Green Hill Solar Farm

EN010170

Environmental Statement

Chapter 22: Ground Conditions and Contamination

Revision A (Tracked)

Prepared by: Lucion Group

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APFP Regulation 5(2)(a)

Schedule of Changes

Revision	Section Reference	Description of Changes	Reason for Revision
A	[cover]	Updated to Revision A	As required for submission at Deadline 1.
	[throughout]	Updates to document references	As required for submission at Deadline 1.
	Table 22.3	Update of Table 22.3, Sensitivity Criteria Table to include underlying aquifers.	In response to Relevant Representations made by the Environment Agency.

Contents

Issue Sheet

Report Prepared for: Green Hill Solar Farm

DCO Submission
Deadline 1

Chapter 22: Ground Conditions and Contamination

Revision A

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Original	23/05/2025	LB	RS
Revision A	07/11/2025	LB	RS

22 Ground Conditions and Contamination

22.1 Introduction

22.1.1 This chapter presents the findings of the Environmental Impact Assessment (EIA) concerning the potential ground conditions and contamination impacts of the Scheme during the construction, operation and maintenance, and decommissioning phases.

22.1.2 The ground conditions and contamination assessment process will consider the following:

- Identification and description of likely significant effects, along with the associated mitigation measures, focusing on risks to key receptors.
- Key receptors include:
  - Construction workers;
  - Controlled waters;
  - Future use and the built environment; and
  - Ecology and sensitive land uses.

22.1.3 Adjacent site users, neighbouring residents, future users of the scheme (including maintenance workers and public rights of way users) and risks associated with hazardous ground gases have been excluded from this assessment, as they were agreed to be scoped out.

22.1.4 For project description details, please refer to Chapter 4: Scheme Description ~~[EN010170/APP~~Revision A **[EX1/GH6.2.4 A]** of this Environmental Statement (ES).

22.1.5 This chapter has been prepared by Lucion Delta-Simons Limited (see Statement of Competence **[~~EN010170/~~APP~~/GH6.3.1.1~~-065]**).

Appendices and Figures

22.1.6 This chapter is supported by the following appendices:

- Appendix 22.1 **~~[EN010170/APP~~**Revision A **[EX1/GH6.3.22.1 A]:** Preliminary Geo-Environmental Risk Assessment (PRA), Green Hill Solar Farm, Northampton, by Lucion Delta-Simons, dated February 2024, updated April 2025.
- Appendix 22.2 **~~[EN010170/APP~~**Revision A **[EX1/GH6.3.22.2 A]:** Preliminary Geo-Environmental Risk Assessment (PRA), Green Hill Solar Farm Cable Route, Northampton, by Lucion Delta-Simons, dated April 2025**.**
- Appendix 22.3 **[~~EN010170/~~APP~~/GH6.3.22.3~~-187]:** Detailed UXO Risk Assessment, Green Hill G, by Impartial Assessments, dated April 2025**.**

22.1.7 This chapter is supported by the following standalone figures:

- Figure 22.1 **[~~EN010170/~~APP~~/GH6.4.22.1~~-536]:** Underlying Bedrock Geology (1 of 2);

- Figure 22.2 **[EN010170/APP/GH6.4.22.2-537]:** Underlying Bedrock Geology (2 of 2);
- Figure 22.3 **[EN010170/APP/GH6.4.22.3-538]:** Underlying Superficial Geology (1 of 2);
- Figure 22.4 **[EN010170/APP/GH6.4.22.4-539]:** Underlying Superficial Geology (2 of 2);
- Figure 22.5 **[EN010170/APP/GH6.4.22.5-540]:** Radon Potential (1 of 2); and
- Figure 22.6 **[EN010170/APP/GH6.4.22.6-541]:** Radon Potential (2 of 2).

22.1.8 This chapter is supported by the following tables:

- **Table 22.1: Relevant Scoping Opinion Comments;**
- **Table 22.2: Statutory Consultation Comments;**
- **Table 22.3: Sensitivity Criteria Table;**
- **Table 22.4: Magnitude of Impact;**
- **Table 22.5: Impact Significance Matrix;** and
- **Table 22.6: Summary of Residual Effects for Ground Conditions and Contamination.**
- **Table 22.1: Relevant Scoping Opinion Comments;**
- **Table 22.2: Statutory Consultation Comments;**
- **Table 22.3: Sensitivity Criteria Table;**
- **Table 22.4: Magnitude of Impact;**
- **Table 22.5: Impact Significance Matrix; and**
- **Table 22.6: Summary of Residual Effects for Ground Conditions and Contamination.**

22.2 Consultation

Scoping Opinion

22.2.1 An EIA Scoping Report was submitted to the Planning Inspectorate (PINS) in July 2024 (Ref 22.1 **[EN010170/APP/GH6.3.2.1-066 to APP-074]**, with a formal request for a Scoping Opinion. PINS subsequently issued the Scoping Opinion on 30 August 2024 **[EN010170/APPEX1/GH6.3.2.2_A]**.

Table 22.1: Relevant Scoping Opinion Comments

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
The Planning Inspectorate 30 August 2024 ID: 2.1.15	Baseline information - The River Nene is described as approximately 1 kilometre (km) from the BESS site in the Hydrology, Flood Risk and Drainage chapter and approximately 620m in the Ground Conditions and Contamination chapter. Baseline information should be consistent across the assessments.	The River Nene is located at its closest point 620 m north-west of the Green Hill BESS site.	Chapter 10: Hydrology, Flood Risk and Drainage has been updated **[~~EN010170/APP~~EX1/GH6.2.10_A]**.
The Planning Inspectorate 30 August 2024 ID: 3.5.1	The potential impacts on receptors should be identified and the relevant measures contained in the OCEMP and ODS identified.	OCEMP, OOEMP and ODS mitigation measures have been outlined. Further detail regarding impacts on receptors has been provided.	OCEMP, OOEMP and ODS measures included in Section 22.7. Details regarding receptors included in Section 22.8.
The Planning Inspectorate 30 August 2024 ID: 3.5.1	In agreement to scope out "Effects on construction workers, including groundworkers; and adjacent users and adjacent residents from exposure to contamination through direct contact/ingestion and inhalation of dust, vapours and asbestos fibres" – construction and decommissioning	Assessment of construction workers as a key receptor has remained within this chapter, following further scoping and statutory consultation comments.	Assessment of significance included in Section 22.8.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
The Planning Inspectorate 30 August 2024 ID: 3.5.2	In agreement to scope out "Effects on controlled waters, including underlying groundwater, from mobilisation of existing contamination via vertical/lateral migration through permeable deposits below the site" – construction and decommissioning	Assessment of Controlled Waters as a key receptor has remained within this chapter, following further scoping and statutory consultation comments.	Assessment of significance included in Section 22.8.
The Planning Inspectorate 30 August 2024 ID: 3.5.3	"Effects on controlled waters, including underlying groundwater, from spillages or leakages of fuels and chemicals and leaching of chemicals from faulty battery incidents (fire damage, ash deposition and extinguishing waters)" - construction and decommissioning. The information provided in para 10.6.8 (which conflicts with para 10.7.6) suggests that construction and decommissioning of the Proposed Development could potentially result in a major/moderate or moderate effect on controlled waters. The River Nene is described as approximately 620m to the north of the BESS site and would be crossed by the Cable Corridor, where	As a result of The Planning Inspectorate comment (ID 3.5.3), the assessment of significance of effect for each receptor has been amended. Mitigation measures for the construction of the cable route across the River Nene, has been included. Assessment of the likely significance of effect / impact on controlled waters, from the construction of the cable route across the River Nene, has	Assessment of significance included in Section 22.8. Cable route crossing the River Nene mitigation measures included in Section 22.7. Assessment of significance regarding construction of cable route included in Section 22.8.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
	construction works would occur. In the absence of evidence demonstrating no likely significant effects (LSE) and/or clear agreement of the conclusion with relevant statutory bodies, the Inspectorate is not in a position to agree to scope out this matter from the assessment. Accordingly, the ES should include an assessment where significant effects may occur or evidence of the absence of a LSE and agreement with the relevant consultation bodies.	been included.	
The Planning Inspectorate 30 August 2024 ID: 3.5.4	In agreement to scope out "Effects on future scheme users, including maintenance workers and PRoW users; and adjacent users and adjacent residents from exposure to contamination through direct contact/ingestion and inhalation of dust, vapours and asbestos fibres" - operation	Aligned with the Planning Inspectorate. Future scheme users, specifically maintenance workers and PRoW users are not addressed further. No further comments regarding risk to maintenance workers, PRoW users, and adjacent users and adjacent residents have been	Addressed in Section 22.1.3.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
		raised within the Scoping Opinion feedback.	
The Planning Inspectorate 30 August 2024 ID: 3.5.4	Works during operation would be limited to maintenance activities and replacement of panels and batteries (the details of which should be set out in the ES).	Details of maintenance activities and replacement of panels have been included.	Details included in Section 22.7.
The Planning Inspectorate 30 August 2024 ID: 3.5.5	Effects on controlled waters, including underlying groundwater, from spillages or leakages of fuels and chemicals and leaching of chemicals from faulty battery incidents (fire damage, ash deposition and extinguishing waters) via vertical/lateral migration through permeable deposits below the site" - operation The information provided in para 10.6.9 (which conflicts with para 10.7.6) suggests that operation of the Proposed Development could potentially result in a major/moderate or moderate effect on controlled waters. The River Nene (part of an SPA, Ramsar site and SSSI) is described as	Assessment of significance of effect for each receptor has been amended. Operational and construction mitigation measures, including those for a potential BESS fire, use of fire-fighting agents containing chemicals, leaching of batteries and leaching of cables have been outlined. Assessment of the likely significance of effect / impact on controlled waters and ecology and sensitive land	Assessment of significance included in Section 22.8. Mitigation measures included in Section 22.7. Assessment of significance on controlled waters and ecology included in Section 22.8.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
	approximately 620m to the north of the BESS site, which is identified as on a Secondary A aquifer, and also would be crossed by the Cable Corridor. The identified mitigation measures relate only to the construction phase and no information is provided on potential operational mitigation. That would need to include measures to address potential contamination impacts on controlled waters and flooding of watercourses arising from waters used to extinguish a BESS fire. In the absence of evidence demonstrating no LSE and/or clear agreement of the conclusion with relevant statutory bodies, the Inspectorate is not in a position to agree to scope out this matter from the assessment. Accordingly, the ES should include an assessment where significant effects may occur or evidence of the absence of a LSE and agreement with the relevant consultation bodies.	uses, in the event of a potential BESS fire, has been included. In response to comments from The Planning Inspectorate, the impact on controlled waters, previously scoped out in the PEIR, has now been included in the ES and fully addressed.	
The Planning Inspectorate	In agreement to scope out "Effects on future users, including	Aligned with the Planning Inspectorate.	Addressed in Section 22.1.3.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
30 August 2024 ID: 3.5.6	maintenance workers; and the built environment and buildings on site from hazardous ground gases accumulating and migrating into buildings, enclosed spaces and subfloor voids, with subsequent asphyxiation and/or the potential for explosion" - operation	Future scheme users, specifically maintenance workers in relation to the built environment and hazardous ground gases are not addressed further.	
The Planning Inspectorate 30 August 2024 ID: 3.5.6	It has been identified that parts of the site are within land potentially impacted by elevated Radon, ranging from less than 1% to 10-30% of homes being above the action level for Radon. Consideration of impacts resulting from elevated levels of Radon on the site should be included in the ES and an assessment of effects made and mitigation proposed where LSE are likely to occur. Efforts should be made to agree the approach and conclusions with the relevant statutory bodies.	Assessment of the likely significance of effect / impact on the built environment, in the event of elevated Radon, has been included. Mitigation measures for potential enclosed buildings within areas of elevated Radon, have been included.	Assessment of significance on the built environment included in Section 22.8. Radon mitigation measures included in Section 22.9.
The Planning Inspectorate 30 August 2024 ID: 3.5.7	The ES should include consideration of potential impacts on ecological receptors resulting from contamination during all phases of	Ecology and Sensitive Land Uses receptors have been included as part of the	Assessment of significance on ecology and sensitive land uses have been included in Section 22.8.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
	the Proposed Development and an assessment of effects made and mitigation proposed where LSE are likely to occur. Efforts should be made to agree the approach and conclusions with the relevant statutory bodies	assessment for ground conditions and contamination.	
The Planning Inspectorate 30 August 2024 ID: 3.5.8	The Inspectorate notes that the EA has identified a number of apparent discrepancies in the geological site characterisation for [Green Hill] A to G and the BESS site within the Scoping Report and Preliminary Risk Assessment and that groundwater levels are only specified for isolated areas. The baseline conditions at [Green Hill] A and A.2 requires separation. Identify non-potable groundwater abstraction points within 500 m of the Sites. The baseline must be accurately and comprehensively described for the entire site within the ES and supporting documents so that relevant receptors, impacts and effects are identified.	Geological discrepancies, aquifer designations, groundwater levels, Green Hill A.2 descriptions and non-potable groundwater abstraction points have been amended within the PRA.	PRA has been reissued and included as Appendix 22.1; information updated in Section 22.6.
The Planning Inspectorate	Controlled waters and the built environment	The terminology	Terminology amended in Section 22.8.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
30 August 2024 ID: 3.5.9	are described here as of 'moderate' sensitivity. The sensitivity criteria set out in Table 10.1 to be used for the assessment are described as high, medium, low and negligible. Care should be taken within the ES to ensure that the methodology and related terminology are consistently applied.	for sensitivity and magnitude has been revised to ensure consistent use throughout the ES.	
The Planning Inspectorate 30 August 2024 ID: 3.5.10	The receptor sensitivity and impact magnitude values set out in the conclusions in Section 7 paras 10.7.3 – 10.7.7, combined therein to determine the level of significance of the resulting effect, differ to those set out in the assessment information within Section 6 paras 10.6.5 10.6.9 in respect of the same receptors. According to the significance matrix contained in Table 10.3 the values assigned in Section 6 would result in a different (higher) level of significance of effect for the following: Controlled waters during construction, operation and decommissioning;	Assessment of significance of effect for each receptor has been amended to reflect design information, consultation feedback and scoping opinion comments.	Assessment of significance amended in Section 22.8.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
	Exposure of future scheme users, including maintenance workers and PRoW users; and adjacent users and adjacent residents to contamination through direct contact/ingestion and inhalation of dust, vapours and asbestos fibres during operation; Direct contact between and accumulation of gas in buildings, enclosed spaces and sub-floor voids of future users during the construction and decommissioning phases. In addition, the sensitivity of future users and the built environment is considered separately in para 10.6.9 and differs between the two receptors, but this is not reflected in the conclusion contained in 10.7.7, and results in a different conclusion, as set out above.		
The Planning Inspectorate 30 August 2024 ID: 3.5.11	Mitigation as detailed in the "Detailed UXO Risk Assessment Site G" recommends implementing a UXO Risk Management Plan and site-specific UXO Awareness Briefings to all	Assessment of the likely significance of effect / impact on construction workers from potential on-site UXO, has	Assessment of significance for onsite UXO included in Section 22.8. Additional UXO mitigation measures included in Section 22.9.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
	personnel undertaking intrusive works; and UXO Specialist On-Site Support specifically for open excavations. The ES should include consideration of potential impacts on receptors resulting from UXO on the site and an assessment of effects made and mitigation proposed where LSE are likely to occur. Efforts should be made to agree the approach and conclusions with the relevant statutory bodies.	been included. Additional mitigation measures for potential on-site UXO have been included.	
Bedford Borough Council Response to Scoping Opinion	In general, BBC is in agreement regarding this aspect's approach as set out by the Applicant and makes limited comment in this regard. The ES will need to address the potential leaching of contaminated fire water and leachants from batteries into the surrounding ground water and water courses including the Ramsar, SSSI and SPA sites. This matter is raised in §10.6.8 (and §10.7.6) but should be addressed in terms of the Chief Fire Officers Guidance; it is suggested that the	Mitigation measures, including those for a potential BESS fire, use of fire-fighting agents containing chemicals, leaching of batteries and leaching of cables have been outlined. Assessment of the likely significance of effect / impact on controlled waters and ecology and sensitive land uses, in the event of a	Mitigation measures included in Section 22.7. Assessment of significance in event of BESS fire is included in Section 22.8. Cumulative effects to human health in regard to BESS fires, will be discussed further within Chapter 18: Human Health **[~~EN010170/~~APP/~~GH6.2.18~~-055]** and Chapter 25: Cumulative Effects and Effects Interactions **[~~EN010170/~~APP/~~GH6.2.25~~-062]**.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
	impact magnitude may currently be understated. §10.9.1) In light of BESS / lithium battery fires being an evolving understanding, it is suggested the 'cumulative effects to human health' should be stated as an unknown. (Table 10.4) In light of the concerns raised regarding the BESS facility (fire and contamination), it is suggested that the Applicant reviews Table 10.4 in terms of matters scoped out, or states that the matters are unknown.	potential BESS fire, has been included. Cumulative effects have been addressed. In response to Scoping comments, the impact on controlled waters and ecologically sensitive areas from BESS fires, previously scoped out in the PEIR, has now been included in the ES and fully addressed.	
The Environment Agency, 22 August 2024 Response to Scoping Opinion	We advise that these documents are used: The Environment Agency's approach to groundwater protection (February 2018): The Environment Agency's approach to groundwater protection (publishing.service.gov.uk). Protect groundwater and prevent groundwater pollution (March 2017): Protect groundwater and	Documents included within Chapter assessment.	Documents updated in Section 22.3.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
	prevent groundwater pollution - GOV.UK (www.gov.uk).		
The Environment Agency, 22 August 2024 Response to Scoping Opinion	BESS fires are a risk to groundwater as it can contain harmful chemicals – both from the batteries that have been burnt, and the chemicals used as fire-suppressants in the water or foam itself. A BESS fire can release lithium, PFAS and hydrofluoric acid, amongst other hazardous substances into the ground water. As the site is on a Secondary A aquifer (and close to an SSSI and the River Nene), we recommend that the BESS has a pollution control method, such as a sealed drainage strategy, to contain firewater or contaminated surface-waters. This is necessary to contain and manage any fire-fighting effluent, or contaminated surface waters generated by a fire, or other spillages, at the site. We request that the risks to groundwater from fire water during the operational phase be scoped into the EIA.	Mitigation measures, including those for a potential BESS fire, use of fire-fighting agents containing chemicals, leaching of batteries and leaching of cables have been outlined. Assessment of the likely significance of effect / impact on controlled waters and ecology and sensitive land uses, in the event of a potential BESS fire, has been included. In response to Scoping comments, the impact on controlled waters and ecologically sensitive areas from BESS fires, previously scoped out in the PEIR, has now been	Mitigation measures included in Section 22.7. Assessment of significance in event of BESS fire is included in Section 22.8.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
		included in the ES and fully addressed.	
The Environment Agency, 22 August 2024 Response to Scoping Opinion	We have identified several historic landfill sites within the proposed site area and in close proximity to the development. The PRA considers Sywell Aerodrome, which has been active since 1928, as well as nearby industrial activities and an historical inert waste landfill. This area is underlain by superficial Secondary (undifferentiated) aquifer, and bedrock Secondary A aquifer. The report assumes the cable route will not pass through the known landfill, but justification for this is not given. We recommend the applicant to address the aerodrome and landfill sites with respect to contamination in the scoping report. While the OCEMP Discovery Strategy, discussed in Section 10.8.1, should be sufficient to address the potential risks posed, we cannot rule out the requirement of further investigation in the area, dependent	Identification of historic landfill sites in relation to the Cable Route Corridor have been identified and updated within Baseline Conditions section.	Updated baseline conditions included in Section 22.6.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
	on the final cable route.		
The Environment Agency, 22 August 2024	Section 8.3.15 states that horizontal directional drilling may be used at some locations of ecological sensitivity, where traditional trenching methods are not feasible. This work could involve the use of drilling muds, and their use may require a risk assessment and a mitigation strategy, to ensure they do not pose a risk to controlled waters. The proposed use of directional drilling techniques will therefore be assessed with the Preliminary Environmental Impact Report (PEIR), and the Environmental Statement (ES), which we welcome.	Mitigation measures for the construction of the cable route across the River Nene, utilising horizontal directional drilling methods, has been included.	Mitigation measures for cable route construction included in Section 22.7.
Grendon Parish Council Response to Scoping Opinion	"Spillages or leakages of fuels and chemicals. Leaching of chemicals from faulty battery incidents (fire damage, ash deposition and extinguishing waters)" are requested to be moved to in scope.	In response to Scoping comments, the impact of spillages and leakages of fuels and chemicals, previously scoped out in the PEIR, has now been included in the ES and fully addressed.	Discussed within Sections 22.7 and 22.8.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
Holcot Parsh Council, 20 August 2024 Response to Scoping Opinion	"Spillages or leakages of fuels and chemicals. Leaching of chemicals from faulty battery incidents (fire damage, ash deposition and extinguishing waters)" are requested to be moved to in scope.	In response to Scoping comments, the impact of spillages and leakages of fuels and chemicals, previously scoped out in the PEIR, has now been included in the ES and fully addressed.	Discussed within Sections 22.7 and 22.8.
Mears Ashby Parish Council, 21 August 2024 Response to Scoping Opinion	Battery Storage Systems are notoriously unsafe, liable to catch fire and require hundreds of gallons of water to extinguish. Run-off from such a fire contains significant amounts of pollutants and can contaminate watercourses. Both areas are close to water courses that eventually run into Sywell reservoir at the Country Park.	Mitigation measures, including those for a potential BESS fire, use of fire-fighting agents containing chemicals, leaching of batteries and leaching of cables have been outlined. Assessment of the likely significance of effect / impact on controlled waters and ecology and sensitive land uses, in the event of a potential BESS fire, have been included.	Mitigation measures included in Section 22.7. Assessment of significance in event of BESS fire is included in Section 22.8.

