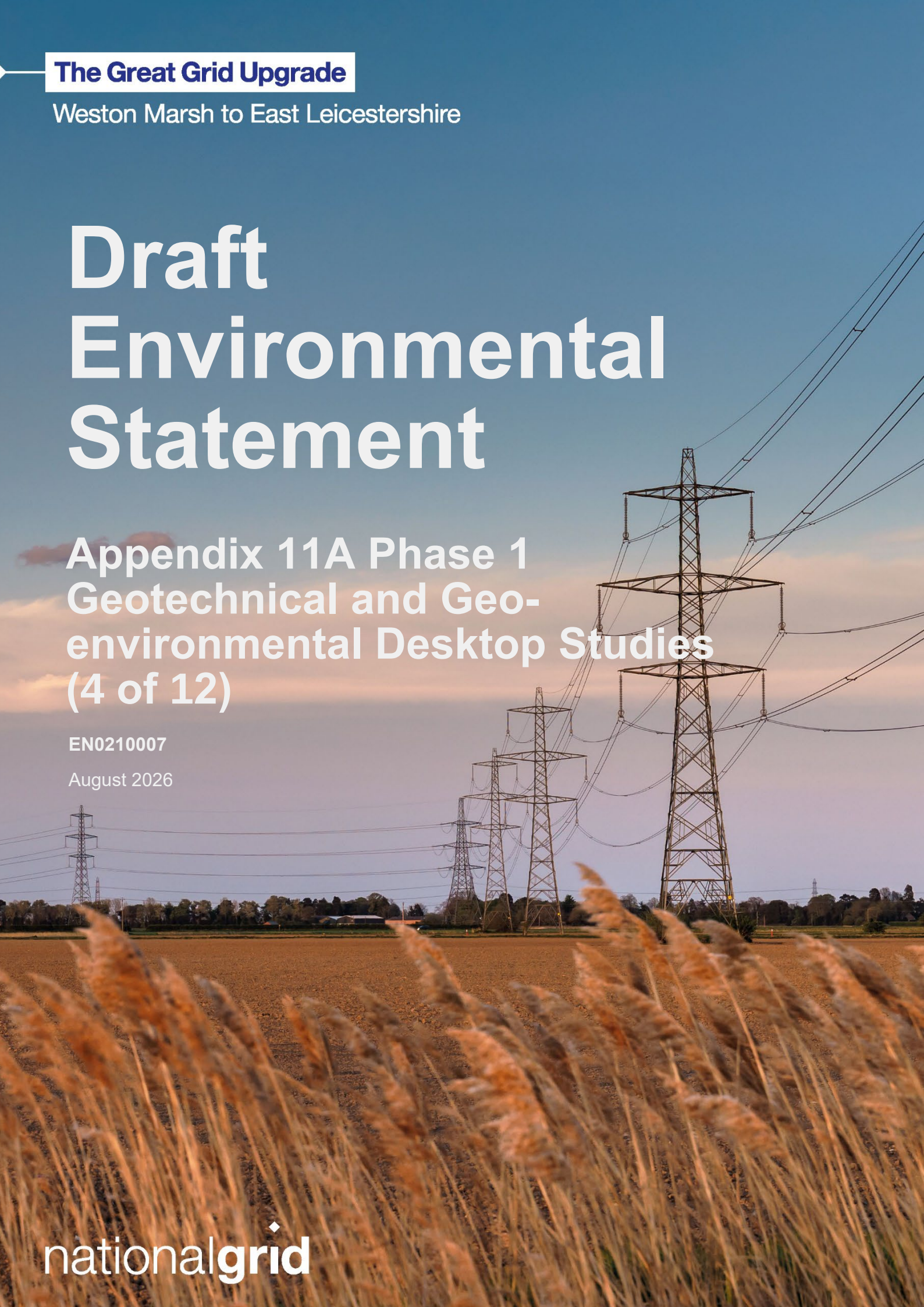




The Great Grid Upgrade

Weston Marsh to East Leicestershire

Draft Environmental Statement

Appendix 11A Phase 1 Geotechnical and Geo- environmental Desktop Studies (4 of 12)

EN0210007

August 2026

nationalgrid

11A. Phase 1 Geotechnical and Geo- environmental Desktop Studies

The Great Grid Upgrade

Weston Marsh to East Leicestershire

Phase 1 Geotechnical and Geo- Environmental Desktop Study Report

WMEL A Substation

June 2026

nationalgrid

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The methodology adopted and the sources of information used by AAJV in providing its services are outlined in this Report. The work described in this Report was undertaken between November 2025 and January 2025, superseded by further updates for the Design Freeze 2 Revision Redline boundary between May and June 2026 based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances. AAJV disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to AAJV’s attention after the date of the Report.

Any risks identified in this Report are perceived risks, based on the information reviewed during the desk study and therefore partially based on conjecture from available information. The study is limited by the non-intrusive nature of the work and actual risks can only be assessed following a physical investigation of the site.

The opinions expressed in this report and the comments and recommendations given are based on a desk assessment of readily available information. At this stage intrusive investigations have yet to be undertaken at Site to establish actual ground and groundwater conditions.

Reference to historical Ordnance Survey (OS) maps provides invaluable information regarding the land use history of a Site. However, it should be noted that historical evidence will be incomplete for the period pre-dating the first edition and between the release of successive maps.

Executive Summary

On the instruction of National Grid Electricity Transmission (NGET), AECOM Arup Joint Venture (AAJV) has undertaken a Phase 1 Geotechnical and Geo-environmental Desk Study for the WMEL A – Substation (The Site) to provide baseline ground information in support of the Development Consent Order (DCO) and future ground investigation and design. The Site is being redeveloped as part of the wider Weston Marsh to East Leicestershire (WMEL) scheme.

