Connah's Quay Low Carbon Power

Environmental Statement Volume II
Chapter 14: Geology and Ground Conditions

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14.1 Introduction

Overview

14.1.1 This chapter of the Environmental Statement (ES) presents an assessment of the likely significant environmental effects of the Connah's Quay Combined Cycle Gas Turbine (CCGT) fitted with Carbon Capture Plant (CCP) (hereafter referred to as the Proposed Development) with respect to geology and ground conditions during the construction, operation (including maintenance), and decommissioning phases of the Proposed Development. A description of the Proposed Development, including details of maximum parameters, is set out in **Chapter 4: The Proposed Development** (**EN010166/APP/6.2.4**).

14.1.2 For this topic, a post-construction and post-decommissioning stage is introduced which recognises that the potential beneficial effect from any soil and/or groundwater remediation undertaken, is realised upon completion of construction but it's not an effect related to the operation of the Proposed Development.

14.1.3 This chapter is supported by the following figures in **ES Volume III** (**EN010166/APP/6.3**):

- **Figure 3-3: Areas Described in the Environmental Statement**;
- **Figure 14-1: Study Area Boundaries**; and
- **Figure 14-2: Potential Areas of Contamination**.

14.1.4 This chapter is supported by the following appendices in **ES Volume IV** (**EN010166/APP/6.4**):

- **Appendix 1-A: Scoping Report**;
- **Appendix 1-B: Scoping Opinion**;
- **Appendix 2-B: Scoping Opinion Responses**;
- **Appendix 7-A: Legislative, Policy and Guidance Framework for Technical Topics**;
- **Appendix 14-A: Geo-Environmental Desk Based Assessment**, including:
  - Figure 14A-1: Planning Outline;
  - Figure 14A-2: Superficial Geology and Historical Boreholes;
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  - Figure 14A-4: Site Walkover Photographs Indicative Locations;
- **Appendix 14-B: Land Contamination Methodology**;
- **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment**;

- **Appendix 14-D: Agricultural Land Classification Report**;
- **Appendix 14-E: Agricultural Land Classification Survey Report**; and
- **Appendix 14-F: Stage 1, Tier 2 Generic Risk Assessment: Soil and Groundwater**.

14.1.5 It should be noted that there is overlap between environmental disciplines considered within the ES. Groundwater, surface water and ecological receptors are discussed within this chapter as they are assessed as potential receptors to any land contamination or pollution related impacts from construction / decommissioning and operation (including maintenance) of the Proposed Development. Groundwater and surface water as strategic resources and / or discharge points, hydrogeological response to dewatering, and flooding are considered in **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP/6.2.13**) and effects on ecological receptors are considered in more detail in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**) and the **Report to Inform Habitats Regulation Assessment** (**EN010166/APP/6.12**). Furthermore, the potential for the disturbance and redistribution of potentially contaminated in-river sediments is discussed in **Chapter 16: Physical Processes** (**EN010166/APP/6.2.16**), and potential impacts of such sediments on in-river fauna is discussed in **Chapter 12: Marine Ecology** (**EN010166/APP/6.2.12**). Excavated Materials and Waste Management in relation to non-hazardous and hazardous landfill capacity is also covered in **Chapter 23: Materials and Waste** (**EN010166/APP/6.2.23**).

Legislation, Policy and Guidance

14.1.6 Legislation, planning policy, and guidance relating to Geology and Ground Conditions and pertinent to the Proposed Development are listed in **Table 14-1.** Further detail regarding these can be found in **Appendix 7-A: Legislative, Policy and Guidance Framework for Technical Topics** (**EN010166/APP/6.4**).

Table 14-1: Legislation, Planning Policy, and Guidance relating to Geology and Ground Conditions

Type	Legislation, Policy and Guidance
Legislation	• Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 (Ref 14-1); • The Environmental Liability Directive (2004/35/EC) (Ref 14-2)[1]; • The Water Framework Directive (WFD) (2000/60/EC) (Ref 14-3)[1]; • The Groundwater Directive (2006/118/EC) (Ref 14-4)[1]; • The Environmental Quality Standards (EQS) Directive (2008/105/EC) (Ref 14-5)[1]; • The Environment Act 2021 (Ref 14-6); • The Environmental Protection Act 1990 (Ref 14-7);

[1] Post Brexit, the Directive itself no longer applies directly to the UK. However, the domestic legislation that was based on the Directive continues to apply.

Type	Legislation, Policy and Guidance
	• The Water Act 2003 (Ref 14-8); • The Water Resources Act 1991 (Ref 14-9); • The Building Act 1984 (Ref 14-10) and The Building (Amendment) Regulations 2016 (Ref 14-11); • The Environment Act 1995 (Ref 14-12); • The Environmental Permitting (England and Wales) Regulations 2016 (EPR) (Ref 14-13); • The Hazardous Waste (England and Wales) (Amendment) Regulations 2016 (Ref 14-14); • The Contaminated Land (Wales) Regulations 2006 (Ref 14-15); • The Environmental Damage (Prevention and Remediation) (Wales) Regulations 2009 (Ref 14-16); • The Anti-Pollution Works Regulations 1999 (Ref 14-17); • WFD (England and Wales) Regulations 2017 (Ref 14-18); and • Construction (Design and Management) Regulations 2015 (CDM Regulations) (Ref 14-19).
National Planning Policy	• The Overarching National Policy Statement (NPS) for Energy (EN-1) (Ref 14-20); • The NPS for Natural Gas Electricity Generating Infrastructure (EN-2) (Ref 14-21); • The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Ref 14-22); • The NPS for Electricity Networks Infrastructure (EN-5) (Ref 14-23); • Planning Policy Wales (PPW) (Ref 14-24); and • Future Wales: The National Plan 2040 (Ref 14-25).
Local Planning Policy	• Flintshire County Council (FCC) Local Development Plan (LDP) (2015-2030) (Ref 14-26).
National Guidance	• Environment Agency's online guidance for the management of land contamination 'Land contamination: risk management' (LCRM), adopted by Natural Resources Wales (NRW) in 2021 (Ref 14-27); • Welsh Land Contamination Working Group: The Development of Land Affected by Contamination: A Guide for Developers 2023 (Ref 14-28); • Contaminated Land Statutory Guidance for Wales 2012 (Ref 14-29); • The Environmental Protection Act: Part 2A Contaminated Land Statutory Guidance (2012) (Ref 14-30); • BS 10175 (2011 + A2 2017), Investigation of Potentially Contaminated Sites - Code of Practice (Ref 14-31) and BS 5930 (2015 + A1 2020), Code of Practice for Site Investigations (Ref 14-32);

Type	Legislation, Policy and Guidance
	• BS 8576 (2013), Guidance on Investigations for Ground Gas. Permanent Gases and Volatile Organic Compounds (VOC) (Ref 14-33); • BS 8485 (2019), Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings (Ref 14-34); • CIRIA C665, Assessing Risks posed by Hazardous Ground Gases to Buildings, 2007 (Ref 14-35); • CIRIA C811, Environmental Good Practice on Site Guide (fifth edition), 2023 (Ref 14-36); • CL:AIRE, Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination, March 2025 (Ref 14-37); • Design Manual for Roads and Bridges (DMRB), LA109 Geology and Soils (2019) (Ref 14-38); • DMRB, LA104 Environmental Assessment and Monitoring (2020) (Ref 14-39); • DMRB, LA113 Road Drainage and the Water Environment (2020) (Ref 14-40); • National House Building Council (NHBC), Environment Agency and Chartered Institute of Environmental Health (CIEH) report R&D66, Guidance for the Safe Development of Housing on Land Affected by Contamination, 2008 (Ref 14-41); • CL:AIRE, Framework for Assessing the Sustainability of Soil and Groundwater Remediation, 2010 (Ref 14-42); • CL:AIRE, Control of Asbestos Regulations (CAR-SOIL) 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials, 2016 (Ref 14-43); • CL:AIRE, Definition of Waste Code of Practice (DoW CoP), 2011 (Ref 14-44); • NRW, Guidance for Pollution Prevention (GPP) documents (Ref 14-45); • Environment Agency, SEPA and NRW, October 2021; Waste Classification: Guidance on the classification and assessment of waste (1st Edition v1.2.GB) Technical Guidance WM3 (Ref 14-46) • Ministry of Agriculture, Fisheries and Food (MAFF), Agricultural Land Classification of England and Wales (Ref 14-47), 1998; • Defra, Construction Code of Practice for the Sustainable Use of Soils on Construction Sites, 2009 (Ref 14-48);

Type	Legislation, Policy and Guidance
	• Institute of Environmental Management and Assessment[2] (IEMA) Guide, A New Perspective on Land and Soil in Environmental Impact Assessment, 2022 (Ref 14-49); • Institute of Quarrying, Good Practice Guide for Handling Soils in Mineral Workings, 2021 (Ref 14-50); • Welsh Assembly Government, Technical Advice Note 6 (TAN 6), Planning for Sustainable Rural Communities, 2010 (Ref 14-51); and • British Society of Soil Science. Guidance Document 3. Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction, 2022 (Ref 14-52).

14.2 Consultation and Scope of Assessment

Consultation

Scoping Opinion

14.2.1 A request for an EIA Scoping Opinion was sought from the Secretary of State (SoS) through the Planning Inspectorate (PINS) in February 2024 as part of the EIA Scoping Process. An EIA Scoping Opinion was adopted on 20 March 2024 (**Appendix 1-B: Scoping Opinion** (**EN010166/APP/6.4**)).

14.2.2 Key issues raised in the EIA Scoping Opinion applicable to Geology and Ground Conditions are summarised and responded to in **Table 14-2**.

Statutory Consultation

14.2.3 **Table 14-3** summarises the Statutory Consultee consultation undertaken to date.

Targeted Consultation

14.2.4 Following Statutory Consultation changes were made to the heights of the proposed absorber and HRSG stacks and the Applicant undertook further targeted consultation. This consultation included a Supporting Information Report which detailed the environmental considerations associated with these changes. This Targeted Consultation was held between Thursday 8 May to Friday 6 June 2025. Responses to this targeted consultation are presented in the **Consultation Report (EN010152/APP/5.1)** and **Table 14-4** below outlines how and where these comments have been addressed within this chapter of the ES.

[2] The Institute of Environmental Management Assessment (IEMA) has changed its name to the Institute of Sustainability and Environmental Professionals (ISEP). Where general reference is made to the institute in this document, the following distinction has been made: ISEP (formerly IEMA). When referencing legacy IEMA documents, this distinction is not made.

Additional Technical Engagement

14.2.5 A summary of consultation undertaken outside of statutory consultation and the EIA Scoping process in relation to the Geology and Ground Conditions assessment is provided in **Table 14-5**.

Table 14-2: Scoping Opinion Responses

Comment ID	Consultee	Comment	Response
3.7.1	PINS	'*The Proposed Development does not include any works beyond routine maintenance for the Repurposed CO_2 Connection Corridor and existing natural gas connection corridor. As such, the Inspectorate is content to scope this matter out for the construction and post construction / post decommissioning phase assessments.*'	This position on the scope of the construction and decommissioning phase assessments is acknowledged and is reflected in this assessment.
3.7.2	PINS	'*The Applicant proposes to scope out impacts on human health from contamination within shallow unsaturated soil and groundwater during operation on the basis that the Proposed Development would operate in accordance with environmental permitting requirements. PINS is content with this approach; however, it would expect to see commentary on the best practice measures being followed during operation and progress or likelihood of securing permitting set out in the ES.*'	During operation, the Proposed Development would require an environmental permit under the Environmental Permitting (England and Wales) Regulations, 2016 (Ref 14-13). For further information regarding aspects that have not been considered within the scope of the assessment, and further details of the environmental permit requirements, please see paragraph 14.5.4. Further details are also provided in the **Consents and Agreements Position Statement** (**EN010166/APP/3.3**).
3.7.3	PINS	'*The Scoping Report sets out that impacts on unsaturated soil and groundwater deriving from pollution*	Drainage design and pollution events during operation is discussed in **Chapter 13: Water Environment and Flood Risk**

Comment ID	Consultee	Comment	Response
		events bypassing the drainage system during operation is to be scoped out on the basis that the Proposed Development would operate in accordance with environmental permitting requirements. *The groundwater table is very shallow at the site, as noted in paragraph 12.5.51 of the Scoping Report. PINS has considered this matter alongside responses from relevant consultation bodies, notably NRW, and deem that this matter should not be scoped out at this stage.* *NRW noted in its response that the drainage system could spread chemicals significantly depending on its design and is seeking further investigation and assessment. PINS encourages the Applicant to discuss this matter further with NRW.*'	(**EN010166/APP.6.2.13**) and also in **Appendix 13-D Outline Drainage Strategy** (**EN010166/APP/6.4**). Furthermore, during operation, the Proposed Development would require an environmental permit under the Environmental Permitting (England and Wales) Regulations, 2016 (see paragraph 14.5.4). Further details are also provided in the **Consents and Agreements Position Statement** (**EN010166/APP/3.3**). Therefore, impacts from unsaturated soil and groundwater deriving from pollution events bypassing the drainage system during operation has been scoped out of this chapter.
3.7.4	PINS	'*The Scoping Report sets out the requirement for further data gathering to inform the methodology and scope of the assessment. The ES should set out the scope of this investigation and*	Preliminary ground investigation (January/February 2025) and monitoring (pre-DCO) has been undertaken (as agreed with NRW. See **Table 14-5**). Further details on groundwater and soil

Comment ID	Consultee	Comment	Response
		any agreements reached with relevant consultation bodies. *The Applicant should consider if monitoring is required to inform the baseline*.'	baseline quality from the preliminary ground investigation and monitoring completed is provided in **Appendix 14-F: Tier 2, Stage 1 Generic Risk Assessment: Soil and Groundwater** (**EN010166/APP/6.4**).
3.7.5	PINS	'*The assessment criteria as set out in the Scoping Report are proposed to follow the Design Manual for Roads and Bridges (DMRB) guidance, which is primarily used for road schemes. The use of this assessment criteria has not been justified within the text to confirm its suitability for the Proposed Development. The ES should provide such justification. The Applicant should seek to agree the assessment criteria with relevant consultation bodies*.'	As detailed in paragraph 14.3.6, although DMRB is applicable to road schemes, it is considered to provide a suitable framework within which to conduct EIA for ground conditions on schemes which include linear elements (including the Proposed Development). Further details on the approach to assessing contaminated land are provided in **Appendix 14-B: Land Contamination Methodology** (**EN010166/APP/6.4**). Engagement has been undertaken with NRW and FCC who have agreed with the methodology used within the assessment. Further information is presented in **Table 14-5**.
3.7.6	PINS	*'The Scoping Report makes reference to a Decommissioning Environmental Management Plan (DEMP).*	Section 14.6 'Decommissioning and post-decommissioning Phase' provides an assessment of the effects during the decommissioning phase of the Proposed Development.