Consultee and Date	Comment	How has the comment been addressed	Location of response in chapter
		In response to Scoping comments, the impact on controlled waters and ecologically sensitive areas from BESS fires, previously scoped out in the PEIR, has now been included in the ES and fully addressed.	
North Northamptonshire Council, 22 August 2024 Response to Scoping Opinion	In agreement to scope out ground conditions.	No amendments required.	Not Applicable.
West Northamptonshire Council, 22 August 2024. Response to Scoping Opinion	No comment provided.	No amendments required.	Not Applicable.

Statutory Consultation

22.2.2 Following scoping, statutory consultation was undertaken following preparation of the Preliminary Environmental Information Report (PEIR). **Table 22.2** outlines the statutory consultation responses to the PEIR relating to Ground Conditions and Contamination and how these have been addressed through the ES.

22.2.3 Responses to the Statutory Consultation are outlined in the Consultation Report **[~~EN010170/APP~~**Revision A **[EX1/GH5.1_A]**.

Table 22.2: Statutory Consultation Comments

Consultee and Date	Comments	How has this comment been addressed	Location of response in the ES
Mears Ashby Council 12 December 2024.	Mears Ashby Council have noted that Battery Storage Systems are liable to catch fire and require extensive amounts of water to extinguish. Concern has been raised upon the run-off containing pollutants, causing contamination to watercourses.	Mitigation measures, including those for a potential BESS fire and use of fire-fighting agents containing chemicals have been outlined. Assessment of the likely significance of effect / impact on controlled waters and ecology and sensitive land uses, in the event of a potential BESS fire, has been included.	Mitigation measures included in Section 22.7. Assessment of significance to controlled waters and ecological / sensitive land receptors is included in Section 22.8.
Forestry Commission 12 December 2024.	The Forestry Commission has expressed concerns about the protective measures to prevent contamination from fuels and chemicals stored on the site.	Mitigation measures to prevent contamination from fuels and chemicals stored on the site have been outlined.	Mitigation measures included in Section 22.7.
Easton Maudit Parish Council 17 December 2024	Easton Maudit Parish Council has raised concerns about the potential impact on the surrounding SSSI/Ramsar site in the event of a BESS fire involving the release of toxic contaminants.	Mitigation measures, including those for a potential BESS fire and use of fire-fighting agents containing chemicals have been outlined. Assessment of the likely significance of effect / impact on controlled waters and ecology and sensitive land uses, in the event of a potential BESS fire, has been included.	Mitigation measures included in Section 22.7. Assessment of significance to controlled waters and ecological / sensitive land receptors is included in Section 22.8.
Irchester Parish Council 18 December 2024	Irchester Parish Council has raised concerns about the fire risks posed by the battery storage	Mitigation measures, including those for a potential BESS fire and use of fire-fighting agents containing	Mitigation measures included in Section 22.7.

Consultee and Date	Comments	How has this comment been addressed	Location of response in the ES
	units and the potential pollution that could result from such incidents.	chemicals have been outlined. Assessment of the likely significance of effect / impact on controlled waters and ecology and sensitive land uses, in the event of a potential BESS fire, has been included.	Assessment of significance to controlled waters and ecological / sensitive land receptors is included in Section 22.8.
Bedfordshire Council 18 December 2024	Bedfordshire Council has expressed concerns about the management of contaminated fire water in the event of a BESS fire. They have also highlighted issues surrounding the decommissioning of the cable route, noting that the plastics and metals in the ducting and cables are toxic and could leach into the surrounding soil and groundwater over time, causing contamination. Additionally, the council is concerned about the hazardous materials used in solar panel manufacturing and the potential for these materials to leach into soils, groundwater, and watercourses.	Mitigation measures, including those for a potential BESS fire and use of fire-fighting agents containing chemicals have been outlined. Assessment of the likely significance of effect / impact on controlled waters and ecology and sensitive land uses, in the event of a potential BESS fire, has been included. The underground ducting and joint bays within the Cable Corridor will be decommissioned in accordance with the latest regulations and good practice at that time. Currently, the most environmentally acceptable option is to leave the cables in-situ to minimise adverse environmental effects from disturbance to overlying land and habitats. Mitigation measures including regular inspections and	Mitigation measures included in Section 22.7. Assessment of significance to controlled waters and ecological / sensitive land receptors is included in Section 22.8.

Consultee and Date	Comments	How has this comment been addressed	Location of response in the ES
		maintenance to identify signs of potential leakage, wear or faults have been outlined. Assessment of significance to controlled waters has been undertaken.	
Earls Barton Parish Council 19 December 2024	Earls Barton Parish Council has raised concerns about the potential impact on the surrounding SSSI/Ramsar site in the event of an emergency involving the release of toxic contaminants. They have also expressed concerns about the condition of the land after the project's tenure and whether it can be returned to agricultural use.	Mitigation measures, including those for a potential BESS fire, use of fire-fighting agents containing chemicals have been outlined. Assessment of the likely significance of effect / impact on controlled waters and ecology and sensitive land uses, in the event of a potential BESS fire, has been included. Mitigation measures to enable the land to be returned to agricultural use have been outlined.	Mitigation measures included in Section 22.7. Assessment of significance to controlled waters and ecological / sensitive land receptors is included in Section 22.8. Assessment of significance for future land use is included in Section 22.8.
UK Health Security Agency 3 January 2025	The UK Health Security Agency has requested an assessment of the potential impacts of a fire in the Battery Energy Storage System, including the effects of fire water runoff on drinking water supplies.	Mitigation measures, including those for a potential BESS fire and use of fire-fighting agents containing chemicals have been outlined. Assessment of the likely significance of effect / impact on controlled waters and ecology and sensitive land uses, in the event of a potential BESS fire, has been included.	Mitigation measures included in Section 22.7. Assessment of significance to controlled waters and ecological / sensitive land receptors is included in Section 22.8.

Consultee and Date	Comments	How has this comment been addressed	Location of response in the ES
Bozeat Parish Council	Bozeat Parish Council has requested details about cleaning practices during the operational phase, ensuring prevention of soil compaction and contamination.	Operational measures including cleaning, regular inspections and maintenance have been outlined.	Operational mitigation measures are included in Section 22.7.
The Environment Agency 24 January 2025	The Environment Agency noted that Appendix 22.1: Preliminary Geo-Environmental Risk Assessment, Green Hill Solar Farm, Northampton, dated October 2024, has not been uploaded to the Green Hill website. Summary of changes is required.	Appendix 22.1: Preliminary Geo-Environmental Risk Assessment has been uploaded onto the Green Hill website. Summary of changes within the PRA include clarifying the geological discrepancies, updates to the aquifer designations, groundwater levels, Green Hill A.2 descriptions and non-potable groundwater abstraction points.	Green Hill website. PRA has been reissued and included as Appendix 22.1; information updated in Section 22.6.
The Environment Agency 24 January 2025	The Environment Agency noted discrepancies in the stated submission date to Planning Inspectorate.	Submission date confirmed as July 2024.	No update required within Chapter 22: Ground Conditions and Contamination.
The Environment Agency 24 January 2025	The Environment Agency required definition of acronym LSE.	LSE is defined as “likely significant effects”. LSE also defined when first used in this chapter.	LSE defined in Table 22.1.
The Environment Agency 24 January 2025	The Environment Agency noted that Source Protection Zones (SPZs) and aquifers to be included in the sensitivity criteria and	SPZ and aquifers included in Sensitivity Table. Assessment has recognised that none of the Green Hill sites are located within an SPZ, therefore not requiring further assessment. Aquifers	Sensitivity Table (Table 22.3) updated in Section 22.4. Assessment of aquifers included within

Consultee and Date	Comments	How has this comment been addressed	Location of response in the ES
	included in receptor assessment.	have been assessed within the controlled waters receptor.	controlled water receptors in Section 22.8.
The Environment Agency 24 January 2025	The Environment Agency noted that Figures 1.1, 1.2, 2.1 and 2.2. have not been uploaded to the Green Hill website.	Figures 1.1, 1.2, 2.1 and 2.2 have been uploaded onto the Green Hill website.	Green Hill website.
The Environment Agency 24th January 2025	The Environment Agency queried the requirement of leak detection systems for the underground cables.	Cables confirmed to not contain any fluids, therefore the requirement of leak-detection of the cables would not be required - this has been removed. The use of high-quality, durable sheathing and insulation materials to protect the cables from physical damage, moisture, and corrosion, ensuring they can withstand harsh underground conditions remains in place.	Updated mitigation measures included in Section 22.7.
The Environment Agency 24 January 2025	The Environment Agency requested the assessment of landfill risk to controlled waters.	Identification of landfill sites in relation to the Cable Route Corridor and BESS have been identified within the Baseline Conditions section.	Updated baseline conditions included in Section 22.6.
Campaign to Protect Rural England – Northamptonshire	CPRE Northamptonshire requested information regarding the containment of potential BESS fire contamination.	Mitigation measures, including those for a potential BESS fire, use of fire-fighting agents containing chemicals and the containment of fuels and chemicals have been outlined.	Mitigation measures included in Section 22.7.

22.3 Legislation, Planning Policy and Guidance

22.3.1 This section provides an overview of the legislation, planning policy and guidance against which the Scheme will be considered for Ground Conditions and Contamination.

Legislation

UK Legislation

Environmental Protection Act 1990 (as amended) (Ref 22.1)

22.3.2 Part IIA of the Environmental Protection Act 1990 (EPA 1990) aims to ensure that contaminated land is identified and remediated where it poses unacceptable levels of risk. Section 78A(2) of the EPA 1990, provides the definition of 'contaminated land' for the purposes of Part IIA, which is:

22.3.3 'Contaminated Land' is any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that

(a) significant harm is being caused or there is a significant possibility of such harm being caused; or

(b) significant pollution of controlled waters is being caused; or there is a significant possibility of such pollution being caused'.

22.3.4 In Section 78A(4) of the EPA 1990, harm is defined as meaning 'harm to the health of living organisms or other interference with the ecological systems of which they form part and in the case of man includes harm to his property'.

Water Resources Act 1991 (as amended) (Ref 22.3)

22.3.5 In addition, Sections 161 to 161D of the Water Resources Act 1991 give powers to the Environment Agency to take action to prevent or remedy the pollution of controlled waters. A "works notice" served under Section 161A specifies what works or operations have to be carried out and in what time periods. A "works notice" is served on any responsible person where it appears that:

- any poisonous, noxious or polluting matter or any waste matter is or has been present in, or is likely to enter, any controlled waters; or
- any controlled waters are being or have been harmed, or are likely to be harmed, by any event, process or other source of potential harm.

Planning Policy

National Planning Policy

22.3.6 National Policy Statements (NPSs) form a principal part of the decision-making process for Nationally Significant Infrastructure Projects (NSIPs); the policy statements of relevance to the Facility are:

- The overarching NPS for Energy (EN-1) (Ref 22.4)Ref 22.4;
- NPS for Electricity Networks Infrastructure (EN-5) (Ref 22.5)Ref 22.5; and
- NPS for Renewable Energy Infrastructure (EN-3) (Ref 22.6)Ref 22.6.

Overarching National Policy Statement for Energy (EN-1) (Ref 22.4)

22.3.7 Section 5.11 Land Use, including Open Space, Green Infrastructure and Green Belt requires that any risks arising from land instability and contamination is managed such that the site is suitable for use following development. These requirements follow those stated in NPPS. For further information, see Section 22.3.10.

National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 22.5)

22.3.8 Section 2.9.25 considers the potential impacts on soils and geology and the need for soil resource and management plans. This will ensure proper soil handling, backfilling, and restoration of the land to its original baseline condition, preventing any degradation or loss of agricultural land.

National Policy Statement for Renewable Energy Infrastructure (EN-3) (Ref 22.6)

22.3.9 In the Solar Photovoltaic Generation section of EN-3, Section 3.10.17 highlights that when solar developments are located on agricultural land, they should enable the continuation of agricultural use to maximise land-use efficiency. Section 3.10.19 outlines the requirement for Soil Management Plans to support the sustainable use and management of soils, aiming to minimise adverse impacts on soil health and potential contamination. Additionally, Section 3.10.118 emphasises the importance of protecting soil during construction by implementing mitigation measures that reduce damage to both in-situ and excavated, stockpiled soil. These measures are designed to preserve soil health and structure, minimise carbon loss, and maintain water infiltration and soil biodiversity.