The proposed development is understood to comprise construction of access roads, earthworks (cut and fill), installation of services and drainage, and construction of a new substation. The Site is located adjacent to the A151, Birkholme, Lincolnshire, NG33 4LE, approximately 1.3km west of the village of Corby Glen and centred on National Grid Reference SK 97915 24500. The Site covers a rectangular area of approximately 216 hectares (ha) and is situated in a rural setting predominantly consisting of agricultural fields. Existing infrastructure comprising overhead transmission line passes through the centre of the Site with associated pylons present in the central west (SK 97749 24284) and central north of the site (SK 97639 24606). These connect into offsite pylons on a roughly north-south bearing orientation beyond the site extents.

The published British Geological Survey 1:50,000 scale (Map Sheet 143 Bourne, 1971 and 1972) and 1:10,560 scale (Map Sheet SK92SE, 1969) indicates the site is underlain by bedrock of the Rutland Formation, Lincolnshire Limestone Formation, Grantham Formation, Northampton Sands Formation, and Whitby Mudstone Formation with a series of interbedded limestones and mudstones. Numerous linear features are present crossing the Site as mapped by the BGS, most notably the Woodlands Fault, trending northwest southeast through the Site, downthrown to northeast within the Upper Lincolnshire Limestone Member. The preliminary ground model for the Site suggests that superficial deposits are locally present only within the north of the Site consisting of glacial till, while elsewhere topsoil directly overlies the aforementioned bedrock deposits.

There is evidence of quarrying on site from the pre-medieval period, the Site lies within a designated Mineral Safeguarding Area therefore consultation with the Mineral Planning Authority is required and potentially a full Minerals Assessment ahead of the works.

The main ground related hazards on the Site are variable stratigraphy and geotechnical material properties resulting in high sulphates and natural obstructions, the potential for voids from karst features and mining features, and presence of existing utilities / services both buried and overhead at the Site.

The only notable potential sources of contamination on site are localised areas of Made Ground (associated with on-site structures and the railway embankment encroaching into the eastern area of the Site), infilled land (associated with the former gravel pit and ponds), storage of sludge (associated with waste exemptions) and general agricultural land use across the majority of the Site throughout its mapped history. A large part of the Site, predominantly in the central area, has an elevated Radon potential with the southeast area having the highest number of properties affected by Radon (10 to 30%). Off-site sources comprise Made Ground associated with the railway embankment and road, infilled land, storage of sludge, railway land to the east and the former sawmill to the east. Risks from these potential contaminant sources have been assessed for three identified receptor groups (Human Health, Controlled Waters and Property). A Moderate / Low risk has been assigned to the scenarios associated with inhalation of ground gas by human health receptors, gas ingress and explosion risk to enclosed structures and leaching of contaminants, migration in groundwater impacting the superficial and bedrock aquifers underlying the Site and

lateral migration in groundwater and baseflow to the West Glen River. The contaminant linkages that have been assessed and the risks assigned are based on the information provided and high-level understanding of the development proposals but may be reviewed as more information on the proposed design is developed and / or as intrusive investigation data provides a more robust characterisation of site conditions. Due to the elevated Radon potential identified, specific consideration of full radon protection measures for any occupied buildings located in these areas should be considered.

Based on preliminary findings, it is anticipated that, from a geotechnical perspective, earthworks and potentially retaining structures will be required to manage ground level changes associated with the development on site. The need and extent of these works will depend on the orientation and final layout of the development, given the sloping topography and the valley feature in the southern part of the Site.

It is recommended that ground investigation is undertaken in accordance with UK Specification for Ground Investigation 3rd Edition. In brief, the outline scope of works is anticipated to include boreholes, trial pitting, in-situ testing (including Standard Penetration Testing, California Bearing Ratio Tests, Infiltration Tests and Percolation Tests), sampling of soil and groundwater, geotechnical and geo-environmental laboratory testing and groundwater and gas monitoring.

An external inspection of the Site was undertaken by an AAJV Engineer on 15th April 2026. The Site reconnaissance generally confirmed the Site's agricultural setting and the main structures identified from desktop data, including the barn on-site, railway and embankment and sawmill to the southeast. It is noted that the Site reconnaissance did not cover the full extent of the Site boundary due to land access constraints. The Site will be revisited by AAJV Geotechnical / Geo-environmental Engineers in advance of any intrusive works. Any additional findings will be incorporated into subsequent reporting and investigation specifications.

1. Introduction

1. Introduction

1.1 Terms of Appointment

- 1.1.1 On the instructions of National Grid Electricity Transmission (NGET), hereafter referred to as 'the Client', AECOM Arup Joint Venture (AAJV) has carried out a Phase 1 Geotechnical and Geo-environmental Desk Study assessment of the site known as WMEL-A Substation, herein referred to as "the Site".

1.2 Background and Proposed Development

- 1.2.1 The report has been produced on the assumption that the Site, defined by the Design Freeze (DF) 2 Revision (Rev) B Redline boundary (Draft Order Limit Boundary – DF2 REVB – 18/06/2026), will be redeveloped as a new substation, as part of the wider Weston Marsh to East Leicestershire (WMEL) development.
- 1.2.2 It is understood that the development will require significant earthworks (Cut and Fill) to achieve a suitable founding level and the Site, alongside the development of access roads. It is noted that the proposed site layout is still under development and consequently are subject to change. The finds of this report should be reviewed if changes in alignment / Site areas are proposed.
- 1.2.3 It is understood that the development is likely to comprise of the following stages:
- Clearing and stripping of the existing site.
 - Construction of new access roads (including earthworks and any crossings).
 - Site earthworks, including excavation levelling and landscaping for external areas, construction of an attenuation pond, access routes and construction laydown area. Retaining structures may also potentially be required to achieve required levels.
 - Installation of services and site drainage.
 - Construction of the new substation.
- 1.2.4 Figures referenced as a part of this report have been included in Appendix A

1.3 Report Objectives

- 1.3.1 The primary objective of this report is to provide baseline information to support the Development Consent Order (DCO) for the scheme and inform ground investigation scope and specification, alongside subsequent interpretative reporting and design stages of the project.
- 1.3.2 This report has been prepared following the recommended good practice outlined in accordance with Eurocode 7 (BS EN 1997-2:2007) and the UK government guidance resource "Land contamination: risk management (LCRM)" (Updated 2025) and comprises:
- A description of the Site layout and setting.

