this assessment.

A8.3.3 Regional Policy

THC has published the following updated and relevant regional policy information since the 2007 ES was prepared:

- Highland Wide Local Development Plan (April 2012);
- Onshore Wind Energy: Interim Supplementary Guidance (March 2012); and
- Assessment of Highland Special Landscape Areas (June 2012).

In these documents, THC acknowledges the need to balance the opportunity to create renewable energy against potential impacts upon various considerations, including landscape character. They also identify the most sensitive landscape areas within the regional context and set out search areas (of which the site is one) indicating where wind energy development could potentially achieve the required balance.

Key policies from the Highland Wide Local Development Plan are Policy 61: Landscape[3] and Policy 67: Renewable Energy[4]. Policy 61 states that all development should reflect landscape character and qualities, with consideration given to scale form and pattern (see also Section 7.3 of Addendum Chapter A7: Planning Context). Policy 67 highlights supplementary guidance and sets out that renewable energy development, including wind farms, should, as well as according with Policy 61, giving additional consideration given to visual impact and general amenity at sensitive locations and recreational or tourist receptors.

A8.4 Changes to Methodology

A8.4.1 Overview

The 2007 ES landscape methodology, as described in Chapter 8: Landscape Character, Section 8.3 of that document, was based upon the Guidelines for Landscape and Visual Impact Assessment (GLVIA), Second Edition, 2002. Although that document has recently been superseded (GLVIA, Third Edition, April 2013), this assessment has been completed as per advice from the Landscape Institute, co-authors of the guidance, stating that assessment started using the Second Edition should be completed using that edition. As the assessment update process for this ES Addendum began in 2012, this is deemed to be appropriate.

As with the 2007 ES assessment, the aim here is to identify those impacts which are significant. This is considered to be those which are Moderate or greater.

SNH Policy Statement No. 02/03 'Wildness in Scotland's Countryside' recognises the concept of wild land / wildness as land that is sensitive to any form of development and provides psychological benefit to those seeking more challenging forms of outdoor recreation. Areas where wild land described in the policy may potentially be found were suggested on the SNH map 'Search Areas for Wild Land' (2002). This policy statement and mapping formed the basis for a Wild Land Assessment in the 2007 ES.

Since the 2007 ES assessment was completed, SNH has published a new interim guidance note (Assessing the Impacts on Wild Land, February 2007), updated mapping (Relative Wildness Throughout Scotland, 2012) and further revised mapping as part of a consultation exercise (Core Areas of Wild Land in Scotland, April 2013). On their website[5], SNH advise that the updated mapping should not be used until the Scottish Government confirms its approach in the finalised National Planning Framework in 2014. However, due to a specific consultation request (see Table A8.1 above), this assessment update has been completed with reference to the 2002 & 2012 mapping and 2007 guidance.

In March 2012, SNH published Assessing the Cumulative Impacts of Onshore Wind Energy Developments and so this document has been referred to when carrying out the new Cumulative Landscape Character Assessment (see Technical Appendix A8.2).

In addition to the visualisations provided in the 2007 ES and in this ES Addendum, further wirelines from various landscape designations, character zones and areas of potential wild land have been used in order to compare and check potential impacts while preparing the assessment update. These are separate from the list of agreed viewpoints and are not reproduced with the graphic material for this ES Addendum.

[3] THC (2012) Highland-Wide Local Development Plan, p115

[4] THC (2012) Highland-Wide Local Development Plan, p123

[5] http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-policy-and-guidance/wild-land/mapping/, updated 12th June 2013

A8.5 Changes to Baseline Conditions

A8.5.1 Context

Since publication of the 2007 ES, Strathy North Wind Farm has been granted consent. The impact of this development, in combination with the Modified 2013 Scheme is considered in Technical Appendix A8.2, Cumulative Landscape Character Assessment. However, as a result of site access tracks which are consented and being built as part of development at Strathy North Wind Farm, the required length of new access specific to the site is reduced. Impacts associated with these consented lengths of track were reported in the 2007 ES but will not be included as part of this chapter.