Comment ID	Consultee	Comment	Response
		NRW (see Appendix 2) [of **Appendix 1-B: Scoping Opinion** (**EN010166/APP/6.4**)] *advises in its response that a Decommissioning Assessment Report is also prepared, with likely decommissioning tasks and estimated costings factored in for ground investigation and remediation scenarios. PINS directs the Applicant to comments in ID 2.1.12 which should be addressed in the ES in relation to decommissioning and therefore does not agree to scope out this matter on the information provided.'*	As detailed in Section 4.6 of **Chapter 4: The Proposed Development** (**EN010166/APP/6.2.4**), a Decommissioning Environmental Management Plan (DEMP) would be produced at the time of decommissioning, pursuant to a Requirement of the **Draft DCO** (**EN010166/APP/3.1**). The DEMP would include an outline programme of works, would consider all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed, accounting for potential future changes to baseline conditions.
N/A	Mining Remediation Authority	'*We assume based on the comments within the Scoping Report that consideration will be given to the potential risks posed by coal mining features to the connection corridor as part of a ground conditions chapter within the ES. For clarity the 'main site'*[3] *as identified does not fall within the defined Development High Risk Area and consideration of risk posed*	Ground stability and geotechnical issues will be assessed in the detailed design phase through an interpretive Ground Investigation Report (GIR) and as the design develops then a Geotechnical Design Report (GDR), or equivalent. Ground stability is a factor to be considered in the engineering design.

[3] The 'main site' referred to in this comment is commensurate with the Main Development Area described within the ES. Please see **Figure 3-2: Areas Described in the ES** (**EN010166/APP/6.3**).

Comment ID	Consultee	Comment	Response
		by coal mining features is not necessary.'	
N/A	FCC	'*Planning/site constraints and opportunities:'* • *Parts of the site are within the Mining Remediation Authority Referral Area and parts are within the Mining Remediation Authority Standing Advice area.'*	This information is acknowledged, and the Mining Remediation Authority online mapping has been reviewed to inform the desk study information presented in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**).
N/A	FCC	'*Planning/site constraints and opportunities:'* • *250 m buffer zone around landfill sites in various locations'*	Some of the Order limits are located within a landfill site and / or within the 250 m buffer zone around landfill sites. Further information on landfill sites is in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**), Section 14.4, **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**) and **Figure 14-2: Potential Areas of Contamination** (**EN010166/APP/6.3**).
N/A	FCC	'*The site lies within the flood zone of the River Dee and is at risk of flooding. Ground contamination and associated risks must be identified by way of a desk study, intrusive ground investigation and risk assessment*.'	A Geo-environmental Desk Based Assessment (equivalent to a Stage 1, Tier 1 Preliminary Risk Assessment (PRA)) has been undertaken (**Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**)).

Comment ID	Consultee	Comment	Response
			This defines the need for future ground investigation and risk assessment. Preliminary ground investigation has been undertaken and soil and groundwater baseline quality and a Stage 1, Tier 2 generic risk assessment is summarised in **Appendix 14-F: Stage 1, Tier 2 Generic Risk Assessment: Soil and Groundwater** (**EN010166/APP/6.4**). Additional ground investigation will be undertaken as the design of the Proposed Development is progressed. Flood risks are discussed in more detail in **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP/6.2.13**).
N/A	NRW	'*We note that adverse impacts on unsaturated soil and groundwater deriving from pollution events bypassing the drainage system are proposed to be scoped out. However, given that groundwater is very shallow at the site we advise that the ES includes a qualitative assessment of one or more pollution events to the wider environment using the source-*	Drainage design is discussed in **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP.6.2.13**) and also in **Appendix 13-D Outline Drainage Strategy** (**EN010166/APP/6.4**). Furthermore, during operation, the Proposed Development would require an environmental permit under the Environmental Permitting (England and

Comment ID	Consultee	Comment	Response
		pathway-receptor principle. This would enable a meaningful assessment based on a robust baseline upon which to assess contamination linkages i.e., which direction the contamination is likely to be directed towards.'	Wales) Regulations, 2016. Further details on the environmental permit are provided in paragraph 14.5.4 and the **Consents and Agreements Position Statement** (**EN010166/APP/3.3**). Therefore, impacts from unsaturated soil and groundwater deriving from pollution events bypassing the drainage system during operation has been scoped out of this chapter.
N/A	NRW	'*The drainage system could significantly spread chemicals depending on its design. We advise that details of the chemical inventory at the site are considered to assess the types of contaminants that could occur at the operating facility and qualitative statements are provided within the ES on these risks*.'	During operation, the Proposed Development would operate in accordance with an environmental permit, governed under the Environmental Permitting (England and Wales) Regulations 2016. Further details on the environmental permit are provided in paragraph 14.5.4 and the **Consents and Agreements Position Statement** (**EN010166/APP/3.3**).
N/A	NRW	'*Given the high groundwater table and proximity to sensitive environmental receptors, we advise that operational contamination assessment aspects are included/cross-referenced within the Major Accidents and Disasters assessment; for which we note that*	For further information relating to operational hazards refer to **Chapter 22: Major Accidents and Disasters** (**EN010166/APP/6.2.22**).

Comment ID	Consultee	Comment	Response
		industrial and hydrological hazards have been scoped in.'	
N/A	NRW	'*Paragraph 3.3.7 provides a commitment that a soil and groundwater investigation will be undertaken prior to commencing construction. We note that no further information is provided on the scope of this investigation, considering that the main site possesses a high groundwater table, is in close proximity to a highly sensitive environment (Dee estuary) and is at risk of groundwater flooding. We advise that ground baseline conditions at the site should be investigated and understood, with sufficient time factored* [into] *any site investigation so that baseline characterisation through monitoring can be suitably determined*.'	A Geo-environmental Desk Based Assessment (equivalent to a Stage 1, Tier 1 PRA) has been undertaken. This defines the need for future ground investigation and risk assessment. Preliminary ground investigation has been undertaken and a summary of the soil and groundwater baseline quality and a Stage 1, Tier 2 generic risk assessment is summarised in **Appendix 14-F: Stage 1, Tier 2 Generic Risk Assessment: Soil and Groundwater** (**EN010166/APP/6.4**). Additional ground investigation will be undertaken as the design of the Proposed Development is progressed.
N/A	NRW	'*We advise that a Decommissioning Assessment Report is prepared, with likely decommissioning tasks and estimated costings factored in for ground investigation and remediation scenarios, e.g., no contamination found after the operational life, some spot contamination found across the*	Section 14.6 'Decommissioning and post-decommissioning Phase' provides an assessment of the effects during the decommissioning phase of the Proposed Development. As detailed in Section 4.6 of **Chapter 4: The Proposed Development**

Comment ID	Consultee	Comment	Response
		site, and major contamination across the site, along with potential long-term, post-decommissioning impacts associated with the project.'	(**EN010166/APP/6.2.4**), a Decommissioning Environmental Management Plan (DEMP)) would be produced at the time of decommissioning, pursuant to a Requirement of the **Draft DCO** (**EN010166/APP/3.1**). The DEMP will include an outline programme of works, will consider all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed, accounting for potential future changes to baseline conditions.
N/A	FCC	'*Any information on landfills – up to 250 m from the site*'	Further information on landfill sites is provided in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**), Section 14.4, **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**) and **Figure 14-2: Potential Areas of Contamination** (**EN010166/APP/6.3**).

Table 14-3: Statutory Consultee Responses

Consultee	Comment	Response
UK Health Security Agency	'*We note that the applicant has considered and identified areas of possible land contamination on site. As such, we anticipate that the applicant* [will] *provide an appropriate assessment within the ES'*	A Conceptual Site Model (CSM) and PRA is included in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**). Section 14.6 and **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**) assesses potential risks from land contamination during the construction phases.
Mining Remediation Authority	'*Our comments remain as those above* [comments given by the Mining Remediation Authority in the EIA Scoping Opinion]*. We would expect the detailed designs, and route layout, to be cognisant of the potential risks posed by coal mining features and the need for any further investigatory or remedial works necessary to address these*.'	Ground stability and geotechnical issues will be assessed in the detailed design phase through an interpretive GIR and as the design develops then a GDR, or equivalent. Ground stability is a factor to be considered in the engineering design.
Environment Agency	'*Issue' 'The main report identifies that a contaminated land investigation will be carried out on the main site prior to construction. No such investigation is mentioned for the Ellesmere Port site.* *'Impact' 'The proposed Ellesmere Port site is brownfield land, and the presence of contamination must be considered. If any intrusive works are required, this could open a pathway for contamination to enter groundwater underlying the site. Neglecting to identify and remediate contaminants could lead the development to pose an unacceptable risk to sensitive receptors such as the bedrock Principal aquifer.* *'Solution' 'Confirm if intrusive works are required for Ellesmere Port and carry out relevant investigations if necessary.*	The Order limits no longer include Ellesmere Port. No works are required at Ellesmere Port and therefore no such investigations are required.

Consultee	Comment	Response
	'Additional narrative/ explanation' [(if necessary: See also Natural Resources Wales EIA Scoping Opinion comment 86).]	
Environment Agency	'*Issue' 'Geological conditions underlying the Ellesmere Port site are not given. The bedrock geology underlying Ellesmere Port is a Principal Aquifer, which is a sensitive receptor.* *'Impact' 'Lack of adequate characterisation can lead to insufficient protection measures and controls. Impacts of the development on underlying aquifers must be considered. The ground investigation mentioned previously can contribute to this. If intrusive works are not currently expected, but are later added to the proposals, it would be possible to inadvertently overlook geological conditions if these have not already been assessed and reported.* *'Solution' 'Ensure the geology in the Ellesmere Port area is characterised and considered in all future documentation. This will enable risks to controlled waters and appropriate mitigation to be identified*.'	The Order limits no longer include Ellesmere Port. No works are required at Ellesmere Port and therefore no such investigations are required. Any operations at Ellesmere Port would be managed in accordance with the Port's existing operating procedures which would include provision for leaks and spills.
Environment Agency	'*Issue' 'Loading and unloading activities, new chemical or equipment storage, or firefighting equipment installed at Ellesmere Port could pose a risk to controlled waters without mitigation.* *'Impact' 'Leaks and spills from loading and unloading, chemical or equipment storage, or firewater run-off, could pose a risk to surface water and underlying aquifers.*	The Order limits no longer include Ellesmere Port. No works are required at Ellesmere Port. Any operations at Ellesmere Port would be managed in accordance with the Port's existing operating procedures which would include provision for leaks and spills.

Consultee	Comment	Response
	'Solution' 'Equipment and chemicals must be appropriately bunded. AIL with the potential to cause contamination must be stored in such a way that prevents contaminants from entering soil or watercourses. We recommend that firewater run-off is controlled with sealed drainage to prevent water from migrating to surface water or groundwater.'	
Environment Agency	'*Issue' '"Information and quantities in relation to hazardous loads and detail of the size / weight of Abnormal Indivisible Loads (AILs) are still being considered as part of the EIA and through ongoing design development. These impacts will be reported and assessed within the ES." The requirement for, and specification of, any mitigation for hazardous materials cannot be determined until details are confirmed.* *'Impact' 'Improper management of hazardous materials can pose an unacceptable risk to sensitive receptors such as controlled waters. Ellesmere Port may require additional permits, or a permit variation, to enable them to handle and store hazardous materials. It is important to ensure that Ellesmere Port is suitably permitted prior to first delivery.'* *'Solution' 'We understand that the details are to be confirmed in the ES. Any permits and mitigation to be agreed with Environment Agency [and Natural Resources Wales, as applicable] prior to commencement of any works. Permits and consents need to be identified in consent document with a description as to what it will cover*.'	The Order limits no longer include Ellesmere Port. No works are required at Ellesmere Port. Any operations at Ellesmere Port would be managed in accordance with the Port's existing operating procedures which would include provision for leaks and spills.
NRW	'***Groundwater***	The extent of 'cut' will not be known until the detailed design and when further ground investigations are

Consultee	Comment	Response
	Chapter 14: Table 14-9 - Potential Areas of Contamination (Baseline Risk Scores 3 to 5) shows all site locations that scored 3-5 in terms of Baseline Risk are defined as 'Cut'. This implies that much of the site will require some degree of excavation, presumably to ensure that the proposed infrastructure is founded on suitable loadbearing materials. The ES should therefore confirm the degree to which 'Cut', i.e., excavation, will be required as its extent and depth will have a direct influence on the degree to which existing contamination could be mobilised and spread. *It is likely that dewatering will be required given the presence of a shallow and tidally influenced groundwater system. Chapter 5: Construction Management and Programme, makes no reference to construction dewatering. However, Appendix 14- A (Geo-environmental Desk-based Assessment) includes various comments on dewatering and with respect to 'Cut' states the following in Table 23: Preliminary Ground Hazard Assessment: "Ground investigation will reduce the uncertainty in knowledge of the ground conditions. A strategy to establish the risk of below-ground obstructions will be developed and mitigation measures implemented which could include bulk excavation to remove them, or excavation to a pre-determined cut-off depth to allow new structures to be founded on consistent strata risk".* *Our EIA Scoping response (dated 06/03/24, our ref. CAS-248951-N4H8) advised that "Dewatering could also generate a moderate cone of influence which may 'spread' existing contamination and salinity, although saline groundwater may be ubiquitously present given the site setting". However, Appendix 13-A: Water Environment Baseline Survey and Methodology Report does not appear to have*	completed. It is assumed that earthworks / excavations / cutting may happen anywhere within the Order limits as a worst-case scenario for the assessment presented in Section 14.6 and **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**). However, the full extent/depth of it is currently unknown. Reference to dewatering is made in **Chapter 5: Construction Management and Programme** (**EN010166/APP/6.2.5**). Dewatering is discussed further in **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP/6.2.13**) and **Appendix 13-E: Hydrogeological Assessment (EN010166/APP/6.4)**. A strategy to establish the risk of below-ground obstructions would be developed and mitigation measures implemented which could include bulk excavation to remove them, or excavation to a pre-determined cut-off depth to allow new structures to be founded on consistent strata risk. This strategy will be developed at detailed design stage.