- A review of the Site's geological, hydrological and hydrogeological setting, and public domain geo-environmental information to build up a more accurate understanding of the Site and surrounding environmental setting/sensitivity.
- The identification and review of potential geotechnical hazards and constraints, including the production of a geotechnical risk register, with consideration given to the presence of historical mining and underground structures.
- An appraisal of current and historical development and land use across the Site and in the surrounding area, with a particular emphasis on identifying potential on-site and off-site contamination sources.
- Preliminary review of Unexploded Ordnance (UXO) risk.
- The production of an initial Conceptual Site Model and Preliminary (Qualitative) Risk Assessment in accordance with the guidance document Environment Agency, Land Contamination: Risk Management. (LCRM 2025).
- Preliminary recommendations for additional geotechnical and geo-environmental investigation and assessment works required.

1.4 Sources of Information

- 1.4.1 The following sources of information have been considered in the authoring of this report, either accessed directly or within the Project WebGIS:
- 1:10,000 scale British Geological Survey (BGS) geological maps (Map Sheet 143 Bourne, 1971).
 - 1:50,000 scale BGS geological map (Map Sheet SK92SE, 1969).
 - 1:10,000 BGS Mineral Resources Map of Lincolnshire (south) (BGS, 2002)
 - BGS GeoIndex borehole records.
 - Natural England Agricultural Land Classification Map East Midlands ALC005.
 - The Environment Agency's MAGIC interactive map.
 - Mining Remediation Authority Map Viewer.
 - DF2.0B Groundsure GIS Dataset (included as a part of the Project WebGIS and therefore not appended)
 - Fellows International Group Preliminary UXO Assessment (June, 2026)
- 1.4.2 Specific information sources are referenced throughout the document, and reference list is included after Section 12 of the report.
- 1.4.3 Site reconnaissance was undertaken to the agreed DF1.5 boundary and did not include the additions of land parcels to the south or east of the Site. It was restricted to permitted access routes across the DF1.5 boundary due to land access constraints.
- 1.4.4 Furthermore, no specifically commissioned survey data was available at the time of writing and has therefore not been considered. Any intrusive survey data will be reviewed during the ground investigation interpretative reporting stage of the project.

2. Site Setting

2. Site Setting

2.1 Location

- 2.1.1 The Site is located adjacent to the A151, Birkholme, Lincolnshire, NG33 4LE, 1.3km west of the village of Corby Glen and centred on National Grid Reference SK 97915 24500. A site location plan is provided as Figure 1 within Appendix A.

2.2 Description and Setting

- 2.2.1 The Site covers a rectangular area of approximately 216 hectares (ha) and is defined by the Redline boundary shown in Figure 1 within Appendix A.
- 2.2.2 The Site is situated in a rural setting and predominantly consists of agricultural fields broken up by lightly vegetated boundaries, and several roads, including Station Road, and Colsterworth Lane. A barn structure is present in the east of the Site (SK 98270 24641), noted as Formerly Spring Farm. In addition, an existing overhead transmission line passes through the centre of the Site with associated pylons present in the central south (SK 97878 23923), central west (SK 97749 24284) and central north of the Site (SK 97639 24606). These connect into offsite pylons on a roughly north-south bearing orientation beyond the Site extents.
- 2.2.3 The topography of the Site is presented within Figure 2 located in Appendix A which shows the Site situated at its highest elevation within the north of the Site at circa (c.) 101m Above Ordnance Datum (AOD), sloping gently towards the southeast of the Site. A valley feature runs parallel to the southern boundary in a northeast-southwest orientation at c. 72-66m AOD. The linear valley feature trends across the Site from the south to the east corner of the Site boundary, indicated by a rapid change in slope angle as shown in Figure 2. South of the valley feature the site then increases in elevation again to the intersection with A151. No named existing watercourses have been identified on, or in the vicinity of the Site, based on the variation in aerial imagery the watercourses could be ephemeral and result of seasonal flooding. Other less prominent linear depressions link into this valley, bearing roughly north south.
- 2.2.4 The Project WebGIS viewer comprised LiDAR mapping indicates minor incised features along the north, south, and central field boundaries, including one that cuts through the aforementioned valley with raised element within it that may represent infrastructure. LiDAR also indicates some linear raised ground along field boundaries, suggesting small scale bunds separating some fields, which is in keeping with the knowledge that ridge, and furrow farming was historically practiced within the area (Lincolnshire County Council, 2021).
- 2.2.5 More locally, LiDAR indicates areas of irregular ground adjacent to the existing barn, along the central southern boundary and around the aforementioned pylons. A semi-circle depression with raised sides is also evident, surrounded by trees / vegetation in the northeast and a further depression is noted on the southeast boundary. Additionally, LiDAR indicates some localised prominent circular depressions in the northern section of the railway line adjacent to the Site.

