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Chapter 10: Geology and Soils

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INDEX

10 GEOLOGY AND SOILS

10.1 Introduction

10.1.1.1 This Chapter of the Environmental Impact Assessment (EIA) Report (EIAR) presents an assessment of the potential significant impacts to the geology and soils environment associated with the construction, operation and decommissioning of the Proposed Development, as described in **Volume 1 Chapter 3: Development Description**.

10.1.1.2 Where likely significant effects are predicted, appropriate mitigations measures are proposed, and the significance of predicted residual effects are assessed.

10.1.1.3 This chapter includes the following elements:

- Scope of Assessment and Methodology;
- Baseline Conditions;
- Assessment of Likely Significant Effects;
- Cumulative Effects;
- Mitigation;
- Residual Effects; and
- Summary and Conclusions.

10.1.1.4 This Chapter is supported by the following figures, presented in **Volume 2a**:

- **Figure 10.1:** Site Plan;
- **Figure 10.2**: Superficial Geology;
- **Figure 10.3:** Bedrock Geology;
- **Figure 10.4:** National Soils Map of Scotland; and
- **Figure 10.5:** Carbon and Peatland Map.

10.1.1.5 This assessment uses information and findings presented in **Chapter 8: Ecology and Nature Conservation.**

10.1.1.6 In addition, this Chapter refers to **Technical Appendix 3.1: outline Construction Environmental Management (oCEMP)**, which details good construction practice measures and works that are established and effective measures to which the Applicant will be committed through the planning consent.

10.2 Scope of Assessment and Methodology

10.2.1.1 The potential effects of the Proposed Development on the geology and soils environment have been assessed through completion of a desk study and an impact assessment across the Proposed Development.

10.2.1.2 The following terms are used within this Chapter to describe the Proposed Development:

- Proposed Development – the physical process involved in the development, construction and operation of the Solar Farm and associated Battery Energy Storage System;
- The Site - all land within the proposed red line boundary, as shown in **Figure 10.1**; and
- Study Area - a defined area for the consideration of environmental effects (including direct, indirect and cumulative) on each relevant factor listed under Regulation 4(3) of the EIA Regulations.

10.2.1.3 **Figure 10.1** details the Proposed Development location and boundary.

10.2.1.4 The Proposed Development site will extend to a total area of 190 hectares. The solar will have a generating capacity of up to approximately 165MW (AC). The Battery Energy Storage System (BESS) will be comprised of up to 40 BESS units with a capacity of up to 80MW.

10.2.2 Legislation, Policy and Guidance

10.2.2.1 Relevant policy and guidance documents have been reviewed and considered as part of this assessment.

Planning Policy

10.2.2.2 The National Planning Framework 4 (NPF4)[1], adopted by the Scottish Government on 13 February 2023, provides planning guidance and policies regarding sustainable development. The NPF4 outlines how nationally important land use planning matters should be addressed.

10.2.2.3 Policy 5 within the NPF4 details the approach to soils:

10.2.2.4 *"Development proposals will only be supported if they are designed and constructed:*

- *In accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land; and*
- *In a manner that protects soil from damage including from compaction and erosion, and that minimises soil sealing.*

[1] The Scottish Government (2024) National Planning Framework 4 [Online] Available at: National Planning Framework 4 (www.gov.scot) [Accessed March 2025]

Development proposals on prime agricultural land, or land of lesser quality that is culturally or locally important for primary use, as identified by the LDP, will only be supported where it is for:

- *Essential infrastructure and there is a specific locational need and no other suitable site;*
- *Small-scale development directly linked to a rural business, farm or croft or for essential workers for the rural business to be able to live onsite;*
- *The development of production and processing facilities associated with the land produce where no other local site is suitable;*
- *The generation of energy from renewable sources or the extraction of minerals and there is secure provision for restoration; and*
- *In all of the above exceptions, the layout and design of the proposal minimises the amount of protected land that is required."*

10.2.2.5 In addition, Policy 9 within the NPF4 details the approach to potential brownfield sites and contaminated land:

- *"Where land is known or suspected to be unstable or contaminated, development proposals will demonstrate that the land is, or can be made, safe and suitable for the proposed new use."*

Guidance, Standards and Legislation

10.2.2.6 The following guidance is relevant to this Chapter:

- NatureScot (2022) General Pre-Application Guidance for Solar Farms[2];
- The Scottish Government (2009) The Scottish Soil Framework[3];
- The Scottish Office (1996) Planning Advice Note (PAN) 50 – Controlling the Environmental Effects of Surface Mineral Working[4];
- Construction Industry Research and Information Association (CIRIA) (2023) C741 Environmental Good Practice on Site[5];
- The Waste Management Licensing (Scotland) Regulations 2011[6];

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[2] NatureScot (2022) – General pre-application and scoping advice for solar farms [Online]. Available at: General pre-application and scoping advice for solar farms | NatureScot [Accessed March 2025]
[3] The Scottish Government (2009) The Scottish Soil Framework [Online]. Available at: http://www.gov.scot/Publications/2009/05/20145602/0 [Accessed March 2025].
[4] The Scottish Office (1996) Planning Advice Note (PAN) 50 – Controlling the Environmental Effects of Surface Mineral Working. [Accessed March 2025]
[5] CIRIA (2023) Environmental Good Practice on Site Guide (Fifth Edition) [online]. Available at: https://www.ciria.org/ItemDetail?iProductCode=C811D&Category=DOWNLOAD&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91 [Accessed March 2025]
[6] Scottish Government 2011, The Waste Management Licensing (Scotland) Regulations 2011. https://www.legislation.gov.uk/sdsi/2011/9780111012147/contents. [Accessed March 2025]

- BS 10175:2011+A2:2017 (2017) "Investigation of potentially contaminated sites. Code of practice"[7]; and
- CIRIA:C552 (2001) – Contaminated Land Risk Assessment – a guide to good practice[8].

10.2.3 Scoping and Consultation

10.2.3.1 To inform the scope of the assessment for the Proposed Development, consultation was undertaken with statutory and non-statutory bodies through early consultation and a formal EIA scoping process.

10.2.3.2 Full details of the consultation process and responses are included in **Chapter 4: EIA Methodology.**

10.2.3.3 Specific scoping responses, relevant to the geology and soils environment, are provided in **Table 10.1**.

[7] BS 10175:2011+A2:2017 (2017) "Investigation of potentially contaminated sites. Code of practice". British Standards Institution. [Accessed March 2025]
[8] CIRIA (2001) – CIRIA:C552 Contaminated Land Risk Assessment – a guide to good practice. [Accessed March 2025]

TABLE 10.1 SCOPING RESPONSES AND CONSULTATION

CONSULTEE	TYPE AND DATE	SUMMARY OF CONSULTATION RESPONSE	EIA/DESIGN RESPONSE TO CONSULTEE
Energy Consents Unit (ECU)	Scoping Opinion 29th January 2025	Scottish Ministers consider that there is a requirement for peat landslide hazard and risk assessment (PLHRA). Where a PLHRA is not required clear justification for not carrying out such a risk assessment is required.	A UK Habitat Classification Survey has since been undertaken. Results from these surveys found no habitats associated with National Vegetation Classification (NVC) communities that are indicative of potential peatland and that the Site was predominantly modified grasslands, arable fields and grazing pastures with some small areas of broadleaved woodland. These site surveys, in addition to a review of the relevant desk-based resources, confirmed the absence of peat and peatland-forming vegetation across the Site; therefore, peat assessments were scoped out of this EIA. Full Habitat Survey results are included in **Chapter 8, Technical Appendix 8.1: Habitat Survey Report**.
Scottish Borders Council	Scoping Response 3rd April 2025	The Contaminated Land Officer advises notes the former uses of the site including a refuse tip, agricultural uses and a sheepwash. It highlights a desk study/preliminary risk assessment has already been undertaken by Argyll Environmental. Table 8.7 notes risks to the water environment will be scoped out of the assessment, however the rationale for this contradicts the subsequent discussion in Table 9.1 which acknowledges the former potentially contaminative uses of the site. This would likely be addressed by the standard CL condition, and which would require appropriate consideration of all statutory receptors, including the water environment."	All statutory receptors, including the water environment, have been considered within the Phase 1 contaminated land assessment detailed in **Section 10.3**.