The baseline condition is also altered by changes in regional planning material, as outlined below, which have altered the extent of designation throughout the study area.

A8.5.2 Desk Studies

Since the 2007 ES was published, THC has published an 'Assessment of Highland Council Special Landscape Areas' (June 2011) which reviews local landscape designations. The implications of this are discussed in Section A8.6.3(a) below.

There have been no other significant changes in the baseline conditions used for the assessment of the Modified 2013 Scheme. However, in the time since the 2007 ES was submitted, there have been several changes to the developments forming the baseline scenario for cumulative assessment. These are presented in full in Table A9.12: Development Information included in the Cumulative Impact Assessment.

A8.5.3 Field Studies

The study area was revisited several times between June 2012 and May 2013. During these visits, site notes and photography were used to record the character of the area and then compared against descriptions contained in the 2007 ES. It was found that these were broadly unchanged.

A8.6 Changes to Effects Evaluation

A8.6.1 Basis of Assessment

The description of the Modified 2013 Scheme in ES Addendum Chapter A4: Development Description includes a turbine with a maximum tip height up to 135 m, a modelled hub height of 83 m and a modelled rotor diameter of 104 m. While the constructed turbines may differ within these parameters up to the 135m tip height, these maximum dimensions represent a worst-case scenario and have been used to generate computer modelling on which to base the assessment.

Direct impacts arising from the Modified 2013 Scheme would occur within landscape designations and local character zones (LCZs) within which the site is located. Beyond this, indirect impacts would occur as a result of visibility of turbines and ancillary elements of the Modified 2013 Scheme. Therefore, it is important to understand the change in visibility, both in terms of the extent of the area potentially impacted and any alteration of appearance. This is illustrated in Figure A9.3: Comparative ZTV, which shows ZTVs for the Original 2007 Scheme and the Modified 2013 Scheme overlaid, and on subsequent figures containing comparative wireline visualisations.

Figure A9.3: Comparative ZTV shows that there are no locations within the study area which were potentially intervisible, and therefore indirectly impacted, with the Original 2007 Scheme which would be unaffected by the Modified 2013 Scheme. This is illustrated by there being no yellow areas on the plan. The blue areas on the drawing indicate that there would be an expansion to some of the areas potentially affected as a result of the design changes and that, in some cases, small areas unaffected by the Original 2007 Scheme would be affected by the Modified 2013 Scheme.

Given the small change in extent of potential indirect effect indicated it is considered that the 15 km detailed study area (as used in the 2007 ES) is still relevant for assessing designated landscapes and LCZs when considering the significant implications of the Modified 2013 Scheme.

A8.6.2 Construction Effects

Under the Modified 2013 Scheme, the proposed changes to elements which would influence direct construction impacts (such as internal track layout, laydown areas and borrow pit locations) are such that they would not alter the previous assessment of construction-related landscape impacts. These direct impacts (i.e. at Upland Plateau with Raised Bogs LCZ and River Strathy Valley LCZ) therefore remain unchanged between the 2007 ES and this ES Addendum.

However, indirect construction impacts, associated with the erection and emerging visibility of larger turbine components, may alter. Where this is the case, it is deemed that increases in construction impacts would be in line with those associated with the operational impacts described below.

A8.6.3 Operational Effects

(a) Designated Areas

Several landscape designations were identified within the study area and included in the 2007 ES. Since that time, a review of regional landscape designations – as described in 'Assessment of Highland Council Special Landscape Areas' (June 2011), THC – has been carried out, changing the title of Area of Great Landscape Value (AGLV) to Special Landscape Area (SLA) and making some minor boundary changes. Having reviewed this new information, it is still considered that the areas are similar enough to allow assessment to take place without redefining the baseline condition.

