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Red John Pumped Storage Hydro Scheme

Volume 2, Chapter 5: Geology and Ground Conditions

ILI (Highlands PSH) Ltd.

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Quality information

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Distribution List

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5 Geology and Ground Conditions

5.1 Introduction

5.1.1 This chapter presents the geology and ground conditions effects impact assessment of the Development undertaken in accordance with IEMA guidelines.

5.1.2 The assessment will provide baseline information, discuss appropriate mitigation measures and assess the significance of residual impacts. Consideration has been given to impacts during the construction, operational and decommissioning phases of the Development.

5.1.3 Potential impacts on surrounding geology and ground conditions will predominately be associated with the construction phase of the Development.

5.1.4 Hydrogeology and groundwater dependant terrestrial ecosystems (GWDTE) are not discussed in this chapter. All relevant information for hydrogeology and GWDTEs can be found in Chapter 10: Water Environment and Chapter 6: Terrestrial Ecology.

5.2 Legislation, Policy and Guidance

5.2.1 The assessment has been undertaken in accordance with the European Union (EU) Directives, national, regional and local legislation planning policies as highlighted in Table 5.1 as relevant to the Development.

Table 5.1 Directives, Legislation and Planning Policies

Area	Directives, Legislation and Planning Policies
EU	Environmental Liability Directive (2004/35/EC)
	Water Framework Directive (2000/60/EC)
	Dangerous Substances Directive (2006/11/EC)
	Renewable Energy Directive
	Climate Change Act 2008
National	The Environmental Liability (Scotland) Regulations (2009)
	Nature Conservation (Scotland) Act (2004)
	Pollution Prevention and Control (Scotland) Regulations (2012)
	Town & Country Planning (Scotland) Acts
	Scottish National Planning Policy, including National Planning Framework 3 (NPF3)
	Scottish Planning Policy (SPP) (2014)
	Historic Environment Scotland Act 2014
	Planning Advice Note (PAN) 50 (surface mineral workings) (1996)
	Planning Advice on hydro schemes, December 2013
	Planning Advice on energy storage, December 2013
	Scotland's Zero Waste Plan (2010)
	The Construction (Design and Management) Regulations 2015

Area	Directives, Legislation and Planning Policies
	Environmental Protection Act 1990 (as amended)
	The Quarries Regulations 1999
	BS 6164: Code of Practice for Health and Safety in Tunnelling in the Construction Industry (2011)
Regional & Local	Inner Moray Firth Local Development Plan (2015)
	Highland-wide Local Development Plan (2012)
	Highland Renewable Energy Strategy (2006)
	Inverness Local Plan (Adopted: 2 March 2006)

National Planning Policy & Legislation

5.2.2 Key national policies that are relevant with respect to geology and ground conditions that have been considered in this assessment are:

- Environmental Protection Act 1990;
- Town & Country Planning (Scotland) Acts;
- Nature Conservation (Scotland) Act (2004).

5.2.3 Scottish Planning Policy (SPP) was published in June 2014; its purpose is to set out national planning policies that reflect priorities of the Scottish Ministers for operation of the planning system and the development and use of land through sustainable economic growth. SPP contains the following policies which are considered in this assessment:

- Hydro schemes (first published 14 February 2011; last updated 12 December 2013)
- Energy storage (published February 2011; last updated 12 December 2013)

Regional Policy

- The Highland-wide Local Development Plan (HwLDP) was published in 2006 and sets out how land can be used most effectively.
- THC website states that their Renewable Energy Strategy will no longer be used as a material consideration; however generation targets would be carried forward for monitoring purposes (Ref 1).

Local Planning Policy

5.2.4 Inverness Local Plan was adopted on the 2 of March 2006 and should be read in conjunction with the HwLDP. The Inverness local plan sets out local planning policies and identifies how land is used, determining what will be built where. Local peoples' views are vital in shaping a local plan, helping determine how their community develops (Local plan – Inverness, 2006).