- 2.2.6 A LiDAR survey undertaken by Air Photo Services Ltd in May 2026 encompassing the DF1.5A boundary supported evidence for former ridge and furrow farming microtopography across much of the northern site area, which are now eroded, and associated headlands. Features of note from the survey include an elongated embanked feature (suspected to be former headland) of downslope in the southern extent of the Site, which may suggest cambered terrains where the Rutland Formation is present at depth in the valley or potentially development karstic features. In addition the survey found elongated depression evidence for former extractive processes, where localised pits are visible indicative of historical quarrying (see Section 3.7 for further details on potential resource).
- 2.2.7 Within the south of the Site an area of potentially raised ground is noted as visible from a review of the LiDAR within the area shown to be for proposed overhead line routes at 497999 323663. The area is currently vegetated, and a pond is shown on OS mapping at this location. In addition, further depressions are noted within the DF2 Rev B site boundary, but outside of the proposed pylon and overhead line locations. They are located at; 498385 323816 , 497704 323634, 498063 323810 and 497906 323541, 498650 322716 and 498498 322754 .
- 2.2.8 Relevant features immediately surrounding the Site are summarised in Table 2.1

Table 2.1 Features Surrounding the Site

Direction	Summary
North	Adjacent land comprises agricultural fields and a small area of woodlands with the EMC1 East Coast Main railway line adjacent to northeast.
South	The Site is terminated within agricultural fields south of the A151. The land is used for agricultural fields with hedgerows between and limited access tracks.
East	The Site is bound immediately by the EMC1 East Coast Main Railway Line in a northwest-southeast orientation and its associated cutting and embankment slopes, with agricultural fields, and the West Glen River, beyond. The railway line is formed on an embankment which is at approximately 80m AOD, up to a 7m height difference relative to adjacent ground. The A151 crosses the railway through an underpass adjacent to the southeastern corner of the Site.
West	The Site is bound by agricultural fields and parcels of woodlands..

3. Geological and Environmental Setting

3. Geological and Environmental Setting

- 3.1.1 The environmental setting including the topography, geology, hydrogeology and hydrology are the key factors that influence the way in which contaminants in the soil or groundwater can be transported on or off site, and also the way in which contamination can affect applicable receptors including controlled waters and users of the Site.
- 3.1.2 The environmental setting of the Site has been assessed by making reference to the information sources detailed after Section 12.

3.2 Geology and Soils

Published Geology & Exploratory Hole Records

- 3.2.1 A review of publicly available information has been undertaken, and the anticipated geological succession for the Site has been summarised. The published 1:50,000 scale (Map Sheet 143 Bourne, 1971 and 1972) and 1:10,560 scale (Map Sheet SK92SE, 1969) have been referenced to define the geological succession. A summary is provided in Table 3.1 with extracts of the superficial deposit and bedrock geology included in Figure 3 and Figure 4 respectively (Appendix A).
- 3.2.2 The bedrock underlying the Site comprises a series of mudstones, limestones, and limestones with subordinate sandstones are indicated to dip towards the east at 1° (BGS, EA, 2006). Numerous linear features are present crossing the Site as mapped by the BGS, the limestones are traversed by a series of shallow west-east trending folds and associated faults which juxtaposed the geological boundaries between the different bedrock geology. Notably the Woodlands Fault, trending northwest southeast through the Site, is downthrown to northeast within the Upper Lincolnshire Limestone Member. The location becomes inferred towards the northwest of site. In addition, a prominent fault branches from the Woodlands Fault trending east across the northern part of site, downthrown to the north. Despite the complicated fault/fold regime present along the boundary, published mapping shows folding to be shallow, with the repeated presence of strata being primarily driven by changes in elevation.
- 3.2.3 Several shorter faults have been mapped off the Woodlands Fault, including an inferred fault trending southwest along approximate alignment of the southern side of the valley feature, downthrown to the south, and a mapped fault trending parallel with the railway line downthrown to the northeast.

Table 3.1 Geological Succession from Published Mapping

Age	Group	Geological Stratum	Stratum	BGS Lexicon Summary Description	Mapped Occurrence	Thickness (m)
Mid Pleistocene	Till	Superficial	Till	Diamicton. Description of parent unit: unsorted and unstratified drift, generally over consolidated. Consists of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape.	Generally absent, locally encroaching on northwest of site and in the south of the Site.	-
Bathonian Age	Great Oolite Group	Bedrock	Blisworth Limestone Formation	Pale grey to off-white or yellowish limestones with thin marls and mudstones, fossiliferous, bioturbated peloidal, ooidal and shell-fragmental more-or-less argillaceous packstones and wackestones, subordinate cross-bedded ooidal shell-fragmental grainstones.	Mapped locally within Rutland Formation extent in the northeast of the Site.	c.2.5-5.0 (based on 1:50k map sheet)
Bajocian Age – Bathonian Age	Great Oolite Group	Bedrock	Rutland Formation	A succession of up to seven shallowing upward, essentially delta-type rhythms, comprising ideally of a grey marine mudstone passing up into non-marine mudstone and siltstone, with a greenish-grey rootlet bed at the top. Presence of sandstone and mudstone members in areas. Rutland Formation has been subdivided into areas of Argillaceous Rocks, and solely Limestone located just outside of the southeastern redline boundary site.	Mapped in north/northeast of site and the southern most portion of the Site	c.6-12 (based on 1:50k map sheet)