(i) Kyle of Tongue National Scenic Area

This designated area is located on the west and north-west boundary of the detailed study area. It is covered by a national-level designation and its special qualities are given as the Kyle itself, the scale and backdrop of mountains, coastal scenery and the distinctive settlement pattern.

The 2007 ES describes the impact upon the National Scenic Area (NSA) within 15 km of the proposals as Negligible. Given the distance between the designation and the site, it is unlikely that the changes to proposed turbine geometry, number and position included in the Modified 2013 Scheme would be distinguishable. The impact therefore remains unchanged.

(ii) Farr Bay, Strathy and Portskerrra Special Landscape Area

At the time of the 2007 ES, this area included a series of four distinct AGLVs along the coast in the north of the 15 km study area with a proposed AGLV (PAGLV) linking them together. Since then, this PAGLV has been carried forward and renamed an SLA with some minor boundary amendments.

The impact assessment of the 2007 ES on the four AGLVs was Negligible. Having joined and expanded these areas into one SLA, a greater area of designated landscape would be potentially exposed to the indirect effects of both the Original 2007 Scheme and the Modified 2013 Scheme.

Given the distance between the designation and the site, it is unlikely that the proposed changes to turbine geometry, number and position included in the Modified 2013 Scheme would be distinguishable from the areas assessed during preparation of the 2007 ES. However, the moorland areas above the bays and cliffs were not previously included under the designation. The result of expanding the designation increases the potential impact here from Negligible to Slight Adverse.

(iii) Bens Griam and Loch nan Clar Special Landscape Area

This designation was not in place at the time of the 2007 ES, existing only as a PAGLV, and so was not assessed at that time. However, the Bens Griam area was assessed as part of the landscape character assessment (contained within the Landmark Peaks and Foothills LCZ) and recognised at that time as an area of special quality and value: as indicated by assessments of very attractive scenic quality, medium-high landscape value and medium-high sensitivity.

Impact assessment for the 2007 ES resulted in a Moderate adverse impact upon the relevant LCZ. While it is acknowledged that the scale of turbines visible from this area (and therefore resulting in indirect change) would be larger as a result of the Modified 2013 Scheme, it is not considered that this would be of an order large enough to alter the level of the assessed landscape impact. The impact upon the SLA is therefore assessed to be Moderate Adverse, as per the 2007 ES assessment for the relevant LCZ.

(b) Local Character Zones

The assessment of potential impacts on landscape character is based upon LCZs identified during preparation of the 2007 ES (refer to Figure 8.2 of the 2007 ES). These were informed by the regional SNH Landscape Character Types (as described in SNH Review No. 103: Caithness and Sutherland Landscape Character Assessment, Caroline Stanton, 1998) which were then refined to reflect more detailed, local conditions within the study area.

(i) B - Upland Plateau with Raised Bogs LCZ

Turbines and the site access track would have a direct impact upon LCZ B: Upland Plateau with Raised Bogs. Having compared the Original 2007 Scheme to the Modified 2013 Scheme, it is recognised that, whilst the reduction in turbine numbers may have some localised effect and the length of track affecting the area would be reduced, the overall impact would be unchanged and so remains Moderate Adverse.

(ii) A - Rocky Coast with Bays LCZ

This LCZ is located along the north of the detailed study area and includes various rocky cliffs, sandy bays and promontories found along the coast. The dominant features have been described in the 2007 ES as the dramatic cliff scenery and seascape with sandy coves.

ZTV analysis indicates that the extent of visibility would be virtually unchanged. Wirelines have been used to ascertain that, while there would be a change in scale of turbines, this is unlikely to alter the perception of the landscape when compared to the Original 2007 Scheme.

As the principal focus of the area is to the north, there is a lesser degree of sensitivity to the development positioned approximately 10 km to the south. Nevertheless, it is recognised that there is an important relationship between this area and the moorland interior (where the development is proposed), as indicated by the assessed impact of Moderate-Slight Adverse which remains unchanged from the 2007 ES.