Consultee	Comment	Response
	considered this. As the information above suggests that 'Cut' (excavation) will be required and hence dewatering likely, we advise that dewatering should be fully considered in the ES. *The nature, extent and, potentially, magnitude of contaminant mobilisation arising from cut and dewatering activities in and around the proposed development footprint will also be significantly influenced by the size of the proposed excavation area. The excavation/cut and dewatering phase could have a duration of many months or potentially a few years. This would be a significant amount of time over which to control contaminant migration which could arise through the influence of dewatering. The duration of construction elements related to cut excavation and groundwater level reduction and control through dewatering is therefore important to consider in terms of managing contamination and operational risks (e.g., dewatering pumps failing); this should be clarified in the ES.* *We maintain our EIA Scoping advice that groundwater flows should be assessed as part of detailed site investigations, including the need to assess for the presence of any private water supplies and also the degree to which the current groundwater flow regime (baseline system) could be changed by the construction, operation and decommissioning of the proposed infrastructure, notably as it appears that much of the infrastructure will be built in 'Cut'.'*	
FCC	'*The submitted environmental statement will need to have regard for Planning Policy Wales (PPW) (edition 12, 2024) and any relevant legislation and guidance such as relevant Technical Advice Notes that is in force/adopted in Wales. Also the application should have regard to the respective and relevant policies within the Flintshire*	Legislation, planning policy, and guidance relating to Geology and Ground Conditions and which are pertinent to the Proposed Development are listed in **Table 14-1** and are inclusive of the noted policy documents, legislation and guidance including: PPW (Ref 14-24), FCC LDP (2015-2030) (Ref 14-26), and

Consultee	Comment	Response
	Local Development Plan (LDP) adopted by the Council on 24 January 2023.'	TAN 6, Planning for Sustainable Rural Communities, 2010 (Ref 14-51). Further detail regarding these can be found in **Appendix 7-A: Legislative, Policy and Guidance Framework for Technical Topics** (**EN010166/APP/6.4**).

Table 14-4: Targeted Consultation

Consultee	Summary of Comment	Response
Flint Town Council	**Mitigation, Monitoring, and Compensation**: The Council expects: Transparent, accountable mitigation strategies for all identified environmental risks—including noise and vibration (e.g., from pile driving) in relation to nearby Listed Buildings; Clear summaries of these assessments for public understanding; Full details of compensation mechanisms available to adversely affected residents and businesses, including: How compensation will be calculated, Who will administer the scheme, How the public will be made aware of it. Additionally, the Council requests: Clarification on how often the project's environmental performance will be reviewed, and How local residents will be kept informed of those findings.	Details of all mitigation and monitoring proposed is included within the **Commitments Register** (**EN010166/APP/6.10**).

Table 14-5: Additional Relevant Engagement

Consultee and date	Nature of Consultation	Summary of Consultee Response	How and where addressed
NRW 12 April 2024	Any information on landfills – up to 250 m from the Order limits.	Please see the following publicly available datasets - Data catalogue | Data Map Wales (Ref 14-53).	This source, along with Groundsure (Ref 14-54) landfill dataset have been used to identify historic and current landfills within the Order limits and study area. Presented in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**), **Table 14-9**, **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**) and **Figure 14-2: Potential areas of contamination** (**EN010166/APP/6.3**).
	Ground investigation reports (including any reports of information on remediation / validation (if available)) – up to 50 m from the Order limits.	For further information, please contact the contaminated land team by contacting our Enquiries Team - Natural Resources Wales / General enquiries.	Email sent to NRW general enquiries on 29 April 2024. No reports provided at the date this EIA was prepared.
	Potential or known contaminated land / known or potential Part 2A sites – up to 250 m from the Order limits.	Please see this report which will be of interest to you here - The State of Contaminated Land in Wales (cyfoethnaturiol.cymru) (Ref 14-55).	Report has been reviewed and does not contain anything specific in relation to the Order limits.

Consultee and date	Nature of Consultation	Summary of Consultee Response	How and where addressed
	Designated Local Geological Sites (LGS) / Geological Conservation Review sites (GCR) (formerly referred to as Regionally Important Geological Sites (RIGS)); or contacts for Local Geology Groups – up to 250 m from the Order limits.	For this information, you are best placed to contact the British Geological Survey (BGS) - Datasets - British Geological Survey (bgs.ac.uk).	Email sent to BGS on 29 April 2024. Response received (see BGS Consultee below).
	Advice regarding the expectations for including 'optional exploratory ground investigation' within Tier 1 Preliminary Risk assessment that accompanies the Development Consent Order (DCO) application. The Applicant's preference is to align ground investigation to engineering design which is due to progress late 2024/2025 and rely on desk-based evaluation only at part of the Tier 1 Preliminary Risk Assessment, however, we wish to agree this position as acceptable to NRW given that we will need to agree **Statements of Common Ground EN010166/APP.8.2)** on our approach during examination.	If you require further information on this or advice, then please contact our Planning Department here - Natural Resources Wales / Contact us about a planning enquiry.	Further engagement has been undertaken with NRW for the preliminary ground investigation. Interpretation of soil and groundwater baseline quality and a Stage 1, Tier 2 generic rick assessment from the preliminary ground investigation (January/February 2025) is summarised in **Appendix 14-F: Stage 1, Tier 2 Generic Risk Assessment: Soil and Groundwater** (**EN010166/APP/6.4**).

Consultee and date	Nature of Consultation	Summary of Consultee Response	How and where addressed
FCC 16 April 2024	Any information on landfills – up to 250 m from the Order limits.	CONNAHS QUAY POWER STATION - Ash from Power Station. Power station ash and construction and demolition waste. Original license issued 23/5/77 area extended in 1979 under license no. B/RD/7/10. SHOTTON WORKS-AREA ON N-W SIDE OF INTERCONNECTING - License 141/85 AWD=5 m. Ten-year expiry limit. Bunding constructed to a sufficient height to prevent ingress of tidal waters from the Dee Estuary. This includes a new bund parallel to the Broken Band Channel. Waste characteristics not known. British Steel. According to records held by Pollution Control, there are 5 historical landfill sites within the	This information, along with Groundsure (Ref 14-54) landfill dataset have been used to identify historic and current landfills within the Order limits and study area. Presented in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**), **Table 14-9**, **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**) and **Figure 14-2: Potential Areas of Contamination** (**EN010166/APP/6.3**).

Consultee and date	Nature of Consultation	Summary of Consultee Response	How and where addressed
		specified search area. Tipping dates, lateral and vertical extents of wastes and waste composition are not known. Monitoring is not carried out by the Council. 1. SJ 274 714. Pulverised Fuel Ash. 80 acres. 2. SJ 2773 3092. Unknown wastes. 1 hectare 3. SJ 285 708. Boiler bottom ash. 3 hectares 4. SJ 260 719. 15 tonnes of paper waste. 5. SJ 291 707. Hazardous / inert / general / industrial wastes. From 1985. 10 hectares	
	Ground investigation reports (including any reports of information on remediation / validation (if available)) – up to 50 m from the Order limits.	No information is held with respect to site investigations / ground condition assessments / land condition.	The response is acknowledged and no further action is required.

Consultee and date	Nature of Consultation	Summary of Consultee Response	How and where addressed
	Potential or known contaminated land / known or potential Part 2A sites – up to 250 m from the Order limits.	The Order limits is not recorded in the Council's Public Register of Contaminated Land. It has not been and is not currently the subject of a Detailed Inspection pursuant to the provisions of Part 2A of the Environmental Protection Act 1990. However, it is expected; given the extensive history of potentially contaminative land uses within part of the red line boundary of the search area, that land contamination assessments would be undertaken, and reports of the findings submitted in support of any application for planning permission or development consent. This will be a regulatory requirement in due course.	This has been considered in the preparation of **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**).

Consultee and date	Nature of Consultation	Summary of Consultee Response	How and where addressed
	Designated LGS / GCR (formerly referred to as RIGS); or contacts for Local Geology Groups – up to 250 m from the Order limits.	No sites within 250 m of the location. North Wales Geology Association - http://www.ampyx.org.uk/cdgc/cdgc.html	North Wales Geology Association was contacted with regards to the Proposed Development (see row below).
	Information regarding Mineral Safeguarding Areas (MSA) / Mineral Consultation Areas (MCA) / designated or safeguarded sites (we're aware of an MSA that overlaps into the south-western boundary of the Order limits, from the Flintshire Local Development Plan mapping) – up to 250 m from the Order limits.	Response from FCC received 16 April 2024. MSA figure sent, along with confirmation that the MSA is Glaciofluvial sand and gravel deposits.	The information provided has been considered in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**) and Section 14.4 'Mineral Resources'.
	Mining / quarrying information – up to 250 m from the Order limits.	No active quarries within 250 m of the site. No information is held by Pollution Control with respect to mining or quarrying within the red line boundary of the search area specifically. Information may be available from historical maps, the BGS, the	This information has been used to inform **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**). Sources of information include historical maps from Groundsure (Ref 14-54), BGS online mapping, Mining Remediation Authority online mapping.

Consultee and date	Nature of Consultation	Summary of Consultee Response	How and where addressed
		Mining Remediation Authority, or other Council departments. E.g., minerals planning.	
BGS 7 May 2024	Designated LGS / GCR (formerly referred to as RIGS); or contacts for Local Geology Groups – up to 250 m from the Order limits.	This is not information that the BGS holds. Link provided to the RIGS mapping on Data Map Wales (Ref 14-53) and recommendation to contact the local council or local geological societies to see if they hold this information.	Paragraph 14.4.5 indicates no RIGS mapped in the area (from Data Map Wales). Both local council and local geological societies contacted. Geological sites have been scoped out of the assessment (paragraph 14.2.7).
North Wales Geology Association 30 April 2024	Designated LGS / GCR (formerly referred to as RIGS); or contacts for Local Geology Groups – up to 250 m from the Order limits.	RIGS database and paper records were searched, and North Wales Geology Association can confirm that there are no protected sites in the area requested.	This point is noted. Geological sites have been scoped out of the assessment (paragraph 14.2.7).

Scope of the Assessment

14.2.6 Following the scoping process that has been undertaken, the scope of the assessment considered in this chapter of the ES is as follows:

Construction / Decommissioning

- temporary compaction and degradation of soils;
- removal of soils from agricultural production;
- temporary mineral severance or sterilisation;
- potential reduction of flow to surface water bodies through soils and change in hydrogeological and hydrological setting locally;
- mobilisation and migration of contamination to unsaturated soils, groundwater and surface water courses;
- potential impacts on groundwater as a pathway may be created for drilling fluids during ground investigations, or other fluids used in construction to reach sensitive groundwater receptors;
- potential for contaminants in unsaturated soils to be exposed to surface water run-off and to leach to groundwater in open excavations;
- potential impacts from migration of contaminants from uncovered stockpiles to surface water and groundwater receptors;
- creation of preferential pathways for the migration of soil contamination and gases;
- potential impacts on groundwater from construction of underground structures / piling;
- impacts from potential contamination in dust and fine particulate matter, groundwater migration and surface run-off on ecological receptors;
- impacts on human health from contamination within unsaturated soil (dust and fine particulate matter) and groundwater; and
- the disturbance or mobilisation of contamination towards buildings or service pipelines on-site or off-site may result in damage or deterioration of buried concrete and potential permeation of drinking water pipes by contaminants, due to aggressive conditions caused by the contaminants present or through the introduction of fill materials (lowering pH).

Post-Construction / Post-Decommissioning

- any contamination removed, remediated, or mitigated leading to removal of contaminant sources and pathway interruption from the source – pathway – receptor linkage (may result in potential beneficial impacts on human health, controlled waters, property receptors and ecological receptors).

Operation

- permanent degradation of soil function and withdrawal from agriculture; and
- permanent mineral severance or sterilization.

14.2.7 The following aspects have not been considered within the scope of the assessment in this chapter of the ES:

Construction / Decommissioning

- damage, disturbance or removal of geological features of interest (including Regionally Important Geological Sites (RIGS)) (more commonly referred to as Local Geological Sites (LGS)) and Geological Conservation Review (GCR) sites). Note that none have been identified within the Order limits and study area (see Section 14.4, 'Geologically Designated Sites'). Stakeholder consultation has also confirmed their absence, and these features are therefore scoped out;
- excavation works are not proposed within the routes intended for the transport of Abnormal Indivisible Loads (AILs) (referred to as the 'Accommodation Work Areas'). Therefore, the Accommodation Work Areas are scoped out, see **Appendix 5-A: Environmental Screening of Accommodation Works** (**EN010166/APP/6.4**) for further details; and
- there would be no works within the Repurposed CO_2 Connection Corridor. The Repurposed CO_2 Connection Corridor is scoped out.
    - Note: **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**) includes the Repurposed CO_2 Connection Corridor. This appendix was written when the extent of work required in the Repurposed CO_2 Connection Corridor was unknown. Further studies showed that existing infrastructure could be repurposed therefore no significant works planned: it is therefore scoped out of the baseline (Section 14.4), the assessment presented within this chapter (Section 14.6) and **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**).

Operation

- permanent damage, disturbance or removal of geological features of interest (RIGS / LGS and GCR). Note that none have been identified within the Order limits and study area (see Section 14.4, 'Geologically Designated Sites'). Stakeholder consultation has also confirmed their absence, and these features are therefore scoped out;
- adverse impacts on human health from contamination within shallow soil, and groundwater because any potential for residual risk will have been addressed during the construction phase through risk assessment and remediation (if / where required);
- adverse impacts on unsaturated soil and groundwater deriving from pollution events bypassing the drainage system as the drainage design is covered discussed in **Chapter 13: Water Environment and Flood Risk (EN010166/APP.6.2.13)** and also in **Appendix 13-D Outline Drainage Strategy (EN010166/APP/6.4)**. Operation of the Proposed Development would require environmental permitting requirements, as clarified in **Table 14-2**;
- impacts to human health and controlled waters caused by land contamination are considered unlikely during operation as maintenance and operation of the Proposed Development would be in accordance

with environmental legislation and good practice (see **Appendix 4-A: Operation and Maintenance Mitigation Register** (**EN010166/APP/6.4**); and

- the operation of the Proposed Development would require an environmental permit under the Environmental Permitting (England and Wales) Regulations 2016 (Ref 14-13). This is detailed further in paragraph 14.5.4 and the **Consents and Agreements Position Statement** (**EN010166/APP/3.3**).

14.2.8 For further information relating to operational hazards refer to **Chapter 22: Major Accidents and Disasters** (**EN010166/APP/6.2.22**).

14.3 Assessment Methodology

14.3.1 The likely significance of effects of the construction / decommissioning, post construction / decommissioning (with respect to contaminated land only) and operational stages to geology, mineral resources, and agricultural soil is assessed based on the sensitivity or importance of the resource and the magnitude of potential impact.

Impact Assessment

14.3.2 This section sets out the methodology for the assessment of effects of the Proposed Development in relation to geology and ground conditions in accordance with the principles set out in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**).

Mineral Resources Assessment Methodology

14.3.3 The construction / decommissioning (temporary) effects occur where construction compounds are proposed within a MSA. In such cases, there will be a temporary sterilisation of the resource. The assessment of significance (using an AECOM derived methodology) considers the sensitivity or importance of the resource (**Table 14-6**) and the magnitude of potential impact (**Table 14-7**) that might occur during the construction / decommissioning phases.

14.3.4 The operational (permanent) effects occur where a MSA is underlying the footprint of the permanent works of the Proposed Development, with area(s) of minerals becoming sterilised. The assessment of significance (using an AECOM derived methodology) considers the sensitivity or importance of the resource (**Table 14-6**) and the magnitude of potential impact (**Table 14-7**) that might occur during the operational phase.