CONSULTEE	TYPE AND DATE	SUMMARY OF CONSULTATION RESPONSE	EIA/DESIGN RESPONSE TO CONSULTEE
Scottish Environment Protection Agency (SEPA)	Scoping Response 10th December 2024	To avoid delay and potential objection the EIA submission must contain a series of scale drawings of sensitivities, including peat depth survey maps with probe locations and peat depth interpolation. The detailed series of layout drawings above should demonstrate that development proposals avoid any near natural peatland, and all excavation is on peat less than 1m deep.	Assessment of desk-based sources and the UK Habitat Classification Survey results indicate that there is no evidence of peat across the Site. Therefore, the assessment of peat (and the associated PLHRA and PMP) has been excluded from this Chapter.*
		SEPA note that impacts on peat are scoped out of further assessment and that the justification for this relies on the Carbon and Peatland Map (2016) showing no Class 1 or Class 2 peatland within 500m of the Site. We are of the view that currently, insufficient information has been provided to support this topic being scoped out of EIAR. High resolution (phase 1) peat probing must be carried out in order to determine whether peat or other carbon-rich soils (as defined in NPF4) are present on site.	A UK Habitat Classification Survey has since been undertaken by the ERM Ecology team. Results from these surveys found no habitats associated with National Vegetation Classification (NVC) communities that are indicative of potential peatland and that the Site was predominantly modified grasslands, arable fields and grazing pastures with some small areas of broadleaved woodland. These site surveys confirmed the absence of peatland across the Site. Therefore, using the survey results in addition to the evidence from desk-based resources, peat probing is not deemed necessary and peat assessments will not be undertaken as part of this Chapter.*
		The Outline Peat Management Plan (PMP) must include volumes of acrotelmic, catotelmic and amorphous peat to be excavated, details of temporary storage and handling of peat.	Assessment of desk-based sources and the UK Habitat Survey results indicate that there is no evidence of peat across the Site. Therefore, the assessment of peat (and the associated PLHRA and PMP) has been excluded from this Chapter.*
	Response to Further Consultation 16th May 2025	Habitat maps provided by ERM do not show any habitats associated with peat formation, and therefore SEPA accept the scoping out of peat from the assessment.	Response Noted. No further action required.

CONSULTEE	TYPE AND DATE	SUMMARY OF CONSULTATION RESPONSE	EIA/DESIGN RESPONSE TO CONSULTEE
		The site is predominantly grassland which is considered to be a carbon store however on the basis that values from Scotland's Soil indicate topsoil organic carbon concentration to be less than 6% on the site we are also content for Carbon Rich Soils to be scoped out.	

*Further consultation was undertaken with SEPA on the 4th March 2025 regarding the exclusion of peat assessments and peat probing surveys, seeking confirmation that the proposed justification is appropriate. The consultation included the UK Habitat Classification Survey Results that had been collected by the ERM Ecology team. These results, in addition to the desk-based resources, all confirmed that peat is absent across the Site and that further assessment is not considered to be required. As detailed in Table 10.1, SEPA responded on 16th May 2025 with acceptance of this approach and acknowledged that peat and carbon-rich soils are scoped out of this assessment.

10.2.4 Potential Impacts Assessed in Full

10.2.4.1 The following effects on soils, peat and geology related to the Site are considered within this Chapter due to the potential for significant effects as agreed during the consultation and scoping process:

- Potential effects relating to loss and compaction of soils;
- Potential effects relating to soil as waste material;
- Potential effects relating to the potential contaminated land associated with former land uses and coal mining; and
- Potential effects relating to bedrock geology.

10.2.4.2 The effects of the Proposed Development on agricultural land have been considered in **Chapter 13: Socioeconomics, Land Use, Tourism and Recreation**.

10.2.5 Issues Scoped Out of Assessment

10.2.5.1 The following effects have been scoped out of the assessment:

- Potential effects relating to loss and compaction of peat;
- Potential effects relating to the disturbance of peat and the subsequent effects from excavated peat and management of peat and peaty soils;
- Potential effects relating to the peat instability and peat slide risk;
- Potential effects relating to soil as waste material;
- Potential effects relating to geological statutory designations;
- Potential transboundary effects; and
- Potential effects relating to the cumulative impact during construction and operation.

10.2.5.2 As detailed previously in **Table 10.1**, UK Habitat Classification surveys have been undertaken (full results are included in **Chapter 8, Technical Appendix 8.1: Habitat Survey Report**). The results of these surveys found no habitats that are associated with NVC communities that are indicative of potential peat-forming habitats. The habitats identified across the Site were predominantly modified grasslands, arable fields and grazing pastures with some small areas of broadleaved woodland. These site surveys did not identify any areas of peatland or peat-forming habitats/vegetation. In addition, further review of desk-based resources across the Site (2016 Carbon and Peatland Map[9], Scottish Soils Mapping[10],

[9] Scottish Natural Heritage, Carbon Peatland Map 2016, available at https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/ [Accessed March 2025]
[10] James Hutton Institute, National soil map of Scotland, available at: https://soils.environment.gov.scot/maps/ [Accessed March 2025]

British Geological Society[11]) indicate that the Site is underlain by mineral soils and/or brown earths and that no peat is present across the Site.

10.2.5.3 Therefore, using the information and resources detailed above, the assessment of peat has been excluded from this Chapter and no peat focused assessments will be undertaken across the Site (i.e. Peat Landslide Hazard and Risk Assessment and an outline Peat Management Plan).

10.2.5.4 In addition, cumulative impacts relating to adjacent developments have been scoped out of this assessment. Geology and soils are considered to be site-specific, localised receptors which are not influenced by external factors in the surrounding area. Therefore, cumulative developments will not affect the geology and soils across the Site.

10.2.6 Desk Study

10.2.6.1 A review of baseline data has been undertaken using publicly available information and open-source data from a range of sources to evaluate potential short- and long-term impacts that the Site may have on the geological environment.

10.2.6.2 The data review included:

- Ordnance Survey (OS) 1:50,000 and 1:25,000 scale mapping;
- NatureScot (formerly Scottish National Heritage (SNH)) SiteLink[12];
- British Geological Survey (BGS) Onshore GeoIndex[11];
- Natural England MAGIC map online viewer[13];
- Scotland's Environment web-based maps[14];
- NatureScot (formerly Scottish National Heritage (SNH)) Carbon and Peatland 2016 Map[9];
- James Hutton Institute, The National Soils Map of Scotland (1:250,000)[10];
- The Coal Authority Interactive Map[15];
- Zetica Unexploded Ordnance (UXO) Desk Study & Constraints Assessment[16];

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[11] British Geological Survey GeoIndex (onshore), available at https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ [Accessed March 2025]
[12] Nature Scot SiteLink, available at https://sitelink.nature.scot/home [Accessed March 2025]
[13] Natural England MAGIC Map, available at: https://magic.defra.gov.uk/MagicMap.aspx [Accessed March 2025]
[14] Scotland's Environment (various) Scotland's Environment Web Map, available at: https://www.environment.gov.scot/ [Accessed March 2025]
[15] Coal Authority Interactive Map (2024), available at: https://datamine-cauk.hub.arcgis.com/ [Accessed March 2025]
[16] Zetica UXO (2024), available at: https://zeticauxo.com/guidance/risk-maps/ [Accessed March 2025]

- National Library of Scotland Historical Maps[17];
- Argyll Environmental Site Solutions Report[18]; and
- Landmark Envirocheck Report[19].

10.2.7 Methodology for the Assessment of Effects

10.2.7.1 The assessment of effects is based on the Site design detailed in **Chapter 3: Development Description**. The assessment considers the sensitivity of the receptor and the potential magnitude of impact to conclude whether the effect is significant.

Sensitivity of Receptors

10.2.7.2 The sensitivity of the baseline conditions, including the importance of environmental features on or near to the Site of the sensitivity of potentially affected receptors, was assessed in line with best practice guidance, legislation, statutory designations and/or professional judgement.

10.2.7.3 **Table 10.2** details the framework for determining the sensitivity of receptors.

TABLE 10.2 FRAMEWORK FOR DETERMINING THE SENSITIVITY OF RECEPTORS

SENSITIVITY OF RECEPTOR	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	Soil type and associated land use are highly sensitive (e.g., peat/blanket bog); Class 1 or 2 priority peatland, carbon-rich and peaty soils cover >20% of the development area; Areas containing geological or geomorphological features considered to be of national importance (e.g., geological SSSIs); and Receptor contains areas of regionally important economic mineral deposits.
Medium	Soil type and associated land use are moderately sensitive (e.g., commercial forestry); Class 1 or 2 priority peatland, carbon-rich and peaty soils cover <20% of the Development Area;

[17] National Library of Scotland (2025) Historic Maps Side by Side Viewer. Available at: https://maps.nls.uk/geo/explore/side-by-side/#zoom=5.0&lat=56.00000&lon=-4.00000&layers=1&right=ESRIWorld [Accessed March 2025].
[18] Landmark Information Group (2023) Argyll Environmental Site Solutions Report. Report Reference: 312901375.
[19] Landmark Information Group. 2024. "Envirocheck Report for site at Bowshiel, UK. Order Number: 371212818". [Accessed March 2025]

SENSITIVITY OF RECEPTOR	DEFINITION
	Class 3 and 5 peatland areas, carbon rich and peaty soils; Receptor contains areas of locally important economic mineral deposits; and Areas containing geological features of designated regional importance.
Low	Geological features or geology not protected and not considered worthy of specific protection; Soil type and associated land use not sensitive to change in hydrological regime (e.g., intensive grazing); and Receptor contains Class -2, -1, 0, and 4 non-peatland areas, with no carbon-rich.
Negligible	The receptor is resistant to change and is of little environmental value.

Magnitude of Impact

10.2.7.4 The potential magnitude of impact would depend upon whether the potential impact would cause a fundamental, material or detectable change. In addition, the timing, scale, size and duration of the potential impact resulting from the Site are also determining factors.

10.2.7.5 The magnitude of impact was identified through consideration of the Proposed Development, the degree of change to baseline conditions predicted as a result of the Proposed Development, the duration and reversibility of an effect and professional judgement, best practice guidance and legislation.

