

3 EIA Methodology and Approach

3.1 Introduction

- 1 Environmental Impact Assessment (EIA) involves the evaluation and presentation of any predicted significant environmental effects resulting from a proposed development, to assist the consenting authority in considering and determining an application. Early identification of potentially adverse environmental effects also leads to the identification and incorporation of appropriate mitigation measures into the scheme design.
- 2 This chapter sets out the approach that has been used in the EIA for the Onshore Works. It provides an overview of the key stages that have been followed, in line with EIA best practice.

3.2 The EIA Process

3.2.1 EIA Legislation and Guidance

- 3 European Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive'), as amended, provides that European Union authorities giving consent for a specific project must take into consideration any significant environmental or socioeconomic impacts the proposed project may cause.
- 4 The EIA Directive is transposed into Scottish law by a number of Regulations, however, the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (hereafter referred to as the 'EIA Regulations') are the relevant regulations in relation to the Onshore Works.
- 5 The Environmental Statement (ES) has been prepared in accordance with the EIA Regulations and advice on good practice, including:
 - Planning Circular 3 2011 *Guidance on The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011*;
 - Planning Advice Note (PAN) 58 *Environmental Impact Assessment* (1999);
 - The Institute of Environmental Management and Assessment (2004) *Guidelines for Environmental Impact Assessment*;
 - Scottish Natural Heritage (2009 Draft 2) *A Handbook on Environmental Impact Assessment: Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment Process in Scotland (3rd Edition)*.
- 6 Schedule 4 Part 2 of the EIA Regulations require that an ES should include at least:
 - a description of the development comprising information on the site, design and size of the development;
 - a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects¹ (mitigation measures);
 - the data required to identify and assess the main effects which the development is likely to have on the environment;
 - an outline of the main alternatives studied by the applicant;
 - an indication of the main reasons for this choice, taking into account the environmental effects;
 - a non-technical summary of the above information.

¹ Section 11.2 of the IEMA EIA Guidelines states that whilst distinguishing between the characteristics of an 'impact' and the significance of the 'effect' can be helpful, the distinction between 'impact' and 'effect' may not necessarily be appreciated by the public and requires a high level of rigour to ensure that the two terms are used in a consistent fashion. For simplicity, the term 'effect' has been used throughout this ES.

3.2.2 Good Practice Guidance

- 7 Scottish Planning Circular 3 2011 and PAN 58 provide guidance on EIA good practice. The key steps to be followed in the EIA process are identified in PAN 58:

Scoping

 - Undertake a scoping exercise to establish likely significant effects.

Baseline Studies

 - Examine, through baseline studies, the environmental character of the area likely to be affected by the development.
 - Identify relevant natural and man-made processes which may already be changing the character of the site.

Predicting and Assessing Impacts

 - Consider the possible interactions between a proposed development and both existing and future site conditions.
 - Predict and assess the possible effects, both negative and positive, of a proposed development on the environment.

Mitigation

 - Introduce design and operational modifications or other measures to avoid, minimise or mitigate adverse effects and enhance positive effects.

3.2.3 EIA and the Design Process

- 8 EIA should be treated as an iterative process, rather than a one-off, post-design environmental appraisal. In this way, the findings from the EIA can be fed into the design process, to avoid and minimise environmental effects. This approach has been used in relation to the design stages of the Onshore Works. Where potentially adverse environmental effects were identified through preliminary investigations or later in the detailed EIA, consideration was given as to how the scheme design should be modified to design out adverse environmental effects, or where this was not possible, to determine appropriate mitigation.
- 9 The mitigation measures proposed do not only focus on construction methods and the timing of construction works. Potential effects on the environment have also been avoided and reduced via the following measures:
 - careful selection of the cable landfall location;
 - positioning the cable underground to avoid significant landscape and visual impacts;
 - selection of a route corridor for the cable considered to have least environmental and technical constraints (this has included avoidance of sites designated for nature conservation).
- 10 This process is explained further in **Chapter 4: Site Selection and Alternatives** and in the subsequent assessment chapters.
- 11 In respect of construction, a commitment has been made to utilise 'trenchless' techniques (for a full description of these refer to **Chapter 5: Project Description**) in order to avoid sensitive sites of archaeological, ecological and landscape value. In addition, micro-siting of the cable route will be undertaken during construction to further avoid features of interest.

3.3 Scope of the Environmental Statement

- 12 To determine which aspects of the Onshore Works are likely to give rise to environmental effects and to inform the requirements for the ES, LUC prepared a Scoping Report² which was submitted to East Lothian Council in January 2012 together with a request for a Scoping Opinion as to the environmental effects to be considered in the EIA. The Scoping Report identified all aspects of the development of potential environmental significance and highlighted the key issues proposed for coverage in the ES.

² Available to view and download from <http://www.neartnagaoithe.com/onshore-scoping-document.asp>

- 13 Importantly, the purpose of scoping is to ensure that the EIA focuses on the key environmental issues. Therefore, the Scoping Report sought to focus the EIA on the main effects, with each of the topic-based chapters within the Scoping Report setting out a provisional list of potentially significant effects prior to mitigation and a second provisional list of non-significant effects to be 'scoped out' of full assessment. These were drafted on the basis of the findings of the preliminary survey work undertaken, the professional judgement of the EIA team, experience from other projects of a similar nature, and guidance and standards of relevance to the topic area in question.
- 14 On this basis, whilst a range of possible effects has been investigated as part of the EIA process, only effects identified as being of likely significance prior to the implementation of the proposed mitigation measures have been addressed fully in the ES.
- 15 The Scoping Opinion provided by East Lothian Council (15th February 2012) included the consultation responses from the statutory consultees. **Table 3.1** provides a summary of the issues raised in the responses to scoping and explains how these have been addressed.
- 16 In addition to the consultees contacted by East Lothian Council during the formal scoping process, topic area specialists contacted a number of other parties to obtain background information to further inform the EIA and to provide them with the opportunity to raise any concerns that they might have in relation to the Onshore Works. Details of this consultation are provided in the specialist topic area **Chapters 8-17**.