Age	Group	Geological Stratum	Stratum	BGS Lexicon Summary Description	Mapped Occurrence	Thickness (m)
Bajocian Age	Lincolnshire Limestone Formation	Bedrock	Upper Lincolnshire Limestone Member	Limestone, overwhelmingly dominated by high-energy ooidal and shell fragmental grainstones, but includes secondarily recrystallized and micritized lithologies.	Mapped across central parts of site	c.12-21 (based on 1:50k map sheet 143)
Bajocian Age	Lincolnshire Limestone Formation	Bedrock	Lower Lincolnshire Limestone Member	Limestones, dominated by low-energy calcilutite, and peloidal wackestone and packstone. Commonly includes sandy limestone or calcareous sandstone in basal part and contains substantial units of mudstone	Mapped in the middle of the Site, correlating with lower lying valley feature	c.9-15m (based on 1:50k map sheet 143)
Aalenian Age	Inferior Oolite Group	Bedrock	Grantham Formation	Mudstones, sandy mudstones and argillaceous siltstone-sandstone, which is commonly ferruginous, and containing generally abundant plant debris.	Anticipated underlying the Lower Lincolnshire Limestone Formation	c. 0-8m (based on 1:50k map sheet 143)
Aalenian Age	Inferior Oolite Group	Bedrock	Northampton Sand Formation	Sandy, berthierine-ooidal and sideritic ironstone, greenish grey where fresh, weathering to brown limonitic sandstone, typically displaying a box-stone structure. The basal part is commonly muddy and less ferruginous. The uppermost beds are generally more or less ferruginous sandstone. The unit includes lenses of mudstone and limestone in places and contains a fairly abundant marine fauna.	Anticipated underlying the Grantham Formation	c. 0-9m (based on 1:50k map sheet 143)

Age	Group	Geological Stratum	Stratum	BGS Lexicon Summary Description	Mapped Occurrence	Thickness (m)
Toarcian Age	Lias Group	Bedrock	Whitby Mudstone Formation	Medium and dark grey fossiliferous mudstone and siltstone, laminated and bituminous in part, with thin siltstone or silty mudstone beds and rare fine-grained calcareous sandstone beds; dense, smooth argillaceous limestone nodules very common at some horizons; phosphatic nodules at some levels.	Anticipated underlying the Inferior Oolite Group	Up to 120 (based on BGS Lexicon)

3.3 BGS Borehole Records

- 3.3.1 The BGS maintains an archive of historical exploratory hole records throughout the UK. AAJV has searched the database and those which are considered to provide useful information on the ground profile at the Site are highlighted as part of the extract below. 15no. boreholes have been referenced in producing this report of varying distance to the Site as outlined in Table 3.2 and selected based on their geological conditions including 3no boreholes on site (SK92SE29, SK92SE30 and SK92SE82).
- 3.3.2 Copies of these exploratory hole records are included as Appendix B, and those available in the WebGIS Viewer are presented on Figure 3 (Appendix A). Relevant information from the records is considered as part of the Preliminary Ground Model in Section 8.

Table 3.2 Summary of BGS records considered relevant to site

BGS Record ID	Distance to site	Date drilled	Ground Level (mAOD)
SK92SE29	On site (East)	Apr-1943	85.3
SK92SE30	On site (East)	May-2943	75.4
SK92SE82	On site (East)	Nov-1925	64.9
SK92SE29	On site (Middle)	Apr-1943	85.3
SK92SE51	On site (Middle)	Nov-1959	92.3
SK92SE83	On site (Middle)	Apr-1941	94.5
SK92SE81	On site (Middle)	Oct-1925	93.0
SK92SE98	300m Southwest	Jun-1951	80.8
SK92SE28	300m southwest	Apr-1943	79.9
SK92SE48	50m West	No date	81.1
SK92NE42	On site (North)	No date	73.9
SK92SE60	800 Northwest	Aug-63	96.3
SK92SE143	700m East	Oct-1971	71.5
SK92SE97	600m West	Apr-1941	NA
SK92SE88	600m West	ND	96.0
SK92SE31	On site (South)	Jun-1948	94.2
SK92SE36	400m South	Jun-1945	82.5
SK92SE38	950m South	Nov-1942	93.0
SK92SE21	620m Southwest	Nov-1959	85.6
SK92SE15	650m Southeast	Nov-1959	88.6

3.4 Soils and Soil Chemistry

- 3.4.1 Information obtained from Soilscape (Cranfield University, 2025) describes the soils within the vicinity of the Site (Soilscape 3) as shallow lime-rich soils over chalk or limestone, with a band of slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (Soilscape 18) present bound the northern and southern boundaries.
- 3.4.2 Natural England reports the Agricultural Land Use Classification to be good to moderate based on the published 1:250,000 scale (Natural England, 2010).
- 3.4.3 The BGS Soil Chemistry datasets provide indicative information on regional concentrations of five potentially harmful elements (PHEs): arsenic (As), cadmium (Cd), chromium (Cr), nickel (Ni) and lead (Pb) in soil, as presented within the Project WebGIS. Elevated concentrations of these PHEs can exist because of natural geological conditions or possible anthropogenic contamination. The following BGS estimated soil chemistry levels are attributed to the vicinity of the Site based on the geometric mean concentrations of available data (presented in Table 3.3).

Table 3.3 Estimated Soil Chemistry

Potentially Harmful Element	Estimated Geometric Mean Concentration across DF2 Rev B Boundary (mg/kg)
Arsenic	<15; 15-25 locally encroaching on the north and south of site in the superficial Till Deposits.
Cadmium	<1.8
Chromium	60-90; 40-60 locally encroaching on the north and south of site in an area underlain by the Upper Lincolnshire Limestone Member; 90-120 in areas adjacent to the north, locally encroaching on a small area of the north and south of site underlain by superficial Till Deposits and bedrock of the Upper and Lower Lincolnshire Limestone Member and Rutland Formation.
Lead	<100
Nickel	30-45; 15-30 locally encroaching on the north and south of site in an area underlain by the Upper Lincolnshire Limestone Member

3.5 Ground Stability Records

- 3.5.1 Table 3.4 summarises the Groundsure hazard ratings for natural ground subsidence hazards on site. The Groundsure data set is based on the BGS GeoSure Dataset comprising six layers representing a different natural ground stability hazard that occurs in Great Britain. The GeoSure datasets are described using a simple Class A to E potential hazard classification (A = Low, E = High).