Contaminated Land Assessment Methodology

14.3.5 The approach to assessing the potential impacts of the Proposed Development from, and to land contamination, has followed a risk-based approach consistent with LCRM(Ref 14-27). The assessment compares the risk levels at baseline (broadly using the preliminary CSM (developed in the Geo-Environmental desk-based assessment, provided in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**)) and the assessed risk levels for the construction / decommissioning and post-construction / post-decommissioning stages respectively. This comparison evaluates the change in risk between each stage, which defines the

magnitude of impact classification for land contamination (detailed further in **Table 14-7**). Potential risks are evaluated and assessed based on the likelihood (or probability) and consequence using the principles given in the NHBC, Environment Agency and CIEH report R&D66 (Ref 14-41) and LCRM (Ref 14-27). This provides guidance on development and application of the consequence and probability matrix to risk assessment with broad definitions of consequence and it is widely used in contaminated land assessment.

14.3.6 Evaluation of the magnitude of impact (**Table 14-7**) and the sensitivity / value of the identified receptor (**Table 14-6**) define the significance of the effects of land contamination. Reference is made to DMRB LA109 (Ref 14-38), LA104 (Ref 14-39) and LA113 (Ref 14-40), which although applicable to road schemes, is considered to provide a suitable framework within which to conduct EIA for ground conditions on schemes which include linear elements (including the Proposed Development) as agreed with FCC and NRW (see Comment ID 3.7.5 of **Table 14-2**). Further details on the approach to assessing contaminated land are provided in **Appendix 14-B: Land Contamination Methodology** (**EN010166/APP/6.4**).

Soil and Agricultural Land Assessment Methodology

14.3.7 The impacts to soils and agricultural land have been assessed for the construction phase of the development. The assessment has assumed that the Main Development Area is both permanent (the proposed CCGT trains) and temporary development (Construction Laydown Areas), whilst construction within the Proposed CO_2 Connection Corridor (if construction works are required) is temporary as the soils would be reinstated and would be available for the resumption of agricultural use.

14.3.8 Agricultural soils within the Main Development Area were surveyed in December 2024 and reported January 2025 (**Appendix 14-E: Agricultural Land Classification Survey Report** (**EN010166/APP/6.4**)). The data supersedes the modelled ALC Grade presented in the PEIR (**Appendix 14-D: Agricultural Land Classification Report**). The ALC methodology is not applied to non-agricultural soils which includes urban areas (particularly developed area within the Main Development Area), the soft estate of highway land, and woodland and hedgerows. ALC data were available for the Proposed CO_2 Connection Corridor, which was surveyed as part of the Hynet CO_2 Pipeline Project DCO application (Ref 14-56).

14.3.9 The December 2024 ALC survey methodology followed the standard approach, with augered soil samples taken on a 100 m grid, supplemented with additional samples at the boundary of soil types and with soil pits to provide additional information for each soil type.

Hydrogeological Assessment Methodology

14.3.10 The hydrogeological baseline and scope of assessment of potential impacts from the Proposed Development on groundwater is provided in **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP/6.2.13**). At this stage, a qualitative impact assessment has been undertaken based on a source – pathway – receptor approach. This considers the pollution risk to groundwater during construction / decommissioning and operation of the Proposed Development, as well as potential impacts on groundwater levels and flows from any deep excavations that may be required.

Assessment Criteria

14.3.11 Definitions of magnitude of impact, sensitivity or importance of the receptor and significance of effect that have been used in **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**) (summarised in Section 14.6 of this chapter) are reported below.

14.3.12 The criteria for assessing receptor sensitivity are defined in **Table 14-6** based on the DMRB LA109 (14-87) and LA113 (Ref 14-40) (which for soils align with the sensitivity criteria within the IEMA guidance). DMRB and the IEMA guidance categorise soils from very high to low rather high to very low but equivalence of receptor sensitivity is maintained within **Table 14-6**.

Table 14-6: Sensitivity / Value Criteria for Geology and Ground Conditions

Sensitivity / Value	Sensitivity / Value Criteria
High	**Geology** • Very rare and of international importance with no potential for replacement (e.g. United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites, UNESCO Global Geoparks, Site of Special Scientific Interest (SSSI) and GCR sites where citations indicate features of international importance). • Geology meeting international designation citation criteria which is not designated as such. **Mineral resources**[4] • Presence of significant mineral reserves and within a Mineral Buffer Zone or MSA. **Soils** • Soils directly supporting an EU designated site (e.g. Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar). • ALC grade 1 and 2. **Contamination** Human health: • Very high sensitivity land use such as residential or allotments. Surface water: • Watercourse having a WFD classification shown in a River Basin Management Plan (RBMP) and Q95 ≥ 1.0 m^3/s. • Site protected / designated under EC or UK legislation (SAC, SPA, SSSI, Ramsar site, salmonid water). • Species protected by EU legislation Ecology and Nature Conservation.

[4] Sensitivity of mineral receptors is not described as part of the referenced DMRB guidance. Therefore, professional judgement has been used.

Sensitivity / Value	Sensitivity / Value Criteria
	Groundwater: • Principal aquifer providing a regionally important resource and / or supporting a site protected under EU and UK legislation Ecology and Nature Conservation. • Groundwater locally supports Groundwater Dependent Terrestrial Ecosystems (GWDTE). • Source Protection Zone (SPZ) 1.
Medium	**Geology** • Rare and of national importance with little potential for replacement (e.g. geological SSSI, National Nature Reserves (NNR)). • Geology meeting national designation citation criteria which is not designated as such. **Mineral resources[4]** • Within a MSA. **Soils** • Soils directly supporting a UK designated site (e.g. SSSI). • ALC Subgrade 3a. • Additional sensitivity criteria based on susceptibility of soils to damage when being handled (not the importance of the land for agriculture) can additionally be applied, if appropriate, based on IEMA guidance, reflecting combinations of soil texture, field capacity days and wetness class (for high, medium and low sensitivity classes only). **Contamination** Human health: • High sensitivity land use such as public open space. Surface water: • Watercourse having a WFD classification shown in a RBMP and Q95 <1.0 m^3/s. • Species protected under EU or UK legislation Ecology and Nature Conservation. Groundwater: • Principal aquifer providing locally important resource or supporting a river ecosystem. • Groundwater supports a GWDTE. • SPZ 2.
Low	**Geology** • Of regional importance with limited potential for replacement (e.g. RIGS). • Geology meeting regional designation citation criteria which is not designated as such. **Mineral resources[4]**

Sensitivity / Value	Sensitivity / Value Criteria
	• Some mineral potential but not within a MSA. **Soils** • Soils supporting non-statutory designated sites (e.g. Local Wildlife Site (LWS), Local Nature Reserve (LNR), LGS, Sites of Nature Conservation Importance (SNCI)). • ALC Subgrade 3b. **Contamination** Human health: • Medium sensitivity land use such as commercial or industrial. Surface water: • Watercourses not having a WFD classification shown in a RBMP and Q95 >0.001 m^3/s. Groundwater: • Aquifer providing water for agricultural or industrial use with limited connection to surface water. • SPZ 3.
Very low	**Geology** • Of local importance / little or low interest with potential for replacement (e.g. non-designated geological exposures, former quarries / mining sites). **Mineral resources**[4] • Limited potential for mineral reserves and site not within a MSA. **Soils** • Soils supporting non-designated notable or priority habitats. • ALC Grade 4 and 5. • Previously developed land formerly in 'hard uses' with little potential to return to agriculture. **Contamination** Human health: • Low sensitivity land use such as highways and rail. Surface water: • Watercourses not having a WFD classification shown in a RBMP and Q95 ≤0.001 m^3/s. Groundwater: • Unproductive strata.

14.3.13 The magnitude of impact, or how considerable the change to ground conditions is, in comparison to the baseline conditions as a result of the construction / decommissioning and operation of the Proposed Development is classified as either being:

- high adverse or beneficial;
- medium adverse or beneficial;

- low adverse or beneficial; or
- very low adverse or beneficial.

14.3.14 The criteria and their respective magnitude of impact classification which has been applied are presented within **Table 14-7** and based on the DMRB LA109 (Ref 14-38) and LA113 (Ref 14-40). In the case of soils magnitude criteria these align with DMRB LA109, incorporating threshold criteria from the IEMA guidance (Ref 14-49).

Table 14-7: Magnitude Criteria for Geology and Ground Conditions

Magnitude	Magnitude Criteria	Demonstrated in the Construction / Decommissioning and Post-Construction / Post-Decommissioning CSM as Risk Level[5] Changes Defined as Follows[6]
High	**Geology and Mineral Resources** Loss of geological feature / designation and / or quality and integrity, severe damage to key characteristics, features, or elements. **Soils** Permanent irreversible loss (including permanent sealing or land quality downgrading) or permanent improvement of one or more soil functions or soil volumes (due to remediation or restoration) over >20 hectares (ha) of agricultural land.	Not applicable
	Contamination 1) human health: significant contamination identified. Contamination levels significantly exceed background levels and relevant screening criteria (category 4 screening levels) within SP1010 (Ref 14-57) with potential for significant harm to human health. Contamination	**High adverse:** An increase in contamination risk of 4 or 5 risk levels in the risk matrix, e.g. land that has a very low contamination risk in the baseline becoming a high or very high risk. **High beneficial:** A reduction in contamination risk of 4 or 5 risk levels in the risk matrix, e.g. land that has a very high contamination risk in the

[5] Risk levels are indicated in **Appendix 14-B: Land Contamination Methodology**, Table 4 **(EN010166/APP/6.4)**
[6] Note that the CSM and risk level changes only apply to the contamination assessment.

Magnitude	Magnitude Criteria	Demonstrated in the Construction / Decommissioning and Post-Construction / Post-Decommissioning CSM as Risk Level[5] Changes Defined as Follows[6]
	heavily restricts future use of land; 2) surface water: refer to sensitivity criteria in LA113; and 3) groundwater: refer to sensitivity criteria in LA113.	baseline becomes a low or very low risk.
Medium	**Geology and Mineral Resources** Partial loss of geological feature / designation, potentially adversely affecting the integrity; partial loss of / damage to key characteristics, features, or elements. **Soils** Permanent irreversible loss (including permanent sealing or land quality downgrading) or permanent improvement of one or more soil functions or soil volumes (due to remediation or restoration) over >5 ha <20 ha of agricultural land.	Not applicable
	Contamination 1) human health: contaminant concentrations exceed background levels and are in line with limits of relevant screening criteria (category 4 screening levels) in SP1010. Significant contamination can be present. Control / remediation measures are required to reduce risks to human health / make land suitable for intended use; 2) surface water: refer to sensitivity criteria in LA113; and 3) groundwater: refer to sensitivity criteria in LA113.	**Medium adverse:** An increase in contamination risk of 2 or 3 risk levels in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate or high risk. **Medium beneficial:** A reduction in contamination risk of 2 or 3 levels in the risk matrix, e.g. land that has a high contamination risk in the baseline becomes a moderate / low or low risk.

Magnitude	Magnitude Criteria	Demonstrated in the Construction / Decommissioning and Post-Construction / Post-Decommissioning CSM as Risk Level[5] Changes Defined as Follows[6]
Low	**Geology and Mineral Resources** Minor measurable change in geological feature / designation attributes, quality, or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features, or elements. **Soils** Permanent irreversible loss (including permanent sealing or land quality downgrading) or permanent improvement of one or more soil functions or soil volumes (due to remediation or restoration) over <5 ha. Temporary loss / reduction of one or more soil function(s) and restriction to current or approved future use (e.g., through degradation, compaction, erosion of soil resource).	Not applicable
	Contamination 1) human health: contaminant concentrations exceed background levels and are in line with limits of relevant screening criteria (category 4 screening levels) in SP1010. Significant contamination can be present. Control / remediation measures are required to reduce risks to human health / make land suitable for intended use; 2) surface water: refer to sensitivity criteria in LA113; and 3) groundwater: refer to sensitivity criteria in LA113.	**Low adverse:** An increase in contamination risk of 1 risk level in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate / low risk. **Low beneficial:** A reduction in contamination risk of 1 risk level in the risk matrix, e.g. land that has a moderate / low contamination risk in the baseline becomes a low risk.

Magnitude	Magnitude Criteria	Demonstrated in the Construction / Decommissioning and Post-Construction / Post-Decommissioning CSM as Risk Level[5] Changes Defined as Follows[6]
Very Low / Negligible	**Geology and Mineral Resources** Very minor loss or detrimental alteration to one or more characteristics, features or elements of geological feature / designation. Overall integrity of resource not affected. **Soils** No discernible loss / reduction of soil function(s) that restrict current or approved future use.	Not applicable
	Contamination 1) human health: contaminant concentrations substantially below levels outlined in relevant screening criteria (category 4 screening levels) in SP1010. No requirement for control measures to reduce risks to human health / make land suitable for intended use; 2) surface water; refer to sensitivity criteria in LA113; and 3) groundwater: refer to sensitivity criteria in LA113.	**Very low adverse / negligible:** An increase in contamination risk of none or 1 risk level in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate / low risk, but only slightly worse. **Very low beneficial / negligible:** A reduction in contamination risk of none or 1 risk level in the risk matrix, e.g. land that has a moderate / low contamination risk in the baseline becomes a low risk, but only slightly better.

14.3.15 The classification and likely significance of the effect resulting from the magnitude of impact (**Table 14-7**) and receptor sensitivity (**Table 14-6**) has been evaluated in accordance with the matrix shown in **Table 14-8**.

Table 14-8: Significance Matrix

Receptor Sensitivity / Value	Magnitude of Impact			
	High	**Medium**	**Low**	**Very low / negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

14.3.16 As a general rule, major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant. Professional judgement has also been applied in reaching conclusions as to the likely significance of effects.

Rochdale Envelope

14.3.17 The setting of design parameters using the Rochdale Envelope approach is described in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**). The maximum parameters for the principal components of the Proposed Development are set out in the **Design Principles Document** (**EN010166/APP/7.8**) and are illustrated on the **Works Plans** (**EN010166/APP/2.4**) and the **Parameter Plans** (**EN010166/APP/2.5**). These parameters, together with assumptions regarding the future plans for the existing Connah's Quay Power Station set out in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**) have been used to inform the representative worst-case scenario that has been assessed in this chapter, in order to provide a robust assessment of the impacts and likely significance of environmental effects of the Proposed Development at its current stage of design.

14.3.18 In particular, focused use of the Rochdale Envelope has been adopted for buildings and structures which are sized to the maximum extent specified in the Rochdale Envelope. It is assumed that earthworks / excavations / cutting may happen anywhere within the Order limits (with the exception of the Accommodation Work Areas and Repurposed CO_2 Connection Corridor which are scoped out; see paragraph 14.2.7).