22.3.10 The following paragraphs of the NPS EN-1 are considered to be relevant to this chapter:

- *"4.12.1 - Issues relating to discharges or emissions from a proposed project, and which lead to other direct or indirect impacts on terrestrial, freshwater, marine, onshore, and offshore environments, or which include noise and vibration may be subject to separate regulation under the pollution control framework or other consenting and licensing regimes.*
- *4.12.8 - Wherever possible, applicants should submit applications for Environmental Permits and other necessary consents at the same time as applying to the Secretary of State for development consent.*
- *4.12.9 - In considering an application for development consent the Secretary of State should focus on whether the development itself is an acceptable use of the land, and the impact of that use, rather than the control of processes, emissions or discharges themselves.*
- *4.12.16 The Secretary of State should not refuse consent on the basis of pollution impacts unless there is good reason to believe that any relevant necessary operational pollution control permits or licences or other consents will not subsequently be granted. On this basis, it is reasonable for the Secretary of State to consider residual amenity issues only when considering whether the development itself is an acceptable use of the land, and on the impacts of that use.*

- *5.11.8 - The ES should identify existing and proposed land uses near the project, any effects of replacing an existing development or use of the site with the proposed project or preventing a development or use on a neighbouring site from continuing. Applicants should also assess any effects of precluding a new development or use proposed in the development plan.*
- *5.11.11 - During any pre-application discussions with the Applicant the LPA (Local Planning Authority) should identify any concerns it has about the impacts of the application on land use, having regard to the development plan and relevant applications and including, where relevant, whether it agrees with any independent assessment that the land is surplus to requirements.*
- *5.11. 2 - Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5) except where this would be inconsistent with other sustainability considerations.*
- *5.11.13 - Applicants should also identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed. For developments on previously developed land, Applicants should ensure that they have considered the risk posed by land contamination."*

22.3.11 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2024) (Ref 22.7) does not contain specific policies relating to NSIPs. However, some policy requirements detailed in the NPPF may be of relevance. The policies relating to this chapter include:

- Planning policies and decisions should contribute to and enhance the natural and local environment by inter alia preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate. Opportunities to incorporate biodiversity improvements into developments are encouraged, especially where they can achieve measurable net gains. Development proposals that result in the loss of irreplaceable habitats, such as ancient woodlands or veteran trees, should generally be refused unless there are exceptional reasons and a suitable compensation strategy. For non-irreplaceable habitats, compensatory measures should be used to ensure a net gain in biodiversity is achieved. (para 187).
- Planning policies and decisions should also ensure that:

  (a) A site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation

(as well as potential impacts on the natural environment arising from that remediation);

(b) After remediation, as a minimum land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990;

c) Adequate site investigation information, prepared by a competent person, is available to inform these assessments. (para 196)

- Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner. (para 197)
- Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. (para 198).

Local Planning Policy *(Ref 22.4Ref 22.6Ref 22.5)*

22.3.12 Green Hill Solar Farm is located within the jurisdiction of West Northamptonshire Council, North Northamptonshire Council, Milton Keynes Council and Bedfordshire Borough Council.

Emerging North Northamptonshire Local Plan (Issues and Scope Consultation, March 2022) (Ref 22.8)

22.3.13 Local Policy 6 - Development on Land Affected by Contamination has been read in conjunction to this chapter. In particular, the requirement to take into account the potential environmental impacts on people, buildings, land, air and water arising from the development itself and any former use of the site including, adverse effects arising from pollution. PRAs have been undertaken and submitted as part of this development. The planning aspects of ground conditions is dealt with by the legislation, policy and guidance in this section.

Emerging West Northamptonshire Local Plan (Public Consultation on Regulation 18 Draft Local Plan, approved March 2024, April to June 2024) (Ref 22.9)

22.3.14 Policy BN9 – Planning for Pollution Control has been read in conjunction with this chapter. In particular, for any event that may cause pollution, expose individuals to pollution sources, or pose safety risks, mitigation measures have been assessed and incorporated into this development. These measures aim to minimise risk, reduce pollution, and ensure a high standard of protection for health and environmental quality.

22.3.15 Local Policy BN10 – Ground Instability has been read in conjunction with this chapter. In particular, the ground stability of the sites has been assessed by evaluating the underlying geological conditions. The assessment confirms that the development will not contribute to or cause instability on the site or surrounding land. Where necessary, mitigation measures for any unstable ground in the context of the development have been included as part of the assessment.

Milton Keynes Council Plan: MK 2016-2031 (Ref 22.10)

22.3.16 Policy NE6 – Environmental Pollution, specifically Contaminated Land and Soil Pollution has been read in conjunction with this chapter. In particular, the required inclusion of PRAs to evaluate the likelihood of ground, groundwater, or gas contamination on the sites. This includes identifying land previously used for industrial, commercial, or utility purposes, as well as any areas that are potentially contaminated, already contaminated, or affected by contamination from adjacent sites. Additionally, land where the proposed use is particularly vulnerable to contamination has been assessed. Mitigation measures have been included to demonstrate how the risk of soil and water pollution will be reduced to an acceptable level.

MK City Plan 2050 (Ref 22.11)

22.3.17 Policy CEA7 Mitigating Wider Environmental Pollution, has been read in conjunction with this chapter. In particular, the requirement to ensure that pollution does not have an unacceptable impact on human health, groundwater, general amenity, biodiversity, or the wider natural environment. PRAs have been conducted to identify land previously used for industrial, commercial, or utility purposes, as well as areas that are potentially contaminated, already contaminated, or affected by contamination from adjacent sites. Additionally, land where the proposed use is particularly vulnerable to contamination has been assessed. Mitigation measures have been included to demonstrate how the risk of soil and water pollution will be managed to an acceptable level.

Bedford Borough Local Plan 2030 (Adopted 2020) (Ref 22.12)

22.3.18 Policy 47S – Pollution, Disturbance and Contaminated Land, has been read in conjunction with this chapter. In particular, the requirement of preventing the emission of significant levels of pollutants into the soil, air or water, ensuring appropriate location in regard to ground stability or pollution environment, including the proximity of pollutants, hazardous substances and disruptive uses.

Guidance

Environmental Protection Act 1990: Part IIA Contaminated Land Statutory Guidance (Ref 22.2)

22.3.19 The statutory government guidance to Part IIA (DEFRA, 2012), describes the concept of the 'contaminant linkage' in Sections 3.8 to 3.11 as quoted below:

22.3.20 (3.8) *"Under Part IIA, for a relevant risk to exist there needs to be one or more contaminant-pathway-receptor linkages – "contaminant linkage" – by which a relevant receptor might be affected by the contaminants in question. In other words, for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that poses a hazard, and one or more pathways by which they might significantly harm people, the environment, or property; or significantly pollute controlled waters. For the purposes of this Guidance:*

> *(a) A "contaminant" is a substance which is in, on or under the land and which has the potential to cause significant harm to a relevant receptor, or to cause significant pollution of controlled waters.*

(b) A "receptor" is something that could be adversely affected by a contaminant, for example a person, an organism, an ecosystem, property, or controlled waters. The various types of receptors that are relevant under Part IIA regime are explained in later sections.

(c)A "pathway" is a route by which a receptor is or might be affected by a contaminant.

22.3.21 (3.9) *The term "contaminant linkage" means the relationship between a contaminant, a pathway and a receptor. All three elements of a contaminant linkage must exist in relation to particular land before the land can be considered potentially to be contaminated land under Part IIA, including evidence of the actual presence of contaminants. The term "significant contaminant linkage", as used in this Guidance, means a contaminant linkage which gives rise to a level of risk sufficient to justify a piece of land being determined as contaminated land. The term "significant contaminant" means the contaminant which forms part of a significant contaminant linkage.*

22.3.22 (3.10) *In some cases the local authority may encounter land where risks are presented by groups of substances which are likely to behave in the same manner, or a substantially very similar manner, in relation to the risks they may present (e.g. as may be the case with organic substances found in oils). For the purposes of identifying and assessing contaminant linkages and taking regulatory decisions in relation to such linkages, the local authority may treat such groups of contaminants as being in effect a single contaminant and multiple contaminant linkages as being in effect a single contaminant linkage. The authority should only do this if there is a scientifically robust reason for doing so, and it should state clearly why this approach has been taken in relevant documentation (including the risk summary discussed later in this Section) if the land is later determined as contaminated land.*

22.3.23 (3.11) *In considering contaminant linkages, the local authority should consider whether:*

(a) The existence of several different potential pathways linking one or more potential contaminants to a particular receptor or class of receptors may result in a significant contaminant linkage.

(b) There is more than one significant contaminant linkage on any land. If there are, the authority should consider whether or not each should be dealt with separately, since different people may be responsible for the remediation of individual contaminant linkages."

22.3.24 The guidance also mentions that its broader approach may include using the planning system to ensure land is made 'suitable for use'.

22.3.25 The UK government guidance titled 'Land affected by contamination', updated in July 2019 (Ref 22.13) provides guiding principles on how planning can deal with land affected by contamination including identifying and remediating statutorily defines contaminated and, the use of buildings regulations and permitting. Guidance is also provided as to how to determine if land is contaminated through the use of several recommended data sources (such as River Basin Management

Plans, National Land Use Database, Historical Ordnance Survey Maps, Local Planning Authority Records and Natural England's MAGIC site).

22.3.26 This assessment has been undertaken in general accordance with guidance on Land Contamination: Risk Management pages (Ref 22.14) of the GOV.UK website, the relevant requirement of the NFPP (Ref 22.7) (as revised December 2023) (paragraphs 180 and 189-194) and the Planning Practice Guidance (Land Affected by Contamination) (Ref 22.13)

22.3.27 Further UK Guidance relevant to this chapter includes:

- British Standard BS 5930:2015 + A1:2020: Code of practice for site investigations (Ref 22.15);
- British Standard BS 8485:2015 + A1:2019: Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings (Ref 22.16);
- British Standard BS 8576:2013: Guidance on investigations for ground gas – permanent gases and volatile organic compounds (Ref 22.17);
- British Standard BS 10175:2011 + A2:2017: Code of practice for investigations of potentially contaminated sites (Ref 22.18);
- CIRIA C665:2007: Assessing risks posed by hazardous ground gases to buildings (Ref 22.19);
- CIRIA C681:2009: Unexploded ordnance (UXO) A guide for the construction industry (Ref 22.20);
- CIRIA C762:2016: Environmental good practice on site (Ref 22.21);
- CIRIA C733:2014: Asbestos in soils and made ground (Ref 22.22);
- The Environment Agency approach to groundwater protection (February 2018 + 2023) (Ref 22.23);
- Environment Agency guidance: protect groundwater and prevent groundwater pollution (March 2017 + 2024) (Ref 22.24);
- Environment Agency guidance: contaminated land exposure assessment (CLEA) tool (May 2014 + 2015) (Ref 22.25);
- Environment Agency science report: human health toxicological assessment of contaminants in soil (2009) (Ref 22.26);
- Environment Agency guidance: land contamination risk management (LCRM) Stage 3 remediation and verification (October 2020 + 2023) (Ref 22.27); and
- Environment Agency research and analysis: land contamination: remedial targets methodology (RTM) (January 2006 + 2014) (Ref 22.28).

22.4 Assessment Methodology and Significance Criteria

22.4.1 The methodologies described in the following section have been developed in line with the relevant planning policy and appropriate industry guidance for

assessing potential effects from the Scheme on Ground Conditions and Contamination.

Study Area

22.4.2 As described in Chapter 3: The Development Site **~~[EN010170/APPGH6~~**Revision A **[EX1/GH6.2.3_A]** the Study Area comprises nine sites (the Sites - Green Hill A to G and Green Hill BESS) and the Cable Route Corridor.

22.4.3 The site locations can be classified into the following:

- Green Hill A - Land east of Broughton Road, Old;
- Green Hill A.2 - Land north-east of Walgrave;
- Green Hill B - Land south of Holcot;
- Green Hill C - Land north of Sywell Road, Sywell;
- Green Hill D - Land west of Highfield Road, Mears Ashby;
- Green Hill E - Land at Wilby Road, Mears Ashby;
- Green Hill F - Land west of Bozeat;
- Green Hill G - Land at Warrington; and
- Green Hill BESS - Land at Grendon Substation.

22.4.4 The Cable Route Corridor will comprise buried and underground cables that will connect the Sites to the PoC at Grendon Substation.

22.4.5 For further detail on the existing site conditions see Chapter 3: The Development Site **~~[EN010170/APP~~**Revision A **[EX1/GH6.2.3_A]** and for a description of the proposed Scheme including the physical characteristics and key activities, Chapter 4: Scheme Description **~~[EN010170/APP~~**Revision A **[EX1/GH6.2.4_A]**.

Sources of Information

22.4.6 The relevant information sources used for the assessment are as follows:

- Current and Historical Ordnance Survey (OS) maps;
- British Geological Survey (BGS) data;
- Environment Agency (EA) online data;
- Coal Authority (CA) online data;
- Landmark Envirocheck® Reports for the Site are included within the PRAs (Appendix 22.1 and 22.2 of this Chapter, as Appendix E). References and dates included below:

  Green Hill A, A.2 and B, Ref. 331731401_1_1, dated 18 January 2024.

  Green Hill C and D, Ref. 331730783_1_1, dated 18 January 2024.

  Green Hill E, Ref. 331730476_1_1, dated 18 January 2024.

  Green Hill F, Ref. 331729469_1_1, dated 18 January 2024.

  Green Hill G, Ref. 346936621_1_1, dated 16 May 2024.

Land at Grendon (BESS), Ref. 324847725_1_1, dated 15 November 2023.

Cable Route Corridor located between Green Hill E and Green Hill BESS, Ref. 371271146_1, dated 5 March 2025.

Cable Route Corridor located internally within Green Hill F, Ref. 371271575_1, dated 5 March 2025.

Cable Route Corridor located between Green Hill F and Green Hill G, Ref. 371272082_1, dated 5 March 2025.

- Historical Maps included as part of the Envirocheck Report; and
- Information provided by West Northamptonshire Council, North Northamptonshire Council, Milton Keynes Council and Bedfordshire Borough Council.

Impact Assessment Methodology

22.4.7 The baseline conditions for soil and groundwater have been established through desktop reviews (Preliminary Geo-Environmental Risk Assessment (PRA)) to identify potential contaminant linkages and assess the risk to key receptors. The methodology used within this assessment is detailed as follows:

- Review of the environmental setting of the Scheme, including the current use / status of the Sites, Cable Route Corridor and surrounding area, and review of the geology, hydrogeology and hydrology;
- Review of the historical activities of the Sites, Cable Route Corridor and surrounding area;
- Review of regulatory information, including the Local Authority / Petroleum Officer / EA in relation to Part IIA of the Environmental Protection Act 1990, relating to the Sites and Cable Route Corridor;
- Review of the online planning records for the Site and Cable Route Corridor;
- Review online records associated with potential unexploded ordnance (UXO) risks;
- Complete a reconnaissance by undertaking a visual inspection of readily accessible areas of the Site and Cable Route Corridor, to identify current conditions and highlight potential risks and constraints;
- Review of readily available third-party reports relating to the Site, Cable Route Corridor or surrounding area;
- Develop an outline Conceptual Site Model, including site zoning, and undertake a PRA with respect to potential contamination focused on the proposed land use; and
- Provide commentary on potential land contamination and geotechnical constraints in the context of the Scheme.

22.4.8 The underlying principle is the evaluation of contaminant linkages via the Conceptual Site Model (CSM) as outlined under Part IIA, in order to assess

whether the presence of a source of contamination could potentially lead to significant harm.

22.4.9 Following the PRA, the sensitivity and magnitude of impact has been determined by considering the nature of the change, its severity, the duration of an effect, the likelihood of an effect occurring, and the relative extent of the effects of contamination to the receptor. This has been evaluated across the construction, operation and decommissioning phases of the scheme. The risk assessment has been based on a qualitative assessment and professional judgement. Potential effects in terms of ground conditions tend to be local given the nature of potential sources of contamination, with the exception of naturally occurring elevated contaminants. Therefore, the effects have not been considered in relation to different geographical contexts.

22.4.10 For further details on the EIA process and methodology see Chapter 2: EIA Process and Methodology **[~~EN010170/~~APP~~/GH6.2.2~~-039]**.

Sensitivity of Receptors

22.4.11 The sensitivity is based on the relative importance of the receptor, as detailed in **Table 22.3**.

Table 22.3: Sensitivity Criteria Table

Sensitivity	Definition
High	Land to be used for human consumption (e.g. agricultural, allotments), sensitive ecosystems (e.g. SPA, SAC, SSSI, NNR) and the receptor being a public drinking water supply. Source Protection Zones (SPZ's) and Principal Aquifers would be considered high sensitivity.
Medium	Parks and open spaces, regional or locally sensitive ecosystems and ~~water bodies of~~Secondary A and Secondary B Aquifers, would be considered medium ~~quality~~sensitivity. .
Low	Commercial or industrial land uses, low to nonsensitive ecosystems (e.g. derelict land, Solar Farms), ~~water bodies of low quality~~Secondary Undifferentiated and Unproductive Strata, and areas not within a public water supply catchment, would be considered low sensitivity.
Negligible	Land with no sensitive environmental receptors. Residual risk considered to be so minor that it would not be detectable. No appreciable change in environmental risk to environmental receptors.