3.3.1 Topic Areas Scoped Out of the Environmental Statement

- 17 Below is a list setting out the potential effects that have been scoped out of the specialist topic area assessments:
- Terrestrial and Inter-tidal Ecology:*
- direct effects on statutory sites for nature conservation (excluding consideration of ancient woodlands); and
 - effects on habitats, and on all protected species, as a consequence of operation and maintenance of the Onshore Works.
- Ornithology:*
- a permanent reduction in breeding or wintering bird populations due to the operational stage of the Onshore Works;
 - direct and indirect effects on designated sites of ornithological interest; and
 - collision risks to flying birds.

Cultural Heritage:

- disturbance from vibration, dewatering or changes in hydrology resulting in indirect effects on cultural heritage features and sites; and
- temporary effects on the setting of nearby cultural heritage features during construction.

Ground Conditions and Geology:

- direct and indirect effects on statutory and non-statutory sites designated for their geological interest through partial/full removal, defacement or obscuring of rock outcrops/landforms, changes to relict or active river landforms, or sediment input;
- effects on subsurface coal deposits, landfill or other waste disposal facilities; and
- ground instability and seismic activity.

Water Resources, Hydrology and Flood Risk:

- pollution of surface water and groundwater as a result of maintenance activities associated with the operation of the Onshore Works (e.g. spillage of fuels, oils, etc.); and
- operational effects including modifications to natural drainage patterns, effects on flow in natural watercourses and flush zones and modification of stream channel morphology.

Traffic and Transport:

- the effect of operational and maintenance vehicles on existing traffic flows and the local road network.

Noise and Vibration:

- operational effects of the Onshore Works, including any associated maintenance works.

Social and Economic Effects

- potential effects on Rights of Way, Core Paths and other paths within the route corridor during operation.

Other Issues

- 18 A study of the likely effects arising from Electric and Magnetic Fields (EMF) has been undertaken and concludes that no significant effects are likely. The full EMF report is provided as **Appendix 3.1** to this Chapter.

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<p>DESCRIPTION OF THE DEVELOPMENT AND ALTERNATIVES</p> <p>The ES should include:</p> <ul style="list-style-type: none"> ● a description of the physical characteristics of the whole development including associated works stating whether they are permanent or temporary; ● the land-use requirements during the construction and operational phases; ● an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the development. <p>An outline of the main alternatives should be provided, highlighting reasons for choosing the final route.</p>	<p>A description of the Onshore Works and the processes involved in the construction of each of its elements are provided in Chapter 5: Project Description. Chapter 5: Project Description also makes reference to the operational and decommissioning phases.</p> <p>Potential effects of the Onshore Works on the topics listed, while being constructed and in operation, are presented in the respective specialist chapters as follows: Chapter 12: Hydrology, Flood Risk, Water Resources and Surface Water Quality, Chapter 13: Soils Agriculture and Land Use, Chapter 15: Air Quality, Chapter 16: Noise and Vibration and Appendix 3.1: Electric and Magnetic Fields Assessment.</p> <p>The alternatives are discussed in Chapter 4: Site Selection and Alternatives.</p>

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<p>POPULATION</p> <p><i>Noise and Vibration.</i></p> <ul style="list-style-type: none"> Noise impacts and vibration impacts from construction and maintenance traffic should be considered. Operational traffic noise and construction traffic noise should be assessed by considering the increase in traffic flows and following the principles of Construction Road Traffic Noise. The ES should consider potential impacts to any identified road receptors in terms of predicted noise levels from construction traffic and an increase in road traffic attributed to the proposed development. <p><i>Electric and Magnetic Fields (EMF) - health</i></p> <ul style="list-style-type: none"> The Scoping Report notes sources of EMF in the area. Cumulative effects should also be considered where relevant. This includes, as suggested by the Scoping Report, infrastructure related to Wester Dod wind farm and Crystal Rig 3 wind farm. Other proposals for which planning applications are received prior to the submission of the EIA (if any) should also be considered. 	<p>Noise related issues are assessed in Chapter 16: Noise and Vibration. This includes a consideration of noise relating from traffic increases during the construction phase.</p> <p>An EMF assessment has been undertaken for the Neart na Gaoithe Onshore Works. The study found that:</p> <ul style="list-style-type: none"> The modelling shows that no significant effects are predicted for the cable. The predicted field levels are low and fall away to virtually zero over a horizontal distance of approximately ten metres. It can reasonably be argued that no cumulative effects are to be expected for a similar source of electromagnetic fields if this source is significantly further away than this. <p>Regarding substations, it is stated within the report that:</p> <p>Available information regarding fields surrounding substations suggests that these fall away within a few metres of the substation. There are no residences within one kilometre of the proposed substation location near Crystal Rig. Refer to Appendix 3.1 for full details.</p>
<p>POPULATION</p> <p><i>Recreation and Tourism</i></p> <ul style="list-style-type: none"> The proposed assessment is generally acceptable. For the baseline, East Lothian Council expects to have the results of the 2011 Visitor Survey which could assist. Local groups to be consulted should include Visit East Lothian, and the East Lothian Tourism Attractions Group. Indirect effects on tourism should include visitor perception of the area as well as visual assessment. <p><i>Safety</i></p> <p>Any safety impacts from construction or maintenance traffic or construction itself should be considered.</p>	<p>The potential effects on recreation and tourism are presented in Chapter 17: Socio-Economic Effects. This chapter also includes detail of the consultation undertaken in relation to this assessment, including contact with Visit East Lothian and East Lothian Tourism Attractions Group. The chapter draws on the Landscape and Visual Impact Assessment in relation to potential effects on visual amenity.</p> <p>Chapter 5: Project Description provides detail of the Health and Safety measures which would be put in place during the construction and operational phases.</p>
<p>BIODIVERSITY (Flora and Fauna)</p> <ul style="list-style-type: none"> The range of species and habitat surveys that have been carried out are generally sufficient. <p>Depending on the final cable route, further assessment/information may be needed, namely:</p> <ul style="list-style-type: none"> Local Biodiversity Sites. Thornton Glen, and the valleys of the Thornton Burn and Dryburn are designated for the wildlife value and need to be part of the assessment if the route of the cable will directly/indirectly affect them. Information should be sought from the local Scottish Ornithologists group (they produce the bird atlas and its members provide detailed local information). Bee orchid has been found along the road verge at NT7548 7362 near Linkshead Farm. The species is not protected in the UK, but there are only three known populations in Scotland and any effect on this species should be noted. Results of the National Vegetation Classification (NVC) survey should be submitted, including a map with the proposed infrastructure overlain on the vegetation maps to clearly show which areas will be impacted and avoided. If there are wetlands present within the development area, the ES should demonstrate how impacts will be avoided on such areas. Any likely impact on groundwater dependent terrestrial ecosystems (GWDTEs) will require assessment. <p>The Council note that the key ecological impacts are likely to be:</p>	<p>Noted.</p> <p>Chapter 8: Terrestrial and Inter-tidal Ecology and Ornithology presents an assessment of the potential effects on flora and fauna within the area of the onshore works. This includes consideration of effects on the Local Biodiversity Sites. Bee orchid populations will not be affected by the Onshore Works. Details are provided in Chapter 8: Terrestrial and Inter-tidal Ecology and Ornithology National Vegetation Classification (NVC) surveys were undertaken and the results are presented in Chapter 8: Terrestrial and Inter-tidal Ecology and Ornithology and the associated Figures 8.4a – 8.4d.</p> <p>Chapter 8: Terrestrial and Inter-tidal Ecology and Ornithology provides an assessment of GWDTEs.</p>