Assessment Assumptions and Limitations

14.3.19 For the purposes of the assessment, the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

14.3.20 For the purposes of the assessment, it is assumed that the decommissioning phase includes for removal of all above ground structures on the Main Development Area, with the ground remediated as required to facilitate future re-use. The decommissioning phase as described in **Chapter 4: The Proposed Development** (**EN010166/APP/6.2.4**) and Section 4.5 Decommissioning has been considered.

14.3.21 The assessment assumes that during the construction phase, excavation / earthworks / cutting may be required anywhere within the Order limits (worst-case situation). The Accommodation Work Areas and Repurposed CO_2 Connection Corridor are scoped out of the assessment as no excavation works are proposed in these locations (see paragraph 14.2.7).

14.3.22 The assessment has been based on the collation and evaluation of readily available documentation provided by Groundsure[7] (Ref 14-54), Natural Resources Wales, the BGS, historical reports for the Order limits and immediate surroundings, and other data sources made available.

14.3.23 Any borehole data from BGS sources are included on the basis that '*The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation*'.

14.3.24 Outline / high-level baseline information on geotechnical considerations / ground stability is included in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**) and the assessment of structural and engineering geology will be undertaken as part of a future GIR and GDR. These will be prepared during detailed design of the Proposed Development prior to construction and would include further details regarding geotechnical considerations and ground stability.

14.3.25 The assessment should be read in light of the legislation, statutory requirements and / or industry good practice applicable at the time of the assessment. Any subsequent changes in this legislation, guidance or design may necessitate the findings to be reassessed in the light of these circumstances.

14.4 Baseline Conditions and Study Area

Study Area

14.4.1 The study area was defined to include geology and ground conditions features likely to be at risk from possible direct and indirect impacts that might arise from the Proposed Development, termed the Zone of Influence (ZOI). The potential ZOI from the Proposed Development is considered to be as follows:

- impacts from the Proposed Development on soils, geological features, and MSA, would typically occur directly within the Order limits where construction / decommissioning activities would take place or interface directly with these receptors;
- impacts to soils in relation to agricultural land only occur on the land that is directly impacted by the Proposed Development and hence a wider study area is not applied when describing and considering agricultural soils;

[7] Groundsure site sensitivity and geological data provided in GIS format, and historical mapping provided in pdf format and presented as Annex A of **Appendix 14-A: Geo-Environmental Desk Based Assessment**.

- for the purposes of determining the wider geological context, geodiversity and to support the conceptual understanding of the ground model, the soils and geology baseline will consider a study area which extends 250 m from the Order limits;
- for the purposes of determining the local baseline conditions with respect to land contamination, a study area that also extends 250 m from the Order limits will be adopted. This has been extended for hydrogeology to 1 km from the Order limits. This is appropriate to assess the hydrogeological setting, and any influence that potential land contamination might have on the Proposed Development or local receptors (taking into consideration the pathways for contaminant migration). The study areas are presented in **Figure 14-1: Study Area Boundaries** (**EN010166/APP/6.3**); and
- the Water Connection Corridor partially extends into the Dee Estuary (referred to as in-river). For the in-river assessment, there will be no contaminated land sites (point sources) or soils, but geology within the Order limits has been considered. The potential for the disturbance and redistribution of contaminated in-river sediments is discussed in **Chapter 16: Physical Processes** (**EN010166/APP/6.2.16**), and potential impacts of such sediments on in-river fauna is discussed in **Chapter 12: Marine Ecology** (**EN010166/APP/6.2.12**).

Existing Baseline

14.4.2 Existing baseline information is detailed within **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**). This includes information regarding the following;

- geology and geomorphological features, including **Figure 14A-2: Superficial Geology and Historical Boreholes** (**EN010166/APP/6.3**) and **Figure 14A-3: Bedrock Geology and Morphological Features** (**EN010166/APP/6.3**);
- mining (coal and non-coal), ground workings and minerals safeguarding;
- soil chemistry;
- hydrogeology including aquifer classification, groundwater vulnerability, groundwater SPZ, groundwater abstractions;
- hydrology including surface watercourses and drainage, flood risk, surface water abstractions and nitrate vulnerable zones;
- radon;
- unexploded ordnance (UXO);
- regulated activities including regulated processes, waste management facilities, hazardous substances and pollution incidents;
- historical development; and
- summary of previous ground investigations.

14.4.3 An initial CSM, PRA (contamination risks) and assessment of ground hazards are included within **Appendix 14-A: Geo-Environmental Desk**

Based Assessment (**EN010166/APP/6.4**), in addition to recommendations for ground investigation and monitoring.

14.4.4 Key baseline information for the geology and ground conditions assessment is summarised below.

Geologically Designated Sites

14.4.5 Mapping available on Data Map Wales (Ref 14-53) indicates no geological SSSI, RIGS / LGS, or GCR sites are located within the study area.

14.4.6 Additionally, stakeholder correspondence with NRW, FCC, BGS and North Wales Geology Association confirmed the absence of geologically designated sites within the study area.

14.4.7 Therefore, these features are scoped out of the assessment.

Mineral Resources

14.4.8 According to the FCC LDP (Ref 14-26) an MSA overlaps the south-eastern area of the Proposed CO_2 Connection Corridor. The specific mineral was not identified in the LDP, although the MSA appears to be mapped in the region of the sand and gravel associated with Glaciofluvial Deposits. This designation was confirmed through stakeholder correspondence with FCC. There are no MSAs located within the rest of the Order limits or study area.

14.4.9 Information provided by Groundsure (Ref 14-54) indicates the presence of a Historical Mineral Planning Area labelled "Little Leadbrook Farm" for sand and gravel, located within the Proposed CO_2 Connection Corridor and extending east. However, while historical mapping suggests quarrying works have occurred immediately east of the Proposed CO_2 Connection Corridor, no evidence was found that actual quarrying works have occurred within the Order limits.

Contaminated Land

Potential Land Contamination Sources

14.4.10 Data obtained from Groundsure (Ref 14-54), aerial mapping, site walkover records, previous reports[8] and stakeholder engagement, have been

[8] Terresearch Limited (1962): Report on Investigation of Site conditions at Connah's Quay for Central Electricity Generating Board (Ref 14-56);
Foundation Engineering Ltd (1963): Central Electricity Generating Board North West Region – Connah's Quay 400kV Substation Report on Site Investigation (Ref 14-59);
Soil Mechanics Ltd (1963): Site investigation for proposed 400kV Transmission line towers between Connah's Quay, Flintshire and Kirkby, Lancashire (Ref 14-60);
Ground Explorations Ltd (1966): Report on Exploration of Ground Conditions for C.E.G.B Bangor – Connah's Quay 400kV Line (Ref 14-61);
C.S. Allott & Son (1968): Central Electricity Generating Board proposed 2,500 MW Nuclear Power Station at Connah's Quay, Flintshire, North Wales – A Civil Engineering Appreciation of the Site Volume 1 (Ref 14-62);
The Cementation Co. Ltd (1968): Report on a site investigation at Connah's Quay Power Station for the Central Electricity Generating Board (Ref 14-63);
Soil Mechanics Ltd (1991): Site Investigation Connah's Quay for Powergen Plc (Ref 14-64);
National Grid Company Plc (1994): Connah's Quat CCGT Banking Compound Site Investigation (Ref 14-65);

reviewed to identify current and historical potential contaminative land uses; this is detailed in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**). A summary of the key areas of potentially contaminated land identified within the study area is presented in **Table 14-9**.

Table 14-9: Summary of Potential Sources of Contamination within the Study Area

Potential Source	Location
Connah's Quay Power Station (formerly coal-fired, currently gas fired), including tanks, Made Ground and capped asbestos landfill	• Main Development Area. • Construction & Indicative Enhancement Area (C&IEA). • Water Connection Corridor.
Electrical substation and associated buildings (off-site but enclosed by Electrical Connection Corridor)	• Enclosed by the footprint of the Electrical Connection Corridor.
Potentially infilled pits, unspecified ground workings and quarries (on-site and off-site)	• Recorded on the Main Development Area.
Historical mine workings and mine shafts (on-site and off-site)	• Recorded 65 m south of the Main Development Area.
Current railway line (on-site and off-site); former railway line associated with former power station (on-site and off-site); former railway off River Dee	• Adjacent to the southern boundary of the Main Development Area. • Historical railway adjacent to the eastern boundary of Electrical Connection Corridor and western part of C&IEA. • Historical railway sidings off the River Dee.
Current and former agricultural land and farms (on-site and off-site)	• Within and surrounding the Proposed CO_2 Connection Corridor and potentially the fields to the north-west of the existing station.

Author Unknown (2005): Connah's Quay Site Report for PPC Application- MP3337SH (Ref 14-68);
RPS (2015): Contaminated Land Due Diligence – Connah's Quay Power Station Summary Report (Ref 14-69);
Uniper (2021): 2017 Remediation of Connah's Quay A Power Station Report (Ref 14-70
Uniper Technologies Limited (2022): Connah's Quay Power Station Systematic Appraisal of the Risk of Contamination in Response to Environmental Permit Condition 3.1.3 (Ref 14-71); and
Uniper (2022): Connah's Quay Hydrogen – North Site Evaluation Report (Ref 14-72

Potential Source	Location
Former landfill sites (on-site and off-site)	• Two located within the Main Development Area and extending further to the west. • Three off-site, one located adjacent to the Electrical Connection Corridor and 80 m north-east of the C&IEA. Two located north of the Site, beyond the River Dee (Shotton Works Landfill and Tata Steel Historical landfill and Refuse Tip), within 250 m of the Site.
Oakenholt Paper Mill (SCA Hygiene Products) (off-site)	• Located approximately 180 m to the south-west of the Main Development Area.
Marshland, peat (on-site and off-site)	• Within soils on-site and off-site.
Oakenholt Household Waste Recycling Centre and light industrial properties (off-site)	• Located 20 m south of the Main Development Area.
Infilled land: old sand pits, potentially infilled land, historical heaps (on-site and off-site)	• On-site: southern and western parts of Main Development Area, Electrical Connection Corridor. • Off-site: multiple locations, within 250 m of the Order limits.
Various historical tanks (off-site)	• Multiple locations, within 250 m of the Order limits.
Former rifle range (on-site)	• Historically located in the south-western part of the C&IEA.
Car garages (off-site)	• Multiple locations, 50-100 m south of the C&IEA. • 90 m south of the Main Development Area.
Petrol Filling Station (off-site)	• Located 100 m south of the C&IEA.
Pumping stations (off-site)	• Multiple locations, 70 m south of the C&IEA.
Filter beds and slurry beds (off-site)	• Located 250 m north-west of the Proposed CO_2 Connection Corridor.
Breweries (off-site)	• Multiple locations, 250 m south of the Main Development Area.

Potential Source	Location
Old lime kiln, and old lime kiln with tank (off-site)	• Located 250 m south-west and 220 m north-west of the Proposed CO_2 Connection Corridor.

Potential Pathways

14.4.11 The following potential pathways have been identified which outline the mechanism through which any potential land contamination could impact upon a receptor:

- direct contact / ingestion of contaminants within Made Ground / soils, together with soil derived dust and groundwater;
- inhalation of organic vapours from Made Ground / soils, soil derived dust, and groundwater;
- leaching of soluble contaminants and migration of mobile contaminants into shallow groundwater;
- vertical groundwater flow through Made Ground and superficial deposits to underlying bedrock aquifer;
- lateral groundwater flow and direct run-off to surface waters;
- vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation / asphyxiation / explosion);
- inhalation of asbestos fibres;
- direct contact of buried concrete with contaminated soils (i.e. hydrocarbons) and aggressive ground conditions (pH and sulphate) / direct contact of services and supply pipes with contaminated soils;
- migration of hazardous gases / vapours via permeable strata into enclosed spaces and service / utility trenches; and
- mine gas generation and migration through bedrock and superficial deposits and / or fissures, faults confined spaces (asphyxiation / explosion).

Identified Receptors

14.4.12 Potential receptors associated with the Proposed Development are indicated in **Table 14-10**, along with their sensitivity (as defined in **Table 14-6**).

Table 14-10: Potential Sensitive Receptors

Receptor Description	Location (Area(s) of the Proposed Development)	Sensitivity (Table 14-6)
Human health (on-site users): Future	All areas	High[9]

[9] Construction/decommissioning worker sensitivity has been increased to high to reflect the high frequency and more acute nature of their exposure to ground conditions. The methodology to define sensitivity for human health considers the residual land use and long-

Receptor Description	Location (Area(s) of the Proposed Development)	Sensitivity (Table 14-6)
Construction / Demolition workers.		
Human health (on-site users): Current commercial users (workers at the Existing Connah's Quay Power Station)	Main Development Area and Electrical Connection Corridor	Low
Human health (on-site users): Future commercial users (workers at the Exiting Connah's Quay Power Station)	Main Development Area	Low
Human health (on-site users): Current public users (using Public Right of Ways (PRoWs) / Nature Reserve etc.) / trespassers	All areas	Medium
Human health (off-site users): Current and future public users (using PRoWs / Nature Reserve etc.) / trespassers	All areas	Medium
Human health (off-site users): Current and future residential users (Kelsterton and Golftyn adjacent to south)	• Adjacent to south of the Main Development Area, Alternative Access to Main Development Area and Access to C&IEA • Adjacent to the east of the Access to Main Development Area • 30 m south of the C&IEA	High
Groundwater: superficial geology • Glaciofluvial Deposits are classified as a Secondary A aquifer	Proposed CO_2 Connection Corridor	Low

term typical human interactions on such land uses as the factor to derive sensitivity which is not wholly applicable to these receptors.

Receptor Description	Location (Area(s) of the Proposed Development)	Sensitivity (Table 14-6)
Groundwater: superficial geology • Tidal Flat Deposits and Till are classified as a Secondary Undifferentiated aquifer	All areas	Low
Groundwater: bedrock geology Gwespyr Sandstone, Pennine Lower Coal Measures Formation and Etruria Formation are classified as a Secondary A aquifer	All areas	Low
Surface waters: located on-site and off-site (various unnamed drains, ponds)	• On-site (culverted drain between C&IEA and Alternative Access to Main Development Area and Access to C&IEA) • Off-site (adjacent to 250 m) of all areas	Low
Surface waters: located on-site and off-site (Kelsterton Brook)	Kelsterton Brook: • Parallel to the northern and southern boundaries, crossing the Main Development Area • Crossing the Existing Surface Water Outfall and the Water Connection Corridor	Medium
Surface waters: located on-site and off-site (Lead Brook)	Lead Brook: • 200 m to the north-west of Main Development Area	High
Surface waters: located on-site and off-site (River Dee)	• On-site: Water Connection Corridor	High[10]

[10] This is a receptor of 'very high' sensitivity / importance in **Chapter 13: Water Environment and Flood Risk (EN010166/APP/6.2.13)**. However, the sensitivity / importance criteria range between low and very high (for the Water Environment assessment), whereas the sensitivity / importance criteria range between low and high in the Geology and Ground Conditions assessment.

