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Red John Pumped Storage Hydro

Volume 2, Chapter 4: Approach to Environmental Impact Assessment

ILI (Highlands PSH) Ltd

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Quality Information

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Table of Contents

Tables

Inserts

4 Approach to Environmental Impact Assessment

4.1 Introduction

4.1.1 This chapter describes the approach to and outlines the scope of the Environmental Impact Assessment (EIA) of the Development. This section provides general information about the EIA process including the key steps taken in the approach to EIA and the terminology used. For a detailed description of topic-specific assessment methods reference should be made to the relevant chapter e.g. for a description of the approach to landscape and visual assessment of the Development see Chapter 11: Landscape and Visual Impact Assessment.

4.2 About Environmental Impact Assessment

4.2.1 EIA is the process of identifying, evaluating and mitigating the likely significant environmental effects of a proposed development. Through the early identification and evaluation of the likely significant environmental effects of a proposed development EIA enables appropriate mitigation (that is measures to avoid, reduce or offset significant adverse effects) to be identified and incorporated into the proposed development's design, or commitments to be made to environmentally sensitive construction methods and practices.

4.2.2 The EIA of the Development has been undertaken in parallel with the design process thereby maximising opportunities to mitigate likely significant effects as they have been identified. This approach ensures mitigation is embedded in the Development design and forms an integral component of it.

4.2.3 The results of the EIA also ensure that decision makers, such as the Scottish Ministers and statutory consultees such as planning authorities, in this case the THC, as well as other interested parties, including local communities, are aware of a development's environmental effects. These are then taken into account by the decision-maker prior to determination of an application for planning approval.

4.2.4 As described in Chapter 1: Introduction (Volume 2), in the case of the Development, the results of the EIA have been described within this EIA Report, which accompanies applications for Section 36 Consent to the Energy Consents Unit (ECU).

4.3 Legislative Background

The Need for EIA of the Development

4.3.1 EIAs have been required for certain major developments since the implementation in the UK of the European Council Directive on Environmental Assessment (EC Directive 85/337/EEC). The Directive, which was implemented in the UK in 1988, has subsequently been amended by Directives 97/11/EC, 2003/35/EC, 2009/31/EC and 2011/70/EU, and a codified Directive 2014/52/EU was adopted in 2015.

4.3.2 For an application under section 36 of the Act, the Directive is implemented through the EIA Regulations.

4.3.3 Schedule 1 of the EIA Regulations identifies development types and thresholds for which EIA must always be undertaken. Schedule 2 of the EIA Regulations identifies development which may require EIA to be undertaken, but only where the development is likely to have significant effects by virtue of factors such as its nature, size or location. Developments that require EIA are known as 'EIA development'.

4.3.4 As a generating station of greater than 50 Mega Watts (MW) the Development constitutes an EIA development under Regulation 2(1) of the EIA Regulations.

Content of the EIA Report

4.3.5 Applications for developments considered to be EIA development must be accompanied by an EIA Report. In order to comply with Schedule 4 of the EIA Regulations, an EIA Report must contain certain prescribed information. Table 4.1 summarises these requirements and identifies where the relevant information may be found within this EIA Report.

Table 4.1 EIA Regulations: Schedule 4 Requirements

Legislative Requirement	Where this information is in the EIA Report
1. A description of the development, including in particular:	
(a) a description of the location of the development;	The Development location is described in Chapter 2: Project and Site Description and can be viewed on Figure 1.1: Location Plan (Volume 3).
(b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;	This is described in Chapter 2: Project and Site Description.
(c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;	These details are set out in Chapter 2: Project and Site Description.
(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.	This is included in Chapter 2: Project and Site Description.
2. A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	A discussion of reasonable alternatives and reasoning for the selection of the chosen option is presented in Chapter 3: Design Evolution and Alternatives.

Legislative Requirement	Where this information is in the EIA Report
3. A description of the relevant aspects of the current state of the environment (the "baseline scenario") and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of relevant information and scientific knowledge.	A description of the current state of the environment is provided in Chapter 2: Project and Site Description with more detailed description available in each topic chapter.
4. A description of the factors specified in regulation 4(3) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.	The results of baseline studies and the environmental factors likely to be significantly affected by the Development (referred to as receptors) have been identified and are reported in chapters 5-16.
5. A description of the likely significant effects of the development on the environment resulting from, inter alia: (a) the construction and existence of the development, including, where relevant, demolition works; (b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources; (c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste; (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters); (e) the cumulation of effects with other existing and / or approved development, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; (f) the impact of the development on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the development to climate change; (g) the technologies and the substances used.	The likely significant effects resulting from the construction, operation and decommissioning of the Development as required by Section 5 of the EIA Regulations are assessed and reported in chapters 5-16.