- 3.5.2 It is noted that the below does not constitute AAJV's assessment of risk of these hazards and the Preliminary Geotechnical Risk Register in Table 3.4 should be referred to for further information. A Groundsure Dataset was used for the DF2 Rev A Site Boundary, but covers the full DF2 Rev B Boundary.

Table 3.4 Ground Stability Records

Hazard Type	Hazard Class Description
Collapsible Ground Stability	Class B - deposits with potential to collapse when loaded and saturated are unlikely to be present
Compressible Ground Stability	Class A - compressible strata are not thought to occur In the northwest and south of the Site associated with Till the stability conditions are increased to Class C "Ground conditions predominantly medium plasticity".
Landslide Ground Stability	Class B - Slope instability problems are not likely to occur, but consideration to potential problems of adjacent areas impacting the Site should always be considered. Pockets of Class C are noted on the western boarder of the Site. These pockets correspond to the presence of superficial deposits. Class C is defined as having significant potential for slope instability with relatively small changes in ground conditions. This classification increases to High risk (Class D) on on southerly dipping slopes within 100 m of the Site. In these areas, there is a very significant potential for slope instability, and active or inactive landslides may be present.
Running Sand Ground Stability	The majority of the Site is classified as Class A, indicating that running sand conditions are not thought to occur irrespective of the position of the water table. Consequently, no constraints on land use have been identified due to running sand conditions. Where Till and Glaciofluvial Deposits are mapped (across the northeastern and northern parts of the Site, and locally to the southwest), the classification increases to Class B defined as "Running sand Conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly."

Hazard Type	Hazard Class Description
Ground Dissolution Stability	The portion of the Site underlain by the Rutland Formation (central and western extent) is considered Class A, which is typically located in the . Where hazard is negligible, soluble rocks are either not thought to be present within the ground, or not prone to dissolution. These areas are dominant to the south of the Site and locally to the north. Within the Blisworth Limestone (northeastern extent) and the Lower Lincolnshire Limestone Member (within central valley orientated as a thin strip east to west) the hazard increases to Class B “Soluble rocks are present. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered. The remainder and majority of the Site is underlain by the Upper Lincolnshire Limestone Member and Till; these areas are considered “Class C - Significant soluble rocks are present. Low possibility of localised subsidence or dissolution related degradation of bedrock occurring naturally but may be possible in adverse conditions such as high surface or subsurface flow.” Very locally to the northeast of the site there is an elevated hazard rating of “Class D”. This area is presented as a linear band following the mapped edge of the outcrop between the Upper Lincolnshire Limestone, and Rutland Formation beneath the Till. Class D is defined as “Very significant soluble rocks are present with a high possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, especially in adverse conditions such as concentrated surface or subsurface water flow”.
Shrinking or Swelling Clay Ground Stability	Within the main central site area, the ground conditions are Class A – ground conditions are predominantly non-plastic. Where Till is present on site (local to the northeast and south of the Site), the classification increases to Class C, which is defined as ground conditions predominantly of medium plasticity.

- 3.5.3 There is potential for the limestone bedrock at the Site to contain karst features. Karst features can result in abnormal ground conditions and voids, posing a risk of subsidence / ground collapse. These features are likely to occur within the Upper Lincolnshire Limestone Member, Blisworth Limestone and the Lower Lincolnshire Limestone Member.
- 3.5.4 There is historical evidence of a stream sink feature in the Lincolnshire Limestone near Burton-le-Coggles north of the Site (Farrant & Cooper, 2008). This feature appears to be of a similar nature and matching orientation to the valley present through the Site; the valley feature on site is therefore considered likely to be associated with a stream sink and karst terrains. The presence of on-site faults is

considered to increase the risk of karst features, due to promotion of water flows into bedrock.

- 3.5.5 It is noted other depressions in the area such as those identified off the valley feature, within the northern area of trees / vegetation and within the railway to the north of the Site may also be associated with karst related subsidence.
- 3.5.6 Due to the risk posed by such features to ground stability, further assessment in the desk study and through subsequent stages of the project will be required, including ground investigation.

3.6 Ground Movements and Seismic Hazard

- 3.6.1 A Review of the BGS GeoIndex recorded earthquake map shows the nearest records of seismic activity to the Site are situated 14.5km southeast of the Site in Ashwell. The largest magnitude recorded was a 3.8 on the Richter scale at a depth of 3.2km dated from January 2015. There is no evidence that the seismicity is associated with local faults.
- 3.6.2 In 2020 BGS seismologists completed a seismic hazard assessment for the UK, producing seismic hazard plans for the country. The assessment was undertaken with support from the Institution of Civil Engineers (ICE), other UK-based seismologists and with oversight from the British Standard Institution (BSI) sub-committee B/525/8 for Eurocode 8 (EC8): Earthquake resistant design of structures. The report states “The maps confirm that seismic hazard is generally low in the UK but that the hazard is slightly higher in areas like Wales and north central England. This largely reflects the higher rates of historical earthquake activity in these regions.”
- 3.6.3 A review of the seismic hazard plan has shown that the Site is located in a low seismicity area, with a peak ground acceleration (PGA) of less than 0.02g for a 10% probability in 50 years (475 year return period) and a PGA of 0.02-0.04g for a 2% probability in 50 years (2,500 year return period). These values fall within the typical low range for England and is therefore inferred that the Site’s seismic risk is consistent with the generally low risk for the UK, as reported by the BGS.