Best Practice & Guidance Documents

5.2.5 Guidance on best practice has been used throughout this EIA Report to ensure the integration of relevant planning policy and compliance measures during all stages of the Development design. Table 5.2 lists best practice guides that have been utilised.

Table 5.2 Best Practice Guidance

Author	Guidance Document
Scottish Government, SNH and SEPA	Peatland Survey – Guidance on Developments on Peatland (2017)
Scottish Renewables and SEPA	Developments on Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste (2012)
SEPA	SEPA Regulatory Position Statement – Developments on Peat (2010)
Scottish Government	Peat Landscape Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments, second edition (2017)
SNH and FCS	Floating Roads on Peat (2010)
Scottish Renewables, SNH, SEPA, FCS and Historic Environment Scotland	Good Practice during Wind Farm Construction (2015)
Health and Safety Executive	Health and safety at quarries Quarries Regulations 1999, Approved Code of Practice and guidance, 2nd edition (2013)

5.2.6 The *Good Practice during Wind Farm Construction* document was produced for wind farm developments, however, principles discussed can be considered as good practise for other similar scale developments in areas with similar infrastructure (access tracks) and typical ground conditions seen on wind farms, particularly peat and around the water environment.

5.3 Methods

Desk Study

5.3.1 A desk study was carried out on the geology and ground conditions of the Development Site, covering a study area as defined by the red line boundary shown on Figure 1.2: The Development Site (Volume 3), using various publications, documents, publicly available information, discussions with consultees and information from site walkovers. However, for certain geology features a wider study was defined as detailed in the baseline section of this chapter where there may be an outer influence.

5.3.2 A review of published geological data has been undertaken to determine the geological and topographical context of the study area. The sources of information are listed in Table 5.3 for reference below.

Table 5.3 Information Sources used for Desk Study

Area	Subject	Source
Geology	Site Geology	Geological Map Sheet No.83 – Inverness (British Geological Society; BGS, 1997)
		Geological Map Sheet No. 75E – Foyers (BGS, 1996)
		British Geological Society (BGS) Onshore Geoindex online viewer
		The Coal Authority online Interactive Map Viewer
Topography	Site Topography	Ordnance Survey Mapping, Scale 1:25,000
		5 m Digital Terrain Model

Site Walkover

5.3.3 Site walkovers were undertaken between May 2017 and July 2017 to observe ground conditions and geological features on and in the vicinity of the Development Site boundary. A short summary of the findings from the site walkover are detailed below.

- The majority of the area around the proposed Headpond was covered with commercial forestry, and some areas clear felled;
- The existing C1064 road travels over areas of peaty ground in the vicinity of Ashie Moor and Loch na Curra;
- Linear boggy areas were present along the existing access road from the Headpond to the Compound 1 area;
- The area of the Development Site around Park and Kindrummond was found to be predominately used for pastoral farming and subsequently is anticipated to be well drained;
- The area of the Development Site around the banks of the Loch Ness was found to be open fields that were undulating and dry; and
- Two small borrow pits, which have likely been used to construct the existing access tracks, were present within the Development Site.

Site Surveys - Site Investigation

5.3.4 An initial preliminary intrusive site investigation (SI) was undertaken in August 2018. The SI works consisted of four rotary boreholes and fifteen trial pits, which were undertaken to inform understanding of the superficial and bedrock geology within the Development Site. The trial pits were taken to a maximum depth of 4.3 m, and the maximum depth of borehole was 20 m.

Site Surveys - Peat Probing

5.3.5 A Phase 1 Peat Probing survey was undertaken in May 2018 in order to obtain information on peat depth across the Development Site to inform the following:

- Site design and layout to minimise disruption to peatlands;
- Drainage planning and hydrological assessment; and
- Post-construction habitat management / site reinstatement and restoration.