(iii) C1 - River Strathy Valley LCZ

This LCZ is located approximately 1 km north of the site's north-eastern boundary and extends north towards the coast. It is described in the 2007 ES as a broad valley with poorly defined side slopes.

Potential indirect impacts within this LCZ would arise from visibility of turbine components above the enclosing slopes and skyline. There is a potential minor increase in the visual envelope of the Modified 2013 Scheme when compared to the Original 2007 Scheme but this would be approximately 10 km north of the scheme and over a very small area.

Within areas already shown to be affected by the 2007 ES, it is assessed that there would be a slight increase in the proportion of the development visible but it is not considered that this would be more noticeable or result in a greater magnitude of change.

In the 2007 ES, it was reported that a direct change would result from proposed access works in this valley. The Modified 2013 Scheme would remove part of this section of track and require widening of other sections, thereby reducing the potential direct impacts here.

The relatively small proportion of the Original 2007 Scheme which would potentially impact on this LCZ would alter its character but it is not considered likely that the Modified 2013 Scheme would significantly increase this. The predicted impact therefore remains Moderate-Slight Adverse.

(iv) C2 - Strath Halladale LCZ

This is a long, enclosed valley located approximately 10 km east of the site's eastern boundary, extending from near Forsinard to Melvich. The 2007 ES describes it as flat-bottomed, broad valley affected by the presence of a road and electricity transmission line.

Analysis of the comparative ZTV shows that there would be virtually no change in the extent of this LCZ affected by the Modified 2013 Scheme. However, wirelines have shown that where impacts would occur, they may be slightly greater than those arising from the 2007 ES due to increased visibility of turbine components above the defining side slopes of the valley.

Turbines of both the Original 2007 Scheme and the Modified 2013 Scheme would be visible above the enclosing slopes of the strath; one of its defining landscape features. The increased magnitude of change associated with the larger turbine geometry of the Modified 2013 Scheme would increase the potential impact of this from Negligible to Slight Adverse.

(v) C3 - Strathnaver LCZ

Approximately 4 km west of the site's western boundary, this LCZ is an enclosed valley which runs from Naver Forest to Bettyhill at the coast. The valley is broad and shallow and includes prominent deciduous woodland clumps close to the river as well as occasional but prominent coniferous blocks.

ZTV analysis indicates that the Modified 2013 Scheme would be visible from a greater extent of the western valley slopes than would be affected by the Original 2007 Scheme. However, having interpreted a series of wirelines, these potential changes have been shown to be imperceptible. Any changes resulting from the Modified 2013 Scheme at this LCZ are therefore likely to occur within the same areas potentially affected by the Original 2007 Scheme.

Turbines would be seen on the skyline, above the enclosing valley slopes. The increased turbine geometry of the Modified 2013 Scheme would be more noticeable from the valley than those associated with the Original 2007 Scheme. The potential impact therefore increases from Negligible to Slight Adverse.

(vi) D - Broad Upland Basin LCZ

This LCZ is positioned in the south of the detailed study area, adjoining Loch Rimsdale and Loch Badanloch. The landscape is described in the 2007 ES as open with extensive lochs and forestry.

ZTV analysis suggests that this LCZ would have been almost unaffected by the Original 2007 Scheme. However, the Modified 2013 Scheme would potentially impact a small area of hilltop at Cnoc Bad a' Ghille Dhuibh and at Cnoc na Gaoithe. Wirelines have shown that a small fraction of no more than two sets of blade tips would be visible from these locations and, at distances of approximately 12.5 km and 14.0 km respectively, it is considered that these would be barely perceptible.

The assessed impact across the LCZ therefore remains unchanged as Negligible.

(vii) E - Landmark Peaks and Foothills LCZ

This is a series of prominent hills occurring in distinct groups near the edge of the detailed study area, to the south-east, south and west.