Magnitude of Impacts

22.4.12 The magnitude of impact on the receptor is detailed in **Table 22.4**.

Table 22.4: Magnitude of Impact

Sensitivity	Definition
High	The proposal will cause the release of contamination which is significantly above guideline values (such as C4SLs, soil guidance values, SoBRA guidance values, etc. specific to the source, receptor and development) or release hazardous contamination for the operational timescale of the development. Remediation will be required.
Medium	The proposal will cause the release of contamination close to the guidance values (such as C4SLs, soil guidance values, SoBRA guidance values, etc. specific to the source, receptor and development) during construction or operational timescale of the development. Remediation may be required.
Low	The proposals will cause the release of contamination which is below the guideline values (such as C4SLs, soil guidance values, SoBRA guidance values, etc. specific to the source, receptor and development) for short period of time. Remediation will be not required; however, mitigation measures may be used to reduce the potential impact.
Negligible	Contaminants found at very low concentrations. Remediation not required.
Neutral	No change from baseline conditions.

Assessment of Significance

22.4.13 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be positive or negative. Effects from moderate and above are considered to be significant. An effect that has been anticipated to be moderate/minor, minor, negligible or neutral, are classed as 'not significant' effects. The significance matrix is set out in **Table 22.5**.

Table 22.5: Impact Significance Matrix

Sensitivity / Magnitude	High	Medium	Low	Negligible
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Negligible
Negligible	Moderate/Minor	Minor	Negligible	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral

22.5 Assessment Assumptions and Limitations

22.5.1 The methodology for Ground Conditions and Contamination has considered the following assumptions:

- Regarding the presence of UXO at Green Hill G, the Conceptual Site Model (CSM) outlined in Impartial Assessments' Detailed UXO Risk Assessment (Appendix 22.3), identifies a heightened risk associated with percussive piling, borehole drilling, and mechanical excavations, particularly concerning RAF and USAAF bombs and rockets. It is therefore understood that a site clearance exercise will be undertaken prior to the development, to clear the area of any identified ammunitions. In addition, concrete feet will be used within the high-risk area to eliminate the need for deep, blind intrusions.

22.6 Baseline Conditions

22.6.1 This section describes the baseline environmental characteristics for the Scheme and surrounding areas with specific reference to Ground Conditions and Contamination.

Existing Baseline

22.6.2 The existing baseline conditions are derived from the completed desk-based PRAs. This assessment comprised the identification of the environmental site setting and surrounding area, including the geology, hydrogeology, hydrology and the historical uses including mining and quarrying and the potential presence of unexploded ordnance. This description is provided given it forms the basis of the CSM, identifying potential sources, pathways and receptors.

22.6.3 The desk-based PRAs are included as Appendix 22.1 and Appendix 22.2 and should be read in conjunction with this chapter. In addition, Figures 22.1 to 22.4 outlining bedrock and superficial deposits should be viewed in conjunction with this chapter.

22.6.4 Chapter 9: Ecology and Biodiversity **[~~EN010170/AAP~~Revision A [EX1/GH6.2.9_A]** outlines the statutory and non-statutory sites designated for nature conservation at international, national and local levels. Section 9.6 outlines the existing baseline conditions and designated sites within proximity to the Scheme. Of consideration is the Upper Nene Valley Gravel Pits Special Protection Area (SPA) (Upper Nene Valley Gravel Pits) which comprises a network of exhausted sand and gravel pits extending across approximately 35km of alluvial deposits of the River Nene floodplain. The SPA lies closest to Green Hill BESS (parts of the SPA lie adjacent to the Site Boundary).

22.6.5 Chapter 11: Minerals **[~~EN010170/AAP/GH6.2.11~~APP-048]** considers the aspects in relation to minerals resources. Section 11.6 considers the existing baseline conditions for the Scheme; the following summaries have been taken from Chapter 11: Minerals **[~~EN010170/AAP/GH6.2.11~~APP-048]**

- Green Hill A and A.2 are together with the Cable Route Corridor connecting the two, are within Mineral Safeguarding Areas (MSAs) protecting sand and gravel resources.
- Green Hill B is also within 2 MSAs protecting sand and gravel resources, however in this case the MSA is more peripheral extending beyond the Site, to the north and west and southwest.

- Green Hill C, D and E plus the connecting Cable Route Corridor linking sites A.2, C, D and E do not affect any safeguard mineral resources.
- Green Hill BESS lies within the safeguarded Nene Valley deposits; however, it is not specifically allocated for future mineral extraction.
- Green Hill F, the northern part of the site is also within a sand and gravel MSA.
- Green Hill G covers a narrow area of safeguarded sand and gravel in the southern western corner.

Green Hill A

Geology

22.6.6 Published BGS data indicates Green Hill A to be underlain by superficial Diamicton of the Oadby Member in the north-east and west, Glacio-fluvial Deposits (Sand and Gravel) in the western area and limited Alluvium Deposits (Clay, Silt, Sand and Gravel) along the unnamed waterway in the south-western portion of Green Hill A.

22.6.7 The bedrock is mapped as the Northampton Sand Formation (Ironstone, Ooidal) and Whitby Mudstone Formation (Mudstone) in the western portion of Green Hill A, with the Stamford Member (Sandstone and Siltstone) and Rutland Formation (Mudstone) in the east.

22.6.8 Made Ground is anticipated in the concrete storage area located to the north of Green Hill A, however, is likely to be limited in thickness. The concrete storage area in Green Hill A was noted to be in use largely for the storage of hay. A stockpile of rubble including brick and concrete was noted and a metal silage container was also present at the time of the walkover.

Hydrogeology and Hydrology

22.6.9 The EA classifies the superficial Oadby Member as a Secondary Undifferentiated Aquifer, the Glacio-fluvial Deposits and Alluvium as Secondary A Aquifers.

22.6.10 Bedrock of the Northampton Sand Formation and the Stamford Member are classified as Secondary A Aquifers, the Rutland Formation as Secondary B and the Whitby Mudstone Formation as Unproductive Strata.

22.6.11 The EA also indicates that Green Hill A is not located within a Groundwater Source Protection Zone (SPZ).

22.6.12 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill A. A non-potable groundwater abstraction point relating to general farming and domestic uses is located 345 m north-west. Two surface water abstractions (variation of one license) relating to general farming and domestic uses located 240 m south-west. Four additional surface water abstractions (variation of two licences) relating to general farming and domestic use are located 210 and 390 m south.

22.6.13 Borehole SP87SW72 (300 m east of Green Hill A), struck groundwater at 27.3 m bgl (metres below ground level), with a resting groundwater level of 23.1 m bgl.

22.6.14 A drainage ditch is orientated north-east to south-west in Green Hill A.

Mining

22.6.15 There is no recorded coal or underground non-coal mining within Green Hill A.

22.6.16 Three BGS Recorded Mineral Sites are mapped on Green Hill A including a sand pit in the north-west, a clay pit in the central southern area and an old gravel pit along the southwestern boundary. All entries are now noted to be ceased.

Historical Summary

22.6.17 Green Hill A has largely remained undeveloped and comprises a series of agricultural fields.

22.6.18 Walgrave Lodge Sand Pit is present in the north-western area of Green Hill A from 1884 until no longer mapped by 1974.

Unexploded Ordnance

22.6.19 A low risk of UXO has been determined for Green Hill A. During the previous PEIR phase of the EIA, it was noted that an archaeological survey had identified the presence of a suspected UXO. After subsequent assessment it has now been confirmed that no UXO had been identified at Green Hill A, with the ferrous anomalies found to be agricultural equipment.

Green Hill A.2

Geology

22.6.20 Published BGS data indicates Green Hill A.2 to be underlain primarily by superficial Diamicton of the Oadby Member.

22.6.21 The bedrock is mapped as the Wellingborough Limestone Member (Limestone and Mudstone) and Rutland Formation (Mudstone) primarily in the eastern portion of Green Hill A.2, with the Stamford Member (Sandstone and Siltstone) in the west. The Northampton Sand Formation (Ironstone, Ooidal) may encroach onto the western portion of Green Hill A.2.

Hydrogeology and Hydrology

22.6.22 The EA classifies the superficial Oadby Member as a Secondary Undifferentiated Aquifer.

22.6.23 Bedrock of the Wellingborough Limestone Member, Stamford Member and Northampton Sand Formation are classified as Secondary A Aquifers, with Rutland Formation as a Secondary B Aquifer.

22.6.24 The EA also indicates that Green Hill A.2 is not located within a Groundwater Source Protection Zone (SPZ).

22.6.25 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill A.2. A non-potable groundwater abstraction point relating to general farming and domestic uses is located 370 m north of Green Hill A.2.

22.6.26 Borehole SP87SW69 located within the north of Green Hill A.2 struck groundwater at 25 m bgl, with resting levels recorded at 8.5 m bgl.

22.6.27 A drainage ditch is present adjacent to the north-west of Green Hill A.2.

Mining

22.6.28 There is no recorded, or evidence of mining within Green Hill A.2.

Historical Summary

22.6.29 Green Hill A.2 has largely remained undeveloped and comprises a series of agricultural fields.

Unexploded Ordnance

22.6.30 A low risk of UXO has been determined for Green Hill A.2.

Green Hill B

Geology

22.6.31 BGS data indicates Green Hill B to be underlain by superficial Diamicton of the Oadby Member.

22.6.32 The bedrock is mapped as the Rutland Formation (Mudstone) and Stamford Member (Sandstone and Siltstone), with Blisworth Limestone Formation (Limestone) mapped in the most northern portion of the Green Hill B.

Hydrogeology and Hydrology

22.6.33 The EA classifies the superficial Oadby Member as a Secondary Undifferentiated Aquifer.

22.6.34 Bedrock of the Blisworth Limestone Formation is classified as a Principal Aquifer, the Stamford Member as Secondary A and Rutland Formation as a Secondary B.

22.6.35 The EA also indicates that Green Hill B is not located within a Groundwater Source Protection Zone (SPZ).

22.6.36 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill B. There are two non-potable groundwater abstraction points relating to general farming and domestic uses located 105 m south-east and 420 m south-west. An additional non-potable groundwater abstraction point relating to general farming and domestic uses is located 66 m south of the Green Hill B access roadway.

22.6.37 Borehole SP86NW78 (350 m east of Green Hill B), recorded resting groundwater levels at 4.1 m bgl. Borehole SP86NW79 (400 m east of Green Hill B), recorded resting groundwater levels at 3.0 m bgl.

22.6.38 A small pond is mapped present along the western boundary. A drainage ditch is present approximately 100 m east, and Pitsford Reservoir is approximately 1 km northwest of Green Hill B.

Mining

22.6.39 There is no recorded evidence of mining within Green Hill B.

Historical Summary

22.6.40 Green Hill B has remained undeveloped throughout its history and comprises a series of agricultural fields.

Unexploded Ordnance

22.6.41 A low risk of UXO has been determined for Green Hill B.

Green Hill C

Geology

22.6.42 BGS data indicates Green Hill C to be underlain by superficial Diamicton of the Oadby Member.

22.6.43 The bedrock is mapped as the Stamford Member (Sandstone and Siltstone), Northampton Sand Formation (Ironstone, Ooidal) and Wellingborough Limestone Member (Limestone and Mudstone).

Hydrogeology and Hydrology

22.6.44 The EA classify the superficial Oadby Member as a Secondary Undifferentiated Aquifer.

22.6.45 Bedrock of the Stamford Member, Northampton Sand Formation and Wellingborough Limestone Member are classified as Secondary A Aquifers.

22.6.46 The EA also indicates that Green Hill C is not located within a Groundwater Source Protection Zone (SPZ).

22.6.47 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill C. A surface water abstraction relating to spray irrigation is located onsite in the south (status is noted as revoked). Two additional non-potable groundwater abstraction points relating to general farming and domestic and agricultural uses are located 280 m north-west and 450 m south, respectively, of an access roadway (north-west of Green Hill C).

22.6.48 Borehole SP86NW82 (10 m south-west of Green Hill C) recorded resting groundwater levels at 7.0 m bgl.

22.6.49 A small pond is located to the north-east of Green Hill C.

Mining

22.6.50 There is no recorded coal or underground non-coal mining within Green Hill C. Mears Ashby Iron Ore Pit is located along the western boundary of Green Hill C. The entry is noted to be ceased.

Historical Summary

22.6.51 Green Hill C has largely remained undeveloped and in agricultural use.

22.6.52 An agricultural building is mapped in the northern central area from 1900 until 1971.

22.6.53 Mears Ashby Iron Ore Pit is mapped along the western boundary of Green Hill C from 1901 until 1958.

22.6.54 An area of EA historical landfill associated with Sywell Range, comprising inert fill, is situated approximately 900m north-west of Green Hill C, at its closest point.

Unexploded Ordnance

22.6.55 A low risk of UXO has been determined for Green Hill C.

Green Hill D

Geology

22.6.56 BGS data indicates Green Hill D to be underlain by superficial Diamicton of the Oadby Member, with Bozeat Till encroaching onto the western portion of Green Hill D.

22.6.57 The bedrock is mapped as the Rutland Formation (Mudstone), Wellingborough Limestone Member (Limestone and Mudstone), Stamford Member (Sandstone and Siltstone), and Northampton Sand Formation (Ironstone, Ooidal).

Hydrogeology and Hydrology

22.6.58 The EA classifies the superficial Oadby Member as a Secondary Undifferentiated Aquifer and the Bozeat Till as Unproductive Strata.

22.6.59 Bedrock of the Wellingborough Limestone Member, Stamford Member and the Northampton Sand Formation are classified as Secondary A Aquifers. The Rutland Formation is classified as a Secondary B Aquifer.

22.6.60 The EA also indicates that Green Hill D is not located within a Groundwater Source Protection Zone (SPZ).

22.6.61 There are no licensed abstraction points for potable, non-potable and/or surface water within 500 m of Green Hill D.

22.6.62 Borehole SP86NW81 within the north of Green Hill D, recorded resting groundwater levels at 13.7 m bgl.

22.6.63 A drainage ditch is present in the centre of Green Hill D orientated north to south.

Mining

22.6.64 There is no recorded, or evidence of mining within Green Hill D.

Historical Summary

22.6.65 Green Hill D has remained undeveloped throughout its history and comprises a series of agricultural fields.

Unexploded Ordnance

22.6.66 A low risk of UXO has been determined for Green Hill D.

Green Hill E

Geology

22.6.67 BGS data indicates Green Hill E to be underlain by superficial Diamicton of the Oadby Member across the northern and central areas. Pockets of Glacio-Fluvial (Sand and Gravel) are present in the south-west, pockets of Bozeat Till are present in the western portion of Green Hill E. Alluvium (Clay and Silt) may encroach onto the south-eastern portion of Green Hill E, along the unnamed waterway.

22.6.68 The bedrock is mapped as the Blisworth Limestone Formation (Limestone), Rutland Formation (Mudstone) and Wellingborough Limestone Member (Limestone and Mudstone) located within the northern portion of Green Hill E, the Stamford Member (Sandstone and Siltstone) within the central area, and the

Northampton Sand Formation (Ironstone, Ooidal) and Whitby Mudstone Formation (Mudstone) in the southern portion.

22.6.69 A review of online imagery noted that Made Ground is anticipated in the developed area located in the central area of the site consisting of a farmyard and agricultural building; however, it is likely to be limited in thickness.

Hydrogeology and Hydrology

22.6.70 The EA classifies the superficial Oadby Member as a Secondary Undifferentiated Aquifer, the Glacio-fluvial Deposits and Alluvium Deposits as Secondary A, and the Bozeat Till as Unproductive Strata.

22.6.71 Bedrock of the Blisworth Limestone Formation is classified as a Principal Aquifer, the Wellingborough Limestone Member, Stamford Member and the Northampton Sand Formation as Secondary A Aquifers, the Rutland Formation as a Secondary B Aquifer and the Whitby Mudstone Formation as Unproductive Strata.

22.6.72 The EA also indicates that Green Hill E is not located within a Groundwater Source Protection Zone (SPZ).

22.6.73 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill E. Two non-potable groundwater abstraction points relating to general farming and domestic uses are located on-site in the south-west, and 30 m east of Green Hill E. Two surface water abstractions relating to spray irrigation are located 30 m east and 430 m west. Six additional non-potable groundwater abstraction points (variations of two licences) relating to general farming and domestic and extractive (dust suppression and mineral washing) uses are located 35 m east, 135 m south-east and 290 m south-east of Green Hill E access roadway.

22.6.74 Groundwater data was not available within BGS borehole records across Green Hill E or in close proximity to Green Hill E.

Two drainage ditches are present onsite in the west and along the eastern perimeter. Sywell Reservoir is present approximately 450 m west of Green Hill E.

Mining

22.6.75 There is no recorded coal or underground non-coal mining within Green Hill E.

22.6.76 Ward's Barn Sand Pit is mapped along the western boundary of Green Hill E. The entry is noted to be ceased.

Historical Summary

22.6.77 The majority of Green Hill E has remained undeveloped and in agricultural use.

22.6.78 Agricultural barns/storage buildings are preset in the central area from the earliest map edition dated 1884 until present.

22.6.79 Ward's Barn Sand Pit is present along the western boundary from 1901 until 1988.

22.6.80 A sewage works is mapped in the western area of Green Hill E adjacent to the on-site stream from 1927 until 1958 when the area is mapped as ‘works’. By 1999 the works are no longer mapped, and the area is noted to comprise woodland from 2004 onwards.