Legislative Requirement	Where this information is in the EIA Report
The description of the likely significant effects on the factors specified in regulation 4(3) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium- term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the development including in particular those established under Council Directive 92/43/EEC3 and Directive 2009/147/EC.	
6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	Relevant methods and limitations are set out in Section 3 of each of the chapters 5-16.
7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.	Embedded mitigation measures are outlined in Section 3.5 of Chapter 3: Design Evolution and Alternatives. Additional mitigation measures are identified in chapters 5-16.
8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to legislation of the European Union such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	The major accidents and / or disasters associated with the Development have been identified and are discussed in Section 4.4 of this chapter.
9. A non-technical summary of the information provided under points 1 to 8.	A non-technical summary (NTS) that sets out the key findings of the EIA is available in Volume 1 of this EIA Report.

Legislative Requirement	Where this information is in the EIA Report
10. A reference list detailing the sources used for the descriptions and assessments included in the EIA report.	Where relevant, reference lists are provided at the end of each EIA Report chapter.

4.4 Scope of the EIA

4.4.1 Part 1 Section 4(3) of the EIA Regulations sets out the factors that should be identified, described and assessed within an EIA Report where there are likely significant effects on the factors listed and / or the interaction between those factors. These factors are:

- *Population and human health;*
- *Biodiversity, and in particular species and habitats protected under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (a) and Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (b);*
- *Land, soil, water, air and climate; and*
- *Material assets, cultural heritage and the landscape.*

4.4.2 In addition, EIA Reports are to include the expected effects deriving from the vulnerability of the development to major accidents and disasters.

4.4.3 The factors relevant to the Development and the scope of their assessment within this EIA Report have been agreed through consultation with relevant statutory consultees. The statutory consultation discussions are listed in Table 4.2: Meetings Undertaken.

Table 4.2 Meetings Undertaken

Date	Consultees in Attendance	Discussion
May 2017	SEPA & Scottish Water	Discussion around using Loch Duntelchaig and awareness of invasive species.
17 August 2017	SEPA & SNH	Informal meeting to introduce the Development and project team.
17 August 2017	THC	Informal meeting to introduce the Development and project team.
24 August 2017	ECU	Introductory meeting to the Applicant and Development.
25 September 2017	Historic Environment Scotland (HES)	Introductory meeting to the Development and to discuss the Scoping Report chapter. Minutes contained in Appendix A.1 of the Gate Check Report (Appendix 4.5 Volume 5).
27 September 2017	Multiple	THC Pre-application meeting – advice pack from the meeting provided in Appendix 4.1 (Volume 5).
5 April 2018	ECU	Meeting to discuss Scoping Opinion and progress on Section 36 application.
27 April 2018	SEPA	Meeting to discuss Scoping Opinion, requirement for invasive species management and screening, and Phase 1 peat probing – minutes provided in Appendix A.3 of the Gate Check Report (Appendix 4.5 Volume 5).

Date	Consultees in Attendance	Discussion
22 June 2018	ECU	Progress meeting on Section 36 Application.
27 June 2018	THC	Private viewing of the public exhibition (SEPA and SNH also invited but could not make it).
28 June 2018	Community Councils	Private viewing of the public exhibition where Dores & Essich, Glenurquhart, Strathnairn, Inverness West and Stratherrick and Foyers Community Councils attended.
5 September 2018	Forestry Commission Scotland	To discuss the forestry plan and felling proposals.
1 October 2018	Gate Check Meeting and Site Visit	Attendance by ECU, SEPA, SNH and THC.

4.4.4 As part of the consultation process, the Development went through THC's Major Applications Pre-Application procedure. This included submission of a draft scoping report on the 29 August 2017 and a meeting with THC, the ECU, SEPA, Marine Scotland and SNH at THC's council chambers in Inverness on the 27 September 2017. THC's pre-application advice is available in Appendix 4.1: Pre-Application Advice Pack (Volume 5).

4.4.5 Following on from the Major Application Pre-Application meeting the finalised scoping report was then submitted to the ECU on 21 September 2017 and was registered by the ECU on the 29 September 2017.