10.2.7.6 The criteria for assessing the magnitude of impact are presented in **Table 10.3**.

TABLE 10.3 FRAMEWORK FOR DETERMINING THE MAGNITUDE OF IMPACT

SENSITIVITY OF RECEPTOR	DEFINITION
High	Major or total loss of or alteration to peatland resource such that post development characteristics or quality will be fundamentally or irreversibly changed; Long term/permanent change to human or environmental health; Catastrophic failure of site infrastructure due to ground instability; Long term/permanent change to baseline resource; and Major or total loss of a geological site or mineral deposit, where the value of the site would be severely affected.
Medium	Loss of, or alteration to the baseline resource such that post development characteristics or quality will be partially changed; Mid-term/permanent change to human or environmental health;

SENSITIVITY OF RECEPTOR	DEFINITION
	Ground failure that requires remediation but does not cause catastrophic failure of site infrastructure; Mid-term/permanent change to baseline resource; and Partial loss of a geological site or mineral deposit, with major effects to the settings, or where the value of the site would be affected.
Low	Small loss of soils or peatland, or where soils will be disturbed but the value not impacted; Short-term change to human or environmental health; Ground settlement/subsidence that does not adversely affect site infrastructure or require remedial action; Short-term change to baseline resource; and Small effect on a geological site or mineral deposit, such that the value of the site would not be affected.
Negligible	Minimal or no change to soils or peatland deposits; Minimal or no change to human or environmental health; Minimal or no change to ground stability; A very slight change from the baseline conditions. The change is barely distinguishable, and approximates to the 'no-change' situation; and Minimal or no change to a geological site or mineral deposit.

Significance of Effect

10.2.7.7 The significance of the effects of the Proposed Development have been assessed by considering the sensitivity of the receiving environment and the potential magnitude of impact, should that effect occur.

10.2.7.8 This approach allows for identification of the areas where mitigation measures are required and for the identification of mitigation measures appropriate to the significance of likely effects presented by the Proposed Development.

10.2.7.9 The sensitivity of the receptors and the predicted magnitude of impact was used as a guide, in addition to professional judgement, to predict the significance of the likely effects. **Table 10.4** summarises guideline criteria for assessing the Significance of Effects.

TABLE 10.4 FRAMEWORK FOR ASSESSMENT OF THE SIGNIFICANCE OF EFFECTS

MAGNITUDE OF IMPACT	SENSITIVITY OF RESOURCE OR RECEPTOR				
	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

10.2.7.10 Effects predicted to be of major or moderate significance are considered to be 'Significant' in the context of the EIA Regulations.

Limitations of the Assessment

10.2.7.11 A variety of sources and information have been consulted to provide an understanding of the Study Area, including publicly available data sources, commercial data supply companies and additional information supplied from stakeholders during the scoping and consultation stages.

10.2.7.12 One limitation is that the desk-based assessments use large scale mapping which does not necessarily include the localised environment and minor variations in ground conditions. In addition, as mentioned previously, no peat or soil data was collected across the Site due to the extensive presence of farmland and mineral soils and the absence of peatland vegetation.

10.2.7.13 Notwithstanding the above, it is considered that the data and information used to complete this assessment is robust and that there are no significant data gaps or limitations.

10.3 Baseline Conditions

10.3.1.1 This section of the Chapter outlines the present conditions which form the existing baseline environment for geology and soils within the Study Area. For the full description of the Proposed Development, refer to **Chapter 3: Development Description**.

10.3.2 Statutory Designations

10.3.2.1 Review of the NatureScot SiteLink[12] indicates that there are no statutory designations across the Site relating to geology and soils.

10.3.3 Land Use, Topography and Slope

10.3.3.1 The predominant land uses across the Site are agricultural land, predominantly pasture fields with localised arable fields in the east and southwest. The main farmhouse and

associated buildings are situated in the central area of the Site and there are localised areas of woodland adjacent to the farm and across a minor area in the eastern extents of the Site.

10.3.3.2 Surface water drainage flow across the Site is predominantly north to south. The south of the Site is drained by two unnamed tributaries of the Pease Burn. In addition, a small unnamed burn flows north from the Site. It discharges into another unnamed burn before linking with the main stem of the Pease Burn. The main channel of the Pease Burn flows north along the eastern boundary of the Site where it ultimately discharges into the Firth of Forth approximately 2.5 km downstream of the Site.

10.3.3.3 OS mapping indicates that the Site is situated on the east and southeastern flanks of Ewieside Hill. The Site generally slopes from the northwest down to the east, south and southwest. The highest elevation across the Site is approximately 230m AOD in the northwest of the Site and the lowest elevation across the Site is approximately 120m AOD in the eastern extents adjacent to the Pease Burn.

10.3.3.4 In general, the Site is situated across gentle to moderate slopes. Gentle slopes and flatter expanses are situated across the north, northwest and central areas of the Site. Steep slopes are present in the northeast, east, southeast and west of the Site, generally associated with the surface watercourse valleys.

10.3.4 Soils

10.3.4.1 The 1:250,000 National Soil Map of Scotland[10] indicates that the Site entirely underlain by brown earths soil.

10.3.4.2 Soil Mapping across the Site is detailed in full in **Figure 10.4**.

10.3.5 Carbon-rich Soils, Deep Peat and Priority Peatland Habitats

10.3.5.1 Review of the Carbon and Peatland 2016 Mapping[9] indicates that the Site is mapped entirely as mineral soils (Class 0) where peatland habitats are not typically found. There are no areas of Class 1 and 2 priority peatland habitats or deep peat mapped across the Site.

10.3.5.2 Carbon and Peatland Mapping across the Site is detailed in full in **Figure 10.5.**

10.3.6 Superficial Geology

10.3.6.1 The BGS GeoIndex[11] Superficial Geology Mapping indicates that Devensian Glacial Till (Diamicton) is mapped across the south and east of the Site. These deposits are comprised of a heterogeneous mixture of clay, sand, gravel and potential boulders.

10.3.6.2 In addition, alluvial deposits are present localised areas in the south of the Site, predominantly concentrated at or adjacent to the Pease Burn watercourse.

10.3.6.3 Areas in the north, west, east and centre of the Site are absent of any mapped superficial deposits, indicating potential bedrock at or near surface.

10.3.6.4 Superficial Geology across the Site is detailed in full in **Figure 10.2**.

10.3.7 Bedrock Geology

10.3.7.1 The BGS GeoIndex[11] Bedrock Geology Mapping indicates that the entirety of the Site is underlain by the Gala Group. This formation is comprised of sedimentary rocks including wacke sandstone, siltstone and mudstone.

10.3.7.2 Bedrock Geology across the Site is detailed in full in **Figure 10.3**.

10.3.8 Linear Features

10.3.8.1 BGS GeoIndex[11] indicates that there are no mapped linear features or faults across the Site.

10.3.9 Hydrogeological Conditions

10.3.9.1 From review of BGS GeoIndex Hydrogeology Maps[11], there is one major bedrock aquifer underlying the Site named the Gala Group. This aquifer is classed as low productivity, comprised of highly indurated greywackes with limited groundwater in near surface weathered zones and secondary fractures.

10.3.9.2 In addition, Scotland's Environment Web map[14] indicates that Site is underlain by the St Abbs groundwater body (ID 150597), classed as a low productivity aquifer with dominant fracture flow.

10.3.10 Mines and Quarries

10.3.10.1 According to BGS GeoIndex[11], there are three recorded historic mines located in the northwest of the Site, named Ewieside Hill Quarries. Outwith the Site, Glenfin Quarries are located to the north and northwest of the Site with two historic sites mapped to the north of the Site within Gledstane Forest and four historic sites mapped to the northwest.

10.3.10.2 The Coal Authority Interactive Map Viewer[15] indicates that the Site is not situated within a coal mining reporting area and is therefore not considered to be at risk from coal mining activities.

10.3.11 Unexploded Ordnance (UXO)

10.3.11.1 A Preliminary Desk Study Assessment for the Site was completed by Zetica[16] to assess the UXO Risk on the Site. This assessment found the following that could pose a risk of UXO:

- One British fighter-bomber aircraft crashed within the Site boundary;
- One Auxiliary Unit Operational Base (AUOB) was established near Penmanshiel, in the immediate vicinity of the Site; and
- Ad-hoc military training is known to have been undertaken in rural areas of Berwickshire during WWII.

10.3.11.2 However, according to the UXO Bomb Risk Maps, the Site is situated in an area of low risk with an estimate of 15 bombs or less per 1000 acre area. Precautions will be taken across

the Site prior to breaking ground, and the appropriate subsurface clearance and UXO scanning should take place to ensure the ground conditions are safe to excavate.

10.3.12 Phase 1 Contaminated Land Assessment

10.3.12.1 During the scoping stages, a full review of the Site was undertaken and key resources were consulted, such as historic maps[17] and the Coal Authority website[15], to identify any potential contaminative sources. From the historical review, it was concluded that there was no history of mining or water/waste treatment facilities that could have led to contamination within the Site boundary. However, an agricultural landfill was identified in the northwestern area of the Site. A sheep wash has also been identified on the farm in the central area of the Site which may have been used for the chemical dipping of livestock. Therefore, there is an associated risk of contamination within the area associated with organophosphates or similar chemicals. In addition, bordering the northwestern extents of the Site, Glenfin Quarry is present which may have resulted in contamination of the land within northwest of the Site due to the proximity.