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<ul style="list-style-type: none"> potential indirect impacts upon nearby Natura sites; potential indirect impacts upon Woodhall Dean Site of Special Scientific Interest (SSSI); and potential impacts upon protected species from cable maintenance. <p><i>Potential indirect effects upon nearby Natura sites</i></p> <ul style="list-style-type: none"> At this stage Scottish Natural Heritage (SNH) does not anticipate a likely significant effect upon Special Protection Areas (SPAs). SNH advises that further information about the use of Thorntonloch beach by seabirds (in relation to the SPAs), alongside other information such as baseline levels of disturbance to seabirds (from walkers etc), should be provided. SNH will provide further advice on the likely requirement for Appropriate Assessment once they have this information. <p><i>Potential indirect impacts upon Woodhall Dean Site of Special Scientific Interest (SSSI)</i></p> <ul style="list-style-type: none"> There is the potential for impacts upon Woodhall Dean SSSI as it lies partly within the route corridor. There is a risk that the natural heritage value of this SSSI could be affected via run-off or other impacts during the construction phase of the proposal. SNH advises the applicant to provide clear and detailed plans to avoid impacts upon this SSSI during construction. <p><i>Potential impacts upon protected species from cable maintenance</i></p> <ul style="list-style-type: none"> Impacts of maintenance activities on badgers, and potentially otters should be considered as this area is known to be used by badgers and they may colonise land near to the cable route. If this is found to be the case, then a protected species licence would be required before maintenance could take place. 	<p>These potential effects are considered in Chapter 8: Terrestrial and Inter-tidal Ecology and Ornithology. The potential for indirect effects on Woodhall Dean SSSI are also considered in Chapter 12: Hydrology, Flood Risk, Water Resources and Surface Water Quality.</p> <p>Impacts upon the named SPAs are considered de minimis and have been scoped out of the EIA due to:</p> <ul style="list-style-type: none"> the very low numbers of waders, gulls and wildfowl observed using Thorntonloch Beach; the high levels of recreational disturbance due to dog walkers, fishermen and patrons of the camp site (see Appendix 8. 9); the size and extent of the proposed works, considered unsuitable habitat for the SPA qualifying species; and the short-term nature of the proposed works <p>Potential effects of construction activities on stream flow and rates and water quality at Woodhall Dean SSSI are considered in Chapter 12: Hydrology, Flood Risk, Water Resources and Surface Water Quality.</p> <p>Chapter 8: Terrestrial and Inter-tidal Ecology and Ornithology considers the potential for effects on protected species during construction. Effects on protected species from operation and maintenance of the Onshore Works have been scoped out on the grounds that maintenance activity will be infrequent and unlikely to result in invasive activity that will have significant effects. Pre-construction badger and otter surveys will be undertaken to gain up to date information on species movements and habitat usage. In the unlikely event that maintenance is required which would disturb an otter holt or badger sett, advice would be sought from a licensed ecologist before any works take place.</p>
<p>SOIL</p> <ul style="list-style-type: none"> The details of recent strategies which will be taken into account in the assessment of soil is welcomed. As well as the potential effects identified, any climate change impact from disturbance of soils should also be acknowledged. Details on how any excess/unsuitable subsoil will be used and/or disposed of should be included. Assessment of soil should include any effects on the sand at the beach and coastal geomorphology. The preferred method of landing the cable uses directional drilling from agricultural land near Thorntonloch beach to below mean low water springs. The alternative method is to excavate, bury the cable, and backfill. Both methods carry a risk of impacts upon coastal geomorphology. The applicant should consider impacts of construction (of the cable landing and transition pits) upon coastal geomorphology. An assessment of coastal processes on the cable route at the beach should be carried out, particularly in relation to any predicted exposure of the cable route. If effects are predicted, these should also be assessed. The East Lothian Council Shoreline Management Plan (2002) should be referred to. 	<p>Chapter 13: Soils, Agriculture and Land Use presents an assessment of the effects of the Onshore Works on soil including those works within the inter-tidal area. The climate change impact from disturbance of soils is acknowledged in Chapter 13: Soils Agriculture and Land Use.</p> <p>It is the intention that most excess spoil from the trenches be stored locally and then backfilled. Some excess material from construction of the substation would be used in the creation of berms and local landscaping. Excess material would be taken off site and this is accounted for in the construction traffic figures. Further details are found in Chapter 5: Project Description and Chapter 10: Landscape and Visual Amenity in respect of the use of excess material for landscaping and Chapters 14: Access, Traffic and Transport, Chapter 15: Air Quality and Chapter 16: Noise and Vibration in respect of the effects of increased traffic on the road network during construction.</p> <p>Consideration of the likely effects on the sand at the beach is considered in Chapter 11: Geology, Ground Conditions, Groundwater and Coastal Processes. There is little evidence of long-shore transport of sediment on this coastline. The beach at Thorntonloch appears to have been created through the re-working of local glacial</p>