4.4.6 The scoping report identified those environmental factors considered likely to be significantly affected by the Development and the proposed approach to the identification and assessment of those effects. It scoped out those environmental factors that were considered unlikely to be significantly affected. The scoping report was submitted as a request to the Scottish Ministers to provide their scoping opinion. The scoping opinion set out the information that the Scottish Ministers require to be provided within this EIA Report and their comments on the identification of significantly affected environmental factors and scope of assessment. A copy of the scoping report is provided in Appendix 4.2: Red John Pumped Storage Hydro Scoping Report (Volume 5) and a copy of the scoping opinion received is contained in Appendix 4.3: Scoping Opinion (Volume 5).

4.4.7 Post-scoping, further consultation was then conducted including a public exhibition with private viewings for the local community councils and THC and topic-specific discussions with relevant consultees. A full overview of the scoping and other consultation comments (including non-statutory and local community consultees) and where they are addressed within this EIA Report is available in Appendix 4.4: Consultation Tracker (Volume 5). Targeted consultation on specific matters is presented within the relevant chapter. Comments received through public consultation are included within the Pre-Application Consultation (PAC) Report and within individual chapters where relevant.

4.4.8 The factors identified through the consultation process as being relevant to the Development and where they are addressed within the EIA Report is set out in Table 4.3: Summary of Factors by Environmental Topic.

Table 4.3 Summary of Factors by Environmental Topic

Chapter	Environmental Topic	Factors
5	Geology and Ground Conditions	Land and Soil
6	Terrestrial Ecology	Biodiversity
7	Aquatic Ecology	Biodiversity
8	Ornithology	Biodiversity
9	Flood Risk and Water Resources	Water, Major Accidents and Disasters, and Human Health
10	Water Environment	Water and Human Health
11	Landscape and Visual	Landscape
12	Forestry	Material assets and biodiversity
13	Archaeology and Cultural Heritage	Cultural Heritage
14	Socio-economics and Tourism	Population and Material Assets
15	Traffic and Transport	Material Assets
16	Noise and Vibration	Human health

4.4.9 Given the low population density in and around the Development Site, the population and human health effects of the Development are considered to be adequately addressed within the water quality, flood risk, noise, and socio- economic assessments.

4.4.10 The major accidents and / or disasters associated with the Development have been identified as uncontrolled releases of water either through embankment overtopping, embankment breach or pipe breach. A Breach Analysis (Confidential Annex 9.1.1, Volume 6) has been conducted as part of the Flood Risk Assessment (FRA) and is available. For security reasons, parts of the Breach Analysis will be confidential. A breach is very unlikely due to the requirements of the Reservoirs (Scotland) Act 2011 with which the design, construction, operation and decommissioning of the Development must comply. This includes appointment of a panel engineer to oversee and approve construction as well as independent inspections, regular safety checks and monitoring during the lifetime of the Development. Details of operational monitoring are provided in Chapter 2: Project and Site Description.

4.4.11 The factors that were not considered relevant to the Development as there was limited scope for likely significant effects were climate and air quality. Climate will be factored into the Development design (climate vulnerability such as finished floor levels) and the abstraction licence (rates of abstraction in years of low levels in Loch Ness), which mitigates the likelihood of significant effects.

4.4.12 Similarly, no significant air quality effects are anticipated as emissions to air are restricted to construction power and construction dust, which can both be mitigated through good practice measures (e.g. dust management plan). In addition, there is the possibility to connect to local mains electricity, which would minimise the need for on-site electrical generators during construction.

4.4.13 With regards to the technical assessments, a summary of the matters that have been scoped out of the EIA Report are listed in Table 4.4: Matters Scoped out of the EIA.