3.7 Mining and Mineral Extraction

Planning Policy for Mineral Use

- 3.7.1 The NPPF for England requires minerals planning authorities to promote sustainable use of mineral resources in their Local Plans. This includes defining mineral safeguard zones to ensure that specific mineral resources of local or national importance are not sterilised by non-mineral development (but not assuming that the identified minerals will be worked). If it is necessary for non-mineral development to take place then the local planning authority should set out policies to encourage the prior extraction of minerals, where practicable and environmentally feasible.
- 3.7.2 When determining planning applications local planning authorities must ensure that, amongst other matters, that there are no unacceptable impacts on the natural and historic environment, human health or aviation safety (taking into account cumulative effects from multiple sites); unavoidable noise, dust and particle emissions, and

vibrations are controlled, mitigated or removed at source; and to not normally permit other developments in mineral safeguard zones.

- 3.7.3 The Site lies within a designated Mineral Safeguarding Area, the BGS published 1:100,000 scale Mineral Resources map (Lincolnshire South, 2002) shows the entirety of the Site to lie within Middle Jurassic Limestone which is a potential resource for crushed rock aggregate. In addition, the northern boundary is encroached by an area with planning permission for ironstone and overlying minerals likely associated with the Northampton Sand Formation. Due to the decline of the steel industry in the UK and the low-grade nature of the ironstone in Lincolnshire, it is considered unlikely that ironstone working will take place in the foreseeable future, other than potentially as a source of building stone (Lincolnshire Minerals and Waste Local Plan , 2016).
- 3.7.4 Consultation with the Mineral Planning Authority (MPA) is required at the pre-application stage (Lincolnshire Minerals and Waste Local Plan , 2016). While the proposed development may meet exemption criteria, meaning a full Minerals Assessment (MA) may not be necessary, the exemption reason must be clearly stated in the Planning Statement accompanying the application or referenced in the local plan evidence base supporting the Site allocation. The MPA should be consulted for guidance on these considerations.

Aggregate/Mineral Quarrying and Mining

- 3.7.5 The strata underlying the Site comprises resources for mineral extraction, such as aggregates from the Lincolnshire Limestone and metalliferous ore within the ironstone, which is most abundant in the Northampton Sand formation but also present within the Rutland Formation.
- 3.7.6 The Lincolnshire Limestone has been extracted through small to medium-sized quarries, several of which produce agricultural lime and building stone. The crushed aggregate is of low strength and poor frost resistance therefore only suitable for construction fill or as a sub-base roadstone material. In addition, the variable lithology of the Lincolnshire Limestone Formation means it is unlikely to form a high purity for lime production. These factors reduce its extraction desirability for construction usage (British Geological Survey, 2002).
- 3.7.7 The resource for ironstone mining was granted 11th April 1958, the working is described as wholly underground for ironstone, associated with Easton mine. The Easton Mine was located c.4km northeast of the Site (SK940266) there is no evidence of workings that extend within the Site boundary. However, the mineral planning area shown within the Project WebGIS and within the East Midlands Mineral Resources Map (British Geological Survey, 2002) does show the area to encroach within the northern boundary of the Site. The mineral planning area is shown as for the purpose of ironstone, likely associated with the Rutland Formation and Northampton Sand Formation. As the Easton Mine is situated within the same geological sequence as the Site, it increases the chance additional unrecorded workings may be present targeting this resource.
- 3.7.8 A review of the Arup (1991) East midlands review of mining instability in Great Britain notes two large ironstone mines to be present within South Kesteven of which one was the Easton mine and noted within the county to be extensively worked both by underground and opencast methods. The mining area code references is 73105 and the Easton mine is noted to be active and outputting ironstone between the 1930s

and 1964. Working methods were listed as roadways, pillar and stall whilst access was through adits. It is be noted than an extract of the Ironstone Railways & Tramways of the Midlands by (Tonks, 1963) was posted on the Industrial Railway society where commentary states “The ironstone properties of the Ore Mining Branch of the United Steel Companies Ltd. are confined to Rutland and Lincolnshire and can be conveniently grouped together for study. There have been quite a few changes since 1958, the most important, perhaps, being the opening of a completely fresh mining area” this area may correspond to the aforementioned mineral resource area.

- 3.7.9 From available information, the Lincolnshire County Council (2016) notes most are now dormant, and where working is still taking place, this is limited to the overlying limestone. The permission is thought to correspond with the transfer of Easton Mine to the United Steel Company who began work on the Easton Mine in 1958, until its closure in 1967 (Lincolnshire County Council, 2021). In addition, review of the MRA mine plan (ref OM15244) shows the location of the workings associated with Easton mine which are situated outside of the Site (BGS, 1963).
- 3.7.10 Table 3.5 presents the available information on mining and quarrying operations, past and present that have taken place within 250m of the Site.

Table 3.5 Quarrying (<250m of site)

National Grid Reference	Distance and Direction from DF2 Rev B	Name/ Operator	Dates	Status/ Material Quarried	Assessment of Likelihood
SK97829 24004	On site	Townshend Lodge Gravel Pit/Unknown	Medieval to Post Medieval - 1066 AD to 1900 AD. The feature is marked as an "old" gravel pit on the Ordnance Survey six-inch map of 1887-1888 and no longer present from OS County Series six inch map 1903-1905 mapping.	Ceased- Sand and Gravel, Old limekiln and old gravel pit	Listed as old limekiln and old gravel pit on 1890 OS mapping.
SK98130 25364	On Site	Burton le Coggles Stone Pit/Unknown (BGS Ref 136179)	Post medieval. Old stone pit on OS Six inch 1830s-1880s county map and gone by the 1888-1915 OS six inch map.	Ceased- assumed limestone	Post medieval. Old stone pit on OS Six inch 1830s-1880s county map and gone by the 1888-1915 OS six inch map. (Archaeology Data Service, n.d)
SK971242	On Site	Unknown	Assumed medieval to post medieval, feature is visible from LiDAR survey. Extends between some possible linear features and a former pit which is now partially infilled and vegetated	Ceased- possibly sand and gravel or limestone	No evidence on historical mapping expected medieval and partially infilled prior to OS mapping,
SK97353 23469	130m Southwest	Birkholme House/Unknown	Post medieval, Quarry present on 1830-1880 OS Six inch maps scar present by 1930's mapping.	Ceased- assumed limestone	Offsite Low likelihood of engineering impact
SK 98654 25395	50m Northeast	Burton le Coggles Stone Pit (BGS Ref 136180)	Old stone pit listed on 1887 mapping. A scar is present on OS Six inch maps scar present by 1930's mapping.	Ceased- assumed limestone	Offsite Low likelihood of engineering impact
SK 98735 25505	80m Northeast	Burton le Coggles Stone Pit (BGS Ref 1887)	Old Marl Pit is listed on OS Six inch 1887 mapping, A scar is present on	Ceased- assumed	Offsite Low likelihood of engineering impact