Receptor Description	Location (Area(s) of the Proposed Development)	Sensitivity (Table 14-6)
	• Off-site: 40 m north-east of the C&IEA • Off-site: 120 m north of the Main Development Area • Off-site: 140 m north of Electrical Connection Corridor	
Surface waters: located on-site and off-site (Old Rockcliffe Brook)	Old Rockcliffe Brook: • Off-site: 200 m south of the Main Development Area where it enters a culvert	Medium
Surface waters: located off-site (Oakenholt Brook)	Oakenholt Brook: • Off-site: 125 m south of the Main Development Area	Medium
Surface waters: located on-site and off-site (Allt-Goch Brook)	Allt-Goch Brook: • On-site: Proposed CO_2 Connection Corridor • Off-site: Adjacent to the eastern boundary of the Proposed CO_2 Connection Corridor, extends to the north and the south of the Order limits	Medium
Buildings and infrastructure (current and future)	All areas	Medium
Ecological sites adjacent to the Site: Ramsar site, SSSI, SPA and SAC – River Dee and Dee Estuary	• On-site: Water Connection Corridor, Existing Surface Water Outfall • Off-site: • Adjacent to Main Development Area and C&IEA • 70 m north of Electrical Connection Corridor • 200 m north of Alternative Access Main Development	High

Receptor Description	Location (Area(s) of the Proposed Development)	Sensitivity (Table 14-6)
	Area and Access to C&IEA	
Ecological Sites 75 m north-east: River Dee SSSI and The River Dee and Bala Lake SAC	• Off-site: • 75 m north-east of the C&IEA • 175 m south of the Water Connection Corridor • 230 m north of the Electrical Connection Corridor	High
Non-statutory designated ecological sites: Connah's Quay Nature Reserve	• On-site: Water Connection Corridor • Adjacent to Main Development Area • 160 m north-east of Existing Surface Water Outfall • 150 m north-east of Electrical Connection Corridor	Low

Groundwater Baseline Quality

14.4.13 An initial stage of preliminary ground investigation (January/February 2025) has been undertaken. Soil and groundwater baseline quality and a Stage 1, Tier 2 generic risk assessment is summarised in **Appendix 14-F: Stage 1, Tier 2 Generic Risk Assessment: Soil and Groundwater** (**EN010166/APP/6.4**). The purpose of this preliminary investigation was to investigate groundwater baseline quality, levels and flow. The investigation was undertaken across the Main Development Area and the C&IEA. These areas were targeted for ground investigation as they are the main areas of planned development and closest to the River Dee. The areas targeted for investigation were also agreed with NRW. The ground investigation was also a preliminary ground investigation and not intended to cover the Order limits.

14.4.14 Laboratory data for groundwater and soil leachate was analysed and screened against environmental quality standards (freshwater and transitional/coastal waters) and drinking water standards. Three groundwater monitoring and sampling events were undertaken in February and March 2025.

14.4.15 Persistent exceedances, i.e., those present across all three monitoring events at concentrations above the standards, were recorded for polycyclic aromatic hydrocarbons (PAH) and metals, including copper, iron and nickel. Other persistent exceedances across the Main Development Area included ammoniacal nitrogen as N and chloride which was present in the majority of the boreholes across each of the three monitoring visits.

14.4.16 Transient exceedances within groundwater, i.e. not present consistently at elevated concentrations within sampled locations, included thiocyanate, aliphatic hydrocarbons (>C16-C21), aliphatic hydrocarbons (>C21-C35), aromatic hydrocarbons (>C16-C21) and hexavalent chromium.

14.4.17 The assessment in **Appendix 14-F: Stage 1, Tier 2 Generic Risk Assessment: Soil and Groundwater** (**EN010166/APP/6.4**) concluded that some of the exceedances may be attributable to natural background levels, resulting from the Main Development Area and the C&IEA, the proximity to the estuary and potential influence of brackish water as well as the presence of coal bearing strata. A number of the more persistent exceedances observed are considered to be related to historical uses associated with the Main Development Area and the C&IEA and the immediate surrounds, including historical landfill and land raising activities, coal-bearing strata and nearby associated historical workings, as well as the site's history as a power station.

Soil and Agricultural Land

14.4.18 Soil series are the base category of soil classification and are defined based upon particle size distribution, parent material, colour and mineralogical characteristics. Related soil series are mapped as soil associations. Mapping indicates that the Clifton Association (0711n) is the principal soil association with soils of the Wisbech Association (812b) along the north-eastern Order limits and soils of the Wick 1 Association (541r) in the south-west of the Order limits.

14.4.19 Information on soil associations is derived from Cranfield Environment Centre (CEC) Land Information System (LandIS) (Ref 14-66). This is the most detailed available soils mapping covering England and Wales and is produced from survey data from the Soil Survey of England and Wales. The Clifton association consists of seasonally waterlogged soils developed in reddish fine loamy till and related glaciofluvial deposits. It is extensive south-west of the Dee estuary.

14.4.20 Additional soils information to convey broad regional differences in the soil landscape of England and Wales is provided on the Soilscapes website (Ref 14-67). The Soilscapes dataset provides 1:250000 scale information of soil types to assist general understanding.

14.4.21 Soils at the Main Development Area, the C&IEA, the Electrical Connection Corridor and the onshore section of the Water Connection Corridor are mapped as Soilscape 21: "*Loamy and clayey soils of coastal flats with naturally high groundwater*".

14.4.22 Soils within the Proposed CO_2 Connection Corridor and access to the Main Development Area are indicated to be "*Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils*" of Soilscape 18. Soilscapes mapping is low resolution and soil survey offers improved clarity of the boundaries between soil types.

14.4.23 Soil characteristics are one of the inter-related parameters, with climate, relief and drainage that allow land to be assessed according to its versatility, productivity and workability for agriculture. These factors are the basis for ALC that offers a standard method for determining land quality in England

and Wales. The approach classifies land according to the extent to which its physical or chemical characteristics restrict agricultural use. Division is into one of five grades, from Grade 1, excellent to Grade 5, very poor. Grade 3 land is divided into Subgrades 3a and 3b. Grades 1, 2 and 3a are recognised as best and most versatile (BMV) agricultural land. The final ALC grade is the lowest grade for any of the determining criteria.

14.4.24 In Wales, predictive ALC is available via the Welsh Government's Data Map Wales (Ref 14-53). The predictive model mapped the Main Development Area as Grade 2 and urban land and this was presented as a worst-case position at PEIR, whilst recognising that flood risk and/or wetness limitation was likely to limit the classification to a lower grade. The results of the December 2024 ALC Survey (**Appendix 14-E: Agricultural Land Classification Survey Report** (**EN010166/APP/6.4**)) which superseded this assumption are summarised in **Table 14-11**.

14.4.25 The survey area was two agricultural fields, used for grazing livestock. The survey identified one soil type, summarised in **Table 14-11,** and the data mapped within **Appendix 14-E: Agricultural Land Classification Survey Report** (**EN010166/APP/6.4**).

Table 14-11: Soil Characteristics derived from field survey

Depth (mm)	Texture	Colour	Stones (%)	Mottles	Structure
0-100	Medium silty clay loam	Very dark brown (10YR 2/2)	5	No	Medium angular blocky
100-350	Medium sandy silt loam	Very dark grey (2.5Y 3/1)	5	No	Medium angular blocky
At 350	Rock	N/A	100	N/A	N/A

14.4.26 The soil profile has been used to assess the Wetness Class (WC) for the soil type, based on a decision flow chart, within the MAFF guidance, using site and soil factors. The soil was likened to the Wisbech Series, shown on soil mapping, and was given a WC I (**Appendix 14-E: Agricultural Land Classification Survey Report** (**EN010166/APP/6.4**). The combination of soil texture and soil water regime results in an ALC Subgrade 3b.

14.4.27 The division of ALC grades for agricultural land, urban land and non-agricultural land (typically trees and hedgerows) is provided in Table 14-12 for the scoped in elements of the Proposed Development.

Table 14-12: Agricultural Land Classification (ALC) within scoped in elements of the Proposed Development (as detailed in Appendix 14-D: ALC Report (EN010166/APP/6.4)

ALC Grade	Main Development Area (ha)	Proposed CO_2 Connection Corridor area (ha)
1	0	0
2	0	1.5
3a	0	11.5
3b	28.0	0.7
5	0	0.4
Urban	26.4	0
Non-agricultural	0	1.0

Survey data for soils of the Proposed CO2 Connection Corridor are available (Ref 14-56) and confirm the soils to be principally Subgrade 3a, which is the only BMV land within the Proposed Development.

Future Baseline

14.4.28 The future baseline scenarios are set out in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**).

14.4.29 This section considers any changes to the baseline conditions described above, and in **Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**) that might occur over the lifespan of the Proposed Development, but in its absence (i.e. if the Proposed Development is not installed).

14.4.30 The existing geology and ground conditions baseline is unlikely to be altered over time without a significant change of land use.

14.4.31 With respect to land contamination, any future development within the study area is subject to appropriate consenting regimes. This requires consideration of the potential for contamination to be present. The developer would be required to carry out remediation to ensure the development is suitable for its proposed use.

14.4.32 Furthermore, natural attenuation processes have the potential to mitigate risks over time from any existing sources of contaminants present within soil and groundwater.

14.4.33 Changes in groundwater abstractions could affect the groundwater flow regime and climate change could influence the future baseline conditions, due to changes on the rainfall regime, recharge, groundwater levels and flow. However, these changes are long-term and are not predictable at this stage.

14.4.34 Limiting physical factors within the ALC methodology include soil wetness and soil droughtiness. In the long term these may be influenced by climate change, but such changes are not currently predictable.

14.4.35 On the basis of the above, the future baseline for this assessment is considered to remain as described in the existing baseline.

14.5 Development Design and Embedded Mitigation

14.5.1 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on geology and ground conditions through the process of design development, and by embedding mitigation measures into the design of the Proposed Development.

14.5.2 The following embedded mitigation measures have been incorporated into the design of the Proposed Development:

Ground Investigation

- ground investigations (geo-environmental and geotechnical) would be undertaken before construction to inform the development of the detailed design. The ground investigations would validate the assumptions made in the preliminary CSM and PRA (**Appendix 14-A: Geo-Environmental Desk Based Assessment** (**EN010166/APP/6.4**)) and provide site-specific data upon which to base a generic quantitative risk assessment (Stage 1, Tier 2 under LCRM);
- an initial stage of preliminary ground investigation (January/February 2025) has been undertaken. Soil and groundwater baseline quality and a Stage 1, Tier 2 generic risk assessment is summarised in **Appendix 14-F: Stage 1, Tier 2 Generic Risk Assessment: Soil and Groundwater** (**EN010166/APP/6.4**). The purpose of this preliminary investigation was to investigate groundwater quality, levels and flow. Subsequent investigations would be more detailed to target potentially contaminative sources identified, including the historical landfilling activities, Made Ground, and former coal-fired power station areas identified within the Order limits. Where risks are deemed to be unacceptable, further detailed quantitative risk assessment and if required, detailed remediation strategies would be developed accordingly;
- the assessment of structural and engineering geology will be undertaken as part of a GIR and GDR (during detailed design) which will include further details regarding geotechnical considerations / ground stability, and how the Proposed Development design would mitigate any effects. Whilst it is acknowledged that the ground investigation and subsequent risk assessments would be undertaken, it is important to indicate that the outcome of these investigations would define whether additional assessment or mitigation may be required; and
- as part of further ground investigation, ground gas (Including potentially from recorded workings to the west of the Main Development Area) monitoring would be undertaken, as there is the potential for ground gas to be displaced and accumulate within future buildings (based on landfills / Made Ground / coal measures anticipated within the Order limits);

Hydrogeological Assessment

- hydrogeological assessment: an understanding of groundwater across the Order limits has been obtained from the preliminary ground investigation (January/February 2025) and will be developed through further detailed ground investigation and monitoring, including before, during and after construction. A more detailed hydrogeological assessment would be undertaken where excavations or dewatering is required in high sensitivity groundwater environments, as detailed in the **Framework Construction Environmental Management Plan (CEMP)** (**EN010166/APP/6.5**). Where dewatering is required, a dewatering scheme would be developed prior to construction to demonstrate that there is an effective strategy to manage water arising from the operations and, where required, sufficient proposals to treat the water prior to controlled discharge. Any such assessment would consider the effects of any drawdown or impacts on nearby abstractions or resources. This is discussed further in **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP/6.2.13**); and

Mineral Resources

- construction of the Proposed Development has the potential to affect existing mineral resources, and proposed areas of mineral exploitation. This could occur by sterilisation of the resource through direct excavation, particularly during construction within the Proposed CO_2 Connection Corridor, or through temporary and / or permanent severance or isolation that may occur during the construction phase, possibly continuing through to its operational phase. As part of the **Framework CEMP** (**EN010166/APP/6.5**), and where a designated mineral resource is confirmed, a plan would be prepared and discussed in advance of the construction works with the landowner, the relevant mineral planning departments at FCC, and any other relevant parties to assist in achieving an effective management of minerals within the affected areas of the MSA.

Standard Construction Practices

14.5.3 The following standard construction practices are relevant to this assessment:

Construction Environmental Management Plan (CEMP)

- the main mitigation measure to prevent adverse effects on geology and ground conditions during all phases of the development would be to ensure good site practice and management through the development and adherence to a final CEMP. Measures contained within the final CEMP would limit the potential for dispersal and accidental releases of potential contaminants, soil derived dusts and uncontrolled run-off to occur during construction. For example, the final CEMP would set out how material is to be excavated, segregated, and stockpiled to minimise the potential for run-off, soil quality degradation and wind dispersal of dusts. The final CEMP would also establish procedures for dealing with unexpected soil or groundwater contamination that may be encountered. The final CEMP would detail requirements around Mining Remediation

Authority permits and associated mitigation needed for any works that may affect or enter Mining Remediation Authority assets. Such assets include coal seams present within the Order limits that may be encountered during construction activities such as piling and also the potential for mine gas or water to be displaced. A **Framework CEMP** (**EN010166/APP/6.5**) has been produced and is submitted as part of the Application. The submission, approval and implementation of the final CEMP would be secured by a requirement of the DCO;

- Impacts to disturbed soils and agricultural land would be controlled through the measures set out in the **Framework CEMP** (**EN010166/APP/6.5**).