Table 4.4 Matters Scoped out of the EIA

Environmental Topic	Element Scoped Out	Reasoning
Geology and Ground Conditions	Operational	Operational effects are considered unlikely to be significant as any disturbance to or effects on geological or ground condition receptors will have occurred during the construction phase. Operation effects have therefore been scoped out of the Geology and Ground Conditions assessment reported in Chapter 5 of this EIA Report (Volume 2).
Socio-economics and Tourism	Businesses within the Development Site	Potential effects on local businesses in relation to economic effects (loss of earnings, impact on bookings, etc) have been excluded for those businesses identified within the Development Site Boundary as they are owned by the landowner or are excluded from the Development Site boundary. These business will be subject to a legal agreement between the Applicant and the business owner and are therefore scoped out of the socio-economic assessment. However they may have been identified as receptors in other topic assessments (such as noise or transport) and assessed in those chapters. In addition, other mitigation measures such as the implementation of the CEMP and Construction Traffic Management Plan (CTMP) will mitigate any impacts to the highway network which may serve these businesses. The Socio-economics and Tourism assessment is set out in Chapter 14.
Traffic and Transport	Operational	Operational effects resulting from traffic and transport have been scoped out of the transport assessment. Under normal operation of the Development, vehicle movements will be limited during a typical working day and as such are considered unlikely to result in a significant effect on road users. During periods of maintenance there may be additional heavy good vehicle (HGV) and abnormal indivisible loads (AIL) movements, but these are considered likely to be rare. Although operational effects resulting from traffic and transport are not assessed, details of the proposed route to site during operation and traffic management are provided in Chapter 15: Traffic and Transport (Volume 2).
Noise and Vibration	Baseline Vibration Survey	The need for a baseline vibration survey has been scoped out as it is assumed that due to the location and character of the Development Site and surrounding area, there are no existing sources of vibration. (Chapter 16: Noise and Vibration, Volume 2).
Ecology	Fish Surveys	SEPA and SNH outlined a requirement for fish surveys in the Scoping Opinion, specifically smolt tracking surveys. Further to the meeting on the 27 April 2018, and confirmation of the use of an appropriate screen, it was agreed between all parties that a desk study would be prepared and included within the EIA Report. The requirement for further detailed fish surveys would be determined once the desk-study and the associated EIA Chapter had been reviewed by SEPA and SNH as part of the determination process.

Environmental Topic	Element Scoped Out	Reasoning
Air Quality	Assessment of adverse effects on air quality	Section 13 of the Scoping Report outlined the proposed scope for an Air Quality assessment, which primarily focused on the generation of dust and emissions from construction vehicles. There are no proposed emissions during operation and so these were proposed to be scoped out. No comments were received on the air quality assessment scope proposed in the Scoping Report. In addition, it has been identified that there is limited potential for direct significant effects from dust on human and ecological receptors with the implementation of embedded mitigation. Therefore it was proposed in the Gate Check Report that a formal assessment was not included within the EIA Report and that a Dust Management Plan is prepared and submitted in the Outline CEMP. The CEMP provides the general good housekeeping requirements to mitigate diesel emissions and PM10 generation. It is noted that in SEPA's scoping response that they did not require a CEMP to be prepared as part of the application documents, however an Outline CEMP has been prepared and will accompany the other topic specific management plans which have been identified as part of the impact assessment process.

4.5 Approach to Environmental Impact Assessment

Overview

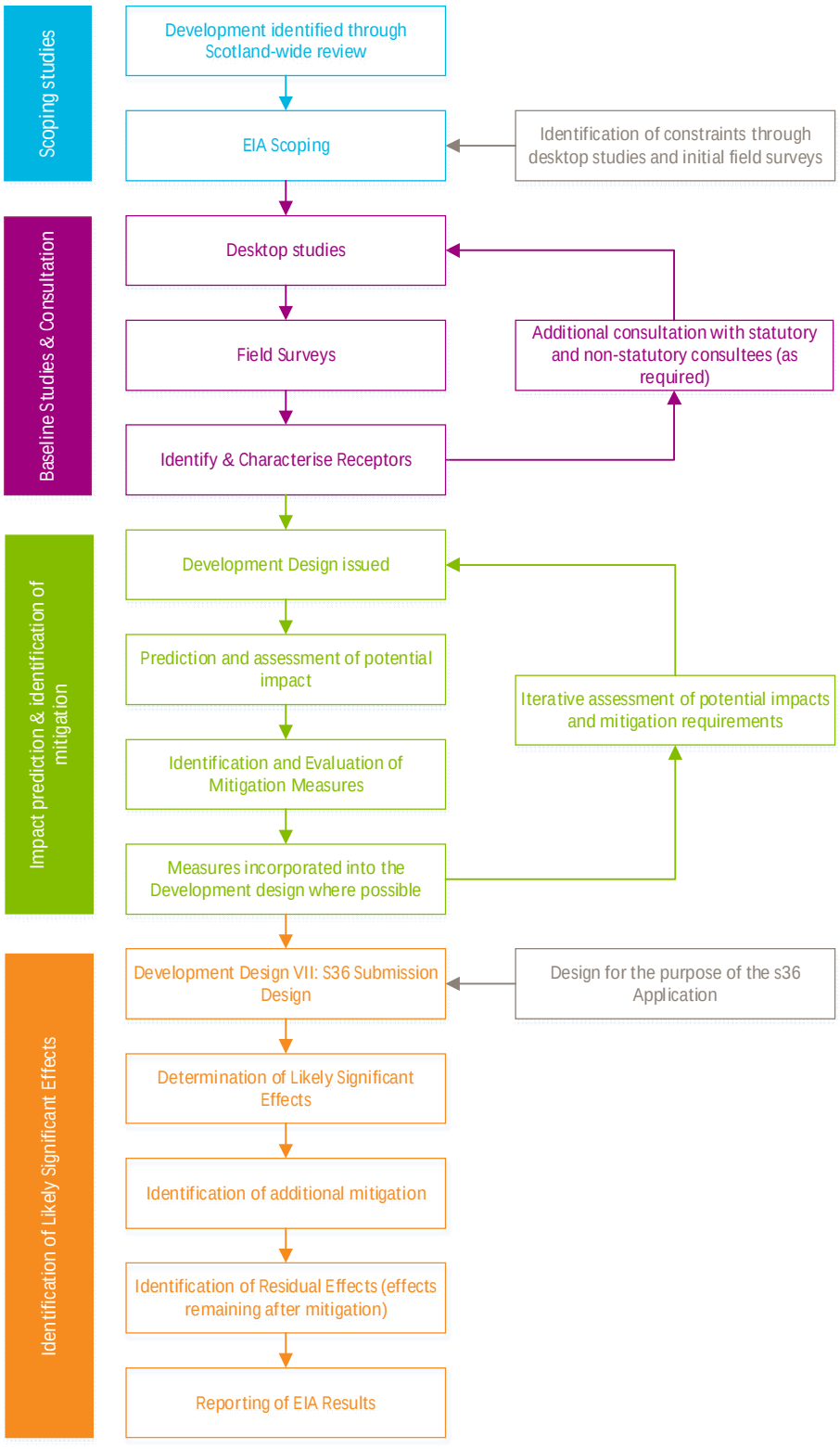
4.5.1 The primary objective of the EIA of the Development, consistent with the requirements of the EIA Regulations, is to identify, assess and report the Development's likely significant effects. This has been done by following a systematic process through the steps described below and illustrated in Insert 4.1. The approach is iterative and has required a close working partnership between those designing the Development and those undertaking the EIA, to ensure that consideration of potential environmental impacts formed an integral part of developing the final design that is described in Chapter 2: Project and Site Description.