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	<p>sands and gravels. As a result, sediment movements on the beach are likely in response to local tidal and wave processes and there is no evidence of long-term erosion or accretion caused by long-shore drift. Hence, in terms of beach processes and beach form, any excavations on the beach would not be expected to impact large scale coastal processes and sediment transport along the shore.</p> <p>Beach erosion can occur during storms. Hence, although the coastal geomorphology of the area would not suggest an ongoing process of beach erosion at the site, there is a risk that after a storm there could be erosion and exposure of a cable. This is not expected and the cable will be placed at a reasonable depth under the beach. If exposure occurs during or after a storm, re-landscaping or local replenishment of the beach may be required.</p> <p>The cable burial depth at the beach will depend on which of the two inter-tidal cable installation methods being considered are chosen. If Horizontal Directional drilling is chosen the cable will follow a close to parabolic profile under the beach and generally be at least 8m below the surface with no risk of erosion exposure. If open trenching is chosen, the burial depth at the beach will generally be in the region of 1-2m. A detailed geotechnical investigation and cable exposure risk assessment will be carried out before design completion. Design burial depths will be adjusted where necessary in areas of loose sand with erosion potential or in areas where shallower burial is appropriate due to outcropping rock.</p> <p>The East Lothian Shoreline Management Plan (2002) indicated that the coastline at Thorntonloch might require 'limited Intervention' in the future with dune planting and fencing, if required. The Plan also suggested that there might be a need for dune management and relocation of caravan park in the future in response to rising sea levels. Any works undertaken during the Onshore Works would not be inconsistent with the approach identified in the Plan. The proposed works would not interfere with or hamper any management actions identified within the Plan.</p>
<p>PEAT</p> <ul style="list-style-type: none"> • Peatland (active blanket bog in particular) should be avoided. • Where the proposed infrastructure will impact upon peatlands, a detailed map of peat depths (this must be to full depth) should be submitted. • The peat depth survey should include details of the basic peatland characteristics. • Where avoidance is not possible, details of how impacts upon peatlands are minimised should be provided. Impacts that should be considered include those from drainage, pollution and waste management. • Likely volumes of surplus peat should be detailed, including quantification of catotelmic and acrotelmic peat, and the principles of how the surplus peat will be reused or disposed of. • Landscaping with surplus peat (or soil) may not be of ecological benefit and SEPA advise consequently a waste management exemption may not apply. If it is proposed to use some excavated peat as bunding then details of the proposals should be outlined in the ES. <p>If extraction of peat is necessary, the scope for minimising this activity should be explored and alternative options identified that minimise risk in terms of carbon release, human health and environmental impact.</p>	<p>Active blanket bog was not observed within the study area during the peat survey work. Blanket bog habitat is also discussed in Chapter 8: Terrestrial and Inter-tidal Ecology and Ornithology.</p> <p>An indicative Peat Thickness Plan showing full peat depths is presented in Appendix B of the Peat Report (provided as Appendix 11.1 of this ES).</p> <p>Where peat deposits were observed (within the substation site and 400m of cable corridor from the substation site), the peat was noted to be shallow; generally less than 0.5m thick. Peat was noted to be fibrous with plant remains indicating that the peat contains some strength. Laboratory results indicate the peat to have high moisture content values and relatively low bulk density values.</p> <p>Where avoidance of peat is not possible, a number of construction methodologies and mitigation measures are presented in Section 6.2 of the Peat Assessment. These include measures in relation to drainage, pollution and waste management.</p> <p>For preliminary design purposes, the approximate volumes of acrotelmic and</p>

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	<p>catoelmic peat have been generated. Refer to Appendix 11.1 Peat Stability Assessment.</p> <p>Guidelines on the reuse of peat is given within the Scottish Renewables and SEPA document 'Developments on Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste' (January 2012). A site specific summary of these is provided in Section 6.3 of the Peat Assessment. These Guidelines have been used to inform the possible reuse of peat.</p>
<p>WATER No comments have been received from East Lothian Council's internal consultee on hydrological issues, so further comment may be provided at a later date.</p> <p><i>Groundwater</i></p> <ul style="list-style-type: none"> • A list of groundwater abstractions both within and outwith the site boundary, within a radius of 100 m from roads, tracks and trenches should be provided. • If groundwater abstractions are identified within the 100 m radius of roads or tracks then the applicant should ensure that engineering operations avoid this buffer area. Alternatively, further information and investigations will be required to show that impacts on abstractions are acceptable. <p><i>Private Water Supplies</i> Any private water supplies within 1 km of the proposed cable route should be identified on a map.</p> <p><i>Flooding</i></p> <ul style="list-style-type: none"> • The Scottish Environment Protection Agency (SEPA) states that built development on the flood plain should be avoided. Any built development proposed for a functional flood plain should be shown in the ES. • SEPA welcomes the stand-alone Flood Risk Assessment (FRA) proposed to be undertaken for key infrastructure and recommend that the proposed FRA considers all watercourse crossings to ensure that proposed culverting does not increase flood risk to nearby areas. • Consideration should be given to any cable crossings to ensure they would not exacerbate flooding by increasing the potential for channel blockage <p><i>Tree removal and flooding</i></p> <ul style="list-style-type: none"> • SEPA advises that the removal of trees could have varying degrees of associated hydrological impacts and localised flooding issues may arise. • The removal of trees can also affect snowpack stability and hence snowmelt flood probability in that local catchment zone. Therefore, tree removal could have 	<p>Noted. Further efforts to make contact have been made as the EIA has progressed.</p> <p>A full list of authorised abstractions and discharges within 5 km of the site was obtained from SEPA. No groundwater abstractions were identified within 100 m of the Onshore Works. Details of abstractions were also requested from the local council and no abstractions were identified close to the Onshore Works.</p> <p>SEPA, Scottish Water and East Lothian Council were consulted with respect to any relevant information held by them related to private water supplies. One licensed drinking water abstraction site at Woodhall Farm (GR 369004, 672566) and a private water supply at Weatherly (367828, 671727) were identified by SEPA close to the Onshore Works.</p> <p>The footprint of the development is not predicted to lie within the floodplain of any watercourse, except where the application boundary crosses the watercourse. The footprint of the development has been selected to limit disturbance as far as possible. Land will be returned to its natural state as far as possible on completion of construction. As a result, the development is not predicted to increase downstream flood risk to others.</p> <p>The cable landfall lies within the 200 year coastal floodplain. However, any changes in ground levels related to the landfall point will not increase flood risk to others, due to its' proximity to the coast.</p> <p>A standalone flood risk assessment has been prepared for the cable landfall (refer to Appendix 12.1). Flood risk for all watercourse crossings is assessed in Chapter 12: Hydrology, Flood Risk, Water Resources and Surface Water Quality. The cable will be installed under the bed of watercourses (except at Thorter Cleugh) so will not increase the potential for channel blockage. At Thorter Cleugh, the cable will be installed above the channel associated with an existing access road and crossing.</p> <p>Minor tree felling will be required but the majority of trees/woodland areas will be avoided by the route completely or passed via trenchless crossing methods.</p>