At Bienn Stumanadh (to the west), the extent of visibility suggested by the comparative ZTV is unchanged while at Beinn a Mhadaidh, Ben Griam Beg and Ben Griam Mor (in the south), there would be slight increases to the extent of visibility. In the south-east, at Meall a Bhealaich, a small area of lower, west-facing slopes unaffected by the Original 2007 Scheme would be affected by the Modified 2013 Scheme.

Having reviewed several wirelines from locations within this LCZ, it is clear that there would be no change in potential impacts as a result of the Modified 2013 Scheme as, in all cases, the whole of both the Original 2007 Scheme and the Modified 2013 Scheme would be visible at distances ranging from 8.5 to 13.5 km. It is not considered likely that the reduction in numbers or changing turbine geometry of the Modified 2013 Scheme would have a material effect on potential impact when compared to the Original 2007 Scheme. The impact therefore remains unchanged as Moderate Adverse.

(c) Wild Land Assessment

SNH policy documents include mapping which identifies, in the 2002 map[6], Search Areas for Wild Land (SAWLs) and, in the 2012 map[7], areas of varying potential for wild land. The earlier map places a boundary around SAWLs while the later mapping uses a gradated colour scale to suggest potential wild land (dark brown for low potential, through yellow to dark green for high potential). More recent SNH mapping[8] has been produced but this is at a consultative stage and was not requested during consultation; it has therefore not been considered in the assessment.

Although the Modified 2013 Scheme is not within any of the SAWLs or dark green areas on the considered SNH maps, it is intervisible with some of them (see Figure A8.2). In order to assess the potential impacts of the intervisibility a Wild Land Assessment has been carried out. This is included in full Technical Appendix 8.1 and is summarised below.

Several areas indicated on the 2012 mapping as having potential for wild land characteristics were ruled out during site appraisal because of the impact of man-made infrastructure and management practices. However, it was found that three SAWLs indicated on the 2002 mapping did conform, in varying degrees, to the criteria described in SNH guidance[9]. A site survey was carried out at several localised study zones (LSZs) within these SAWLs and an assessment carried out to assess whether these areas displayed wild land characteristics, the magnitude of change likely to result from development at the site and the potential impacts arising.

It is concluded that each of these areas identified do have wild land characteristics in varying degrees and that their overall quality varies between High (in the case of the Ben Hope Massif) and Medium-Low (in the case of the Flow Country).

The magnitude of change has been assessed as generally Negligible or Low, with the exception of the Ben Hiel LSZ (part of the Ben Hope Massif SAWL) where it would be Medium and would result in a Moderate Adverse impact. Apart from this localised area however, impacts on the wild land resource have been assessed as either Slight Adverse or Negligible and, therefore, are not considered to be significant.

It should be noted that the Wild Land Assessment does not consider cumulative impacts other than for those wind farms which are in operation, i.e. part of the baseline. However, Strathy North Wind Farm has received planning consent and, in 2007, it was anticipated that it would have a Slight Adverse impact on the Ben Hope Massif SAWL[10]. In line with best practice at the time, potential impacts were assessed across the SAWL rather than areas of

[6] SNH (2002) Search Areas for Wild Land

[7] SNH (2012) Relative Wildness throughout Scotland

[8] SNH (2013) Core Areas of Wild Land in Scotland 2013

[9] SNH (2007) Assessing the Impacts on Wild Land

[10] SSE (2007) Strathy North Wind Farm Environmental Statement

identified wild land or individual LSZs within a search area. It is therefore likely that this predicted Slight Adverse impact across the SAWL is a mean assessment with higher or lower impacts occurring at specific locations, such as Ben Heil.