Key Stages in EIA

4.5.2 The key stages in the EIA are:

- Scoping studies: Scoping was the first step in the EIA process. Scoping provided an opportunity for the ECU and other consultees to comment on the proposed scope of and approach to the EIA of the Development. Subsequent chapters set out comments received in scoping and how they have been addressed in undertaking the EIA.
- Baseline studies and consultation: These have comprised a combination of desk-based studies and field surveys to establish an understanding of the existing environmental conditions ('the baseline') within the study area and therefore ensure an accurate assessment of the likely significant effects of the Development. Baseline studies have been ongoing since 2017, informing the design of the Development as well as forming the basis of the EIA. The scope of baseline studies has been agreed with relevant consultees as part of scoping and where appropriate additional consultation.

- Impact prediction and identification of mitigation: The potential environmental impacts of the Development (both beneficial and adverse) have been predicted and evaluated using a range of specialist methods which are described in subsequent chapters. Through iterative assessment, potential impacts have been predicted and opportunities to mitigate them identified, with the aim of preventing or reducing impacts as much as possible. Where possible mitigation measures have been incorporated into the Development design such that they inform its detailed design and / or how it shall be constructed. This approach provides the opportunity to prevent or reduce adverse effects from the outset. These embedded mitigation measures are set out in Chapter 3: Evolution of Design and Alternatives.
- Identification of likely significant effects: As stated above, the purpose of the EIA is to determine the likely significant effects of the Development. A detailed description of the general approach to assessing impacts is contained in this chapter, with detailed approaches tailored to individual technical assessments following environmental topic-specific guidance contained in subsequent sections. The EIA Report identifies the significance of potential effects, identifies any additional mitigation and then the significance of the residual effect of the Development. Residual effects are those which remain taking into account proposed additional mitigation. As described above, the approach to the design and EIA of the Development has resulted in much of the mitigation being embedded within the final design. Therefore design and construction mitigation has been taken into account when evaluating the significance of the potential impacts, meaning that in some instances the significance of residual effects is the same as that reported for potential effects.



Insert 4.1 EIA Process Schematic

Assessment of Impacts

4.5.3 The determination of the significance of the impacts arising from the Development is a key stage in the EIA process. In order to assess the overall significance of an impact, it is necessary to establish the magnitude of the effect occurring i.e. the change to the existing baseline conditions as a result of the development and the sensitivity or importance of the receiving environment or receptor. Assessment of significance for environmental topics combines professional judgement with consideration of a number of factors including:

- The type of effect, i.e. whether it is adverse, beneficial, neutral or uncertain;
- The probability of the effect occurring based on the scale of certain, likely or unlikely;
- The sensitivity of the resource or receptor under consideration;
- The magnitude of the potential effect in relation to the degree of change which occurs as result; and
- Whether the effect is temporary, permanent, and / or reversible.