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<p>a significant impact in terms of increasing both the likelihood and the rate of snow melt from the site.</p> <ul style="list-style-type: none"> In light of the above, careful consideration should be given to the extent of deforestation and flood risk mitigation measures. <p><i>Water Framework Directive</i></p> <ul style="list-style-type: none"> Developments should be designed to avoid engineering activities in the water environment wherever possible and it should be demonstrated that every effort has been made to leave the water environment in its natural state. Engineering activities such as culverts, watercourse diversions, bank modifications or dams should be avoided unless there is no practicable alternative. Where a watercourse crossing cannot be avoided, bridging solutions or bottomless or arched culverts which do not affect the bed and banks of the watercourse should be used. A site survey of existing water features and a map of the location of all proposed engineering activities in the water environment should be included in the ES. 	<p>It has not been possible to avoid all potential watercourse crossings. A site survey of existing water features has been undertaken and a map of proposed crossings is provided as Figure 12.4 Stream Crossings.</p> <p>At four stream crossings, the cable will be installed by trenchless methods that will not disturb the stream channel. At Thorter Cleugh, the cable may be installed above the channel associated with an existing access road and crossing. At other crossings, the cable will be installed by way of a trench, but the channel bed will be returned to the pre-development state once the cable has been installed.</p> <p>The majority of streams crossed are minor drainage features and a bank erosion risk was identified at one crossing only (Weatherly Burn) where additional sediment control measures are proposed.</p> <p>Impacts on stream crossings and crossing types are considered in Chapter 12: Hydrology, Flood Risk, Water Resources and Surface Water Quality.</p> <p>During construction, temporary stream crossings will be single span bridges where the channel is wide enough to allow use of such a method.</p>
<p>AIR</p> <ul style="list-style-type: none"> The proposals for assessment of construction impacts in the Scoping Report are acceptable. It is agreed that operational impacts on air quality can be scoped out, other than if screening against the recommended criteria suggests assessment of maintenance traffic is needed (although, it is noted that this would be unlikely). If a significant change in road traffic characteristics is identified, changes in air quality at a worst case sensitive receptor adjacent to the road (including the trunk road) will require further assessment. In addition to the Design Manual for Roads and Bridges, it is recommended that a second criterion for identifying roads with a significant traffic change is used, as defined in the Environmental Protection UK <i>“Development Control: Planning for Air Quality”</i>. In the assessment, a conservative approach should be utilised and traffic changes screened against both sets of criteria. If a road link triggers any of the criteria, it should be assessed further. 	<p>An assessment of impacts on air quality during the construction period is provided in Chapter 15: Air Quality.</p>
<p>CLIMATIC FACTORS</p> <p>Construction of a connection to the grid enables use of this renewable energy which will have climatic impacts and this should be included briefly in the ES.</p>	<p>Chapter 2: Climatic Change and the Need for the Project provides detail on the potential positive impacts of the project on the climate.</p>
<p>MATERIAL ASSETS</p> <p><i>Decommissioning</i></p> <ul style="list-style-type: none"> Any anticipated long term significant environmental effects of leaving the cables in situ should be noted. Decommissioning of the transition pit is not mentioned. An indication of the how this will be treated (left in situ or removed) should be included, and if there is potential for it to be exposed by processes of erosion (including coastal erosion) this should be assessed. The Scoping Report states the operational life of a substation exceeds that of a wind farm. Although likely that the substation will be retendered for continued use, it is not inevitable; and whenever it does occur it is an effect related to this project. The potential effects of decommissioning should therefore be considered. 	<p>No significant long term environmental effects from leaving the cable in situ are anticipated.</p> <p>It is anticipated that the transition pit and cables will be left in situ. Therefore, no environmental effects are predicted. However, the potential effect of decommissioning has been considered in each of the topic chapters at the request of ELC.</p> <p>If decommissioning of the substation is required, this would be undertaken in accordance with industry requirements (and the conditions of any future consent). The likely effects of decommissioning of the substation are considered in the respective specialist chapters, Chapters 8 - 17.</p>