10.3.12.2 Therefore, a targeted Phase 1 Contaminated Land Assessment has been undertaken across the Site, encompassing the key areas of concern within the northwest and central farm area of the Site. It is considered that the remainder of the Site, outwith these defined areas, is not at risk of significant contamination from historic activities.

10.3.12.3 Information from a 2025 Envirocheck Report[19] was used, which targeted the key areas of concern in the northwest and central areas of the Site, in addition to the area of quarrying that borders the northwestern boundary of the Site. In addition, information from an Argyll Environmental Site Solutions Report[18] (2023) was reviewed, which assesses the entirety of the Site.

10.3.12.4 For avoidance of doubt, the targeted area in the northwest and central sections of the Site that has been used for the Envirocheck Report has been referred to as the 'assessment area' throughout this Phase 1 Contaminated Land assessment. This area is shown in Appendix A.

The Site

10.3.12.5 The targeted assessment area situated across areas of the northwest and central areas of the Proposed Development, in addition to the area of quarrying outwith the northwestern boundary, comprises approximately 26.75 Ha of land located to the south of the village of Cockburnspath. The predominant land uses across the entirety of the Site are agricultural land, predominantly pasture fields with localised arable fields in the east and southwest. The main farmhouse and buildings are situated in the central area of the Site and there are localised areas of woodland adjacent to the farm and across a minor area in the eastern extents of the Site.

Historical Land Uses

10.3.12.6 Historical Ordnance Survey (OS) Maps and aerial imagery was used from Envirocheck, covering a time period between 1857 and 2025, which are included within Appendix A. **Table 10.5** below summarises the historical review of historical map extracts across the assessment area of the Site and surrounding area within a 500 m buffer.

TABLE 10.5 HISTORICAL REVIEW OF THE SITE AND THE SURROUNDING AREA

YEAR	ASSESSMENT AREA OF THE SITE	SURROUNDING AREA
1857 – 1858	• The central area of the Site was recorded as Bowshiel Farm, with marked stiles, troughs, a dam and a well. Small areas of woodland were also recorded adjacent to Bowshiel Farm. • In the northwestern area of the Site, Whinstone quarries are recorded. • In the north of the assessment area, outwith the Site boundary, Whinstone quarries are recorded.	• The remainder of the Site (outwith the assessment area) was predominantly recorded as unoccupied land conjectured to be agricultural in nature associated with Bowshiel Farm. • Four historical forts (camps) were recorded in the southeast of the Site and one in the southwest. • Pease Burn was recorded to the east and immediate south of the Site. • Whinstone quarries were recorded to the immediate northeast and south of the Site. • A road was recorded to the immediate east of the Site. • The North British Railway was recorded to the east of the Site.
1893 – 1899	• Whinstone Quarries recorded in northwestern area of the Site no longer named, therefore, potentially disused. • The dam adjacent to Bowshiel Farm was recorded as Mill Dam and Peel Tower is recorded to the south of the Dam. • Gledstane Forest is recorded in the north of the assessment area to the north of the Site.	Glenfin Quarry (previously named Whinstone Quarry) was recorded to the immediate northeast of the Site.
1900	The assessment area remains unchanged.	The surrounding area remains unchanged.
1907 – 1908	The assessment area remains unchanged.	The surrounding area remains unchanged.
1957	The assessment area remains unchanged.	The surrounding area remains unchanged.
1968 – 1978	• Quarries located in the northwestern area of the Site no longer recorded or mapped, therefore, potentially been infilled. • A tank and a sheep wash/dip were recorded to the north and east of the farm buildings, and silos have been recorded in the central area of the farm. • The dam to the north of the farm is now recorded as a pond.	Glenfin Quarry recorded as disused.

YEAR	ASSESSMENT AREA OF THE SITE	SURROUNDING AREA
	• Earthworks located in the north of the assessment area have progressed.	
1981 – 1986	The assessment area remains unchanged.	The surrounding area remains unchanged.
1995 – 2001	The assessment area remains unchanged.	The road (A1) to the east of the Site has been further developed.
2006 – 2013	The assessment area remains unchanged.	The surrounding area remains unchanged.
Present Day	• The assessment area remains largely unchanged with Bowshiel Farm, associated agricultural fields and localised areas of woodland. • The historical quarry within the assessment area is no longer recorded and is conjectured to be infilled. • The quarry in the north of the assessment area, to the north of the Site, is recorded as Glenfin Quarry.	The surrounding area remained largely unchanged from the earliest available historical map with minimal development in the area with the exception of the A1 Road to the east.

10.3.12.7 The historical review has concluded that the assessment area and surrounding area have remained largely unchanged since the earliest available historical maps, with minimal development in the area. Bowshiel Farm was present in the central area of the Site since the earliest historical map reviewed (1857). In addition, the quarry within the northwestern area of the Site was recorded in 1858 and is estimated to have been infilled by 1978. Adjacent to Bowshiel Farm, a sheep wash/dip and a tank were recorded from the 1970s onwards. To the north of the Site, within the northern section of the assessment area, earthworks and quarrying were recorded from the earliest historical map.

10.3.12.8 No other contaminative sources were identified outwith the assessment area across the remainder of the Site. Outwith the Site, quarries were recorded from the earliest historical maps to the northeast and south. In addition, railways and major roads such as the A1 have been developed to the east of the Site.

10.3.12.9 Considering all historic land uses, the majority of the Site can be classed as 'greenfield' in nature. However, the assessment area is classified as brownfield due to the historic quarries present, infilled land, potential made ground and potentially contaminative agricultural land uses associated with Bowshiel Farm.

Mining and Quarrying

10.3.12.10 According to the BGS GeoIndex[20], there are no mines located within the Site.

10.3.12.11 In addition, the Coal Authority Interactive Map Viewer[15] indicates that the Site is not situated within a 'Coal Mining Reporting Area' and that there are no historic mine workings across the Site. As such, the Site is not considered to be at risk from coal mining.

10.3.12.12 As discussed within the historical review, quarries were recorded on the earliest historical maps within the northwestern area of the Site. These were no longer recorded after 1978 and are assumed to be infilled with agricultural infill from Bowshiel Farm. This could be a potential source of contamination and/or ground gas.

10.3.12.13 In addition, to the north of the assessment area, Glenfin Quarry was recorded to the outwith the north of the Site. Glenfin Quarry was previously recorded in earlier historic maps as part of the Whinstone quarry series.

10.3.12.14 Outwith the southern extents of the Site, approximately 150m to the south, there is one Man-Made Mining Cavity recorded. The cavity type is 'Not Supplied' and the commodity is stated as oil.

Environmental Considerations and Sensitive/Contaminative Land Uses

10.3.12.15 Information regarding the environmental and engineering considerations for the assessment area was obtained from the Envirocheck Report[19] (included in Appendix B). The report includes information covering potentially sensitive land uses/receptors and industrial land uses, geology, hydrology, hydrogeology, discharge consents, pollution incidents and radon risk.

Sensitive Land Uses

10.3.12.16 The Envirocheck Report indicates that the following sensitive land uses are located across the assessment area of the Site:

- Nitrate vulnerable zones – areas designated as at risk from agricultural nitrate pollution / polluted water; and
- Ancient Woodland - recorded 237 m north and 268 m northeast of the assessment area, defined as ancient and semi-natural woodland.

Industrial Land Uses (Trade Directory Entries)

10.3.12.17 The Envirocheck Report indicates there are no trade directory entries within the assessment area or within 500 m of the assessment area.

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[20] British Geological Survey GeoIndex (onshore), available at https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ [Accessed March 2025]

Discharge Consents

10.3.12.18 There is one discharge consent situated within the northern assessment area at Glenfin Quarry with the location stated as Glenfin Quarry Site Toilet Cockburnspath. This is situated approximately 550m to the north of the Site boundary and was issued by SEPA in 1993. The discharge type is a Non-Water Company (Private) Sewage: Septic Tank and the discharge environment and status are 'Not Supplied'.

10.3.12.19 There is one discharge consent recorded approximately 300 m south of the southern Site boundary. This was issued in 1969 by the Scottish Environment Protection Agency (SEPA) and the discharge type is a Septic tank. The discharge environment and status are 'Not Supplied'.

Water Abstraction

10.3.12.20 The Envirocheck Report indicates that there are no licensed water abstractions onsite or within 500 m of the Site.

Pollution Incidents

10.3.12.21 The Envirocheck Report recorded no pollution incidents to controlled waters or substantiated pollution incidents within 500 m of the Site.

Registered Landfills and Waste Management

10.3.12.22 The Envirocheck Report recorded one Registered Landfill site approximately 59 m to the northeast of the assessment area at Glen Fin, authorised by SEPA in 1991. It is categorised as a landfill and there is no known restriction on the source of waste. This is conjectured to be associated with the Glen Fin quarry.

10.3.12.23 The Local Authority Landfill Coverage is recorded by the Scottish Borders Council within the assessment area. However, there is no recorded landfill data supplied.

10.3.12.24 There are no Waste Transfer sites recorded within 500 m of the assessment area.

10.3.12.25 There is one recorded area of potentially infilled land within the assessment area that is classified as unknown filled ground. This area correlates with the location of the historic quarries within the northwestern area of the Site.

10.3.12.26 There are also three areas of potentially infilled land recorded outwith the assessment area. One is recorded approximately 144 m to the northeast of the assessment area, one approximately 191 m northeast and one approximately 365 m to the south of the assessment area. These areas of infilled land are assumed to be associated with the historical quarries in the locations.