Sensitivity or Importance of Receptors

4.5.4 The sensitivity of the baseline conditions is assessed according to the relative importance of existing environmental features on or near to the Development Site, or by the sensitivity of receptors which could potentially be affected by the Development. Criteria for the determination of sensitivity or of importance or value of receptors are established based on approved guidance, legislation, statutory designation and / or professional judgement.

4.5.5 The criteria in Table 4.5: Sensitivity provide a general definition for determining the sensitivity of receptors.

Table 4.5 Sensitivity

Sensitivity	Definition
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is of low environmental value, or of local importance.
Negligible	The receptor is resistant to change and is of little environmental value.

Magnitude of Effect

4.5.6 The magnitude of potential effects on environmental baseline conditions is identified through consideration of the Development, taking into account the scale or degree of change from the existing baseline as a result of the effect. Consideration is given to the duration and reversibility of the effect as well as consideration of relevant legislative or policy standards or guidelines.

4.5.7 Table 4.6: Magnitude provides a general definition for determining the magnitude of a particular effect.

Table 4.6 Magnitude

Magnitude	Definition
High	Total loss or major alternation to key elements / features of the baseline conditions such that post development character / composition of baseline condition will be fundamentally changed.
Medium	Loss or alteration to one or more key elements / features of the baseline conditions such that post development character / composition of the baseline condition will be materially changed.
Low	Minor shift away from baseline conditions. Changes arising from the alteration will be detectable but not material; the underlying character / composition of the baseline condition will be similar to the pre-development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a 'no change' situation.

Significance of Effect

4.5.8 The general approach adopted in the assessment of significance is outlined in Table 4.7: Approach to the Assessment of Effects below. A combination of the magnitude of the impact under consideration and the sensitivity of the receiving environment determines the significance of effect. For some specialist topics, additional categories have been added where a greater level of definition is required. It should be noted that this approach provides a general framework, but should not be treated as a simple matrix; professional judgement should be applied in all cases.

Table 4.7 Approach to the Assessment of Effects

	Sensitivity				
Magnitude	**Very High**	**High**	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

4.5.9 The significance of the effects arising from the Development will be reported using a seven-point scale, as follows:

- Major Adverse, Moderate Adverse, Minor Adverse;
- Negligible;
- Minor Beneficial, Moderate Beneficial, Major Beneficial.

4.5.10 This scale may differ between the specialist chapters, but where this occurs, the variation will be explained clearly and fully.

4.5.11 Effects predicted to be Minor are considered to be manageable and such effects are 'Not Significant'. Effects assessed as Moderate or Major are considered to be 'Significant'. When the significance of effects is assessed, this takes into account mitigation, i.e. the assessment applies to the residual effects of the Development, which can be defined as any effect that would remain following the implementation of proposed mitigation measures.

Approach to Mitigation

4.5.12 Some mitigation measures to avoid, reduce or offset the consequences of the Development, are embedded within the Development design whilst others may require adherence to particular constraints on construction methods or mode of operation. The final assessment of significance will take into account the mitigation measures and constraints that have been incorporated into the Development – this will be the assessment of residual likely significant environmental effects.

4.5.13 The EIA also identifies where it is considered appropriate to undertake monitoring as part of construction and / or operation of the Development. Monitoring provides a mechanism to take remedial action in the event that unforeseen significant effects occur. For example this could include monitoring the water quality in discharges to ensure that no contaminated water is being released or monitoring noise emissions to ensure that they comply with agreed limits.

Temporary Effects

4.5.14 Temporary effects mainly occur during the construction phase only and are typically short-term. This would include effects resulting from the construction of the Development such as construction traffic, noise and vibration from construction plant and machinery, dust generation and site run-off as well as effects resulting from temporary loss of agricultural land or other temporary effects resulting from requirements for temporary access roads or compounds.

Longer-Term, Operational and Permanent Effects

4.5.15 Longer-term, operational and permanent effects are those which would occur as a result of the Development such as its land take or as a result of its operation. This would include effects that may begin during construction and endure for the lifetime of the Development (for example the realignment of the C1064) or effects which occur for a period of time following completion of construction or during operation only (for example operational hydrological impacts on the Allt a' Mhinisteir stream due to catchment loss).