5.3.6 The survey was based upon probing predefined probe locations on a 100 x 100 m grid across the Development Site. Areas that were not going to be used during construction or have above ground infrastructure were not included with the survey area. In addition to this, areas that were identified as being unlikely to have peat present, pastoral fields and agricultural land were also excluded from the survey.

5.4 Baseline Environment

Topography

5.4.1 The Development Site generally slopes from the summit of Tom Bailgeann (464 m above ordnance datum; AOD) south of the Development Site towards the north where the Site flattens out in the proximity of the Headpond then falls off towards Loch Ness in the west and Loch Duntelchaig in the east. The majority of the study area that sits north of the proposed Headpond falls towards the west.

5.4.2 The Headpond lies on generally flat land approximately between 230 and 270 m AOD around the area of the Merchants Stone. Loch Ness sits at around 15.8 m AOD and Loch Duntelchaig sits at around 213 m AOD.

5.4.3 The area of land where the Headpond will be constructed is relatively flat with most of the existing ground level at less than 8 % slope. The rest of the study area is generally above an 8 % slope. The north western half of the Development Site slopes down towards Loch Ness, with the majority of that area having a slope of 20 % or greater.

5.4.4 Figures 5.1: Topography (Volume 3) shows the topography of the study area based upon 5 m digital terrain mapping.

Geology

5.4.5 As shown on Figure 5.2: Bedrock Geology (Volume 3), the bedrock geology of the Development Site is dominated by sedimentary rocks of the Old Red Sandstone (ORS) system. The ORS is now used as a facies, a depositional term describing distinctive rock units that form under certain conditions of sedimentation, reflecting a particular process or environment. The rocks have been described as being predominantly of Devonian age and principally Middle Devonian in the Development Site. The rocks of the Middle ORS are fluvial in origin, deposited by rivers draining north-east, with subordinate largely fine-grained, lacustrine sediments. The local name for these sandstones is the Inverness Sandstone Group, which also includes some other sandstone and conglomerate formations, this Group contains the Inshes Flagstone Formation to the southwest of the site on the banks of Loch Ness, this formation is described as containing sandstone with rare occurrences of mudstone and limestone. The study area is covered on the Geological Map Sheet No. 83 – Inverness (BGS, 1997) and Sheet No. 73E – Foyers (BGS, 1996).

5.4.6 The geological setting of the Development Site is generally dictated by the Great Glen Fault, which is located to the west of the Development Site and trends from south-west to north-east. The fault is marked by the deeply glaciated valley that contains Loch Ness. The Gleann Liath Fault runs parallel to the Great Glen Fault and is located in the south of the Development Site. The fault can be identified by the valley that contains Loch Duntelchaig and Loch Ceo Glais.

5.4.7 Located between the Glen Liath Fault and Great Glen Fault is an unnamed fault, which trends from south-west to north-east through the middle of the Development Site. Across the Development Site, the strata are shown to dip in several different directions ranging from 10° to 30° as shown on Figure 5.2: Bedrock Geology.

5.4.8 As shown on Figure 5.3: Superficial Geology (Volume 3), the superficial deposits are Quaternary period from the Late Devensian glaciation. Till is the most common in the more inland (and therefore upland) areas. The tills tend to occur in poorly drained ground of low relief and smooth slopes. The tills are composed of ice-transported diamicton, a poorly sorted mixture of rock fragments, gravel, sand, silt and clay, although they may vary in lithology and thickness across the area (Merritt, et al., 2003).

5.4.9 Four areas of peat are present within the study area: a small linear strip of peat parallel to the C1064 on Ashie Moor a small area to the south of the C1064 at the junction with the B862 and two linear strips in the open ground of Clune Wood in the north of the study area

5.4.10 Elsewhere in the study are small areas of alluvium and areas of no superficial deposits (bedrock at surface) are present. On the banks of Loch Ness lacustrine beach deposits are present, these are described as sand and gravel deposits.