Unexploded Ordnance

22.6.81 A low risk of UXO has been determined for Green Hill E.

Green Hill F

Geology

22.6.82 BGS data indicates Green Hill F to be underlain by superficial Diamicton of the Oadby Member in the south, with pockets of Bozeat Till, Milton Formation (Sand and Gravel) and Alluvium (Clay and Silt) in the central and northern portions of Green Hill F.

22.6.83 The bedrock is mapped as the Wellingborough Limestone Member (Limestone and Mudstone), Rutland Formation (Mudstone), Stamford Member (Sandstone and Siltstone) and Whitby Mudstone Formation (Mudstone) in the northern portion of Green Hill F, with Blisworth Limestone Formation (Limestone) and Blisworth Clay Formation (Mudstone), Cornbrash Formation (Limestone), Kellaways Formation (Sand and Siltstone) recorded in the central to southern portion.

22.6.84 Made Ground is anticipated in the developed area however, it is likely to be limited in thickness.

Hydrogeology and Hydrology

22.6.85 The EA classifies the superficial Oadby Member as a Secondary Undifferentiated Aquifer, the Milton Formation and Alluvium Deposits as Secondary A Aquifers and the Bozeat Till as Unproductive Strata.

22.6.86 Bedrock of the Blisworth Limestone Formation is classified as a Principal Aquifer, the Wellingborough Limestone Member, Stamford Member, Cornbrash Formation and Kellaways Formation (Sand Member) are classified as Secondary A Aquifers, the Rutland Formation as a Secondary B Aquifer, with the Whitby Mudstone Formation and Blisworth Clay Formation as Unproductive Strata.

22.6.87 The EA also indicates that Green Hill F is not located within a Groundwater Source Protection Zone (SPZ).

22.6.88 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill F. Two surface water abstractions relating to spray irrigation and agricultural uses are located onsite in the north (status revoked) and east, respectively. An additional surface water abstraction relating to a public water supply located 30 m west (also listed as a non-potable groundwater abstraction) (status revoked).

22.6.89 Borehole SP85NE10 (150 m west of Green Hill F) recorded resting groundwater at 31 m bgl. Borehole SP85NE3 (250 m south of Green Hill F) recorded resting groundwater at 36.5 m bgl.

22.6.90 Two drainage ditches are present onsite in the west and central areas. In addition, a number of small ponds are present in the north.

Mining

22.6.91 There is no recorded coal or underground non-coal mining within Green Hill F.

22.6.92 From available online planning records, several historical planning applications for the extraction of sand and gravel were present within the northern area of Green Hill F, associated with the now restored Bozeat Quarry. There is an allocation for future sand and gravel extraction off-Site of Green Hill F, through quarrying methods rather than mined, however no planning application has been submitted to date. For further information see Chapter 11 - Minerals.

Historical Summary

22.6.93 The majority of Green Hill F has remained undeveloped and in agricultural use.

22.6.94 Three agricultural barns/storage buildings are present in the western area of Green Hill F from the earliest map edition dated 1884. The most northern barn is no longer visible in 2003 aerial Imagery and the central and southern buildings remain until present.

Unexploded Ordnance

22.6.95 A low risk of UXO has been determined for Green Hill F.

Green Hill G

Geology

22.6.96 BGS data indicates Green Hill G to be underlain by superficial Diamicton of the Oadby Member in the central and northern portions. Superficial deposits are not mapped in the southern portion, however Alluvium (Clay and Silt) may encroach onto the south-eastern portion of Green Hill G, along the unnamed waterway.

22.6.97 The bedrock is mapped as the Cornbrash Formation (Limestone) across the majority of Green Hill G, with a pocket of the Kellaways Clay Member (Mudstone) and Kellaways Sand Member (Sandstone and Siltstone) mapped in the south-east portion of Green Hill G.

22.6.98 Made Ground is not anticipated at Green Hill G. If Made Ground is encountered, it will be limited to current field boundary farm tracks of likely minimal thickness.

Hydrogeology and Hydrology

22.6.99 The EA classify the superficial Oadby Member as a Secondary Undifferentiated Aquifer and Alluvium as Secondary A Aquifer.

22.6.100 Bedrock of the Cornbrash Formation and the Kellaways Sand Member are classified as Secondary A Aquifer, with the Kellaways Clay Member as Unproductive Strata.

22.6.101 The EA also indicate that Green Hill G is not located within a Groundwater Source Protection Zone (SPZ).

22.6.102 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill G. One non-potable groundwater abstraction point relating to domestic and agricultural uses is located 305 m south-east (status revoked).

22.6.103 Borehole SP95NW5 (500 m north of Green Hill G) recorded resting groundwater levels at 41 m bgl.

22.6.104 Multiple drainage ditches are present in the centre of Green Hill G, leading into a singular tributary of the River Great Ouse (1.60 km south).

Mining

22.6.105 No record, or evidence of mining is noted across Green Hill G.

Historical Summary

22.6.106 The majority of Green Hill G has remained undeveloped and in agricultural use.

22.6.107 A named farm, Tinick Farm is present in the centre of Green Hill G from the earliest map edition dated 1885 to 1981.

22.6.108 Historical aerial photographs from 1947 and 1948 highlight ground disturbance within the central portion of Green Hill G. Further information has been provided in the section below.

Unexploded Ordnance

22.6.109 A Detailed UXO Risk Assessment was conducted by 1st Line Defence (ref: DA20134-00) dated 29th June 2024 for Land at Green Hill G, following in-field geophysics results that indicated evidence of suspected bomb craters and plane wreckage. A peer review of this report was completed by Impartial Assessments dated 24th October 2024, with an additional Detailed UXO Risk Assessment conducted by Impartial Assessments dated 1st April 2025. Key findings from all reports are summarised below. The revised Detailed UXO Risk Assessment Report undertaken by Impartial Assessments has been included as Appendix 22.3.

22.6.110 Green Hill G and the wider area was used during WWII as a practice bombing range (PBR), known as Lavendon PBR, operated by the United States Army Air Forces (USAAF) 95th Bombing Group. The PBR utilised low-hazard explosive ordnance (EO) variants and was operational from approximately 1944. On 21st January 1957, a de Havilland Vampire aircraft crashed near Lower Farm, located in the far east of the Green Hill G, scattering wreckage across the south-east. However, this incident is not considered a source of unexploded ordnance (UXO), as the aircraft was conducting a navigation exercise.

22.6.111 A former explosives demolition ground has also been identified within Green Hill G. Explosives were likely destroyed through burning, controlled detonations, or, in some cases, unauthorised burial. Crater features observed in aerial imagery confirm that controlled explosions occurred, likely leaving behind significant quantities of inert scrap metal. Despite this, partially destroyed UXO may still remain on-site, posing a residual risk. While post-war agricultural ploughing would have uncovered any shallow-buried EO, thereby mitigating the risk of explosion, items buried at depths beyond the reach of standard ploughing equipment may remain in situ.

22.6.112 A magnetometer survey conducted across Green Hill G has revealed numerous ground anomalies, which could indicate the presence of unexploded bombs, inert metals from detonated bombs or agricultural debris.

22.6.113 Given that multiple USAAF practice bombs have been uncovered within archaeological trenches on-site, future intrusive works are likely to encounter additional EO. However, this has not been deemed a significant risk. If intact EO devices (buried but not destroyed) exist within the primary area of concern, they are expected to be located at shallow depths. The report further states that the

use of piled foundations would increase the likelihood of forcefully encountering EO due to the blind nature of such methodologies. Should potential EO be discovered during future mechanical excavations, work can be halted to facilitate its safe removal and mitigate risks.

22.6.114 Green Hill G has been subdivided into risk zones:

- A **high-risk zone** in the central area.
- A **low to moderate-risk zone** across the central north, west, and south.
- A **low-risk zone** across the remaining areas of site, notably the northern, western and southern boundaries.

22.6.115 According to the Conceptual Site Model (CSM) outlined in Impartial Assessments' Detailed UXO Risk Assessment, heightened risks have been identified for percussive piling, borehole drilling, and mechanical excavations, particularly in relation to RAF and USAAF bombs and rockets. As per the recommendations of the Impartial Assessments' Report, a site clearance will be undertaken prior to development, to clear the area of identified munitions. Additionally, the use of concrete feet for the development will eliminate the need for deep, blind intrusions such as percussive piling and borehole drilling, thereby further minimising the risk of forceful encounters and overall impact. All other risks identified within the CSM have been classified as moderate to very low.

Green Hill BESS

Geology

22.6.116 BGS data indicates Green Hill BESS is underlain by superficial Alluvium (Clay and Silt), Ecton Member (Sand and Gravel) and Glaciofluvial Deposits (Sand and Gravel).

22.6.117 The bedrock is mapped as the Whitby Mudstone Formation (Mudstone).

Hydrogeology and Hydrology

22.6.118 The EA classifies the Alluvium, Ecton Member and Glaciofluvial Deposits as Secondary A Aquifers.

22.6.119 Bedrock of the Whitby Mudstone Formation is classified as Unproductive Strata.

22.6.120 The EA also indicates that Green Hill BESS is not located within a Groundwater Source Protection Zone (SPZ).

22.6.121 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill BESS. One surface water abstraction relating to spray irrigation uses is located onsite in the centre (status revoked). Eight non-potable groundwater abstraction points (variations of one licence) relating to extractive (dust suppression and mineral washing) uses are located 490 m north-west. Four additional surface water abstractions relating to mineral washing and spray irrigation are located 285 m west and 410 m east (revoked).

22.6.122 Borehole SP86SE51 located within the north of Green Hill BESS struck groundwater at 2.3 m bgl. Borehole SP86SE52 located within the south of Green Hill BESS did not encounter groundwater, with a maximum base depth recorded at 3.3 m bgl.

The northern land parcel is bounded by a stream along the north-western boundary which connects to a series of lakes located to the north, recognised as part of the Upper Nene Valley Gravel Pits Site of Special Scientific Interest (SSSI) and SPA. The eastern land parcel is also bound by a stream in the east which connects to a series of lakes in the north (Grendon Lakes) and south (Grendon Quarter Pond). In addition, the River Nene is located approximately 620 m north-west of Green Hill BESS at its closest point, which is also part of the Gravel Pits SSSI/SPA.

Mining

22.6.123 There are seven BGS Recorded Mineral Sites associated with Earls Barton Quarry (former sand and gravel) located within 300 m, to the north-east of Green Hill BESS. One entry is indicated to be within Green Hill BESS, with aerial imagery showing it being worked until 2004. The wider off-site area associated with Earls Barton Quarry to the north-east of the Green Hill BESS boundary has now been infilled and is listed as an EA Historical Landfill Area. The first input date was recorded as 1st October 1979 and the last as 30th September 1986. Deposited waste is recorded as inert. The boundary of the landfill follows the boundary stream, however, no evidence of quarrying and infill of the void is noted within Green Hill BESS, as such, it is considered the above entries likely relate to offsite activities beyond the adjacent stream.

Historical Summary

22.6.124 The Green Hill BESS has remained undeveloped and in agricultural use throughout its history. The land is centred around Grendon Substation, which was constructed in c.1970.

Unexploded Ordnance

22.6.125 A low risk of UXO has been determined for Green Hill BESS.

Cable Route Corridor

Geology

22.6.126 Published BGS data indicates that the Cable Route Corridor is largely underlain by superficial deposits of the Oadby Member with pockets of Glaciofluvial Deposits (Sand and Gravel), Alluvium (Clay and Silt), Bozeat Till, Ecton Member (Sand and Gravel) and River Terrace Deposits (Sand and Gravel) mapped present.

22.6.127 The bedrock is mapped as the Whitby Mudstone Formation, Northampton Sand Formation, Stamford Member, Wellingborough Limestone Member, Rutland Formation, Blisworth Limestone Formation, and Cornbrash Limestone Formation.

Hydrogeology and Hydrology

22.6.128 The EA classifies the superficial Oadby Member as a Secondary Undifferentiated Aquifer, the Alluvium, Ecton Member and River Terrace Deposits as Secondary A Aquifers and Bozeat Till as Unproductive Strata.

22.6.129 Bedrock of the Blisworth Limestone Formation is classified as a Principal Aquifer, the Northampton Sand Formation, Stamford Member, Wellingborough Limestone Member, and Cornbrash Limestone Formation as Secondary A Aquifers, the

Rutland Formation as a Secondary B Aquifer and the Whitby Mudstone Formation as Unproductive Strata,

22.6.130 The EA also indicates that the Cable Route Corridor is not located within a Groundwater Source Protection Zone (SPZ).

22.6.131 There are no licensed groundwater abstractions for potable water located within the vicinity of the Cable Route Corridor.

22.6.132 There are a number of non-potable water abstraction points located within 500m of the Cable Route Corridor. Between Green Hill A, A.2, B and C, there is one groundwater abstraction point, used for general agriculture and domestic uses, located c.65m north-west (Teacaddy Farm, north of A43 roadway). Two surface water abstraction points, used for general agriculture and spray irrigation, located c.210m west and c.390m west (both south of Green Hill A.2, along Red House Lane). One revoked status, well/borehole abstraction point, used for general agriculture, located c.450m south-west (Sywell Grange). Between Green Hill C, D, E and BESS there is one groundwater abstraction point from a well / borehole, used for general farming, domestic uses, and spray irrigation, located c.225m south-west (south of Mears Ashby Road). One surface water abstraction point, used for mineral washing, sourced at Earls Barton Spinney Quarry, c.295m west (along the River Nene). Three revoked status, surface water abstraction points used for spray irrigation, two located c.40m east (in proximity to the A45 roadway) and one located c.435m north-east (proximity of Green Hill BESS). Between Green Hill BESS, F and G there is one groundwater and surface abstraction point, both at Hollowell Springs, use unknown, located c.300m south-west of the Cable Route (north of Green Hill F).

22.6.133 A review of BGS borehole data within the vicinity of the Cable Route Corridor indicates that groundwater levels vary across the area. At the northernmost point of the Cable Route, near Green Hill A, resting groundwater is anticipated at 23.1m bgl, decreasing southward to 8.5m bgl near A.2, 4.1m bgl towards Green Hill B, and 7.0m bgl north-east of Green Hill C. From nearby data between Green Hill C and D, groundwater was recorded at 13.7m bgl, further decreasing to 5.65m bgl south of Green Hill E and 2.1m bgl north-east of Green Hill BESS. Beyond this point, groundwater levels deepen along the Cable Route towards the south, reaching 31.0m bgl near Green Hill F and 41.0m bgl near Green Hill G.

22.6.134 The most significant surface water feature is the River Nene in the central area with associated ponds and tributaries.

Mining

22.6.135 There are a number of Historical BGS recorded Mineral Sites adjacent to the Scheme and located within the vicinity of the Cable Route Corridor. The closest BGS Mineral Site is Earls Barton Quarry, at closest, located within 100m of the Cable Route Corridor. Other now ceased BGS Mineral Sites include the Hannington Pit (from c.175m), Grange Farm Pits (from c.410m) and Brook Hill Farm Pits (from c.465m). Historical mineral extraction is noted within the vicinity of the Cable Route Corridor as discrete small-scale extraction, with a large-scale extraction adjacent to the River Nene.

Historical Summary

22.6.136 Historical maps indicate that the majority of the Cable Route Corridor has remained in agricultural use with discrete areas of development.

22.6.137 Small scale mineral (clay, sand and gravel) extraction is noted in discrete locations throughout the Cable Route Corridor. Large scale mineral extraction (sand and gravel) is mapped in the central area adjacent to the River Nene. For further details on mineral extraction, see Chapter 11 'Minerals'.

22.6.138 Three areas of EA historical landfill have been identified. Landfill associated with Sywell Range, comprising inert fill runs adjacent to the Cable Route Corridor, it has been designed to avoid interception, thereby preventing potential mobilisation of existing contamination. The second historical landfill is associated with inert fill from Barton Plant Ltd, located to the east of Green Hill E, relating to a former unrecorded sand pit mapped between 1970 and 1993. The Cable Route Corridor has been mapped as potentially intersecting the eastern-most portion of the landfilled area. The third historical landfill is associated with inert infill from the Earls Barton Quarry, located north-east of the Green Hill BESS boundary. The Cable Route Corridor is located approximately 175m south-west of the landfill area at its nearest point.

22.6.139 Although the proposed Cable Route Corridor has been mapped to potentially intersect the landfill area associated with Barton Plant Ltd, it has been designed with flexibility in cable placement. This flexibility allows the installation to avoid both the landfill and any remaining permitted mineral reserves identified within Chapter 11 ‘Minerals’. For further details, see Chapter 11 ‘Minerals’. If landfill is encountered, the contractor must comply with all relevant Waste Management Regulations and any existing permits related to the site.

22.6.140 Additional key historical features identified within the vicinity of the Cable Route Corridor include a railway track (west of Castle Ashby Station) present from 1885 to 1980s, and Sywell Grange Airfield constructed in 1928 and remaining to present day.

Unexploded Ordnance

22.6.141 A low risk of UXO has been recorded across the Cable Route Corridor. Pertinent features located within 1km of the Cable Route Corridor are noted as the Sywell Aerodrome, located to the adjacent south-west of the Cable Route Corridor, which is mapped as a potential Luftwaffe Target, and the Castle Ashby Military Site which has been mapped c.1km south-west of the Cable Route Corridor.