Decommissioning Effects

4.5.16 Decommissioning effects would be those which would occur as a result of the dismantling and draining of the Development at the end of its operational life (as outlined in Chapter 2: Project and Site Description) and would typically be similar to those assessed for construction. The likely effects of decommissioning the Development will be outlined in each specialist assessment chapter where relevant.

Residual effects

4.5.17 Residual effects are those effects that remain having taken account of mitigation measures. As noted above, the approach taken to the EIA of the Development means that much of the mitigation is an inherent part of the design (design measures) and how it will be constructed (management measures). As a result the significance of some residual environmental effects may be the same as the significance of the potential environmental effects. It should be noted that this is not because they have not been mitigated, but rather that by incorporating mitigation into the design and construction of the Development from the outset, effects have been mitigated as far as possible. In subsequent chapters, this means that there may be more substantive reporting of the potential effects as opposed to the residual effects.

Cumulative Effects

4.5.18 The effects of the Development are assessed in combination with other projects that are either under construction or currently going through planning. Other projects have been identified through a search of the Highland Council Planning Portal and confirmed with THC Planning Officers. The final planning portal check was conducted on the 14 August 2018, even though it had been agreed with THC that the cumulative sites review would end on the 28 June 2018 (the day of the final public consultation event). Cumulative effects will be considered for each of the environmental topics, unless stated otherwise within Chapters 5-16 (Volume 2). The cumulative assessment will take into account any existing environmental problems and any areas of particular environmental importance such as designated sites and landscapes. The cumulative assessment will also consider effects between the different environmental topics (intra-project effects) for the Development as well as the effects from other projects (inter-project effects).

4.5.19 Cumulative effects will also consider the operational effects related to the water catchments related to other PSH schemes such as Coire Glas and Foyers. Whilst their operation is considered baseline, the cumulative operation in terms of drawdown and discharge on the hydrology and water balance of the receiving catchments will be considered although could be controlled through the conditions of the Controlled Activities Regulations (CAR) and abstraction licence.

4.5.20 Table 4.8: Cumulative Developments, lists other developments that have been identified as either going through screening or scoping, with a granted planning application or under construction at present.

4.5.21 The search of the planning portal identified a further nine local planning applications, which were predominantly for the erection of, or alteration to, single dwellings. Three of the nine were within the Development Site and a fourth is adjacent to the red line boundary. These additional applications are not included in Table 4.8 as they have been scoped out of the cumulative assessment. As a result of their nature, location and small size, the additional applications are unlikely to pose significant environmental effects on their own or in combination with the Development.

Table 4.8 Cumulative Developments

Development	Description	Location*	Status	Likely Shared Receptors
EE Telecommunications Tower 17/03199/FUL	15 metre (m) high lattice telecommunications tower with ancillary equipment in a fenced compound at Farr.	7.4 km E	Application permitted Decided 20 Oct 2017	Amenity
Underground Water Main 16/05768/SCRE	New underground water main from Dores to Inverness treatment works.	1.2 km NNW**	Screening Request - EIA not required 19 Jan 2017. No application submitted yet	Land Temporal – duration of construction phase
Tulloch Homes 17/02007/FUL	446 new homes on the south side of Inverness of the B862.	11.4 km NNE	Application permitted Decided 03 Aug 2018	Roads

Development	Description	Location*	Status	Likely Shared Receptors
Ness Castle (phase 2) 17/01189/MSC	137 new homes off the B862.	9.3 km NNE	Application permitted Decided 02 Jun 2017	Roads
Scainport 17/02446/PIP	5 new homes off the B862.	7.1 km NNE	Awaiting Decision Application Validated 29 May 2017	Roads
B851 Junction with the A9 18/03539/FUL	Change of use of existing buildings to office, use for maintenance of vehicles & fleet vehicles used for temporary and permanent road engineering.	12.45 km NE	Under Consideration Application Validated 30 July 2018	Roads
Coire Glas 18/01564/S36	Revised application for 1500 MW PSH scheme	53 km SW	Under Consideration Application Validated 03 April 2018	Landscape and visual Water resources Socio-economics

** Distances are calculated from the central grid reference of the Development*

*** As a linear feature, the distance was measured to the location referenced as the start grid reference.*

Source: The Highland Council Planning Portal [Accessed: 14/08/18]

4.5.22 From Table 4.8 the following applications will be included within the assessment of inter-cumulative effects:

- Scottish Water Main – due to close proximity and likely similar construction timescales;
- Coire Glas extension – due to similar construction timescales; and
- Tulloch Homes - due to similar construction timescales.

4.5.23 All other developments are not on a like-for-like comparison basis or are scoped out due to there being limited or no shared receptors with the Development.