Scoping Consultation Response	Action Taken/Future Tasks
<p><i>Cultural Heritage</i></p> <ul style="list-style-type: none"> Other than the points listed below, the proposed methodology is considered acceptable. All elements of the development should be planned to avoid adverse direct and indirect impacts on these features: <ul style="list-style-type: none"> Thornton Mill, enclosure 350m ESE of (Index No. 3990) Skateraw, ring ditches and cropmarks 300m NW of (Index No. 4040) Dryburn Bridge, enclosure 300m SE of (Index No. 4038) Thurston, enclosures and ring-ditch 600m NE of (Index No. 5870) Corsick Hill, enclosure (Index No. 5769) Thurston Home Farm (HB Num 7711) Thurston Mains, enclosure 600m WNW of (Index No. 5845) Woodhall Farm, enclosure 600m E of (Index No. 5930) Dunbar II historic battlefield Innerwick Conservation Area It is expected that direct impacts on any designated cultural heritage interests would be avoided and any direct impacts identified should be assessed. For assessment of the indirect impacts the study area should extend to 5 km, or the limit of the zone of theoretical visibility, whichever is smaller. All cultural heritage features within this area should be included in the baseline. Longer distance views on certain key receptors should also be considered and if relevant identified and included in the ES. These can be identified in discussion with East Lothian Council’s archaeology service. Cumulative impacts with other development on identified receptors should also be assessed. Impacts on features located within forestry should be considered in the ES. <p><i>Transport</i></p> <ul style="list-style-type: none"> A formal Transport Assessment (TA) will be required for the proposal which must cover the construction period of the proposal along with an assessment of the access requirements once operational. East Lothian Council (ELC) agrees that the levels of traffic when the cable route is complete are likely to be negligible but this requires to be confirmed by the TA. The TA/Method Statement should be agreed with ELC’s Head of Transportation. With regard to the crossing of the A1, the appropriate trunk road management organisation should be consulted. Where the traffic crosses over/under Network Rail infrastructure, this should be noted to allow assessment of the possible impacts and the suitability of these crossings. Details of the preferred method of construction to cross under the East Coast Main Line railway should be included and the design and construction of the cable at this point will have to be carried out in full agreement with Network Rail and Transport Scotland. Full consultation with Network Rail’s Asset Protection Engineers will be required. A wayleave agreement will have to be secured with Network Rail. <p><i>Existing buildings and other infrastructure</i></p> <ul style="list-style-type: none"> It is unlikely that the route will affect any existing buildings, however were it to do so this should be assessed. There is also some existing infrastructure which will require to be crossed, including the A1 road, the East Coast Main Line, power cables and minor roads. All crossing methods employed to avoid existing infrastructure and residual effects should be shown in the ES. 	<p>Cultural Heritage is considered in Chapter 9: Cultural Heritage. Direct effects on all of these features have been avoided.</p> <p>Direct impacts on designated cultural heritage interests have been avoided. A study area of 5 km was used to predict the Zone of Theoretical Visibility from the substation (the only permanent, upstanding structure) to assess indirect effects on key cultural heritage receptors. There is no predicted intervisibility between the substation and any designated cultural heritage site within the assessment radius.</p> <p>Cumulative impacts with other developments have been considered in Chapter 9: Cultural Heritage.</p> <p>An assessment of construction traffic flows is provided in Chapter 14: Access, Traffic and Transport. Discussion of operational traffic movements is also provided. A separate Transport Assessment has not been prepared. This has been discussed and agreed with ELC.</p> <p>Access during operation and maintenance will largely be on foot or utilising the existing local road network.</p> <p>Transport Scotland and BEAR have been consulted in respect of crossing the A1. In respect of the crossing of the East Coast Main Line (ECML), discussions with Network Rail are ongoing. It is proposed to cross the ECML via a trenchless technique. Further details are provided in Chapter 5: Project Description.</p> <p>Details of where the cable route crosses key infrastructure (including the ECML; the A1; power cables and minor roads) is provided in Chapter 5: Project Description and shown on Figure 5.5. The construction method to be applied at these crossings is also provided here.</p>
<p>LANDSCAPE</p> <ul style="list-style-type: none"> The proposal to undertake a full Landscape and Visual Impact Assessment is welcomed. <p><i>Hedgerows, Hedgerow Trees, Shelterbelts, Woodland and Stone walls</i></p> <ul style="list-style-type: none"> Areas of trees that will be impacted during the construction process should be shown in the ES. 	<p>Chapter 10: Landscape and Visual Amenity presents an assessment of the potential landscape and visual effects of the assessment.</p> <p>Chapter 10: Landscape and Visual Amenity refers to the landscape features (including trees, hedgerows and stone walls) that will be affected by the proposals.</p>

Scoping Consultation Response	Action Taken/Future Tasks
<ul style="list-style-type: none"> The ES should include details of the existing landscape features and the impact on existing hedgerows, hedgerow trees, shelterbelts, woodlands and stonewalls along the proposed underground cable route. All natural features that will be removed and or felled to accommodate the cable route should be indicated on a plan. A series of typical cross sections showing the proposed working method along the cable route corridor and the likely visual impacts which clearly illustrate before and after sections should accompany this plan. The after sections should show details of any replacement planting or stone wall replacement. The ES should show where existing stone boundaries are (and are not) to be reinstated and a method statement to evidence this should be submitted. A program of replacement planting should be submitted for all of the physical boundaries/crossing points that the underground cable negatively impacts. If it is not possible to carry out replacement planting in the same location where felling has happened, details of replacement planting in a nearby location which preferably ties into existing green networks should be given. <p><i>Viewpoints</i></p> <ul style="list-style-type: none"> Of the ten proposed viewpoints, SNH has requested that Viewpoint 1 is located closer to the transition pit. Final viewpoint locations should be agreed with SNH and East Lothian Council once the cable route has been finalised. <p><i>Construction and operation</i></p> <ul style="list-style-type: none"> The ES should consider the impact of construction on hedgerows, hedgerow trees, shelterbelts, woodlands and stonewalls. There is a need to avoid the cumulative damaging effects of incursions into the Root Protection Area (RPA). A minimum distance of 1 m from the edge of hedgerows to be retained should be maintained at all times during construction. A method statement should be submitted giving details on appropriate ground protection methods that will be used to prevent soil compaction and incursions within the root protection area of trees to be retained. Details on the proposed location of the stockpile of excavated materials will be required. 	<p>Details of the potential effects on natural features will also be presented in Chapter 8: Terrestrial and Inter-tidal Ecology and Ornithology and Chapter 10: Landscape and Visual Amenity.</p> <p>The landscape resources section of Chapter 10: Landscape and Visual Amenity includes photographs of existing features affected and the mitigation section of this Chapter provides details of their replacement. Figure 10.9 indicates the landscape features to be removed and reinstated along the cable corridor.</p> <p>Chapter 10: Landscape and Visual Amenity also provides information on replacement planting and a planting maintenance schedule.</p> <p>The viewpoint list has been amended in consultation with SNH and ELC. Viewpoint 1 is now located on the beach.</p> <p>See comments above.</p> <p>Chapter 10: Landscape and Visual Amenity provides consideration of the effects of construction on hedgerows trees, shelterbelts, woodlands and stonewalls. This is also considered in Chapter 9: Ecology.</p> <p>An Arboricultural Method Statement is provided as Appendix 8.8. This includes consideration of Root Protection Zones.</p> <p>It is the intention that most excess spoil from the trenches be stored locally and then backfilled.</p>
<p>MITIGATION</p> <p>A description of any measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment should be given. In addition to the measure proposed the following should be noted:</p> <p><i>Population- Noise</i></p> <p>The Scoping Report states that Best Practicable Means in accordance with BS5228 will be employed, and lists potential measures. Where relevant consideration should be given to limits on hours of working.</p> <p><i>Population- EMF</i></p> <p>For EMF health effects, if levels or cumulative levels of potential exposure exceed the international commission on non-ionizing radiation protection (ICNIRP) guidelines, proposed mitigation that reduces this exposure to acceptable levels should be set out.</p>	<p>Proposed mitigation measures specific to each topic area included in the assessment are provided within the respective specialist chapters, Chapters 8 - 17.</p> <p>Noted.</p> <p>As discussed earlier, an EMF assessment has been undertaken for NnG. The study reports that:</p> <ul style="list-style-type: none"> The modelling has shown that no significant effects are predicted for the NnG cable. The predicted field levels are low and fall away to virtually zero over a horizontal distance of approximately ten metres It can reasonably be argued that no cumulative effects are to be expected for a similar source of electromagnetic fields if this source is significantly further away than this. <p>Regarding substations, it is stated within the EMF report (refer to Appendix 3.1) that available information regarding fields surrounding substations suggests that these fall away within a few metres of the substation. There are no residences within one kilometre of the proposed substation location near Crystal Rig.</p>