5.4.11 A review of the Carbon and Peatland 2016 map on Scotland's Soils online map viewer (Ref 2) shows the entire study area is covered by 'mineral soil' which "peatland habitats are not typically found on such soils" (Ref 3) with the exception of a small area at the junction of the C1064 and the B862 which has a small area of 'peat soil' and some 'predominantly mineral soil with some peat soil'.

5.4.12 The hydrogeology of the Development Site is discussed in detail in Chapter 10: Water Environment, together with details of all known groundwater and surface water abstractions within the Development Site and immediate surrounding area.

SI Results

5.4.13 The locations of the SI works undertaken are shown on Figure 5.4: SI Works (Volume 3), primarily around the Headpond area.

5.4.14 The trial pits (TP) undertaken indicate that typically about 1.5 m of superficial deposits or weathered bedrock overlies bedrock. This was significantly different around the banks of Loch Ness where up to 4.3 m of superficial deposits were encountered and no base proven. In some locations bedrock was exposed at ground level rending trial pitting not possible. Groundwater was encountered in two trial pits, in TP11 at 1.0 m within possible bedrock and in TP13 at 4.3 m adjacent to Loch Ness.

5.4.15 The boreholes undertaken proved bedrock typically between 1 m and 11 m, proving 10 m of rock, again the exception to this is adjacent to Loch Ness where the borehole was sunk to 20 m and did not encounter bedrock. Groundwater was encountered in all boreholes, at between 3 m and 5.5 m within the bedrock, and 1.2 m in the superficial deposits adjacent to Loch Ness.

5.4.16 The superficial deposits consisted of interbedded alluvial coarse-grained and fine-grained deposits adjacent to Loch Ness and outside this area at higher elevations, peat, coarse-grained glacial till and weathered bedrock overlying strong sandstone.

5.4.17 The investigation results broadly confirm the review of available geological information and indicate that the Loch Ness channel once extended wider and has retreated to leave significant superficial deposits. At higher elevation, peat is present at ground level and only a thin strata of superficial coarse-grained glacial till material is present over weathered Sandstone bedrock.

5.4.18 The logs taken during the SI works are included in Appendix 5.1: SI Logs (Volume 5).

Peat

5.4.19 Peat probing was undertaken within the study area in May 2018. The survey was to be undertaken on 100 m grid, however during the survey it was identified that relatively narrow linear peat hollows were located between the 100 m grid. In order to ensure these features were captured, additional probes were undertaken and recorded.

5.4.20 Figure 5.5: Site Visit Features and Peat Probes (Volume 3) shows the location of all 436 peat probes as well as additional features noted during the survey, these features are described below.

- Feature 1: Narrow peat bog located at the field boundary between Dirr Wood and Ashie Moor.
- Feature 2: Narrow peat bog located between two undulating outcrops of rock within Dirr Wood.
- Feature 3: Peaty hollows located between two boundary fences within Dirr Wood.

- Feature 4: Wet shallow bog within an area of thick vegetation around the southern end of the headpond. Depths of between 0.5 and 0.99 m were recorded.
- Feature 5: Wet shallow bog within an area of thick vegetation.
- Feature 6: Peaty hollow with surface water located between the Allt a' Mhinisteir Burn and the Merchants Stone.
- Feature 7: Narrow peaty bog located between rocky outcrops.
- Feature 8: Small peaty hollow located near to the Allt a' Mhinisteir Burn.
- Feature 9: Small peaty flush located near the Allt a' Chruineachd Burn and Balnafoich.
- Feature 10: Small borrow pit likely associated with existing access tracks.
- Feature 11: Small borrow pit likely associated with existing access tracks.

5.4.21 The results from the survey indicate that the majority of the area (over 86 %), covered by the survey, has peat of < 0.5 m depth. The widest spread and deepest area of peat covered by the survey is located on the northern side of the C1064 on Ashie Moor and into Dirr Wood, peat in this area ranged from 1 m to 5 m in depth.