Soil and Groundwater Pollution Control Mitigation

- it is assumed that the structures associated with the CQLCP Abated Generating Station may require piling. Piling options would be fully defined on conclusion of scheme specific ground investigation at detailed design stage with final layout for the Proposed Development. If piling is the adopted foundation solution, a piling risk assessment will be required for the Proposed Development and this may need to demonstrate that mitigation has been incorporated into the pile design solution to avoid creating flow paths between potentially contaminated soils and / or groundwater in the underlying superficial deposits and bedrock aquifers;
- a Pollution Prevention and Emergency Response Plan would be in place prior to the commencement of construction / decommissioning works. The Pollution Prevention Pollution Prevention and Emergency Response would outline key pollution mitigation measures to be adopted including a Control of Substances Hazardous to Health (COSHH), fuel inventory and key contacts to be notified in the event of a significant pollution incident, which may subsequently lead to the contamination of controlled waters or soils. All bulk fuel and COSHH items would be stored in accordance with the relevant Guidance for Pollution Prevention (GPP) (Ref 14-45) or where GPP are yet to be published, Pollution Prevention Guidance (PPG) notes (withdrawn but widely considered good practice) and storage regulations – refer to **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP/6.2.13**). Tanks and dispensing pumps will be locked when not in use to prevent unauthorised access;
- any hazardous materials would be stored in designated locations with specific measures to prevent leakage and the release of their contents. This would include a requirement for storage areas to be set back an appropriate distance from surface water features / drains to prevent any uncontrolled discharge (and take into consideration the positions of any groundwater abstraction wells), on an impermeable base with an impermeable bund that has no outflow and is of adequate capacity to contain at least 110% of the contents. Valves and trigger guns would be protected from vandalism and kept locked when not in use;
- only well-maintained plant would be used during construction to minimise the potential for accidental pollution from leaking machinery or damaged equipment. Static machinery and plant are expected to be stored in hardstanding areas when not in use and, where necessary, to make use

of drip trays beneath oil tanks / engines / gearboxes / hydraulics. Spill response kits containing equipment that is appropriate to the types and quantities of materials being used and stored during construction would be maintained within the Order limits for the duration of the works;

- the design of the Proposed Development includes measures that would contain and control any releases of contaminants to ground and the surface drainage network. As part of the **Framework CEMP** (**EN010166/APP/6.5**), the requirement for a Construction Drainage Management Strategy is outlined, which would be developed further by the contractor, to remain in place during the operational phase of the Proposed Development;
- the potential for mobilising fine sediment (and any contamination) into the water column in the estuary would be controlled by a Marine Licence (see **Chapter 16: Physical Processes** (**EN010166/APP/6.2.16**));

Dealing with Potential Contamination during Construction

- potential impacts specific to construction workers during site preparation and construction / decommissioning works would be controlled and mitigated by the following measures and through working in accordance with CIRIA C811 (Ref 14-36):
  - measures to minimise dust generation;
  - provision of Personal Protective Equipment (PPE), such as gloves, barrier cream, overalls etc. to minimise direct contact with soils;
  - provision of adequate hygiene facilities and clean welfare facilities for all construction site workers;
  - monitoring of confined spaces for potential ground gas accumulations, restricting access to confined spaces, i.e., to suitably trained personnel only, and use of specialist PPE, where necessary; and
  - preparation and adoption of a site and task specific health and safety plan as is required under health and safety legislation.
- the final CEMP would set out procedures for dealing with unexpected soil or groundwater contamination that may be encountered. This would typically require affected works to stop to enable appropriate people to be notified, and further characterisation and risk assessment to be undertaken before remediation or mitigation proposals are agreed with all stakeholders. In the event that unacceptable risks are identified, or encountered during construction, and routing through these areas is unavoidable, specific mitigation measures may be required in the form of treating / remediating contamination (e.g., contamination that may be associated with potentially contaminative sites identified as part of the assessment, notably the areas of historical landfilling activities, Made Ground and the former coal-fired power station). This would be confirmed based on information gathered through further ground investigation. Any remediation works, or the removal of contaminated soils or waters associated with the construction of the Proposed Development would be expected to result in the enhancement of the

local environment. Any such need would be defined by the ground investigations and interpretive assessments that follow; and

- there is potential for asbestos to be present in any Made Ground within the Order limits. Any Made Ground found to be contaminated with asbestos would require suitable management if it is to be retained on-site or removed (in line with the CL:AIRE, CAR-SOIL 2012 (Ref 14-43). As asbestos only presents a risk if it is disturbed, it is considered that the highest risk would be during the construction and decommissioning of the Proposed Development. Asbestos management would be included within the final CEMP, incorporating the Final Site Waste Management Plan (SWMP).

Excavated Materials and Waste Management (Excluding Soil Management)

- see also **Chapter 23: Materials and Waste** (**EN010166/APP/6.2.23**) for further information;
- assumptions have been adopted as to how the earthworks stage of the construction and the decommissioning of the Proposed Development would be undertaken (see **Chapter 5: Construction Management and Programme** (**EN010166/APP/6.2.5**)). Additional information would be made available during the detailed design and support the preparation of the final CEMP and final SWMP. Consideration would be given as part of the design process as to what excavated materials could be reused or would be required for the various components of the Proposed Development, and what materials would be surplus and would require either disposal or onward management to ensure appropriate re-use. The overall aim of the earthworks design would be to achieve an optimal cut-fill balance, as far as practicable within the project constraints, to avoid or minimise the creation of surplus material. The volume of disposal of soil waste, contaminated or otherwise, to landfill sites would be mitigated by minimisation during design of the overall quantities of surplus material generated during construction, and by optimising the cut to fill balance as part of the design;
- re-use of excavated materials during construction and decommissioning of the Proposed Development would be governed by either a Materials Management Plan (MMP) developed in accordance with the CL:AIRE Definition of Waste: Development Industry Code of Practice (DoW CoP), 2011 (Ref 14-44), an environmental permit or a relevant exemption. The CL:AIRE DoW CoP is a voluntary framework for excavated materials management and re-use. Following this framework results in a level of information being generated that is sufficient to demonstrate to the regulator that excavated material can be re-used appropriately and is suitable for its intended use. It demonstrates that material which has been used in the development is not waste. The MMP details the procedures and measures that would be taken to classify, test, excavate, track, store, verify, reuse and where necessary selectively dispose of excavated materials encountered during the construction of the Proposed Development;
- where there is a requirement to dispose of surplus excavated materials off-site as waste, the material will be characterised to determine firstly

whether it is Hazardous or Non-Hazardous waste in accordance with the Technical Guidance WM3 (Ref 14-46) and then once this is established, the appropriate disposal facility would be determined and Waste Acceptance Criteria (WAC) analysis undertaken, if required; and

14.5.4 The following standard operational practices are relevant to this assessment:

- operational materials, including chemicals, fuels and oils (acetylene, lubricating oils, distillate fuels, or other fuels), would be stored at the Proposed Development. In common with other modern infrastructure development, secondary containment appropriate to the level of risk would be included in the detailed design;
- the design of the Proposed Development includes measures that would contain and control any releases of contaminants to ground and surface and foul drainage network. Drainage control for the Proposed Development is considered further in **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP/6.2.13**);
- good housekeeping and management practices (such as operating an accredited Environmental Management System (EMS), which would detail procedures for chemical storage, spill response, pollution incident response etc.) would be adopted and adhered to through the operational lifetime to minimise impacts to soil and groundwater; and
- the Proposed Development would require an environmental permit under the Environmental Permitting (England and Wales) Regulations 2016 (Ref 14-13). This would likely require:
  - a condition would be placed on the operator to prepare a Site Condition and Baseline Report (SCBR) which would establish the Site condition as the Order limits becomes operational;
  - groundwater monitoring arrangements are anticipated to be set such that impact of Order limits operations on underlying ground / groundwater can be monitored during the lifetime of the Proposed Development, and data along with operational records would be used to update the SCBR to demonstrate to the regulator that the permit can be surrendered following closure and decommissioning;
  - the environmental permit application would also have to demonstrate the infrastructure arrangements including aspects such as use of impermeable surfaces and containment provision for storage of materials all of which will be constructed to appropriate standards; and
  - the operator would Implement an environmental management system that will meet regulatory requirements including procedures / arrangements for Emergency Management (e.g. spill response, fire response, firewater containment, etc.).

14.5.5 The following standard decommissioning practices are relevant to this assessment:

- the Proposed Development is expected to operate for at least 30 years. At the end of its operating life, the most likely scenario is that the Proposed Development would be shut down and all above ground

structures removed. The Proposed Development would then be suitably remediated as required to facilitate re-use; and

- a Decommissioning Environmental Management Plan (DEMP) would be produced and agreed with NRW as part of the Environmental Permitting and site surrender process. The DEMP would consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed.

Soil Management

14.5.6 To minimise the effects on soil resources during any earthworks, including materials management following foundation construction and excavation for the Proposed Development, high standards of soil handling and management would be employed with a view to minimising where possible the double handling of soils and the extent to which exposed soils would be left vulnerable to erosional processes. Guidelines are published in documents such as DEFRA's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009) (Ref 14-48) and Good Practice Guide for Handling Soils in Mineral Workings (Ref 14-50).

14.5.7 Impacts relating to the handling, movement and temporary storage of soils, will be controlled through Soil Management Plan(s) (SMP(s)) to be included within the final CEMP(s). The SMP(s) would provide final details on the following:

- Soil management during construction, including:
  - Soil moisture conditions for handling, in accordance with sheets A to D of the Institute of Quarrying Good Practice Guide for Handling Soils in Mineral Workings (Ref 14-50);
  - Soil stripping;
  - Soil storage, in accordance with guidance given in sheets B and C of the Institute of Quarrying Good Practice Guide for Handling Soils in Mineral Workings (Ref 14-50);
  - Stockpile locations;
  - Forming the stockpiles; and
  - Maintenance of stockpiles during storage.
- Soil Restoration, including:
  - Excavation of soil stockpiles;
  - Preparation of the base layer; and
  - Soil reinstatement.
- Aftercare of re-instated soils, including:
  - Aftercare plan including periodic assessment to determine soil use and function meets landowner requirements.

14.5.8 The SMP(s) should also consider the measures prescribed in the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref 14-48) and identify the requirement for regular inspections of activities by a suitably experienced soil scientist.

14.6 Assessment of Likely Impacts and Effects

14.6.1 Taking into account the embedded mitigation measures as detailed in Section 14.5 above, the potential impacts and effects of the Proposed Development have been assessed using the methodology as detailed in Section 14.3 of this chapter and **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**).

14.6.2 Groundwater (hydrogeology) is considered as part of the contaminated land assessment as a receptor to any soil and/or groundwater contamination, with further assessment on groundwater as a resource presented in **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP/6.2.13**).

Construction Phase

14.6.3 Impacts on Geology and Ground Conditions features during construction of the Proposed Development are likely to include:

Mineral Resources

- temporary adverse effects may occur where working areas (including construction compounds) are proposed within the MSA. In such cases, there will be a temporary sterilisation of the resource during construction works. The locations of the construction compounds are yet to be confirmed; and
- if working areas are located within the MSA, the impact of temporary sterilisation on the MSA, which is of medium sensitivity, has been assessed as having a magnitude of impact of **very low adverse** which results in a **negligible** effect, which is considered to be **not significant**.

Contaminated Land

- mobilising existing contamination in soil and groundwater as a result of ground disturbance and potential dewatering during construction;
- increasing the potential for contaminants in unsaturated soils to leach to groundwater in open excavations during construction;
- increasing the potential for contaminated surface run-off to migrate to surface water and groundwater receptors as a result of leaching from uncovered stockpiles;
- introducing new sources of contamination, such as fuels and oils used in construction plant;
- creating preferential pathways for the migration of soil contamination and gases, for example, along new below ground service routes, service ducts and as a result of potential dewatering; and
- introducing new human health receptors such as site staff during and post-construction.

14.6.4 **Figure 14-2: Potential Areas of Contamination** (**EN010166/APP/6.3**) illustrates the identified historical and current areas of potential contamination within the Order limits and 250 m study area. In accordance with the screening methodology presented in **Appendix 14-B: Land Contamination Methodology** (**EN010166/APP/6.4**), a baseline risk score

has been assigned to each of these areas and this is presented in **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**) and is also visually represented on **Figure 14-2: Potential areas of contamination** (**EN010166/APP/6.3**). For the purposes of this chapter, it has been assumed at this stage that excavation (cut) may occur anywhere within the Order limits (excluding the Accommodation Work Areas and Repurposed CO_2 Connection Corridor) (see Rochdale Envelope assumption in paragraph 14.3.17). Those with a risk score of three and above have been considered for further impact assessment in **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**), those with a risk score of two or below are not considered to pose an unacceptable risk within the context of Proposed Development construction or operation and have therefore been scoped out.

14.6.5 **Table 14-13** presents a summary of the potential areas of contamination with baseline risk scores of 3 to 5. Risks from potential ground gas and groundwater derived from former abandoned coal workings have also been considered in the further risk and impact assessment. These areas have not been given an individual site ID or baseline risk score as they are considered to be more pervasive sources in the area.

Table 14-13: Potential Areas of Contamination (Baseline Risk Scores 3 to 5)

Site ID	Site Name	Proximity Zone[11]	Land Use Class[12]	Relationship to Cut / Fill / Construction Work[13]	Baseline Risk Scores[14]
CL01	Existing Connah's Quay Power Station including historical tanks, substation, and infilled historical pond	Zone 1	Class 2	Cut	4
CL02	Former Connah's Quay Power Station; including tanks, heaps; former rifle range; former railway, area of capped asbestos	Zone 1	Class 3	Cut	5
CL04	Historical landfill sites - Connah's Quay Landfill and infilled ponds;	Zone 1	Class 3	Cut	5

[11] See **Appendix 14-B: Land Contamination Methodology**, Table 1
[12] See **Appendix 14-B: Land Contamination Methodology**, Table 2
[13] Assume cut may happen anywhere within the Order limits
[14] See **Appendix 14-B: Land Contamination Methodology**, Table 3

Site ID	Site Name	Proximity Zone[11]	Land Use Class[12]	Relationship to Cut / Fill / Construction Work[13]	Baseline Risk Scores[14]
	includes very small portion of current Power Station				
CL05	Current railway line	Zone 1	Class 2	Cut	4
CL06	Light industrial properties; unspecified heap; old coal shafts; historical tanks; historical railway sidings	Zone 1	Class 2	Cut	4
CL09	Farm	Zone 1	Class 1	Cut	3
CL14	Sand pit with ponds (>0.5ha)	Zone 1	Class 2	Cut	4
CL29	Unspecified heap	Zone 2	Class 2	Cut	3
CL30	Garage	Zone 2	Class 2	Cut	3
CL32	Petrol filling station	Zone 3	Class 3	Cut	3
CL36	Tata Steel site; Shotton Works historical landfill (industrial, household waste); historical railway sidings; historical tank	Zone 3	Class 3	Cut	3
CL37	Historical railway sidings north of River Dee; historical tank; part of the Tata Steel site; current / former COMAH site	Zone 2	Class 2	Cut	3
CL38	Shotton Works historical landfill (inert, industrial, household, liquid sludge) and refuse tip; current/recent landfill (industrial waste); historical railway sidings	Zone 3	Class 3	Cut	3

Site ID	Site Name	Proximity Zone[11]	Land Use Class[12]	Relationship to Cut / Fill / Construction Work[13]	Baseline Risk Scores[14]
CL41	Connah's Quay Power Station No. 1 historical landfill (inert, industrial)	Zone 1	Class 3	Cut	5

14.6.6 In the locations of the identified potentially contaminative land uses (**Table 14-13**) and **Figure 14-2: Potential Areas of Contamination** (**EN010166/APP/6.3**)), there is the potential for construction to impact on human health, controlled waters, buildings and infrastructure, and ecological receptors, where present.