Scoping Consultation Response	Action Taken/Future Tasks
<p><i>Biodiversity</i></p> <ul style="list-style-type: none"> The developer should show where the opportunity has been taken to enhance habitats along the route. Where the developer intends to work directly with landowners to achieve this or provide funding for improvements this should be noted. Any groundwater dependent terrestrial ecosystems (GWDTes) located within the site boundary should be noted. Where GWDTes are present, mitigation of likely impact on these features should be proposed. <p><i>Soil</i></p> <p>Where peatland is (potentially) affected, mitigation measures to avoid significant drying or oxidation of peat should be shown in the ES (i.e. via the construction of access tracks, dewatering, excavations, drainage channels, cable trenches, or the storage and re-use of excavated peat).</p> <p><i>Soil/Water/Air: Pollution Prevention</i></p> <ul style="list-style-type: none"> The ES should identify all aspects of site work that might impact upon the environment, potential pollution risks associated with the proposals and identify the principles of preventative measures and mitigation. A draft Schedule of Mitigation should be produced as part of this process. This should cover all the environmental sensitivities, pollution prevention and mitigation measures identified to avoid or minimise environmental effects. The principles of a Construction Environmental Management Document should be set out in the ES outlining how a draft Schedule of Mitigation will be implemented. <p><i>Water/(Landscape)</i></p> <ul style="list-style-type: none"> Where felling may be considered as mitigation for potentially significant effects on hydrology, the requirements of the Scottish Government’s Policy on Control of Woodland Removal should be referred to, in particular, the requirement for replacement planting. A systematic table detailing the justification for each engineering activity in the water environment and how any adverse impact will be mitigated should be included, accompanied by a photograph of each affected water body along with its dimensions. SEPA encourages applicants to seek opportunities to avoid or offset environmental impacts in the water environment. Any such proposed mitigation should be shown. <p><i>Landscape</i></p> <ul style="list-style-type: none"> The ES should show an appropriate methodology to minimise disturbance to the hedgerows, hedgerow trees, shelterbelts, woodlands and stonewalls along the proposed underground cable route. Appropriate mitigation measures are required to compensate for the loss of these existing features. Replacement planting of all trees, shrubs removed from hedgerows, shelterbelts, woodlands, the area above the high tide mark at Thorntonloch beach and an area of moorland at Crystal Rig II and reinstatement of all existing stone boundaries would be preferred; where this is not possible, reasons for this should be given. Where necessary, consideration should be given to adjusting the underground cable route should any significant trees or ancient woodlands be affected by the excavation works. Reference should be made to The Root Protection Area. <p><i>Material Assets</i></p> <ul style="list-style-type: none"> Archaeological sites or areas that may need to be mitigated prior to construction works starting should be identified. There will also need to be provision for the uncovering of previously unidentified remains during the construction process. These will also need to be mitigated and should not be dealt with solely by Watching Brief. Any measures undertaken to ensure that the works will not go into any Scheduled Monument area should be set out in the ES and Construction Management Plan. This could include protective fencing and marking of areas. 	<p>Habitat mitigation and enhancement measures are discussed in Chapter 8: Terrestrial and Inter-tidal Ecology and Ornithology and Chapter 10: Landscape and Visual Amenity.</p> <p>GWDTes are considered in Chapter 8: Terrestrial and Inter-tidal Ecology and Ornithology.</p> <p>Mitigation measures to avoid significant drying or oxidation of peat would be addressed during the design phase by an appointed contractor.</p> <p>A full description of all site works is provided in Chapter 5: Project Description.</p> <p>Mitigation measures are provided within each topic chapter. These will be used to develop a Draft Schedule of Mitigation.</p> <p>Minimal tree felling is required and is not predicted to have a significant effect on the hydrological environment.</p> <p>Refer to Chapter 12: Hydrology, Flood Risk, Water Resources and Surface Water Quality for further detail.</p> <p>Minimal tree felling will be required. Other features will be fully reinstated following completion of the works. Chapter 10: Landscape and Visual Amenity includes a section on landscape resources. This includes photographs of features affected. Appropriate mitigation is also set out in this Chapter. For details of replacement planting and maintenance, refer to Chapter 10: Landscape and Visual Amenity. Trenchless techniques will be used to cross any significant woodland areas or areas of ancient woodland.</p> <p>Archaeological sites that need to be mitigated prior to construction have been identified. Method statements have been put forward to address the potential to uncover unidentified remains during construction. The works have been planned to avoid any Scheduled Monument areas. Further details can be provided in Chapter 9: Cultural Heritage.</p>

Table 3.1: Scoping Consultation Responses

3.4 Identification of Effects

19 To ensure the identification of all the key effects arising from the Onshore Works, the principles outlined below were applied throughout the EIA process.