Explosive sites

10.3.12.27 The Envirocheck Report recorded no explosive sites within 500 m of the Site.

Radon Gas

10.3.12.28 According to the UK Radon Map[21] and the Envirocheck report, the entirety of the Site is situated within an area where 1-3% of homes, or lower, are estimated to be at or above the action level. Where this gas occurs under buildings, the external walls may contain it and radon gas may accumulate over time within buildings which can ultimately pose a risk to human health. The amount of radon that collects in a building depends on its location, structure and how it is used[22].

10.3.12.29 According to Public Health England (2019)[23], basic radon protection is required in areas where the potential for homes to exceed the radon action level is 3% or above. Although this guidance is aimed at residential properties, the same conservative approach will be undertaken for proposed buildings that are to be occupied by site end-users across the Proposed Development. In addition, the Scottish Government Building Standards[24] advise that every building must be designed and constructed in such a way that there will not be a threat to the health of people in or around the building due to the emission and containment of radon gas.

10.3.12.30 Since there are proposed buildings across the Site that will be occupied by site users, radon protection measures will be required within any proposed building structures on the Site. These may include ventilation systems or the installation of a membrane to prevent the ingress of radon gas into the buildings.

Geotechnical Considerations

10.3.12.31 The Envirocheck Report indicates that there are several ground stability hazards noted within the assessment area. These are all classified as either 'No Hazard', 'Very Low' or 'Low' hazard potential as defined below:

- Potential for Collapsible Ground Stability Hazards 'Very Low' Hazard Potential;
- Potential for Compressible Ground Stability Hazards – 'No Hazard';
- Potential for Ground Dissolution Stability Hazards – 'No Hazard';
- Potential for Landslide Ground Stability Hazards - 'Very Low' and 'Low' Hazard Potential;
- Potential for Running Sand Ground Stability Hazards – 'No Hazard', 'Very Low' and 'Low' Hazard Potential; and

[21] UK Health Security Agency (2024) UK Radon Map, available at: https://www.ukradon.org/information/ukmaps [Accessed March 2025]
[22] Health and Safety Executive (2025), Radon in the workplace. Available at: https://www.hse.gov.uk/radiation/ionising/radon.htm [Accessed May 2025].
[23] Public Health England (2019) Performance of basic radon protection in new homes [online]. Available at: Performance of basic radon protection in new homes (publishing.service.gov.uk). Accessed [March 2025]
[24] Scottish Government (2025), Building Standards Technical Handbook 2025: Non-Domestic. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-january-2025-non-domestic/ [Accessed May 2025].

- Potential for Shrinking or Swelling Clay Ground Stability Hazards – 'No Hazard' or 'Very Low' Hazard Potential.

10.3.12.32 From the review of this information, ground stability hazards are considered to pose a low risk to the Site.

Potential Contaminative Land Uses

10.3.12.33 Based on information from the historical review and from the review of aerial imagery, it is concluded that the assessment area and surrounding area have not undergone significant changes over the years. The primary land use has remained agricultural with a localised area of quarrying and agricultural landfill in the northwestern area of the Site. In addition, adjacent to Bowshiel Farm buildings, a sheep wash/dip and tank were noted within the assessment area. The sheep wash may have been used for the chemical dipping of livestock, with disposal of spent dip to land being common practice. There is a risk of significant contamination associated with these activities, such as organophosphates or similar chemicals. In addition, due to intense agricultural activities across the Site, there may be the potential for other contaminants associated with the machinery and fuel. Furthermore, there may be a presence of made ground associated with the infilled land and potential contamination and/or ground gas associated with historic quarrying activities.

10.3.12.34 Two manufacturing and production points of interest were recorded within the assessment area, noted as Glenfin Quarry and the sheep dip/wash. The Glenfin Quarry to the immediate north was also recorded as a point of interest. Tanks were also documented within the Envirocheck Report, with one noted directly northeast of Bowshiel Farm buildings in the central area of the Site and one located approximately 323 m northeast of the main farm buildings.

10.3.12.35 Outwith the Site, disused Glenfin Quarries were recorded directly northeast of the Site's northeastern boundary, located within the Gledstane Forestry adjacent to the A1 Road. In addition, two public infrastructure points of interest noted as Dams were recorded 440 m and 441m south of the assessment area, bordering the southern boundary of the Site.

10.3.12.36 There are no Control of Major Accident Hazard Sites (COMAH) or Notification of Installations Handling Hazardous Substances (NIHHS) recorded within 500m of the Proposed Development.

10.3.12.37 There are no Planning Hazardous Substance Consents recorded within 500 m of the Proposed Development.

Conceptual Site Model

Introduction

10.3.12.38 This assessment has been undertaken in accordance with BS 10175 'Investigation of Potentially Contaminated Sites'[7] and the desk-based research has supported the development of a preliminary Conceptual Site Model (CSM). A CSM represents the potential contaminative 'Source-Pathway-Receptor' linkages which could be a hazard or risk to sensitive receptors at the Site or in the surrounding area.

10.3.12.39 The desk study assessment established previous uses, ground conditions, previous ground investigations, and hydrological and hydrogeological environments, taking account of the development Site's end-use.

10.3.12.40 In the context of land contamination, there are three essential elements to any risk:

- Source contaminant – a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of a receptor;
- Pathway – a route or means by which a receptor can be exposed to, or affected by, a contaminant; and
- Receptor – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body.

10.3.12.41 While each of these elements can exist independently, risk exists only in the scenario where there is a pollutant linkage.

Potential Contamination Source

10.3.12.42 The historical map review provides an understanding of the historical uses both across the assessment area and in the surrounding area. This allows an assessment of possible contamination sources to be identified.

10.3.12.43 The historical review indicates that the Site and surrounding area have remained largely unchanged. The primary land use has remained agricultural with a localised area of quarrying and agricultural landfill in the northwestern area of the Site.

10.3.12.44 Agricultural activities may potentially be a source of contamination across the Site. The sheep wash present in the central area of the Site may have been used for the chemical dipping of livestock and presents a risk of significant contamination associated with these activities, such as organophosphates or similar chemicals. Due to years of agricultural practice across the land within the Site, the soils may be contaminated with herbicides and pesticides if these have been utilised over arable fields. Further to this, there may be the potential for other contaminants associated with the farmland machinery and fuel. It should be noted, however, that the Site infrastructure and site design have avoided known areas of contamination such as the tanks and sheep wash area.

10.3.12.45 In relation to the area of quarrying and infilled land within the northwestern area of the Site, there may be potential contamination or ground gas associated with the industrial quarrying activities and a presence of made ground associated with the infilled land. However, it should be noted that the area of infilled land within the Site is not being targeted for proposed infrastructure, therefore, this area should remain undisturbed during the construction phase of the Site.

10.3.12.46 Directly to the north of the Site boundary, the Glenfin Quarry to the northwest and historic quarries to the northeast may be a potential of contamination, especially if they have been infilled with waste material, and these may be a source of ground gas within the Site due to ground gas migration.

10.3.12.47 If any Phase 2 intrusive ground investigations are to occur across the Site, pesticides and herbicides should be tested for, in addition to hydrocarbons and chemicals associated with the sheep wash, such as organophosphates. In addition, ground gas should be tested.

10.3.12.48 Vigilance should be maintained for potential unrecorded contamination sources during any future assessments and intrusive site works across the Site.

10.3.12.49 **Table 10.6** provides a summary of the potential contamination sources that could be present on the Site associated with current and historical uses.

TABLE 10.6 POTENTIAL CONTAMINATION RISKS AT THE SITE AND THE SURROUNDING AREA

SOURCE	POTENTIAL RISK	POTENTIAL CONTAMINANTS AND / OR CONSIDERATIONS
Contaminated soils associated with tanks, sheep wash, quarrying, infilled ground/ probable made ground, herbicides and pesticides at the Site and surrounding areas.	Potential for risk to site personnel, construction materials and groundwater systems from contaminated soil beneath the Site.	Hydrocarbons, organophosphates, herbicides, pesticides and ground gases.
Contaminated groundwater associated with tanks, sheep wash, quarrying, infilled ground/ probable made ground, herbicides and pesticides at the Site and surrounding areas.	Potential for risk to site personnel, construction materials and groundwater systems from contaminated soil beneath the Site.	Hydrocarbons, organophosphates, herbicides and pesticides.
Potentially harmful ground gases from quarrying, infilled ground, potential made ground and agricultural activities.	Potential for risk to site personnel, construction materials and structures within the Site.	Potentially hazardous ground gases including Methane, Carbon Dioxide, Radon and Carbon Monoxide.

Potential Pathways

10.3.12.50 Based on the proposed Solar and BESS end-use, the following potential pathways outlined in **Table 10.7** are considered for the newly constructed area.