Construction phase

14.6.7 Whilst adoption of the measures included within the final CEMP would make it unlikely that there would be significant impacts during construction, there may still be some temporary adverse impacts during construction from ground disturbance or groundwater controls which may inadvertently mobilise contamination or create preferential pathways; in particular for groundwater and ground gas migration, which may cause a temporary adverse impact on groundwater quality or increased ground gas risk compared to the baseline risk.

14.6.8 It should be noted that the potential impacts and risks presented in the construction CSM are those after embedded mitigation outlined in Section 14.5 is applied. Any remediation determined to be necessary following ground investigation and subsequent risk assessment is assumed to take place before or during the construction stage.

14.6.9 As presented in **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**), the significance of effect (Tables 8, 14, 19, 24 and 30 in **Appendix 14-C**) takes into consideration the magnitude of impact (Tables 7, 13, 18, 23 and 29 in **Appendix 14-C**) and the receptor sensitivity (as identified in **Table 14-6** and **Table 14-10**).

14.6.10 To summarise the assessment presented in **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**), there are no significant effects assessed for the construction of the Proposed Development.

Post-construction phase

14.6.11 It is anticipated that if any remediation is carried out on potentially contaminated sites identified within the Order limits, there would, in most instances, be overall beneficial effects post-construction. If required, (subject to further ground investigation within the Order limits), site-specific permanent remediation measures, which would focus on source removal, pathway breakage or receptor protection, would be developed during the detailed design stage. These measures would reduce risks to human health,

controlled waters and property from contamination, gas and vapours in the ground (the principal risks in this area), to an acceptable level.

14.6.12 As presented in **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**), the significance of effect (Tables 8, 14, 19, 24 and 30 in **Appendix 14-C**) takes into consideration the magnitude of impact (Tables 7, 13, 18, 23 and 29 in **Appendix 14-C**) and the receptor sensitivity (as identified in **Table 14-6** and **Table 14-10**).

14.6.13 To summarise the assessment presented in **Appendix 14-C: Potential Areas of Contamination and Further Risk and Impact Assessment** (**EN010166/APP/6.4**), there are no significant post-construction (i.e. remediation) effects; effects are considered to be **negligible** to **minor beneficial** (**not significant**).

Soil and Agricultural Land

14.6.14 The withdrawal of land from agricultural use would begin with construction activities at the Main Development Area and Proposed CO_2 Connection Corridor. At the Main Development Area some effects would be temporary, and others would continue throughout the operational phase and those are discussed below. Temporary effects at the Main Development Area would be use of agricultural land for construction laydown areas to a total of 13.0 ha, which represents a low magnitude impact. Soil survey identifies that the combination of soil texture and soil water regime results in ALC Subgrade 3b, and no BMV land would be used within the Main Development Area. This would represent medium magnitude impact on a low sensitivity receptor, resulting in a **minor adverse** effect, which is considered **not significant**.

14.6.15 The effects of construction on the Proposed CO_2 Connection Corridor would be limited to the construction phase. Temporary removal of soils from agriculture represents a low magnitude effect to medium sensitivity soils (ALC Subgrade 3a). The burial depth of the pipelines below the surface would allow continuation of agricultural operations after restoration. The temporary withdrawal from agriculture would represent a **minor adverse** effect, which is considered **not significant**.

14.6.16 Management practices are outlined in the **Framework CEMP** (**EN010166/APP/6.5**) and the final CEMP would be developed by the appointed contractor once construction methods are known.

Operation Phase

14.6.17 The earliest year of operation for the Proposed Development is anticipated to be 2030, under a phased construction approach beginning in Q4 2026 for a period of five years. If construction was to be undertaken in a simultaneous construction approach, the earliest year of operation is anticipated to be 2035. If a simultaneous construction approach was undertaken at the latest possible time, five years after DCO Consent, operation would be anticipated to occur in late 2036.

14.6.18 Impacts on geology and ground conditions features during operation of the Proposed Development are likely to include:

- Mineral Resources

- the effect from the operation of the Proposed Development on the identified MSA would be permanent where underlying the footprint of the permanent works (south-eastern area of the Proposed CO_2 Connection Corridor), with a strip of mineral becoming sterilised. The Proposed CO_2 Connection Corridor would occupy the area, limiting the opportunity to use it for mineral extraction; and
- the impact of sterilisation on the MSA, which is of medium sensitivity, has been assessed as having a magnitude of impact of **low adverse** (based on the proportion of the total MSA area affected) which results in a **minor adverse** effect, which is considered to be **not significant**.

- Contaminated Land
  - impacts to human health and controlled waters caused by land contamination are considered unlikely as maintenance and operation of the Proposed Development would be in accordance with environmental legislation, good practice and in accordance with an environmental permit required for the Proposed Development (see paragraph 14.2.7, Operation for further details). Contaminated land has been scoped out of the assessment.
- Soil and Agricultural Land
  - impact on soil and agricultural land would occur during operation of the Proposed Development at the Main Development Area. Soil function would be lost under the footprint of the development (including areas of hard standing), which totals 12.9 ha of the agricultural land. All the land was classed as Subgrade 3b following field survey because of a combination of soil texture and soil water regime. The land is of low sensitivity of medium magnitude and the withdrawal of land from agriculture is a **minor adverse** effect, which is considered **not significant**.
  - the impact on the remaining undeveloped agricultural land, within the Main Development Area, involves the withdrawal of land from agriculture but the maintenance of healthy soil function under green infrastructure, to provide an Ecological Safeguard Zone. The design of green infrastructure and ecological land use has not been fully developed. It is unlikely that the land will be put back to production agriculture but the potential, particularly of grassland ecosystems, will be preserved. During the operational phase there would be no discernible loss / reduction of soil function(s) (very low magnitude). The impact is **negligible** and **not significant**.

Decommissioning and post-decommissioning Phases

14.6.19 Impacts on geology and ground conditions features during decommissioning of the Proposed Development are likely to include:

- Mineral Resources
  - the Proposed CO_2 Connection corridor will be left in situ and no works considered. Therefore, no impacts on MSA during the decommissioning phase.

- Contaminated Land
  - potential impacts during the decommissioning and post-decommissioning phase are considered to be the same as the construction and post-construction phases (see paragraphs 14.6.7 to 14.6.11).
- Soil and Agricultural Land
  - agricultural use of land within the Proposed CO_2 Connection Corridor would be possible throughout operation and following decommissioning of the Proposed Development, with the infrastructure remaining in situ, which would present no effect in terms of EIA; and
  - it is not foreseen that decommissioning of the Main Development Area would result in a return to agriculture and the impacts should be considered permanent. The effect in terms of EIA would remain that realized at construction. However, soil function within green infrastructure of the Main Development Area would persist through operation and decommissioning.

14.7 Additional Mitigation and Enhancement Measures

14.7.1 The assessment found that the construction, post-construction, operation, decommissioning and post decommissioning phases of the Proposed Development are likely to have no significant effects on geology and ground conditions. Therefore, additional mitigation measures and enhancements are not required.

14.8 Summary of Likely Significant Residual Effects

14.8.1 **Table 14-14** to **Table 14-16** summarise the likely residual significant effects of the Proposed Development on Geology and Ground Conditions and receptors following implementation of mitigation.

14.8.2 Appropriate mitigation measures to limit or potentially remove the effects described above have been outlined in Section 14.5.

14.8.3 The potential significance of the effects during the construction, post-construction, operation and decommissioning and post-decommissioning phases has been provided in Section 14.6.

14.8.4 An assessment of cumulative effects with other proposed developments that could interact with the effects of this Proposed Development has been carried out with a short-list of other developments, as detailed in **Chapter 24: Cumulative and Combined Effects** (**EN010166/APP/6.2.24**). **Chapter 24: Cumulative and Combined Effects** (**EN010166/APP/6.2.24**) also assesses the in-combination effects of multiple aspects on one receptor.

Table 14-14: Summary of Residual Effects (Construction)

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
	During Construction						
Mineral Resources	Medium	Potential impacts include: • temporary adverse effects may occur where working areas (including construction compounds) are proposed within the MSA. In such cases, there will be a temporary sterilisation of the resource during construction works. The locations of the construction compounds are yet to be confirmed.	Very low adverse	Negligible (not significant) effect).	N/A14.5	Very low adverse	Negligible (not significant) effect).

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
Receptors to Contaminated Land: Human health, groundwater, surface water, ecological designations, property (development infrastructure) In and around potential areas of contamination identified as having a baseline risk score of 3 – 5 (see **Table 14-12** and **Figure 14-2: Potential areas of contamination** (**EN010166/APP/6.3**)).	Low to high	Potential impacts include: • mobilising existing contamination in soil and groundwater as a result of ground disturbance and potential dewatering during construction; • increasing the potential for contaminants in unsaturated soils to leach to groundwater in open excavations during construction; • increasing the potential for contaminated surface run-off to	Negligible to low adverse	Negligible to minor adverse (not significant) effect.	N/A14.5	Very low adverse	Negligible to minor adverse (not significant) effect.

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
		migrate to surface water and groundwater receptors as a result of leaching from uncovered stockpiles; • introducing new sources of contamination, such as fuels and oils used in construction plant; • creating preferential pathways for the migration of soil contamination and gases, for example, along new below ground service routes, service ducts and as a result of potential dewatering; and					

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
		• introducing new human health receptors such as site staff during and post-construction.					
Soils and agricultural land:	Low	Change of land use from agriculture within the Maine Development Area. Temporary in the case of laydown areas and compounds.	Low adverse	Minor	N/A	Low adverse	Minor adverse
Soils and agricultural land:	Medium and Low	Temporary change of land use from agriculture for pipeline corridors.	Low adverse	Minor	N/A	Low adverse	Minor adverse
Post-Construction							
Receptors to Contaminated Land:	Low to high	It is anticipated that if any remediation is carried out on potentially	Negligible to low beneficial	Negligible to minor beneficial (not	N14.5/A	Negligible to low beneficial	Negligible to minor beneficial (not significant).

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
Human health, groundwater, surface water, ecological designations, property (development infrastructure) In and around potential areas of contamination identified as having a baseline risk score of 3 – 5 that are *within* the Order limits (see **Table 14-12** and **Figure 14-2: Potential areas of contamination** (**EN010166/APP/6.3**)).		contaminated sites identified within the Order limits, there would, in most instances, be overall beneficial effects post-construction. If required, (subject to further ground investigation within the Order limits), site-specific permanent remediation measures, which would focus on source removal, pathway breakage or receptor protection, would be developed during the detailed design stage. These measures would reduce risks to human health,		significant) effect.			

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
		controlled waters and property from contamination, gas and vapours in the ground (the principal risks in this area), to an acceptable level.					

Table 14-15: Summary of Residual Effects (Operation)

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
Mineral Resources:	Medium	Potential impacts include: • the effect from the operation of the Proposed Development on the identified MSA would	Low adverse	Minor adverse (not significant) effect.	N/A14.5	Low adverse.	Minor adverse (not significant) effect.

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
		be permanent where underlying the footprint of the permanent works (south-eastern area of the Proposed CO_2 Connection Corridor), with a strip of mineral becoming sterilised. The Proposed CO_2 Connection Corridor would occupy the area, limiting the					

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
		opportunity to use it for mineral extraction; and • the impact of sterilisation on the MSA, which is of medium sensitivity, has been assessed as having a magnitude of impact of low adverse (based on the proportion of the total MSA area affected) which results in a minor adverse					

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
		effect, which is considered to be not significant.					
Soils and agricultural land:	Low	Sealing of agricultural land for proposed development. Repurposing of agricultural land for green infrastructure.	Medium	Minor adverse in respect of permanent sealing. Negligible in respect of use of agricultural soils for green infrastructure.	N/A Medium.		Minor adverse to negligible.

Table 14-16: Summary of Residual Effects (Decommissioning)

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
During Decommissioning							
Receptors to Contaminated Land: Human health, groundwater, surface water, ecological designations, property (development infrastructure) In and around potential areas of contamination identified as having a baseline risk score of 3 – 5 (see **Table 14-12**and **Figure 14-2:**	Low to high	Potential impacts include: • mobilising existing contamination in soil and groundwater as a result of ground disturbance and potential dewatering during construction; • increasing the potential for contaminants in unsaturated soils to leach to	Negligible to low adverse	Potential negligible to minor adverse (not significant) effect.	14.5N/A	Very low adverse	Negligible to minor adverse (not significant) effect.

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
Potential areas of contamination (**EN010166/APP/6.3**)).		groundwater in open excavations during construction; • increasing the potential for contaminated surface run-off to migrate to surface water and groundwater receptors as a result of leaching from uncovered stockpiles; • introducing new sources of contaminatio n, such as fuels and oils used in					

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
		construction plant; • creating preferential pathways for the migration of soil contamination and gases, for example, along new below ground service routes, service ducts and as a result of potential dewatering; and introducing new human health receptors such as site staff					

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
		during and post-construction.					
Soils and agricultural land	Low to medium	No activity/change to soils and agriculture	N/A	No effect	N/A	None	No effect
Post-decommissioning							
Receptors to Contaminated Land: Human health, groundwater, surface water, ecological designations, property (development infrastructure) In and around potential areas of contamination	Low to high	It is anticipated that if any remediation is carried out on potentially contaminated sites identified within the Order limits, there would, in most instances, be overall beneficial effects post-construction. If required,	Negligible to low beneficial	Negligible to minor beneficial (not significant) effect.	N/A14.5	Negligible to low beneficial	Negligible to minor beneficial (not significant).

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
identified as having a baseline risk score of 3 – 5 that are *within* the Order limits (see **Table 14-12** and **Figure 14-2: Potential areas of contamination** (**EN010166/APP/6.3**)).		(subject to further ground investigation within the Order limits), site-specific permanent remediation measures, which would focus on source removal, pathway breakage or receptor protection, would be developed during the detailed design stage. These measures would reduce risks to human health, controlled					

Receptor	Sensitivity (value)	Description of Impact	Magnitude of Impact (prior to Additional Mitigation)	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation / Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect after Additional Mitigation
		waters and property from contamination, gas and vapours in the ground (the principal risks in this area), to an acceptable level.					

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