4.5.24 It is also acknowledged that a grid connection will be required for the Development (as described in Section 2.11 of Chapter 2: Project and Site Description). This has been assessed within the technical chapters as appropriate, but as the grid connection is expected to be underground and within the highway verge, limited effects are anticipated.

4.6 Limits of Deviation

4.6.1 The matter of design uncertainty has been addressed within this EIA by adopting a precautionary approach to identifying significant environmental effects, through the establishment of a series of maximum development extents known as a ‘Rochdale Envelope’.

4.6.2 The Rochdale Envelope is named after a UK planning law case (Ref 1). It is an established principle that allows a development to be described by broad or alternative parameters. Its adoption allows meaningful EIA to be undertaken by defining a ’realistic worst case’ scenario that decision-makers can consider when determining the acceptability or otherwise of the environmental effects of a development.

4.6.3 The principle is founded on the assumption that as long as the technical and engineering parameters of a development fall within the limits of the envelope, and the EIA has considered the likely significant effects of that envelope, then flexibility within those parameters is deemed to be permissible within the terms of any consent granted for the development.

4.6.4 The realistic worst case scenario reflects the most environmentally detrimental parameter for assessment within the EIA. Where multiple options, or a range, are provided for a parameter it is assumed that one or other of the parameters will have a more significant adverse effect than the alternatives. The realistic worst case can differ depending on the environmental resource or receptor being assessed, and this has been highlighted where relevant.

4.6.5 In line with this approach, a series of parameters have been established across a number of aspects relating to the design and construction of the Development to manage design uncertainty and provide flexibility for deviation where needed, for example to enable minor design refinements to be made by the Applicant and / or their appointed Construction Contractor within the overall parameters of any consent granted.

4.6.6 These parameters are presented as follows and include matters such as defining the maximum extent of land required to mitigate environmental effects, and the identification of horizontal and vertical limits of deviation within which the design of the Development can be adjusted if necessary, for example in response to local ground conditions.

4.6.7 This approach to managing uncertainty within defined parameters and limits ensures that any design changes that may arise post submission of the Section 36 application will not be of an order that renders the content of this EIA Report inadequate or invalid.

Limits of Deviation – C1064 Improvement and Realignment

4.6.8 As described in Chapter 2: Project and Site Description, the construction of the Development will result in the improvement and realignment of the C1064. The orientation and indicative plan view on Figure 2.21: C1064 Realignment - Indicative Arrangement (Volume 3) shows the final realigned road being approximately 11 m at its widest point where the road includes a passing place. In order to micro-site the road in response to ground conditions (such as peat which has been identified on the north side of the existing C0164 route near Ashie Moor) and for detailed design of the visibility splays, it is proposed that a working width of 50 m is applied as a limit of deviation

Limits of Deviation – Permanent Access Track

4.6.9 The Permanent Access Track is shown on Figure 2.22 (Volume 3) with an indicative 50 m wide arrangement. This permanent access track will incorporate the existing forestry road and so it is proposed to apply a 50 m limit of deviation either side of the existing track. This would allow a 100 m buffer for the proposed 50 m access track, and allow for micrositing for local ground conditions, topography, forestry and watercourses.

Limits of Deviation – Temporary Access Track

4.6.10 The Temporary Access Track is shown on Figure 2.23 (Volume 3) with an indicative 30 m wide arrangement. This access track has been minimised as far as reasonably practical, and in places follows the routing of informal and previously used forestry access tracks. However to account for the topography, watercourses, forestry and tree root protection within the ancient woodland inventory towards Loch Ness, it is proposed to have a 35 m

buffer either side of the indicative route of the Temporary Access Track. This would allow for a 70 m buffer for the proposed 30 m access track.

Limits of Deviation – Generation and Reuse of Material

4.6.11 The Development will generate approximately 6,797,000 m^3 of material (as summarised in Chapter 2). It has been recognised that the material generated from the Development will be excavated using different methods and be sourced from rock of varying quality. Therefore to provide flexibility and allow for any optimisation during detailed design approximate volumes have been calculated using standard methods, on a reasonable assumption of the likely size required for the infrastructure and then rounded up to the next ten thousand to provide a likely worse case for the purposes of the assessment. This is explained in detail within the Materials Management Appraisal (Appendix 5.2, Volume 3).

4.7 References

Ref 1. R. v. Rochdale MBC ex parte Milne (No. 1); R. v. Rochdale MBC ex parte Tew [1999] and R. v. Rochdale MBC ex parte Milne (No. 2) [2000].

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