TABLE 10.7 POTENTIAL CONTAMINATION PATHWAYS

POTENTIAL PATHWAYS	DESCRIPTION OF PATHWAY
Dermal Contact	Skin contact with soils, dust or water
Ingestion	Potential for risk to site personnel, construction materials and groundwater systems from contaminated soil beneath the Site.
Inhalation	Potential for risk to site personnel, construction materials and structures within the Site.
Mobilisation and Leaching of Contaminants	Mobilisation of contamination through leaching of contaminants from soil to surrounding groundwater

POTENTIAL PATHWAYS	DESCRIPTION OF PATHWAY
Degradation of Materials through Direct Contact	Corrosion and breakdown of any potential buried structures and services
Potentially Hazardous Ground Gas	Generation and migration of ground gases from soils or rock, potentially leading to asphyxiation, explosion and/or fires

Potential Receptors

10.3.12.51 Potential receptors associated with the Proposed Development include:

- Site personnel during construction phase;
- End-users including site visitors and infrastructure occupants;
- Adjacent land users;
- Water environment – groundwater aquifer and surface watercourses such as Pease Burn; and
- Construction materials – potential buried structures and services, future concrete foundations and water supply pipes.

10.3.12.52 The Envirocheck Report indicates that there are several recorded ground stability hazards within the assessment area of the Site, however, all of these are classed as either 'No Hazard' or 'Very Low' Hazard risk.

Risk Assessment

10.3.12.53 This desk study includes a preliminary qualitative contamination risk assessment carried out for the assessment area of the Site using the findings of the desk study.

10.3.12.54 The Proposed Development will comprise a Solar PV Array, an electrical substation, Battery Energy Storage System, access roads and other associated infrastructure.

10.3.12.55 The risk assessment has been carried out in line with current UK guidance, CIRIA Report C552 'Contaminated Land Risk Assessment – a guide to good practice'[8], adopting the Source-Pathway-Receptor assessment principle based on a Conceptual Site Model developed for the Proposed Development.

10.3.12.56 The Conceptual Site Model is presented further below. This details the potential connectivity between potential sources, pathways and receptors. A pathway must be present for the source to provide any risk to any given receptor. The magnitude of any such risk is assessed by considering the vulnerability of the receptor and the possible impact of the source.

Identification of Hazards

10.3.12.57 Shallow subsurface excavations are proposed to take place across areas where new access roads are proposed and for infrastructure foundations such as the solar panel mounts, substation and BESS.

10.3.12.58 On this basis, risk from contamination for construction personnel, construction materials and end-users must be considered.

10.3.12.59 It is important to consider the implications of any contamination and potential pathways to the surrounding area, therefore, risks associated with adjacent land users and ecological receptors must be considered.

Identification of Pollutant Linkage

10.3.12.60 The potential receptors and exposure pathways considered are summarised below.

- Site users/construction personnel – dermal contact with contaminated soil and inhalation of dust, vapours or ground gas;
- Site end-users – inhalation of vapours or ground gas, accumulation and explosion of any ground generating gas within confined spaces;
- Ecological Receptors – planting, flora and fauna;
- Adjacent land-users – inhalation of dust or vapours during construction works;
- Water environment – leaching of contaminants from soil to underlying groundwater via lateral or vertical migration through drift deposits;
- Construction materials – degradation of construction materials due to aggressive contaminants within soil or groundwater; and
- Buried utilities and water supply pipes – corrosion of utilities and potential permeation into water supply.

Risk Assessment

10.3.12.61 The risks identified as having potential to affect receptors have been assessed through a preliminary qualitative risk assessment based on the guidance provided in the CIRIA C552 guidance[8], as shown in **Table 10.8** and **Table 10.9** below.

TABLE 10.8 RISK CLASSIFICATION MATRIX

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Likelihood	**High Likelihood**	Very High	High	Moderate	Moderate / Low
	Likely	High	Moderate	Moderate / Low	Low
	Low Likelihood	Moderate	Moderate / Low	Low	Very Low
	Unlikely	Moderate / Low	Low	Very Low	Very Low

TABLE 10.9 RISK CLASSIFICATION DEFINITION

RISK CLASSIFICATION	DEFINITION
Very High	Avoid project development at these locations.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

10.3.12.62 **Table 10.10** summarises the possible source-pathway-receptor relationships and estimates the consequence and probability of the risks posed. Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations.

10.3.12.63 Although sources of potential contamination have been identified across the Site, the Proposed Development design has avoided these areas so that any potential contaminated ground will remain undisturbed.

10.3.12.64 Risk to site end-users being exposed to soil contamination is classified as Low given that the potential primary sources of contaminated land have been avoided by design and that, once constructed, there will be limited activity across the Proposed Development that requires subsurface excavation. Although potential contaminative sources have been avoided by design, areas of the ground across the Proposed Development will be resurfaced for areas of infrastructure which will introduce a barrier against any potential underlying contamination.

10.3.12.65 Activities on the Proposed Development should be restricted to equipment and infrastructure maintenance and monitoring the continued operation of the Proposed Development. In addition, during the decommissioning phase, it is not anticipated that there will be any additional risks to site end-users as the same ground will be disturbed as the construction phase.

10.3.12.66 As discussed previously, potential contamination may have resulted from agricultural activities at Bowshiel Farm, including the sheep wash, tanks and use of herbicides and

pesticides, in addition to potential contamination associated with the infilled quarry in the northwest of the Site. Any potential contaminants could be leaching into the surface watercourses or the groundwater underlying the Site. The bedrock aquifer underlying the Site is classed as low productivity and permeability, which lowers the risk of potential contaminants migrating and leaching within the groundwater across the bedrock strata. Cohesive soils with generally low permeability act as a barrier to any potential contaminants at the Site. A Moderate risk remains, however, and leachate or groundwater testing is advised as part of any future ground investigations to determine the presence of any unacceptable risk at the Site.

10.3.12.67 It could be likely that the construction materials proposed for use in the Site could come into contact with aggressive ground conditions, such as elevated pH or sulphates, or contamination from historical activities associated with Bowshiel Farm and/or the infilled quarries. Ground contamination can be detrimental to water supply pipes by corroding joints which can lead to contaminants entering the water supply systems, ultimately affecting Site end-users. However, it should be noted that the primary contaminative sources identified across the Site have been avoided by design, therefore limiting the risk of infrastructure exposure to contaminated soil. Considering all factors, the risk posed to building materials on Site can be classified as Low.

TABLE 10.10 PRELIMINARY CONCEPTUAL SITE MODEL

POTENTIAL RECEPTOR	POTENTIAL SOURCE	POTENTIAL PATHWAY	CONSEQUENCE OF RISK	LIKELIHOOD OF RISK	LEVEL OF RISK (WITHOUT MITIGATION)	MITIGATION AND BEST PRACTICE GUIDANCE	RESIDUAL RISK (POST-MITIGATION)
Site Personnel	Potential made ground associated with Bowshiel Farm agricultural activities/sheep wash / tanks / herbicides and pesticides/infilled quarries and potential made ground.	Direct dermal contact, ingestion, inhalation of soil / water / dust / vapours.	Medium	Likely	Moderate	There are no Control of Major Accident Hazard Sites (COMAH) or Notification of Installations Handling Hazardous Substances (NIHHS) recorded within 500m of the Site. In addition, there are no pollution incidents recorded within 1km of the Site. However, historical mapping indicates that the presence of tanks, a sheep wash and also infilled quarries may be sources of contamination. The Proposed Development design has sought to avoid these areas to prevent disturbance of contaminated land. Although the Proposed Development has avoided the potential sources of contamination by design, vigilance should still be maintained across the Site and a conservative approach has been applied. Therefore, it has been considered likely that site personnel will be exposed to contamination during the construction phase of the Proposed Development. This is especially prevalent adjacent to areas of higher risk including the sheep wash, tanks and infilled ground. Vigilance should be maintained for potential unrecorded contamination sources during any future assessments and or potential site investigations. In the event that potentially contaminated materials are encountered, samples should be taken and a subsequent risk assessment and remediation strategy may be required.	Moderate/Low
	Ground gases associated with potential made ground from quarrying and infilled land / radon gas.	Inhalation of ground generating gases such radon, carbon dioxide, hydrogen sulphide, methane or depleted oxygen.	Medium	Low	Moderate/Low	There is a potential for ground gases from infilled quarries and potential made ground within the Site. Gas monitoring may be required to determine if these areas should be classified as a 'Characteristic Situation 2', whereby ground gas protection measures are required. However, since the main contaminative sources have been avoided by design, it is not anticipated that the Proposed Development will be affected by harmful ground gases from infilled quarries or made ground. In addition, it is not anticipated that site personnel will be in enclosed spaces where harmful gases may accumulate. The Radon UK map has indicated the Site is within an area where between 1 and 3% of homes are estimated to be at or above action level. During the construction phase, there will not be any deep or enclosed excavations where radon gas may accumulate and pose a risk to human health. Radon gas is only considered a risk in areas of infrastructure which may allow for the accumulation of the gas from the subsurface (i.e. buildings). Since buildings are proposed across the Proposed Development that will be occupied by site users, radon protection measures will be required within building structures on the Site. These may include ventilation systems or the installation of a membrane to prevent the ingress of radon gas into the buildings.	Low
Site end-users	Potential made ground or contamination associated with Bowshiel Farm/sheep wash / tanks / infilled quarries/herbicides and pesticides.	Direct dermal contact, ingestion, inhalation of soil / dust / water / vapours.	Medium	Unlikely	Low	The risks of soil contamination to site end-users being exposed is classified as Low given that, once constructed, there will be limited activity on the Site that requires excavation, and the resurfacing of the ground creates a barrier against any potential underlying contamination. It is considered that the pathway will be inactive in terms of end user risk, as any hydrocarbons or any other potential contamination will be contained below the hard standing. Throughout areas of open infrastructure outwith buildings (e.g. solar panels), it is not anticipated that there will be activity that requires excavation across the Proposed Development during the operational phase, therefore, any potential contaminated land will remain undisturbed and will not affect site end-users. Activities across the Site should be restricted to equipment and infrastructure maintenance and monitoring the continued operation of the Site. It is understood that when end-users enter the Site intermittently, appropriate PPE should be worn and good	Very Low