5.4.22 Other small pockets of peat, up to 3 m in depth, are present at the Headpond location; however, these areas are unavoidable. Due to the minimal extent of these pockets of peat they will not present a significant engineering risk and the peat will be excavated and reused within the development.

5.4.23 The results of the Phase 1 Peat Probing survey were used to create a map of the varying depths of the peat surface across the Development: this is shown on Figure 5.6: Peat Surface (Volume 3).

5.4.24 Following completion of Phase 1 Peat Probing, the results were sent to SEPA for comment. SEPA has confirmed that they do not believe that further peat probing is required to inform the S36 application.

Land Use and Soils

5.4.25 A review of the National Soil Map of Scotland on Scotland's Soils online map viewer (Ref 4) identified the entire study area, with the exception of a small area to the south-west, as covered with soils described as 'humus-iron podzols'. According to The James Hutton Institute these soils are "naturally acidic and nutrient deficient but support a number of uses" such as forestry plantations (Ref 5).

5.4.26 The small area to the south-west of the Development Site is identified as having soils described as 'peaty rankers with peaty gleyed podzols'. These soils are similar to humus-iron podzols in that they are "acid, nutrient deficient soils" (Ref 6) and support forestry plantations, however, they can support wider vegetation communities such as heather moorland and native pinewoods.

5.4.27 From a geology and ground conditions perspective the soil and subsequent land use, primarily commercial forestry, are not viewed as sensitive receptors therefore these are not discussed further in this assessment, however, they are further discussed in Chapter 6: Terrestrial Ecology and Chapter 12: Forestry.

Seismic Risk

5.4.28 A review of the BGS Onshore GeoIndex has shown no evidence of past seismic activity within the Development Site; however several historic events have occurred in the wider area as detailed in Table 5.4.

Table 5.4 Seismic Activity

Type	Easting	Northing	Year	Magnitude	Depth (km*)	Distance from Development Site (km)
Modern Instrument Recorded Earthquakes	259192	837267	2011	2.4	6.7	2.6 North-West
Historical Earthquakes	260720	840086	1901	5.1	11.0	4.3 North
Historical Earthquakes	260119	840084	1816	5.1	18.0	4.5 North
Modern Instrument Recorded Earthquakes	257233	824179	2007	1.5	4.3	4.8 South
Modern Instrument Recorded Earthquakes	252893	830018	2013	2.4	2.6	5.6 South-West
Modern Instrument Recorded Earthquakes	252728	819180	1971	3	0.5	11.2 South

*kilometres

Ground Contamination

5.4.29 Given the present commercial forestry, location of surface water supplies and absence of any large intrusive or potential contaminating historical developments, it is unlikely that the Development Site will contain contamination.

Mineral Rights

5.4.30 Two small borrow pits, shown in Figure 5.5 (Volume 3), are present within the study area, these are likely to have been used to construct the existing access tracks associated with the commercial forestry.

5.4.31 No other evidence of mineral extraction has been found and, given the nature of the underlying geology it is not anticipated future mineral extractions would be likely.

Sensitive Receptors

5.4.32 The value of receptors is based on the definitions provided in Chapter 4: Approach to EIA . Sensitive receptors that may be directly or indirectly affected by the Development and the value of each receptor are summarised in Table 5.5.

Table 5.5 Sensitive Receptors

Receptor	Distance from Development	Sensitivity	Reason
Peat	On-site	Medium	Areas of peat not mapped by Soils Scotland as 'peat soil' therefore not considered nationally important. The peat affected has also been modified due to commercial forestry.

5.5 Assessment of Effects

5.5.1 The assessment of effects for Geology and Ground Conditions is not as per the standard assessment as described in Chapter 4: Approach to the EIA. This approach has been taken

as the potential effects on geological and soil receptors are extremely limited. However the volume of material to be excavated does have the potential to affect other receptors which are contained in other chapters. Therefore, this chapter provides information on the basis of other potential indirect effects from the excavation of material in order to construct the Development, and signposts to the relevant assessments where required.