Future Baseline

22.6.142 This section considers changes to the baseline conditions, described above, that might occur in the absence of the Scheme and during the time period over which the Scheme would be in place. The future baseline scenarios are set out in Chapter 2: EIA Process and Methodology **[~~EN010170/~~APP~~/GH6.2.2~~-039]**.

22.6.143 In absence of the Scheme, it is considered there will be no change to the future baseline for onsite ground conditions and contamination. There is the potential for future quarrying of sand and gravel at Bozeat Quarry offsite of Green Hill F, which could change future baseline conditions, however no planning application

has been submitted to date. Therefore, the current baseline details as presented above, including geology, hydrogeology and hydrology, mining, historical features and unexploded ordnance are not anticipated to change in the absence of the Scheme.

22.7 Embedded Mitigation Measures

22.7.1 The way that potential environmental impacts have been or will be prevented, avoided or mitigated to reduce impacts to a minimum through design and/or management of the Scheme is outlined in this section and will be taken into account as part of the assessment of the potential effects. Proposed environmental enhancements are also described where relevant.

22.7.2 The following embedded mitigation measures for the construction, operation and decommissioning phases have been incorporated into the Scheme's design.

Embedded Construction and Decommissioning Mitigation Measures

22.7.3 A Construction Environmental Management Plan (CEMP) and Decommissioning Environmental Management Plan (DEMP) will be required for the construction and decommissioning phases through a requirement in the DCO, which will be based on the Outline Construction Environmental Management Plan (OCEMP) and Outline Decommissioning Statement (ODS). The plans will describe the construction and decommissioning related mitigation measures and good practices to ensure any environmental impacts in terms of land and groundwater contamination are minimal.

22.7.4 Construction based mitigation measures included within the OCEMP will include, but not be limited to:

- Horizontal directional drilling (HDD) techniques will be used to avoid and reduce adverse effects for the construction and placement of the cable route beneath the River Nene. This technique is preferred as it minimises disruption to the watercourse by avoiding open trenching, thereby reducing sediment displacement. Flood risk and drainage concerns associated with the HDD are addressed within Chapter 10: Hydrology, Flood Risk and Drainage.
- A spill response plan will be implemented during the HDD process to manage drilling fluids and fuels, with closed-loop drilling systems in place to minimise the risk of fluid escape. All fuels on site will be securely stored within a contained, bunded system to prevent potential leakages.
- Site clearance to be undertaken prior to development within Green Hill G, to remove any identified munitions across the site area. The use of concrete feet within the high-risk zone, will eliminate the need for deep, blind intrusions such as percussive piling or borehole drilling. The establishment of a UXO Risk Management Plan, conducting site-specific UXO awareness briefings, and ensuring the presence of a UXO specialist ('Watching Brief' supervision) during any excavations within the high-risk area will also be included.
- Alluvium and Made Ground deposits are considered to be too variable and compressible in their existing condition for conventional shallow foundations

at the Site. Floor loads to be transferred to ground improved soils or to piles through concrete ground beams/concrete frame or otherwise suspended.

22.7.5 The CEMP and ODS shall include, but not be limited to, the following:

- Site workers will be made aware of the possibility of encountering localised contamination through toolbox talks. Good standards of personal hygiene, welfare facilities on-site and the use of appropriate levels of personal protective equipment (PPE), will be enforced. All personnel will be educated about the potential environmental impacts of their activities, such that all workers are aware of the risks and the necessary precautions to take to minimise pollution.
- Workers will adhere to health, safety and environmental precautions to reduce the potential for accidents and incidents.
- A 'Discovery Strategy' protocol shall be implemented with specific focus on encountering suspected landfill materials within the vicinity of Sywell Range (Cable Route Corridor), area of landfill associated with Barton Plant Ltd (Cable Route Corridor), and Earls Barton Quarry (Green Hill BESS). This will include but not be limited to stopping works in the area and ensuring the identified materials / residual contamination does not pose a risk until an environmental specialist undertakes an assessment and a method is agreed to deal with the identified contamination. The Local Planning Authority will be notified and a method agreed to deal with the identified contamination.
- To mitigate the risk of airborne contamination, a dust suppression and management system will be implemented. This system will control dust emissions during construction and decommissioning activities, preventing them from migrating off-site and impacting neighbouring environments. Methods include washing down vehicles' wheels and dampening down materials.
- Topsoil displaced within the construction and decommissioning of the cable route, should be appropriately stored and reused. Temporary stockpiles and/or excavated topsoil from the cable route is to be stored away from any Flood-Zone 3 areas where practicable. Site compounds and stockpiles will be located as far as possible (ideally at least 30 m) away from receptors.
- Bulk fuels or chemicals used on-site during the construction and decommissioning phases should be stored appropriately, within an impervious bund of 110% of the volume of the container to reduce the potential for impact to the environment in the event of a container failure/leak of battery chemicals during a fire and/or associated fire suppressant foam and waters. Any spillages will be promptly addressed by appropriate measures, such as spill kits, and a spill response plan will be developed. The contractor will ensure immediate notification of the EA in the event of a suspected pollution incident, facilitating response measures.
- All equipment and vehicles will be regularly maintained and inspected to prevent leaks, with refueling activities occurring on impermeable surfaces. Biodegradable hydraulic oils to be prioritised for use in identified sensitive areas.

- To prevent pollution from accidental leaks or spills of construction materials, the contractor will implement robust pollution prevention plans (PPP) adhering to established guidelines, such as the Guidance for Pollution Prevention. Drainage systems, including sustainable drainage systems (SuDS), will be developed in line with hydrology requirements and outlined within Chapter 10: Hydrology, Flood Risk and Drainage.
- A Battery Storage Safety Management Plan (BSMP) will be implemented throughout the Scheme to ensure the safe design, production, use, transportation, storage, and disposal of batteries. This approach will minimise risks associated with batteries while complying with relevant standards.

Embedded Operation Mitigation Measures

22.7.6 An Operational Environmental Management Plan (OEMP) will be required for the operational and maintenance phase through a requirement in the DCO, which will be based on the Outline Operational Environmental Management Plan (OOEMP). The plan will describe the operational related mitigation measures and best practices to ensure any environmental impacts during operation in terms of land contamination are minimal.

22.7.7 Maintenance activities, including the replacement of solar panels and batteries, will consist of one round of solar panel replacements and five rounds of battery replacements (at Green Hill BESS and Green Hill C) throughout the lifespan of the Scheme. Solar panel and battery replacements will follow mitigation measures from the OCEMP and ODS, including toolbox talks to inform workers about potential localised contamination, though contamination is considered unlikely. Strict hygiene standards, onsite welfare facilities, and appropriate personal protection equipment (PPE) will be enforced. Workers will comply with health, safety, and environmental precautions to minimise risks.

22.7.8 The OOEMP will implement measures which are outlined above for the CEMP, additional to this, measurement specific to the operational phase will include the following:

- Mitigation measures to manage potential risks associated with BESS fires, particularly focused on the containment of hazardous substances. Battery storage units will be housed in fully contained systems, ensuring that release of chemicals or contaminated fire water is captured and prevented from leaching into the environment. Fire suppression systems will prioritise the use of environmentally safer foams or fire waters, with containment measures in place to manage runoff. In the event of a fire, hazardous materials from damaged battery systems will be managed through containment and cleanup protocols. An emergency response plan will be implemented, detailing fire control procedures and environmental protection measures. Post-incident environmental monitoring will be conducted to ensure soil and water quality is not compromised.
- The underground cables will employ high-quality, durable sheathing and insulation materials to protect the cables from physical damage, moisture, and corrosion, ensuring they can withstand harsh underground conditions. In areas of particular environmental significance or sensitivity, such as

beneath the River Nene, bunded containment systems can be utilised as an additional protective measure.

- Regular inspections and maintenance of battery storage systems and solar panels will be routinely undertaken to identify any signs of potential leakage, wear, or faults. This ensures early detection and rectification of issues, thereby minimising operational risks. Additionally, solar panels will undergo routine cleaning using water only, to prevent environmental contamination and maintain optimal performance.
- Real-time monitoring systems will be installed to continuously track the performance of the solar panels and battery systems. These systems enable the early identification of any performance issues or faults, helping to prevent more significant problems such as fires or equipment malfunctions, and ensuring efficient, safe operations throughout the facility's lifecycle.

22.8 Assessment of Impacts and Effects

22.8.1 The potential for the Scheme to generate effects was assessed using the methodology as detailed in **Section 22.4** of this chapter. In the sections below, the assessment considers the impacts and effects during the construction, operation and decommissioning phases of the Scheme, with consideration to the implementation of embedded mitigation, in on the following key receptors:

- Construction workers (third parties during construction and decommission);
- Controlled waters (including on and off-site land drains; adjacent rivers and the underlying aquifers);
- Future use and the built environment (new buildings and infrastructure/utilities); and
- Ecology and sensitive land uses (designated sites including SSSI, Special Areas of Conservation (SAC), SPA and Ramsar sites).

22.8.2 Adjacent site users and adjacent residents, future users of the Scheme including maintenance workers and public rights of way users (PRoW) and risks associated with hazardous ground gases have been discounted from this assessment, due to the agreement of being scoped out.

Environmental Receptor [Construction Workers]

22.8.3 Construction workers (groundworkers involved with the Scheme's construction and decommissioning) may be exposed to contamination through direct dermal contact, ingestion and inhalation. Limited potential sources of contamination have been identified within the PRAs. Additionally, with the implementation of the mitigation measures contained in the OCEMP and ODS including toolbox talks, good standards of personal hygiene, welfare facilities and appropriate levels of personal protective equipment (PPE), outlined in Section 22.7, the likely significant effect of contaminants to construction workers is reduced.

22.8.4 During the operational phase onsite staff will be required for general maintenance and replacement activities, these activities will not require extensive amounts of intrusive works and the impacts will be less than that required for construction.

Mitigation measures for maintenance activities will be included within the OEMP which will align with those implemented for construction and decommissioning.

22.8.5 The potential for UXO has been identified within Green Hill G, with the site formerly part of Lavendon Practice Bombing Range (PBR) and former explosives demolition ground, during World War II. According to the Conceptual Site Model (CSM) outlined in Impartial Assessments' Detailed UXO Risk Assessment (Appendix 22.3), heightened risks have been identified for percussive piling, borehole drilling, and mechanical excavations, particularly in relation to RAF and USAAF bombs and rockets. As such, this would potentially present an increased risk to construction workers. As per the recommendations set out in Impartial Assessments' Report, a site clearance will be undertaken prior to development, to clear the area of any identified ammunitions. Furthermore, the use of concrete feet for the development will eliminate the need for deep, blind intrusions such as percussive piling and borehole drilling, thereby further minimising the risk of forceful encounters and overall impact. The establishment of a UXO Risk Management Plan, conducting site-specific UXO awareness briefings, and ensuring the presence of a UXO specialist ('Watching Brief' supervision) during any excavations within the high-risk area will also be included. All other risks identified within the CSM have been classified as moderate to very low.

22.8.6 The assessment of significance on construction workers is outlined below:

Green Hill A to F, BESS and Cable Route Corridor:

- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.
- During operational phase – Medium Sensitivity and Negligible Magnitude: Minor significance.

22.8.7 With the implementation of embedded mitigation measures outlined in the CEMP, OEMP and DEMP, the impact to construction workers across Green Hill A to F, BESS and Cable Route Corridor is considered **not significant**.

Green Hill G:

- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.
- During operational phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.

22.8.8 With the implementation of embedded mitigation measures outlined in the CEMP, OEMP and ODS, the impact to construction workers across Green Hill G is considered **not significant**.

Environmental Receptor [Controlled Waters]

22.8.9 Controlled waters encompass both groundwater and surface water assessments.

22.8.10 Groundwater could become contaminated via the mobilisation of existing contamination during construction and decommissioning phase, however, limited potential sources of contamination have been identified within the PRAs. No

potable water abstraction points have been identified within 500 m of the Scheme in any location.

22.8.11 Three areas of EA historical landfill have been identified in close proximity to the Sites the Cable Route Corridor. The historical landfill associated with Sywell Range, comprising inert fill, is situated approximately 900m north-west of Green Hill C, at its closest point. While the Cable Route Corridor runs adjacent to this landfill, it has been designed to avoid interception, thereby preventing potential mobilisation of existing contamination.

22.8.12 The second historical landfill is associated with inert fill from Barton Plant Ltd, located to the east of Green Hill E, relating to a former unrecorded sand pit mapped between 1970 to 1993. The Cable Route Corridor has been mapped to potentially intersect the eastern-most portion of the landfilled area. However, the proposed Cable Route Corridor has been designed with flexibility in cable placement, allowing the installation to avoid landfill designated areas. If landfill is encountered, the contractor must comply with all relevant Waste Management Regulations and any existing permits related to the site.

22.8.13 The third historical landfill is associated with inert infill from the Earls Barton Quarry, located north-east of the Green Hill BESS boundary. The landfill boundary follows the adjacent stream, which connects to a series of lakes located to the north, recognised as part of the Gravel Pits SSSI / SPA. However, there is no evidence of quarrying or void infill within the Green Hill BESS site itself. Therefore, this entry is attributed to offsite activities beyond the stream. Additionally, the Cable Route Corridor will be located approximately 175m south-west of this landfill area at its nearest point, thus presenting a minimal risk to mobilisation of existing contaminants.

22.8.14 The ‘Discovery Strategy’, as detailed within the OCEMP and within Section 22.7, provides a mitigatory measure in the event that suspected landfill material is encountered during the construction phase. This will include but not be limited to stopping works in the area, ensuring the identified materials / residual contamination do not pose a risk until an environmental specialist undertakes an assessment and a method is agreed with the Local Planning Authority to deal with the identified contamination. It is anticipated that the residual contamination associated with the historical landfills will present a low risk to the Scheme.

22.8.15 The Blisworth Limestone Formation (BLF) is the only Principal Aquifer identified across the Sites. While the BLF extends into the northern boundary of Green Hill B, the extent is limited and is overlain by the Oadby Member, a Secondary Undifferentiated Aquifer. As the Oadby Member is predominantly clay, it significantly restricts the potential for water infiltration into the BLF. A small pocket of BLF has also been mapped in the north of Green Hill E, but, like Green Hill B, it is overlain by the Oadby Member, which limits infiltration. Within Green Hill F, the BLF has been identified in the north-east, north-west, and central areas. In the north-east, it is overlain by both the Oadby Member and the Bozeat Till, an Unproductive Stratum that is also clay-rich, restricting infiltration. The central area of Green Hill F is largely covered by these same deposits, reducing filtration; however, there are limited pockets of BLF exposed. In the north-west, the BLF is largely unconfined by superficial deposits, except for a small-isolated pocket of

Bozeat Till in the centre of this area. In the areas where the BLF is unconfined and a slightly increased risk exists to sensitive groundwater receptors, the mitigation measures outlined within the CEMP, OEMP and DEMP will be implemented to reduce risk.

22.8.16 Controlled waters could become contaminated via potential spillages or leakages of temporary fuels and chemicals, or faulty batteries during construction, operational and decommissioning phases. Drainage ditches present onsite at Green Hill A, D, E, F and G have the potential to transport potential spillages or leakages. However, with the implementation of mitigation measures outlined within the CEMP, OEMP and DEMP, including a spill response plan, appropriate storage of fuels and chemicals within impervious bunds with 110% capacity, a pollution prevention plan and regular maintenance of equipment and vehicles, as detailed in Section 22.7, the likely significant effect of contaminants impacting controlled waters is reduced.

22.8.17 Controlled waters could become contaminated via potential fires/damage to the storage of batteries and associated subsequent fire ash deposition/ extinguishing fire waters. In the absence of mitigation, there is a potential risk of a battery fire at Green Hill C and BESS and subsequent discharge of chemicals into adjacent watercourses. This is most tangible for Green Hill BESS, which lies closest to the SPA of all the Sites, and adjacent to a stream which feeds into the River Nene. The Grendon Lakes (Gravel Pits SSSI / SPA) is located off-site to the adjacent north of Green Hill BESS. In the event that a BESS fire does occur and fire waters / firefighting foams are released into the surrounding environment then there is the potential for PCBs associated with damage to the BESS to be released, along with potential per- and polyfluoroalkyl substances (PFAS), subject to further UK regulation, associated with the firefighting foams. Both of which, dependent on the exact substance, can be mobile within the environment should it reach a water source, therefore creating a contamination risk to controlled waters. However, with the implementation of the mitigation measures to be contained in the CEMP, OEMP and DEMP, outlined in Section 22.7, including the fully housed contained systems to prevent hazardous substances or contaminated fire water from leaching into the environment. Fire suppression using environmentally safer foams or fire waters. In case of fire, hazardous materials will be managed through containment and cleanup protocols, supported by an emergency response plan outlining fire control and environmental protection measures. A Battery Safety Management Plan will be implemented for the duration of the scheme. Post-incident monitoring will ensure soil and water quality remain unaffected. Regular inspections and maintenance will detect and address potential leaks or faults early. With these measures minimising the impact pathway between the scheme and the receptor, the possibility of impact and associated effects on controlled waters is reduced.

22.8.18 The Cable Route Corridor will cross beneath the River Nene using HDD methods. HDD could impact the controlled water receptor, with a potential release of contaminants including drilling fluid. However, with the implementation of the mitigation measures outlined in Section 22.7, including the use of a spill response plan and appropriate storage of fuels or chemicals within an impervious bund of

110% capacity, the likely significant effect of HDD on controlled waters is reduced.