POTENTIAL RECEPTOR	POTENTIAL SOURCE	POTENTIAL PATHWAY	CONSEQUENCE OF RISK	LIKELIHOOD OF RISK	LEVEL OF RISK (WITHOUT MITIGATION)	MITIGATION AND BEST PRACTICE GUIDANCE	RESIDUAL RISK (POST-MITIGATION)
						site hygiene should be observed at all times, this may include the use of hand protection. In addition, no work within confined spaces is anticipated.	
	Ground gases associated with contamination or potential made ground	Inhalation of ground generating gases such as carbon dioxide, hydrogen sulphide, methane or depleted oxygen.	Medium	Unlikely	Low	The potential presence of made ground at the Site may have resulted in elevated ground gases within the assessment area. This may result in vapour ingress to structures which may expose site end-users. However, areas of potential contamination have been avoided by design, limiting the potential risk to site end-users. As indicated previously, the Radon UK map has indicated the Site is situated in an area above the radon action level. Following construction of the Site and implementation of radon protective measures within occupied buildings, it is not anticipated that there will be any risk relating to radon gas across the Proposed Development. In open areas of infrastructure, such as the solar panels, radon gas is not considered to pose a risk to site end-users as these are exposed in open air and do not allow for the accumulation of the gas. Throughout the operational life of the Proposed Development, if significant changes are made to a building or to the work processes carried out within it, then a radon risk assessment should be undertaken and the need to remeasure the radon levels should be considered.	Very Low
Adjacent Land Users	Soil dust from made ground or contaminated soils.	Inhalation of soil particles during construction.	Mild	Low likelihood	Low	There is a risk of inhalation of dust by adjacent land users during the construction phase of the Proposed Development, in addition to the general public that may be in the surrounding area. Areas of potential contaminative risk and made ground have been avoided by design, limiting the risk of contaminated soil dust being disturbed during the construction phase. Extensive excavations are not anticipated at the Site that would result in significant contaminated soil dust being airborne. Therefore, it is considered unlikely that contaminated soil dust would impact the adjacent land users. However, as a precautionary measure, mitigation will be implemented to suppress any soil dust particles (e.g. dampening down of soils to minimise airborne particles) as required and discussed in the oCEMP.	Very Low
Water Environment	Contamination in groundwater due to contaminated soil associated with potential made ground / quarrying / infilled ground/sheep wash / tanks / herbicides and pesticides.	Vertical or lateral migration of contaminants to groundwater within made ground and/or underlying natural soils.	Medium	Likely	Moderate	Contamination from agricultural activities, the infilled quarries and the potential presence of made ground across the Site may have leached into the water environment. Although the Proposed Development design has sought to avoid these potential sources, there is the potential that the contaminants have migrated within the water environment underlying the Proposed Development. Vigilance should be maintained for potential unrecorded contamination sources during any future assessments and or potential site investigations. In the event that potentially contaminated materials or groundwater are encountered, samples should be taken and a subsequent risk assessment and remediation strategy may be required. A conservative approach should be considered for this receptor, therefore, a moderate level of risk has been applied in the absence of mitigation.	Moderate/Low
Construction Materials	Exposure to altered pH and/or sulphates or other corrosive contaminants through soil	Degradation of materials	Mild	Low	Low	Agricultural activities and historic quarrying activities / infilled ground means that it may be likely that there is ground contamination with the potential to degrade construction materials. However, since the main potential contaminative sources have been avoided via design, it is not anticipated that there would be potentially corrosive contaminants	Very Low

POTENTIAL RECEPTOR	POTENTIAL SOURCE	POTENTIAL PATHWAY	CONSEQUENCE OF RISK	LIKELIHOOD OF RISK	LEVEL OF RISK (WITHOUT MITIGATION)	MITIGATION AND BEST PRACTICE GUIDANCE	RESIDUAL RISK (POST-MITIGATION)
	infiltration to buried concrete.					within the soils across the Proposed Development. Therefore, the level of risk is considered to be Low.	

Risk Classification, Mitigation and Conclusion

Risk Classifications and Mitigation

10.3.12.68 From the findings of this desk study and in the absence of mitigation measures, it is considered that the maximum risk to the identified receptors is Moderate associated with potentially contaminated soils, potential harmful ground gases and the potential for contaminants to leach into the water environment.

10.3.12.69 Upon implementation of the mitigation measures detailed below, within **Table 10.10** and **Technical Appendix 3.1: oCEMP**, it is considered that the Proposed Development has the potential to pose a **Moderate/Low** risk in relation to contaminated land.

Residual Risk and Good Practice Measures

10.3.12.70 Recommended good practice mitigation to be undertaken prior to the commencement of works includes:

- Potential wider ground investigations to identify any contaminants or potential ground gas sources at the Site with subsequent updates to the CSM;
- A site-specific contamination risk assessment should be carried out to allow the design of any appropriate remedial measures. Implementation of suitable remedial measures will mitigate any contamination risks identified;
- Vigilance should be maintained during any construction for unrecorded contamination as it cannot be discounted that contamination may be present associated with industrial activities in close proximity to the Site;
- During construction, the safe storage of chemicals, fuels and other construction equipment should be practiced in order to reduce pollution and accidental spillage; and
- During the construction and operational phase of the Proposed Development, appropriate PPE should be worn at all times.

10.4 Assessment of Likely Significant Effects

10.4.1.1 An assessment of the effects of the Proposed Development on the geology and soils environment has been undertaken, identifying significant effects during the construction, operational and decommissioning phases.

10.4.2 Construction Phase

Loss and Compaction of Soils

10.4.2.1 During the construction phase, there is the potential that the Proposed Development infrastructure may result in degradation, removal or loss of soils. In particular, plant and vehicle movements, soil stripping and stockpiling may affect the nature of the soils across the Proposed Development. Plant and vehicle movements may compact areas of unstripped soils. All activities requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation.

10.4.2.2 The key infrastructure which may cause potential loss and compaction of soils are new access tracks, steel pile supports for solar panels, inverter transformer, BESS compound, substation and temporary construction compound facilities. Each solar panel will be mounted on aluminium frames, with steel supports pile driven into the ground at a depth of approximately 1.5 – 2.5 m. In some cases, the solar panels may sit on concrete footings, with no subsurface elements. In addition, individual BESS containers are anticipated to sit on 6 concrete pillars with an anticipated height above ground level of 0.2 m.

10.4.2.3 All traffic routes will be clearly demarcated across the Proposed Development and vehicles would not be permitted outwith these areas. In addition, only tracked or low ground pressure vehicles would be permitted to access any unstripped ground.

10.4.2.4 As there is no peat-forming vegetation across the Site and no anticipated peatland deposits (>0.5m thick), soils across the Site are anticipated to be less than 0.5m thick and are generally classed as mineral soils that are not considered nationally or environmentally significant. These soils would be reinstated in the vicinity of their origin where possible.

10.4.2.5 In regard to compaction of soils, the construction of access tracks and movement of construction traffic, in the absence of good construction practice, could potentially lead to the compaction of the thin soils underlying the Site. Compaction reduces soil permeability, resulting in increased run-off and erosion of the soils. Permeability of the superficial soils underlying the Site may vary, therefore, any potential compaction of soils could result in a significant increase in run-off, altering the existing ground conditions.

10.4.2.6 Considering all relevant factors and in accordance with the criteria outlined in **Table 10.2**, soil is classed as a Low sensitivity receptor, in relation to compaction and loss. The soil type and associated land use across the Site is not carbon-rich and is not sensitive to change in the hydrological regime, therefore, soil across the Site has been assigned a Low sensitivity. The overall magnitude of impact is Low; therefore, the significance of effect associated with the loss of soils is considered to be **Negligible** and **Not Significant,** in accordance with the EIA regulations.

Soils as Waste Material

10.4.2.7 As discussed in the section above, excavation of thin soils across the Proposed Development for installation of proposed infrastructure and tracks could result in the loss of soils. Soils will be reinstated, where possible, at the original excavation location. However, there may be a surplus of excavated soils.

10.4.2.8 It is anticipated, however, that the soils across the Site are shallow, mineral soils and that it is unlikely that a surplus will be generated that would result in off-site transportation or disposal of soils. At the time of construction, if this is required, the soils should be transported and dealt with accordingly following best practice guidance and the relevant legislation (e.g. The 2011 Waste Management Licensing (Scotland) Regulations[6]).

10.4.2.9 Considering all relevant factors, soil is classed as a Low sensitivity receptor, in relation to waste material. The overall magnitude of impact is Low; therefore, the significance of effect associated with the soil as a waste material is considered to be **Negligible** and **Not Significant** in accordance with the EIA regulations.

Impacts on Geology

10.4.2.10 As detailed in **Section 10.3**, there are no geological designated sites associated with the geology and soils environment across the Site. Therefore, the bedrock geology formations underlying the Site are not considered to be of national importance or high conservation value and the sedimentary geological strata are widespread throughout Scotland.