Once constructed, it is anticipated that Strathy North Wind Farm would reduce the perceptual qualities which contribute to the Ben Heil LSZ Wild Land Quality and would also reduce the magnitude of change which would result from the Modified 2013 Scheme. It is considered that the combination of these factors would result in an impact at the Ben Hiel LSZ of less than Moderate Adverse (as was assessed above) and this would therefore not be significant.

A8.6.4 Cumulative Effects

Since the 2007 ES was prepared, a number of developments included in the cumulative assessment have been removed from the cumulative baseline, others have been added and some have changed their status within the planning system. Table A9.1 of Technical Appendix A8.2 shows the status of developments included in this ES Addendum assessment as of 16th May 2013.

The differences in baseline information and the updated assessment methodology make a comparison between the 2007 ES and the Modified 2013 Scheme very difficult. For this reason, a new cumulative landscape impact assessment is contained in Technical Appendix A8.2.

The cumulative landscape character assessment concludes that the majority of the landscape designations and Landscape Character Types (LCTs) identified within the study area would receive impacts ranging from Neutral to Slight-Moderate Adverse, and therefore not significant, cumulative impacts as a result of the addition of the Modified 2013 Scheme into the cumulative baseline scenario. However, it is anticipated that the Lone Mountains LCT would receive Moderate Adverse, and therefore significant, cumulative impacts. This is the combined result of its High sensitivity to further change (other developments have an extensive and varied effect across this LCT) and the Medium magnitude of change which would result from the Modified 2013 Scheme.

Contributing factors similar to those noted above for the Lone Mountains LCT would result in some areas within the Bens Griam and Loch nan Clar SLA receiving locally Moderate cumulative impacts. However, the overall cumulative impact on the Bens Griam and Loch nan Clar SLA would be Slight Adverse, and therefore not significant.

A8.7 Changes to Mitigation

No mitigation, beyond that developed as part of the design process, was recommended for the Original 2007 Scheme. This remains unchanged for the Modified 2013 Scheme.

A8.8 Changes to Monitoring

No monitoring was recommended for the Original 2007 Scheme and this remains unchanged for the Modified 2013 Scheme.

A8.9 Changes to Summary & Conclusion (Inc Residual Impacts)

As a result of redefinition of landscape designations within the Highland Council area, one new designated landscape is located within the detailed study area which was not included in the 2007 ES. However, the relevant area was previously assessed as part of the landscape character assessment (as part of the Landmark Peaks and Foothills LCZ) with due recognition given to the quality and value which have since resulted in its more recent designation. The earlier assessment considered the likely impact here to be Moderate Adverse and this remains unchanged.

Indirect impacts would result at areas not previously included in the Farr Bay, Strathy and Portskerra SLA (formerly PAGLV). However, as the resultant impacts upon the designation would increase from Negligible to Slight Adverse, this is not considered to be significant.

The Modified 2013 Scheme would result in significant impacts at two LCZs: Moderate Adverse impacts at both Upland Plateau with Raised Bogs and at Landmark Peaks and Foothills. This is unchanged from the 2007 ES assessment.

The assessment of impacts at all other designated landscapes within the detailed study area remain unchanged.

It is judged that, as a result of the change in design proposed for the Modified 2013 Scheme, impacts would increase at two of the straths associated with the study area: Strathnaver LCZ and Strath Halladale LCZ. For limited extents of these valleys, turbine components would be more noticeable above the enclosing slopes than would be the case for the Original 2007 Scheme. However, as these impacts would increase only from Negligible to Slight Adverse, this is not considered to be significant.

At the three other LCZs included in the assessment, potential impacts would be unchanged as a result of the Modified 2013 Scheme.

Rather than updating previous assessment, it was considered appropriate to carry out separate wild land and cumulative landscape impact assessments.