22.8.19 As such, the assessment of significance for controlled waters is outlined below:

- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.
- During operational phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.

22.8.20 Where the BLF Principal Aquifer is unconfined within parts of Green Hill F and areas within the vicinity of the SSSI / SPA, the assessment of significance for controlled waters is outlined below:

- During construction and decommissioning phase – High to Medium Sensitivity and Low Magnitude: Moderate to Moderate/Minor significance.
- During operational phase – High to Medium Sensitivity and Low Magnitude: Moderate to Moderate/Minor significance.

22.8.21 With the implementation of mitigation measures outlined in the CEMP, OEMP and DEMP, the impact to controlled waters and BLF Principal Aquifer is considered **not significant**.

Environmental Receptor [Future Use and Built Environment]

Future Ground Use and Ground Stability

22.8.22 Following decommissioning, the future use of the land is intended to return to agricultural farming. While limited potential sources of existing contamination have been identified in the PRAs, there is a risk of contamination throughout the lifetime of the Scheme from chemical and fuel leaks, spills, and incidents related to BESS fires. However, with the implementation of embedded mitigation measures outlined in the CEMP, OEMP and DEMP, including spill response plans, a 'Discovery Strategy', appropriate storage of fuels and chemicals within impervious bunds with 110% capacity, pollution prevention plans, and regular maintenance of equipment and vehicles, as detailed in Section 22.7, the likely significant effect of contaminants impacting the future agricultural land-use is reduced.

22.8.23 Alluvium deposits have been identified within Green Hill A, F, BESS, Cable Route Corridor, and possibly encroaching into Green Hill E and G. Limited potential areas of Made Ground have also been identified within Green Hill A, E, F and G, associated with former developed areas or agricultural tracks. Alluvial deposits and Made Ground have potentially low bearing capacity and unacceptable levels of total/differential settlement, which can impact the built structures on the sites. However, with the implementation of embedded mitigation measures outlined in the CEMP, including floor loads to be transferred to ground improved soils or to piles through concrete ground beams/concrete frame or otherwise suspended, as detailed in Section 22.7, the likely significant effect of unstable ground conditions is reduced.

22.8.24 As such, the assessment of significance for future use and the built environment regarding future ground use and ground stability is outlined below:

- During construction and decommissioning phase – Medium Sensitivity and Negligible Magnitude: Minor significance.
- During operational phase – Medium Sensitivity and Negligible Magnitude: Minor significance.

22.8.25 With the implementation of embedded mitigation measures outlined in the CEMP, OEMP and DEMP, the impact to built environment regarding future ground use and ground stability is considered **not significant**.

Elevated Radon

22.8.26 Green Hill B and the majority of Green Hill E are located within an elevated area of radon potential (30 - <100% above the action level for radon). Green Hill A, western portion of Green Hill A.2, central to southern portions of Green Hill D, and the north-western portion of Green Hill F are located within an elevated area of radon potential (10 – <30% above the action level for radon). Prolonged exposure to elevated radon has a negative impact on human health, included the increased risk of lung cancer, with smokers being particularly vulnerable. The majority of the Scheme is considered open and free venting, therefore would not require the implementation of mitigation measures. Any enclosed buildings within the elevated radon potential areas, would be subject to require radon protective mitigation measures. Radon potential maps have been included as Figures 22.5 and 22.6.

22.8.27 As such, the assessment of significance for future use and the built environment regarding elevated radon is outlined below:

- During construction and decommissioning phase – Medium Sensitivity and Neutral Magnitude: Neutral significance.
- During operational phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.

22.8.28 The impact to the built environment regarding elevated radon is considered **not significant**.

22.8.29 Additional mitigation measures that will apply to enclosed buildings in areas of elevated radon have been provided in Section 22.9.

Environmental Receptor [Ecology and Sensitive Land Uses]

22.8.30 Ecological and sensitive land use receptors, including sites of special scientific interest (SSSIs), special areas of conservation (SACs), special protection areas (SPAs) and Ramsar (Convention on Wetlands), and areas of sensitive flora and/or fauna, may become contaminated via the mobilisation of existing contamination during the construction and decommissioning phase, however, limited potential sources of contamination have been identified within the PRA.

22.8.31 The Cable Route Corridor will cross beneath the River Nene using horizontal directional drilling (HDD) methods. There is a potential that an impact could be caused to the controlled water environment, leading to the downstream Upper Nene Valley Gravel Pits, an area classified as an SSSI, SPA, SAC and Ramsar site. Green Hill BESS is also located within proximity to the Gravel Pits. However,

it must be noted that the ecologically significant and sensitive land use areas are not located within the development site boundaries.

22.8.32 The Cable Route crossing the River Nene has the potential to increase sedimentation and the potential release of contaminants including drilling fluid. However, the HDD technique minimises disruption to the watercourse by avoiding open trenching, thereby reducing sediment displacement. In addition, mitigation measures contained within the CEMP and DEMP in Section 22.7, including a spill response plan will be implemented during the HDD process to manage drilling fluids and fuels, with closed-loop drilling systems in place to minimise the risk of fluid escape. All fuels on site will be securely stored within a contained, bunded system to prevent potential leakages. With the implementation of these mitigation measures, the likely significant effect of HDD on ecological and sensitive land uses is reduced.

22.8.33 Controlled waters leading to sensitive land use areas could become contaminated via potential spillages or leakages of temporary fuels and chemicals, or faulty batteries during construction, operational and decommissioning phases. However, with the implementation of mitigation measures outlined within Section 22.7, including spill response plans, appropriate storage of fuels and chemicals within impervious bunds with 110% capacity, pollution prevention plans and regular maintenance of equipment and vehicles, the likely significant effect of contaminants impacting ecological and sensitive land uses is reduced.

22.8.34 Controlled waters leading to sensitive land use areas could become contaminated via potential fires/damage to the storage of batteries and associated subsequent fire ash deposition/ extinguishing fire waters. The Grendon Lakes (Gravel Pits SSSI / SPA) is located within proximity to the Green Hill BESS. In the event that a BESS fire does occur and fire waters / firefighting foams are released into the surrounding environment then there is the potential for PCBs associated with damage to the BESS to be released along with potential per- and polyfluoroalkyl substances (PFAS), subject to further UK regulation, associated with the firefighting foams. Both of which, dependent on the exact substance, can be mobile within the environment should it reach a water source. However, with the implementation of the mitigation measures outlined in Section 22.7, including the fully housed contained systems to prevent hazardous substances or contaminated fire water from leaching into the environment. Fire suppression using environmentally safer foams or fire waters.

22.8.35 In case of fire, hazardous materials will be managed through containment and cleanup protocols, supported by an emergency response plan outlining fire control and environmental protection measures. A Battery Safety Management Plan will be implemented for the duration of the Scheme. Post-incident monitoring will ensure soil and water quality remain unaffected. Regular inspections and maintenance will detect and address potential leaks or faults early. With these measures minimising the impact pathway between the Scheme and the receptor, the possibility of impact and associated effects on ecology and sensitive land uses are reduced.

22.8.36 Ecologically sensitive areas, including SSSIs, SACs, SPAs, and Ramsar sites, are categorised as high sensitivity within the sensitivity matrix. However, for potential contamination to impact these sensitive receptors, it would need to traverse the Green Hill BESS site and reach controlled waters pathways that connect to them. The underlying geology which limits groundwater pathways across a large section of the development, and with the implementation of the mitigation measures outlined above, the likelihood of impact to these ecologically sensitive areas is reduced.

22.8.37 As such, the assessment of significance for ecological and sensitive land uses is outlined below:

- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.
- During operational phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.

22.8.38 Where the Site is located within proximity to SSSI / SPA areas, notably the Cable Route and Green Hill BESS, the assessment of significance for ecological and sensitive land uses is outlined below:

- During construction and decommissioning phase – High to Medium Sensitivity and Low Magnitude: Moderate to Moderate/Minor significance.
- During operational phase – High to Medium Sensitivity and Low Magnitude: Moderate to Moderate/Minor significance

22.8.39 With the implementation of mitigation measures outlined in the CEMP, OEMP and DEMP, the impact to environmental receptors is considered **not significant**.

22.9 Additional Mitigation Measures

22.9.1 The following additional mitigation measures are to be incorporated into the Scheme design with detailed proposals and locations to be submitted with the DCO application.

22.9.2 The following mitigation measures for radon have been identified:

- Green Hill B and the majority of Green Hill E are located within an elevated area of radon potential (30 - <100% above the action level for radon). Green Hill A, western portion of Green Hill A.2, central to southern portions of Green Hill D, and the north-western portion of Green Hill F are located within an elevated area of radon potential (10 – <30% above the action level for radon). These areas are therefore subject to potential radon protection measures. Any radon protection measures installed will need to be in accordance with BRE Report BR211 (2023) Radon: Protective measures for new buildings and as required by Building Regulations (Ref 22.29). Radon potential maps have been included as Figures 22.5 and 22.6.
- The requirement for radon protection measures will be evaluated based on the placement of enclosed confined spaces. The substation within Green Hill B is within an area of 30 - <100% of radon potential, the substations within Green Hill A and E, and southern BESS area are located within, or partly within areas of 10 - <30% radon potential. Radon protection measures

may be deemed necessary within these areas. The measures implemented will effectively mitigate the potential risks associated with elevated radon concentrations. The specific measures required for implementation will be determined by the design team and architect during the subsequent phases of the Scheme at detailed design stage post consent.

22.9.3 No further mitigation measures for the Scheme are considered to be required given that no residual significant adverse effects are expected.

22.10 Residual Effects

22.10.1 This section summarises the residual effects of the Scheme on Ground Conditions and Contamination and receptors following the adoption of embedded and additional mitigation.

22.10.2 With the additional mitigation measures outlined above (Section 22.9), with the implementation of well-established good industry practices, along with measures contained within the CEMP, OEMP and DEMP (Section 22.7), it is considered that the potential impact, effects and significance on the environmental receptors underpin the following risk ratings.

Environmental Receptor [Construction Workers]

22.10.3 No additional mitigation measures for construction workers have been identified. However, with the implementation of mitigation measures outlined in Section 22.7, the assessment of significance of effects on construction workers, is detailed below:

22.10.4 **Green Hill A to F, BESS and Cable Route Corridor:**

- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.
- During operational phase – Medium Sensitivity and Negligible Magnitude: Minor significance.

Green Hill G:

- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.
- During operational phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.

22.10.5 With the implementation of embedded mitigation measures, the impact is considered **not significant**.

Environmental Receptor [Controlled Waters]

22.10.6 No additional mitigation measures for controlled waters have been identified. However, with the implementation of mitigation measures outlined in Section 22.7, the assessment of significance of effects on controlled waters, is detailed below:

- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.

- During operational phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.

22.10.7 Where the BLF Principal Aquifer is unconfined within parts of Green Hill F and areas within the vicinity of the SSSI / SPA, the assessment of significance for controlled waters is outlined below:

- During construction and decommissioning phase – High to Medium Sensitivity and Low Magnitude: Moderate to Moderate/Minor significance.
- During operational phase – High to Medium Sensitivity and Low Magnitude: Moderate to Moderate/Minor significance.

22.10.8 With the implementation of embedded mitigation measures, the impact is considered **not significant**.

Environmental Receptor [Future Use and Built Environment]

22.10.9 With the implementation of the additional mitigation measures for potentially elevated areas of radon outlined in Section 22.9, the risk to the built environment will be reduced. As such, the assessment of significance of effects on the built environment, with additional mitigation, is detailed below:

- During construction and decommissioning phase – Medium Sensitivity and Neutral Magnitude: Neutral significance.
- During operational phase – Medium Sensitivity and Negligible Magnitude: Minor significance.

22.10.10 With the implementation of additional mitigation measures, the impact is considered **not significant**.

Environmental Receptor [Future Use and Built Environment]

22.10.11 No additional mitigation measures for future use and ground stability have been identified. However, with the implementation of mitigation measures outlined in Section 22.7, the assessment of significance of effects on the built environment, is detailed below:

- During construction and decommissioning phase – Medium Sensitivity and Negligible Magnitude: Minor significance.
- During operational phase – Medium Sensitivity and Negligible Magnitude: Minor significance.

22.10.12 With the implementation of embedded mitigation measures, the impact is considered **not significant**.

Environmental Receptor [Ecology and Sensitive Land Uses]

22.10.13 No additional mitigation measures for ecology and sensitive land uses have been identified. However, with the implementation of mitigation measures outlined in Section 22.7, the assessment of significance of effects on ecology and sensitive land uses is detailed below:

- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.

- During operational phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.

22.10.14 Where the Site is located within proximity to SSSI / SPA areas, notably the Cable Route and Green Hill BESS, the assessment of significance for ecological and sensitive land uses is outlined below:

- During construction and decommissioning phase – High to Medium Sensitivity and Low Magnitude: Moderate to Moderate/Minor significance.
- During operational phase – High to Medium Sensitivity and Low Magnitude: Moderate to Moderate/Minor significance

22.10.15 With the implementation of embedded mitigation measures, the impact is considered **not significant**.

22.11 Cumulative Effects

22.11.1 A list of cumulative projects can be found in Appendix 25.1 **[~~EN010170/~~APP~~/GH6.3.25.1~~-188]** of the ES. A summary of cumulative effects will be listed within Chapter 25: Cumulative Effects and Effect Interactions **[~~EN010170/~~APP~~/GH6.2.25~~-062]** of this ES.

Cumulative effects

22.11.2 A series of management plans will support the planning application, including the comprehensive OCEMP, OOEMP and ODS, to ensure there are no adverse impacts arising in respect of ground conditions and contamination. Given modern methods of construction and decommissioning used by other developments, the implementation of good practices and the schemes end use, there are not considered to be likely significant cumulative effects in conjunction with other developments in relation to ground conditions and contamination.

22.12 Summary

22.12.1 **Table 22.6** sets out a summary of the ground conditions and contamination effects.

Table 22.6: Summary of Residual Effects for Ground Conditions and Contamination

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
Construction and Decommissioning Phase							
Construction Workers	Risk of exposure to contamination through direct dermal contact, ingestion and inhalation.	Medium	Low	Toolbox talks, good standards of hygiene, welfare facilities and appropriate levels of personal protective equipment (PPE) set out in OCEMP **[EX1/GH7.1_A]** and ODS **[~~EN010170/APP/GH7.1~~] [~~EN010170/APP~~EX1/GH7.3_A]**	Moderate / Minor	None proposed.	Moderate / Minor (Not Significant) Neutral Residual Effect
Construction Workers	Risk of encountering unexploded ordnance at Green Hill G.	Medium	Low	Site clearance prior to development to remove any identified munitions, the use of concrete feet to eliminate the need for deep, blind intrusions. UXO Risk Management Plan, conducting site-specific UXO awareness briefings, and ensuring the presence of a UXO specialist ('Watching Brief' supervision) during any excavations within the high-risk area. Set out in the OCEMP **[~~EN010170/APP~~EX1/GH7.1_A]**	Moderate / Minor	None proposed.	Moderate / Minor (Not Significant) Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
Controlled Waters	Risk of contamination via the mobilisation of existing contamination	Medium	Low	Discovery Strategy: stopping works, assessment and method of removing risk – set out in the OCEMP **[EX1/GH7.1_A]** and ODS **[~~EN010170/APP/GH7.1~~] [~~EN010170/APP~~EX1/GH7.3_A]**	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect
		Unconfined BLF Principal Aquifer and SSSI / SPA vicinity: High/Medium			*Unconfined BLF Principal Aquifer and SSSI / SPA vicinity:* Moderate to Moderate / Minor		*Unconfined BLF Principal Aquifer and SSS I/ SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect
Controlled Waters	Risk of contamination via potential spillages or leakages of temporary	Medium	Low	Spill response plans, appropriate storage of fuels and chemicals, pollution prevention plans, regular maintenance of equipment and vehicles, and Battery Safety	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
	fuels and chemicals, or faulty batteries.	*Unconfined BLF Principal Aquifer and SSSI / SPA vicinity:* High/Medium		Management Plan. Set out in the OCEMP **[EX1/GH7.1_A]** and ODS ~~**[EN010170/APP/GH7.1]**~~ ~~**[EN010170/APP**~~ **[EX1/GH7.3_A]**	*Unconfined BLF Principal Aquifer and SSSI / SPA vicinity:* Moderate to Moderate / Minor		*Unconfined BLF Principal Aquifer and SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect
Controlled Waters	Risk of contamination via potential leaching of chemical contaminants from faulty cables.	Medium	Low	Cables will employ high-quality, durable sheathing and insulation materials. Possible bunded containment systems. Set out in the OCEMP **[EX1/GH7.1_A]** and ODS ~~**[EN010170/APP/GH7.1]**~~ ~~**[EN010170/APP**~~ **[EX1/GH7.3_A]**	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect
		Unconfined BLF Principal Aquifer and SSSI / SPA vicinity: High/Medium			*Unconfined BLF Principal Aquifer and SSSI / SPA vicinity:* Moderate to Moderate / Minor		*Unconfined BLF Principal Aquifer and SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)**