5.5.2 Other than peat, no other features associated with geology or ground conditions have been identified as a sensitive receptor therefore impacts on geology have been scoped out.

5.5.3 For impacts on hydrogeology and GWDTE refer to Chapter 10: Water Environment.

5.5.4 There is no contaminated land within the study area, therefore any potential impacts from this, on human health and other receptors have been scoped out.

5.5.5 Given the locality of the Development in relation to the Great Glen Fault, and the presence of inferred fault lines across the Development Site, there is potential for varying rock quality, even at significant depths. To mitigate issues with varying rock quality, which could result in unstable rock faces during underground excavation and tunnelling works, the potential requirement for lining of the Tunnels and underground excavations is embedded in the design.

5.5.6 Seismic activity in the area could have the potential to destabilise the Embankment, however, embedded within the design is the legal requirement that the Embankment will be designed constructed, operated and decommissioned in line with the Reservoir Act, therefore, this is scoped out.

5.5.7 Although the impacts on geology have largely been scoped out, during the construction phase substantial excavation, tunnelling and earthworks will be undertaken.

5.5.8 Approximately 6,797,000 metres cubed (m^3) of bulked material will be excavated in order to construct the Headpond, High- and Low-Pressure Tunnels, Power Cavern, Access Tunnels and for the Inlet / Outlet structure at the Tailpond. The MMA provides detailed calculations of the materials balance of the Development (Appendix 5.2, Volume 5). In order to demonstrate reuse and resourcing of the excavated material, a Materials Management Plan will be prepared to audit and record the movements of materials, as identified in the MMA.

5.5.9 One of the main design principals embedded within this Development was to minimise any unsuitable / excess material by balancing the material that is generated from the excavation works with the works associated with construction of the Headpond Embankment.

5.5.10 The results of the desk top study and the SI have shown that the material at or near the surface will likely be suitable for the proposed design of the Headpond Embankment. However, there will be a percentage of this material that is not suitable for use during construction. Therefore to demonstrate the balance of the excavated material with the construction of the headpond embankment a Materials Management Appraisal (MMA) has been produced and is included in Appendix 5.2 (Volume 5).

5.5.11 As demonstrated by the MMA, approximately 12,000 m^3 of excess material may be generated by the Development. There are a number of ways this material will be dealt with on-site as detailed in the MMA, preventing the requirement for removal off-site.

5.5.12 Further SI works will be undertaken during the detailed design stage, post consent, to confirm rock properties across the Development Site, in addition to the design optimisation opportunities as detailed in Chapter 3: Design Evolution and Alternatives and within Section 5.8 of the MMA (Appendix 5.2, Volume 5).

Construction Phase

5.5.13 The construction of above-ground infrastructure may require excavation, storage, re-use and waste disposal of peat deposits. As this is a medium sensitive receptor, this is expected to have a permanent adverse effect of Medium magnitude resulting in a Moderate significance on peat deposits within the Development Site without mitigation. This is therefore a **Significant** effect.

Operational and Decommissioning Phase

5.5.14 Peat excavated during the construction phase will be permanently displaced from the areas required for above ground infrastructure. Therefore as the impact has occurred already in the construction phase, there are no operational or decommissioning effects on peat.

5.6 Cumulative effects

5.6.1 Inter-project effects were considered for the cumulative developments listed in Table 4.8 of Chapter 4: Approach to EIA. No direct combined effect on geology or ground conditions were identified from the Development and the cumulative developments. Shared fault lines and geology between Coire Glas pumped storage hydro (PSH) and the Development were considered, however no effect was identified given the distance between the two sites and the safety standards and requirements incorporated into the design.