3.4.1 Significant Effects

20 The assessment of the significance of effects arising from the Onshore Works is a key stage in the EIA process. It is this judgement that is vital in informing the decision-making process.

21 As the significance of effects will differ depending on the context and the 'receptors' affected by the Onshore Works, there is no general definition of what constitutes significance. In EIA, the term *significance* reflects both its literal meaning of 'importance' and its statistical meaning where there is an element of quantification. This combination of judgemental/subjective and quantifiable/objective tests has become the standard approach to understanding and applying the test of 'significance'.

22 Specific significance criteria have been defined for the majority of topic areas, and these are listed in the topic chapters. As the specialists undertaking each assessment have defined these criteria to reflect the topic area in question, there is some variation. However, each of the sets of criteria is based on the following aspects:

- type of effect;
- sensitivity of receptor;
- extent and magnitude of effect;
- comparison with legal requirements, policies and standards; and
- comparison with environmental thresholds.

23 Using the criteria in each chapter, the predicted significance of the effects arising from the proposed development has been categorised, where possible, as follows:

- major;
- moderate;
- minor; and
- negligible.

24 Effects of 'major' or 'moderate' significance are considered to be 'significant' in the context of the EIA Regulations. The term 'negligible' is also used in instances where there is 'no effect'.

3.4.2 Interrelationships between Effects

25 For the purposes of the ES, the potential effects of the Onshore Works are considered in terms of effects on each of the discrete topic areas. In reality, topic areas such as ecology and hydrology are interrelated. In accordance with Annex 5 of PAN 58, indirect and secondary effects resulting from the interaction of separate direct effects arising both within a topic area and interrelated with other topics areas are addressed within the ES.

3.4.3 Cumulative Effects

26 The EIA Regulations state that types of impact identified "*should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects.*" It is also important to consider the possible effects that the Onshore Works may have in combination with existing, consented or other proposed developments or activities.

27 There are three possible types of cumulative effects which have been considered in the EIA of the Onshore Works across all topic areas. The adopted, three stage approach is set out below:

1. *Cumulative Effects Arising with Other Schemes:* Although not specifically relevant to grid connection works, reference has been made to the online advice from the Scottish Government on Onshore Wind Turbines. The guidance advises that likely cumulative effects are defined as the predicted effects that a development may have in combination with other developments of a similar or related nature which are at application stage, consented, under construction or operational³.

28 East Lothian Council confirmed within the Scoping Opinion that, at that time, there were only two schemes nearby that need to be given consideration in light of the potential for cumulative effects. These include Aikengall II Wind

Farm and Crystal Rig III Wind Farm. These are both proposed extensions to existing wind farms and are lodged planning applications.

29 Since the issue of the Scoping Opinion, a third scheme has been identified that needs to be considered in the cumulative assessment. This is the SPT scheme to connect Neart na Gaoithe to the national electricity grid from the substation at Crystal Rig.

2. *Effects Arising from the Onshore Construction Works:* Effects have been assessed across all topic areas in relation to the potential for onshore construction works to cumulatively lead to significant inter-related effects on a single receptor. This is considered specifically in **Chapter 18 Summary**.
3. *Effects of the Onshore Construction Works in Combination with Offshore Construction:* The potential for cumulative effects arising from the onshore construction works in combination with offshore construction. These effects are most likely to arise when offshore and onshore works take place concurrently, i.e. works associated with landing the offshore cable.

3.4.4 Mitigation and Enhancement

30 Part I, paragraph 5 of Schedule 4 of the EIA Regulations states that the ES should include "*a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.*" These measures have been termed 'mitigation' measures for the purposes of the Onshore Works ES.

31 The EIA has identified, and assessed, predicted significant effects prior to mitigation, and, where mitigation measures are proposed, their likely effectiveness has been examined and the significance of the 'residual' effect assessed. Mainstream is committed to implementing all the mitigation measures identified in this ES which are indicated as reducing the significance of the residual impact.

32 A number of measures are not considered 'mitigation' as such but rather an integral part of the design/construction process, and have been taken into account *prior* to assessing the likely effects of the Onshore Works. Where relevant, these good practice measures are described in the topic chapters.

3.4.5 Monitoring

33 PAN 58 states that the process of EIA *should "continue right through to monitoring the impacts of the development, the on-going operation of mitigation measures and, where appropriate, site restoration"*. The monitoring of effects of a development and the effectiveness of mitigation measures compared to predicted effects is considered "*an essential part of the process*".

34 The ES sets out details of any post-consent monitoring which is proposed. This includes, where appropriate, proposals to measure the effectiveness of the identified mitigation measures.

3.4.6 Uncertainty

35 The EIA process is designed to assist informed decision-making, based on sound information about the environmental implications of a proposed development. However, there may be some uncertainty as to the exact scale and nature of environmental effects. This may arise due to technical deficiencies, limitations of the prediction process or shortcomings in information.

36 In accordance with Paragraph 7 of Part I to Schedule 4 of the EIA Regulations, the ES states where uncertainties have arisen. However, it is considered that the ES contains adequate information to enable East Lothian Council to review and form a judgement on the predicted significant environmental effects of the Onshore Works.

³ The cumulative landscape and visual amenity assessment is undertaken on the basis of incremental effects in accordance with SNH Guidance (2009).

3.5 References

European Commission 85/339/EEC Council Directive of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment. Available at: <http://ec.europa.eu/environment/eia/full-legal-text/85337.htm>

Planning Circular 3 2011 *Guidance on The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011*. Available at: <http://www.scotland.gov.uk/Publications/2011/06/01084419/0>

Scottish Government (February 2011 updated May 2012) *Policy Guidance - Onshore Wind Turbines* Available at: <http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables/Onshore>

Scottish Executive, Development Department (1999) *Planning Advice Note 58: Environmental Impact Assessment*. Available at: <http://www.scotland.gov.uk/Resource/Doc/927/0016387.pdf>

The Institute of Environmental Management and Assessment (2004) *Guidelines for Environmental Impact Assessment*.

Scottish Natural Heritage (2009 Draft 2) *A Handbook on Environmental Impact Assessment: Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment Process in Scotland (3rd Edition)*. Available at: <http://www.snh.org.uk/pdfs/publications/heritagemanagement/EIA.pdf>