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
							Neutral Residual Effect
Controlled Waters	Risk of contamination via potential fires/ damage to the storage of batteries and associated subsequent fire ash deposition/ extinguishing fire waters.	Medium *SSSI / SPA vicinity:* High/Medium	Low	Fully housed contained systems. Environmentally safer foams or fire waters. Containment and cleanup protocols, Emergency response plan. Battery Safety Management Plan. Regular inspections and maintenance. Post incident monitoring. Set out in the OCEMP **[EX1/GH7.1_A]** and ODS **~~[EN010170/APP/GH7.1]~~ ~~[EN010170/APP~~ [EX1/GH7.3_A]**	Moderate / Minor *SSSI / SPA vicinity:* Moderate to Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect *SSSI / SPA vicinity:* Moderate to Moderate Minor **(Not Significant)** Neutral Residual Effect
Controlled Waters	Risk of HDD impacting the controlled water receptor, with potential	Medium	Low	A spill response plan and appropriate storage of fuels or chemicals. Set out in the OCEMP **[EX1/GH7.1_A]** and ODS~~.~~	Moderate / Minor	None proposed.	Moderate / Minor (Not Significant) Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
	release of contaminants including drilling fluid.	SSSI / SPA vicinity: High/Medium		~~[EN010170/APP/GH7.1]~~ ~~[EN010170/APP~~ [EX1/GH7.3~~]~~ A].	SSSI / SPA vicinity: Moderate to Moderate / Minor		SSSI / SPA vicinity: Moderate to Moderate / Minor (Not Significant) Neutral Residual Effect
Future Use and Built Environment	Risk of contamination from chemical and fuel leaks, spills, and incidents related to BESS fires.	Medium	Low	Spill response plans, appropriate storage of fuels and chemicals, pollution prevention plans and regular maintenance of equipment and vehicles. Set out in the OCEMP [EX1/GH7.1 A] and ODS~~.~~ ~~[EN010170/APP/GH7.1]~~ ~~[EN010170/APP~~ [EX1/GH7.3~~]~~ A].	Moderate / Minor	None proposed.	Moderate / Minor (Not Significant) Neutral Residual Effect
Future Use and Built Environment	Risk of unacceptable levels of total/differential settlement of structures, caused by Alluvium and	Medium	Negligible	Floor loads should be transferred to ground improved soils or to piles through concrete ground beams/concrete frame or otherwise suspended. Set out	Minor	None proposed.	Minor (Not Significant) Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
	Made Ground deposits.			in the OCEMP **[EX1/GH7.1_A]** and ODS~~.~~ ~~**[EN010170/APP/GH7.1]**~~ ~~**[EN010170/APP**~~ **[EX1/GH7.3**~~]~~ **_A].**			
Future Use and Built Environment	Risk of radon to accumulate and migrate into buildings.	Medium	Neutral	N/A	Neutral	Elevated radon areas above (10-30%) will be subject to radon protective measures in accordance with BRE Report BR211 (2023).	Neutral **(Not Significant)** Neutral Residual Effect
Ecology and Sensitive Land Uses	Risk of contamination via the mobilisation of	Medium	Low	Discovery Strategy: stopping works, assessment and method of removing risk. Set out in the OCEMP **[EX1/GH7.1_A]** and ODS~~.~~	Moderate / Minor	None proposed.	Moderate / Minor (Not Significant) Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
	existing contamination	*SSSI / SPA vicinity:* High/Medium		~~[EN010170/APP/GH7.1]~~ ~~[EN010170/APP~~ [EX1/GH7.3~~]~~ A].	*SSSI / SPA vicinity:* Moderate to Moderate / Minor		*SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect
Ecology and Sensitive Land Uses	Risk of contamination via potential spillages or leakages of temporary fuels and chemicals, or faulty batteries.	Medium	Low	Spill response plans, appropriate storage of fuels and chemicals, pollution prevention plans and regular maintenance of equipment and vehicles. Set out in the OCEMP [EX1/GH7.1_A] and ODS~~.~~ ~~[EN010170/APP/GH7.1]~~ ~~[EN010170/APP~~ [EX1/GH7.3~~]~~ A].	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect
		SSSI / SPA vicinity: High/Medium			*SSSI / SPA vicinity:* Moderate to Moderate / Minor		SSSI / SPA vicinity: Moderate to Moderate / Minor (**Not Significant**) Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
Ecology and Sensitive Land Uses	Risk of contamination via potential leaching of chemical contaminants from faulty cables.	Medium	Low	Cables will employ high-quality, durable sheathing and insulation materials. Possible bunded containment systems. Set out in the OCEMP **[EX1/GH7.1_A]** and ODS~~.~~ **~~[EN010170/APP/GH7.1]~~** **~~[EN010170/APP~~** **[EX1/GH7.3~~]~~_A]**.	Moderate / Minor	None proposed.	Moderate / Minor (**Not Significant**) Neutral Residual Effect
		SSSI / SPA vicinity: High/Medium			*SSSI / SPA vicinity:* Moderate to Moderate / Minor		*SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect
Ecology and Sensitive Land Uses	Risk of contamination via potential fires/ damage to the storage of batteries and associated	Medium	Low	Fully housed contained systems. Environmentally safer foams or fire waters. Containment and cleanup protocols, Emergency response plan. Battery Safety Management Plan. Regular	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
	subsequent fire ash deposition/ extinguishing fire waters.	*SSSI / SPA vicinity:* High/Medium		inspections and maintenance. Post incident monitoring. Set out in the OCEMP **[EX1/GH7.1_A]** and ODS~~.~~ **~~[EN010170/APP/GH7.1]~~** **~~[EN010170/APP~~** **[EX1/GH7.3~~]~~_A]**.	*SSSI / SPA vicinity:* Moderate to Moderate / Minor		*SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect
Ecology and Sensitive Land Uses	Risk of HDD impacting the controlled water receptor, with potential release of contaminants including drilling fluid.	Medium	Low	A spill response plan and appropriate storage of fuels or chemicals. Set out in the OCEMP **[EX1/GH7.1_A]** and ODS~~.~~ **~~[EN010170/APP/GH7.1]~~** **~~[EN010170/APP~~** **[EX1/GH7.3~~]~~_A]**.	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect
		SSSI / SPA vicinity: High/Medium			*SSSI / SPA vicinity:* Moderate to Moderate / Minor		*SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
Operational Phase							
Construction Workers	Risk of exposure to contamination through direct dermal contact, ingestion and inhalation.	Medium	Negligible	Toolbox talks, good standards of hygiene, welfare facilities and appropriate levels of personal protective equipment (PPE). Set out in the OOEMP~~.~~ ~~[EN010170/~~ **[APP~~/GH7.2]~~** ~~-~~ **546].**	Minor	None proposed.	Minor **(Not Significant)** Neutral Residual Effect
Construction Workers	Risk of encountering unexploded ordnance at Green Hill G.	Medium	Low	None proposed.	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect
Controlled Waters	Risk of contamination via potential spillages or leakages of temporary fuels and chemicals, or faulty batteries.	Medium	Low	Spill response plans, appropriate storage of fuels and chemicals, pollution prevention plans, regular maintenance of equipment and vehicles, and Battery Safety Management Plan. Set out in the OOEMP~~.~~ ~~[EN010170/~~ **[APP~~/GH7.2]~~**	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
		Unconfined BLF Principal Aquifer: High/Medium		**-546].**	*Unconfined BLF Principal Aquifer:* Moderate to Moderate / Minor		*Unconfined BLF Principal Aquifer:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect
Controlled Waters	Risk of contamination via potential leaching of chemical contaminants from faulty cables.	Medium *Unconfined BLF Principal Aquifer and*	Low	Cables will employ high-quality, durable sheathing and insulation materials. Possible bunded containment systems. Set out in the OOEMP~~.~~ ~~[EN010170/~~ **[APP**~~/GH7.2]~~ **-546].**	Moderate / Minor *Unconfined BLF Principal Aquifer and*	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect *Unconfined BLF Principal Aquifer*

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
		SSSI / SPA vicinity: High/Medium			*SSSI / SPA vicinity:* Moderate to Moderate / Minor		*and SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect
Controlled Waters	Risk of contamination via potential fires/ damage to the storage of batteries and associated subsequent fire ash deposition/	Medium	Low	Fully housed contained systems. Environmentally safer foams or fire waters. Containment and cleanup protocols, Emergency response plan. Battery Safety Management Plan. Regular inspections and maintenance. Post incident monitoring. Set out in the OOEMP~~.~~	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
	extinguishing fire waters.	*SSSI / SPA vicinity:* High/Medium		~~[EN010170/~~ [APP~~/GH7.2]~~-546].	*SSSI / SPA vicinity:* Moderate to Moderate / Minor		*SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect
Future Use and Built Environment	Risk of contamination from chemical and fuel leaks, spills, and incidents related to BESS fires.	Medium	Low	Spill response plans, appropriate storage of fuels and chemicals, pollution prevention plans and regular maintenance of equipment and vehicles. Set out in the OOEMP ~~[EN010170/~~ [APP~~/GH7.2]~~-546].	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect
Future Use and Built Environment	Risk of unacceptable levels of total/differential settlement of structures, caused by Alluvium and	Medium	Negligible	N/A	Minor	None proposed.	Minor **(Not Significant)** Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
	Made Ground deposits.						
Future Use and Built Environment	Risk of radon to accumulate and migrate into buildings.	Medium	Low	N/A	Moderate / Minor	Elevated radon areas above (10-30%) will be subject to radon protective measures in accordance with BRE Report BR211 (2023).	Minor **(Not Significant)** Neutral Residual Effect
Ecology and Sensitive Land Uses	Risk of contamination via potential spillages or leakages of temporary	Medium	Low	Spill response plans, appropriate storage of fuels and chemicals, pollution prevention plans and regular maintenance of equipment and vehicles. Set out in the	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
	fuels and chemicals, or faulty batteries.	*SSSI / SPA vicinity:* High/Medium		OOEMP~~.~~ ~~[EN010170/~~ [**APP~~/GH7.2]~~ ~~-546].~~	*SSSI / SPA vicinity:* Moderate to Moderate / Minor		*SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect
Ecology and Sensitive Land Uses	Risk of contamination via potential leaching of chemical contaminants from faulty cables.	Medium	Low	Cables will employ high-quality, durable sheathing and insulation materials. Possible bunded containment systems. Set out in the OOEMP~~.~~ ~~[EN010170/~~ [**APP~~/GH7.2]~~ ~~-546].~~	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect
		SSSI / SPA vicinity: High/Medium			*SSSI / SPA vicinity:* Moderate to Moderate / Minor		*SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect

Receptor	Description of Impact	Sensitivity of Receptor	Magnitude of Impact	Embedded Mitigation	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures	Residual Effect (with additional mitigation)
Ecology and Sensitive Land Uses	Risk of contamination via potential fires/ damage to the storage of batteries and associated subsequent fire ash deposition/ extinguishing fire waters.	Medium	Low	Fully housed contained systems. Environmentally safer foams or fire waters. Containment and cleanup protocols, Emergency response plan. Battery Safety Management Plan. Regular inspections and maintenance. Post incident monitoring. Set out in the OOEMP **~~[EN010170/~~ [APP~~/GH7.2]~~ -546]**.	Moderate / Minor	None proposed.	Moderate / Minor **(Not Significant)** Neutral Residual Effect
		SSSI / SPA vicinity: High/Medium			*SSSI / SPA vicinity:* Moderate to Moderate / Minor		*SSSI / SPA vicinity:* Moderate to Moderate / Minor **(Not Significant)** Neutral Residual Effect

References

Ref 22.1 Green Hill Solar Farm (2024) *Scoping Report.* Available at: EN010170-000012-GHSF - Scoping Report.pdf

Ref 22.2 UK Government (1990). *Environmental Protection Act 1990 (as amended)*. Available at: https://www.legislation.gov.uk/ukpga/1990/43

Ref 22.3 UK Government (1991). *Water Resources Act 1991 (as amended)*. Available at: https://www.legislation.gov.uk/ukpga/1991/57

Ref 22.4 Department for Energy Security and Net Zero. (2023). *Overarching National Policy Statement for Energy (EN-1)*. Available at: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1

Ref 22.5 Department for Energy Security and Net Zero. (2023). *National Policy Statement for Electricity Networks Infrastructure (EN-5)*. Available at: https://assets.publishing.service.gov.uk/media/65a78a5496a5ec000d731abb/nps-electricity-networks-infrastructure-en5.pdf

Ref 22.6 Department for Energy Security and Net Zero. (2023). *National Policy Statement for Renewable Energy Infrastructure (EN-3)*. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3

Ref 22.7 Ministry of Housing, Communities and Local Government (2024). *National Planning Policy Framework (as amended).* Available at: https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf

Ref 22.8 North Northamptonshire Council (Adopted 2016). *Joint Core Strategy 2011 – 2031*. Available at: https://www.northnorthants.gov.uk/planning-strategies-and-plans/north-northamptonshire-local-plan

Ref 22.9 West Northamptonshire Council (Adopted 2014). *Joint Core Strategy Local Plan (Part 1).* Available at: https://www.westnorthants.gov.uk/west-northamptonshire-joint-core-strategy/west-northamptonshire-joint-core-strategy-local-plan-part

Ref 22.10 Milton Keynes Council (Adopted 2019). *Plan:MK 2016 – 2031.* Available at: https://www.milton-keynes.gov.uk/sites/default/files/2022-05/PlanMK%20Adoption%20Version%20%28March%202019%29.pdf

Ref 22.11 Milton Keynes Council (2024). *MK City Plan 2050.* Available at: https://milton-keynes.moderngov.co.uk/documents/s19212/MK+City+Plan+2050+Regulation+18.pdf

Ref 22.12 Bedford Borough Council (Adopted 2020). *Local Plan 2030.* Available at: https://www.bedford.gov.uk/files/local-plan-2030.pdf/download?inline

Ref 22.13 UK Government (2014 updated 2019). *Planning Practice Guidance (Land Affected by Contamination) (as amended)*. Available at: https://www.gov.uk/guidance/land-affected-by-contamination

Ref 22.14 UK Government (2020 updated 2023) *Guidance: Land Contamination: Risk Management (LCRM) (as amended)*. Available at:

https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm

Ref 22.15 British Standards Institution (2015, amended 2020). *BS 5930: Code of practice for site investigations*. Available at: https://geotechnicaldesign.info/download/bs5930-2015.pdf

Ref 22.16 British Standards Institution (2015, amended 2019). *BS 8485: Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*. Available at: https://knowledge.bsigroup.com/products/code-of-practice-for-the-design-of-protective-measures-for-methane-and-carbon-dioxide-ground-gases-for-new-buildings?version=standard

Ref 22.17 British Standards Institution (2013). *BS 8576: Guidance on investigations for ground gas – permanent gases and volatile organic compounds*. Available at: https://knowledge.bsigroup.com/products/guidance-on-investigations-for-ground-gas-permanent-gases-and-volatile-organic-compounds-vocs?version=standard

Ref 22.18 British Standards Institution (2011, amended 2017). *BS 10175: Code of practice for investigations of potentially contaminated sites*. Available at: https://knowledge.bsigroup.com/products/investigation-of-potentially-contaminated-sites-code-of-practice-code-of-practice?version=standard

Ref 22.19 CIRIA (2007). *CIRIA C665: Assessing risks posed by hazardous ground gases to buildings*. Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C665&Category=BOOK

Ref 22.20 CIRIA (2009). *CIRIA C681: Unexploded ordnance (UXO) A guide for the construction industry*. Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductcode=C681

Ref 22.21 CIRIA (2016). *CIRIA C762: Environmental good practice on site*. Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C762&Category=BOOK

Ref 22.22 CIRIA (2014). *CIRIA C733: Asbestos in soils and made ground*. Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductcode=C733

Ref 22.23 Environment Agency (2018, updated 2023). *The Environment Agency approach to groundwater protection*. Available at: https://assets.publishing.service.gov.uk/media/5ab38864e5274a3dc898e29b/Environment-Agency-approach-to-groundwater-protection.pdf

Ref 22.24 Environment Agency (2017, updated 2024). *Environment Agency guidance: protect groundwater and prevent groundwater pollution*. Available at: https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protect-groundwater-and-prevent-groundwater-pollution

Ref 22.25 Environment Agency (2014, updated 2015). *Environment Agency guidance: contaminated land exposure assessment (CLEA) tool*. Available at: https://www.gov.uk/government/publications/contaminated-land-exposure-assessment-clea-tool

Ref 22.26 Environment Agency (2009). *Environment Agency science report: human health toxicological assessment of contaminants in soil*. Available at: https://assets.publishing.service.gov.uk/media/5a7b96a6ed915d131106039e/scho0508bnqy-e-e.pdf

Ref 22.27 Environment Agency (2020, updated 2023). *Environment Agency guidance: land contamination risk management (LCRM) Stage 3 remediation and verification*. Available at: https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm/lcrm-stage-3-remediation-and-verification

Ref 22.28 Environment Agency (2006, updated 2014). *Environment Agency research and analysis: land contamination: remedial targets methodology (RTM)*. Available at: https://www.gov.uk/government/publications/remedial-targets-worksheet-v22a-user-manual

Ref 22.29 BRE Report (2023) *BR211: Radon: Protective measures for new buildings and as required by Building Regulations.* Available at: https://www.brebookshop.com/details.jsp?id=328065