The Wild Land Assessment has confirmed that wild land characteristics, as defined in SNH guidance, exist within the three SAWLs located in the study area. It has also found that the majority of potential impacts associated with the Modified 2013 Scheme would not be significant. Of the areas assessed, significant impacts would occur only within a small area of one of the SAWLs: around Ben Loyal in the Ben Hope Massif SAWL. However, once constructed, it is anticipated that Strathy North Wind Farm would reduce the perceptual qualities which contribute to the Ben Heil LSZ Wild Land Quality and would also reduce the magnitude of change which would result from the Modified 2013 Scheme. It is considered that the combination of these factors would result in an impact at the Ben Hiel LSZ of less than Moderate Adverse (as was assessed above) and this would therefore not be significant.

Assessment of potential cumulative landscape impacts has concluded that the majority of designated landscapes and landscape character types identified would not be subject to significant impacts as a result of the Modified 2013 Scheme. A combination of the high number of schemes in the baseline scenario affecting summits and slopes and the potential introduction of the Modified 2013 Scheme mean that significant cumulative impacts would result locally within the Bens Griam and Loch nan Cloch SLA and within the Lone Mountains LCT.

Table A8.2: Summary of Potential Impacts of the Proposed Wind Farm

Designation or LCZ	**Potential Impact from Original 2007 Scheme**	**Potential Impact from Modified 2013 Scheme**
Construction		
Kyle of Tongue NSA	Negligible	Negligible
Farr Bay, Strathy & Portskerra SLA/ PAGLV	Negligible	Slight
Bens Griam & Loch nan Cloch SLA/ PAGLV	Moderate	Moderate
Upland Plateau with Raised Bogs LCZ	Moderate	Moderate
Rocky Coast with Bays LCZ	Moderate-Slight	Moderate-Slight
River Strathy Valley LCZ	Moderate	Moderate
Strath Halladale LCZ	No Change	Slight
Strathnaver LCZ	No Change	Slight

Table A8.2: Summary of Potential Impacts of the Proposed Wind Farm		
Designation or LCZ	**Potential Impact from Original 2007 Scheme**	**Potential Impact from Modified 2013 Scheme**
Broad Upland Basin LCZ	Negligible	Negligible
Landmark Peaks and Foothills LCZ	Moderate	Moderate
Operation		
Kyle of Tongue NSA	Negligible	Negligible
Farr Bay, Strathy & Portskerra SLA/ PAGLV	Negligible	Slight
Bens Griam & Loch nan Cloch SLA/ PAGLV	Moderate	Moderate
Upland Plateau with Raised Bogs LCZ	Moderate	Moderate
Rocky Coast with Bays LCZ	Moderate-Slight	Moderate-Slight
River Strathy Valley LCZ	Moderate-Slight	Moderate-Slight
Strath Halladale LCZ	Negligible	Slight
Strathnaver LCZ	Negligible	Slight
Broad Upland Basin LCZ	Negligible	Negligible
Landmark Peaks and Foothills LCZ	Moderate	Moderate

A8.10 Bibliography

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Guidelines for Landscape and Visual Impact Assessment, Second Edition (2002), Spon Press

Assessing the Cumulative Impacts of Onshore Wind Energy Developments (2012), Scottish Natural Heritage

Table A8.3: Glossary and Abbreviations	
Glossary	
Term	**Definition**
Modified 2013 Scheme	The development as described in Chapter A4: Development Description of this 2013 Addendum.
Original 2007 Scheme	The development as described in Chapter 4: Development Description of the 2007 ES.
National Scenic Area	A national level landscape designation applied to the highest quality scenic areas.
Area of Great Landscape Value	A regional or local level landscape designation applied by The Highland Council prior to June 2012.
Special Landscape Area	A regional or local level landscape designation applied by The Highland Council since June 2012.
Abbreviations	**Definition**
ES	Environmental Statement
ZTV	Zone of Theoretical Visibility
SNH	Scottish Natural Heritage
THC	The Highland Council
LCZ	Local Character Zone
NSA	National Scenic Area
AGLV	Area of Great Landscape Value
SLA	Special Landscape Area
SAWL	Search Area for Wild Land