10.4.2.11 The Proposed Development should not require bedrock excavations as part of the design. Excavations across the Proposed Development should only affect shallow soils and the underlying superficial deposits (glaciofluvial deposits, glacial till and alluvium). The greatest subsurface impact will be pile-driven steel supports at depths of approximately 1.5 – 2.5m below ground level (BGL) for the solar panel frames, however, it is anticipated that these excavations would be situated within the superficial geology layers. In some cases, the solar panels may sit on concrete footings and will not require subsurface excavations.

10.4.2.12 On this basis, while the receptor sensitivity is assessed as Low where *"geological features or geology* [are] *not protected and* [are] *not considered worthy of specific protection*", the magnitude of impact would be Negligible due to minimal or no change to bedrock geology across the Proposed Development. Therefore, the significance of effect is classed as **Negligible** in accordance with the EIA regulations and guidance.

Contaminated Land

10.4.2.13 The Contaminated Land Assessment undertaken in **Section 10.3.12** identified potential sources of contamination across the Site and the immediate surrounding area. Following a review of the relevant desktop resources and the Envirocheck and Landmark reports, the main potential sources of contamination identified across the Site were from agricultural activities such as the presence of a sheep wash, tanks, and the potential use of herbicides and pesticides. In addition, there is an infilled quarry in the northwestern area of the Site. However, the Proposed Development design has sought to avoid the main sources of contamination to limit any associated risks during the construction phase of the Proposed Development.

10.4.2.14 If any evidence of potential contamination is encountered during the construction phase of the Proposed Development, appropriate action would be taken in accordance with the **outline CEMP (Technical Appendix 3.1: outline Construction Environmental Management (oCEMP))** and relevant conditions on the Section 36 consent. The outline CEMP will outline construction management best practice for the Proposed Development and will also be consulted on should any potential contamination be encountered during construction.

10.4.2.15 With the implementation of mitigation measures proposed during the Contaminated Land Assessment, the residual risk of contaminated land across the Site was classed as Moderate/Low in accordance with the CIRIA C552 guidance[8]. On this basis and applying this to EIA terms post-mitigation, contaminated land across the Site can be regarded as a Medium sensitivity receptor with a Medium magnitude of impact. Therefore, the significance of effect is classed as Moderate in accordance with the EIA regulations and guidance.

10.4.3 Operational Phase

10.4.3.1 During the operational phase and maintenance activities, it is anticipated that there would be no further disturbance towards the soils and geology environment across the Site.

10.4.3.2 It is assumed that the access across the Proposed Development will be via the permanent proposed track infrastructure, suitably constructed to account for the low volume of maintenance traffic. Minimal traffic is anticipated during the operational phase of the Proposed Development, and it is assumed that all vehicles will only drive on the permanent access tracks. It is not anticipated that vehicles will require off-road access, which could potentially impact soils. Any significant maintenance operations requiring off-road access will require further detailed environmental assessment.

10.4.3.3 In relation to contaminated land, it is not anticipated that there would be any activities across the Proposed Development that would require disturbance of the ground and that site access would be for non-intrusive routine maintenance of Proposed Development infrastructure. In addition, it is not anticipated that the Proposed Development will result in contamination associated with operational infrastructure. Adherence to the relevant UK guidance and good construction practices, as detailed in **Technical Appendix 3.1: outline Construction Environmental Management Plan (oCEMP)**, will mitigate the risk of any potential spills or contamination of soils across the Proposed Development. This is discussed in detail in **Section 10.6**.

10.4.3.4 Therefore, there would be no anticipated impacts upon soils and geology during the operational phase of the Proposed Development and the effects on geology and soils will be **Not Significant** in accordance with EIA regulations.

10.4.4 Decommissioning Phase

10.4.4.1 Once the Proposed Development has reached its operational lifetime, the decommissioning phase will commence, and the Proposed Development will be restored in accordance with the decommissioning and restoration plan. All solar infrastructure will be removed from the Proposed Development, including modules, mounting structures and cabling. These would be removed from the Proposed Development and recycled or disposed of in accordance with good practice guidance and market conditions at that time. Access tracks will likely remain across the Proposed Development for use by the landowner.

10.4.4.2 It is anticipated that the effects of the decommissioning phase will be of lesser magnitude than the construction phase of the Proposed Development. Ground disturbance in relation to decommissioning activities will only occur at the infrastructure locations, therefore, it is anticipated that there will be little or no requirement for further disturbance of the soils and geology across the Proposed Development and that the effects of the decommissioning phase are anticipated to be **Not Significant.**

10.5 Cumulative Effects

10.5.1.1 Geology and soils are considered localised receptors specific to the defined Proposed Development area, therefore, cumulative developments in the wider vicinity of the Proposed Development have not been considered to have a cumulative effect on the geology and soils environment.

10.5.1.2 Although the cumulative effects are considered Not Significant in relation to the soils and geology environment, **Chapter 16: In-combination Effects** details a full summary of findings for all EIA chapters.

10.6 Mitigation

10.6.1.1 Embedded mitigation has been developed as the Proposed Development design has progressed through the scoping and EIA stages. Standard mitigation measures relating to the soils and geology environment, during construction and operational phases, are embedded through the design and adoption of best practice measures during construction to ensure that disturbance of geology and soils is avoided or minimised.

10.6.1.2 **Volume 1 Chapter 3: Development Description** provides further details of the mitigation embedded into the design of the Proposed Development, avoiding key environmental constraints and limiting the impacts on the geological environment, as well as taking cognisance of hydrological and ecological features and associated buffers.

Outline Construction Environmental Management Plan (oCEMP)

10.6.1.3 Detailed embedded mitigation measures, relevant to the geology and soils environment and other environmental factors, are set out within the oCEMP (**Technical Appendix 3.1: oCEMP)** comprising good practice methods and guidelines, including UK and Scottish guidance on good practice for construction of infrastructure projects. These are established and effective measures to which the applicant will be committed to throughout the planning consent and duration of the Proposed Development.

10.6.1.4 A final CEMP will be developed for the Proposed Development and used during the construction phase. The principal objective of this document will be to provide information on the proposed infrastructure and to aid in avoiding, minimising and controlling adverse environmental impacts associated with construction of the Proposed Development. Furthermore, the CEMP will aim to define good construction practice as well as specific actions required to implement mitigation identified in the EIAR, the planning process and / or other licencing or consenting processes. The CEMP would be updated during the pre-construction phase and would form part of the contractor documents between the Applicant and the appointed construction contractor.

10.6.1.5 The CEMP will also outline measures to ensure that the works minimise the risk to soils and the geological environment. It is expected that the measures outlined within the oCEMP will be included in the final CEMP and would ensure the works are undertaken in accordance with good practice guidance.

10.7 Residual Effects

10.7.1.1 Following the inclusion of and adherence to the embedded mitigation measures detailed in the oCEMP (**Technical Appendix 3.1: oCEMP**), no potential residual effects have been identified that will impact the soils and geology across the Proposed Development in relation to loss and compaction of soils, soils as a waste material and impact on geology. Therefore, all of these factors are considered Negligible and **Not Significant** in accordance with the EIA regulations. No additional mitigation is required for these factors.

10.7.1.2 However, following implementation of the proposed mitigation, it is considered that there will be a residual effect of Moderate in relation to Contaminated Land across the Proposed Development. Additional mitigation should be implemented regarding radon protection measures in areas of the Proposed Development where buildings are proposed that will be occupied by site end-users. Following this implementation, the residual effect in relation to Contaminated Land can be classed as Minor.

10.7.1.3 **Table 10.11** provides a summary of the effects and additional mitigation detailed within this chapter.

TABLE 10.11 CONSTRUCTION PHASE – SUMMARY OF EFFECTS

RECEPTOR	POTENTIAL EFFECT	EMBEDDED MITIGATION	SIGNIFICANCE OF EFFECT	ADDITIONAL MITIGATION	RESIDUAL EFFECT
Soils	Loss and Compaction of Soils	Mitigation has been embedded into the design of the Proposed Development through the implementation of good practice measures and through following key legislation and guidance documents. Further information on embedded mitigation measures is detailed in Section 1.6 and the oCEMP.	Negligible	No additional mitigation required.	Negligible
Soils	Soil as a Waste Material		Negligible	No additional mitigation required.	Negligible
Geology	Impact on Bedrock Geology		Negligible	No additional mitigation required.	Negligible
Geology	Impact of Contaminated Land		Moderate	If any contaminated land is encountered during construction, works should be stopped, and this should be dealt with accordingly in line with relevant guidance in the CEMP, and relevant conditions on the Section 36 consent to prevent risk to site personnel/adjacent land-users. Radon protection measures should be implemented for proposed buildings across the Site to protect end-users.	Minor

10.8 Summary and Conclusions

10.8.1.1 This Chapter has assessed the likely significance of effects on the geology and soils environment during the construction, operational and decommissioning phases of the Proposed Development.

10.8.1.2 Following the implementation of embedded mitigation measures outlined in **Technical Appendix 1: oCEMP** and the Phase 1 Contaminated Land Assessment, contaminated land was identified as the only residual effect classed as Minor. The remainder of the other effects relating to geology and soils were considered Negligible. Therefore, given that only effects of moderate significance or greater are considered in terms of the EIA regulations, the potential effects on geology and soils are **Not Significant**.