5.6.2 The potential for indirect combined effects on the transport network was also considered. Although the material management for Coire Glas PSH is unknown, no combined effect between the Development and Coire Glas, or the other cumulative developments, was identified, due to the proposal to retain and re-use excavated material on the Development Site. This is to be managed and implemented via the MMA (Appendix 5.2, Volume 5). Therefore, there are no inter-project cumulative effects anticipated with the cumulative developments.

5.6.3 Intra-project effects were also considered. No potential direct combined effects on geology or ground conditions were identified. Potential indirect combined effects were identified from material management on the transport network, and on human receptors from nuisance such as reduced amenity, dust and noise. If excavated material were transported off-site, this would increase the required number of vehicle journeys to and from the Development Site and create a combined adverse effect of greater significance. However, as demonstrated in the MMA (Appendix 5.2, Volume 5), all excavated material can and will be reused within the Development Site, removing any potential intra-project transport effects.

5.6.4 Amenity effects from noise and dust generation as a result of material excavation, transportation within the Development Site and storage could be compounded as a result of the overlapping construction programme for the different Development Components. The Outline Construction Environment Management Plan (CEMP) (Appendix 3.1, Volume 5) provides mitigation in relation to generation of dust, noise and other emissions.

5.6.5 Therefore, there are not expected to be any significant cumulative effects on geology or ground conditions, and other shared receptors.

5.7 Mitigation and Monitoring

5.7.1 Post-consenting SI works will confirm soil and rock properties to assist the detailed design. SI works are likely to include additional peat probing to inform the exact routes / location of above and below ground infrastructure.

5.7.2 The Phase 1 Peat Probing survey identified areas of peat along the C1064 which have been avoided via the design of the C1064 realignment, and so this is embedded mitigation within the design of the Development.

5.7.3 There is a small area of peat under the Headpond which will be permanently lost. An outline Peat Management Plan (PMP) (Appendix 5.3, Volume 5) has been produced which demonstrates the approximate volumes of peat expected to be disturbed / excavated, the potential re-use options and the handling and storage methods to be used.

5.8 Residual effects

5.8.1 In accordance with the methodology described in Chapter 4: Approach to EIA, potential effects have been assessed prior to mitigation, with the residual effects after implantation of the mitigation measures detailed in Table 5.6.

5.8.2 As demonstrated in Table 5.6, there are no significant residual effects anticipated to remain after the implementation of mitigation.

Table 5.6 Potential and Residual Effects

Receptor	Description of Effect	Effect	Additional Mitigation	Residual Effects	Significance
Peat	Excavation for Development Site above ground infrastructure, resulting in loss of peat.	Moderate Adverse	Layout developed to minimise infrastructure in areas of peat. Appropriate peat guidance to be adhered to. Outline PMP (Appendix 5.3, Volume 5) to be implemented	Minor Adverse	Not Significant

5.9 References

Ref 1. The Highland Council (2006) *Highland Renewable Energy Strategy and Planning Guidelines* https://www.highland.gov.uk/downloads/file/1009/highland_renewable_energy_strategy_may_2006 [Accessed 08/10/18]

Ref 2. Scotland's Soils online viewer – Carbon & Peatland 2016 Map http://map.environment.gov.scot/Soil_maps/?layer=10 [Accessed 05/10/18]

Ref 3. Scotland Soils – Peatland Restoration http://soils.environment.gov.scot/resources/peatland-restoration/ [Accessed 05/10/18]

Ref 4. Scotland's Soils online viewer – National soil map of Scotland http://map.environment.gov.scot/Soil_maps/?layer=1 [Accessed 05/10/18]

Ref 5. The James Hutton Institute – Humus-Iron Podzols https://www.hutton.ac.uk/learning/exploringscotland/soils/humusironpodzols [Accessed 05/10/18]

Ref 6. The James Hutton Institute – Peaty Podzols https://www.hutton.ac.uk/learning/exploringscotland/soils/peatypodzols [Accessed 05/10/18]

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