National Grid Reference	Distance and Direction from DF2 Rev B	Name/ Operator	Dates	Status/ Material Quarried	Assessment of Likelihood
		136181)	OS Six inch maps scar present by limestone 1930's mapping.		

In addition to the above there are a number of surface ground workings identified in the Groundsure GIS data from historical OS Mapping within 250m of the DF2 Rev B Site Boundary. These features have been listed in Table 3-6.

Table 3.6 Surface Ground Working (<250m from the Site).

Distance and Direction	Dates on Mapping	Description
On site	1887 -1888	Old Gravel Pit – Same location as Townshend Lodge Gravel Pit
On site	1977-1994	Unspecified Disused Pit, mapped as having 130m in diameter
On Site	1887-1994	Ponds x2 on OS Mapping marked by Groundsure in 1982 features. One has since been infilled (Northwestern pond) based on Aerial imagery, one is still present and with water.
On Site	1887-1994	Ponds marked on OS Mapping, not visible from Aerial imagery assume infilled from 1994
On Eastern site Boundary	1887 - 1994	Cutting – Associated with railway line
10m East	1884-1994	Cutting associated with railway line visible on 1884 mapping shown by 1888 as field boundary with no slope. 1994 mapping marks top of slope , Aerial imagery shows area to be covered by vegetation.
50m Northeast	1887-1994	Unspecified Pit- Same location as Burton Le Coggles Pit
170m East	1887 - 1982	Cutting – Associated with railway line
80m North	1887-1930	Marl Pit- Same location as Burton Le Coggles Pit
150m West	1887-1994	Pond marked on OS Mapping, not visible from Aerial imagery assume infilled from 1994 currently shown as vegetated land.

Coal Mining

- 3.7.11 The Site does not lie within a Coal Mining Authority reporting area, based on a review of the Project WebGIS data and Mining Remediation Authority Web viewer.

3.8 Radon

- 3.8.1 The radon potential varies across the Site, with the highest levels in the southeast, where the Project WebGIS data estimate radon potential to be between 10–30 %; radon protection measures should therefore be implemented. In parts of the central and northern site area, radon potential is lower, at 3–5 %, and the lowest levels are observed in the north, central and south parts of the Site, at less than 1 % above the Action Level. In these lower-risk areas, no radon protection measures are required.
- 3.8.2 The United Kingdom Health Security Agency (UKHSA) has published reports containing Radon Affected Area maps for the whole of the United Kingdom. The UKHSA defines Radon Affected Areas as those with 1% chance or more of a house having a radon concentration at or above the action level of 200 becquerels per cubic metre (Bq m-3).

3.9 Hydrogeology

Aquifer Classification

- 3.9.1 The Environment Agency's Groundwater Protection Policy adopts aquifer designations that are consistent with the Water Framework Directive (WFD). Definitions of the various aquifer types can be found on the Environment Agency section of the gov.uk website. According to this system, the surface geology at the Site is classified as follows:
- The superficial Till which is generally absent across the Site but locally encroaches on the northwest of the Site and in the south of the Site is classified as a Secondary (Undifferentiated) Aquifer.
 - The Blisworth Limestone formation, which is mapped locally within the Rutland Formation extent in the northeast of the Site and the southernmost portion of the Site, is classified as a Principal Aquifer.
 - The Rutland Formation which is mapped in the north/northeast of the Site is classified as a Secondary B Aquifer.
 - The Lincolnshire Limestone Formation (Upper and Lower Lincolnshire Limestone Members) which is mapped across central southern parts of the Site is classified as a Principal Aquifer.
- 3.9.2 Principal Aquifers are the most sensitive of the aquifer types as a receptor for contamination. Secondary aquifers, whilst less sensitive than Principal Aquifers, are still a potential receptor for contamination.
- 3.9.3 Groundwater bodies are classified by the EA under the WFD, whereby water bodies in England are classed as High, Good, Moderate, Poor or Bad, defined by chemical

status and quantitative status. The chemical status assesses the compliance with environmental quality standards for pollutants (i.e., whether they exceed criteria) whilst quantitative status evaluates whether groundwater affects water levels and dependent ecosystems (i.e., is it sustainable).

- 3.9.4 A search of the Environment Agency's Catchment Data Explorer (Environment Agency, 2026) was conducted regarding the groundwater quality beneath the Site. The majority of the Site falls within the Welland Mid Jurassic Unit (GB40501G445300) groundwater body, which has an overall 'Good' status. The northernmost part of the Site falls within the Welland Limestone Unit A (GB40501G445900) groundwater body, which has an overall 'Poor' status.

Groundwater Vulnerability

- 3.9.5 The Environment Agency's Combined Groundwater Vulnerability Map of the area presented within the Project WebGIS shows that the Site has a high vulnerability to pollution, with the exception of an area in the north of the Site which has a low vulnerability and the northernmost part of the Site which has a medium vulnerability.
- 3.9.6 All associated terminology/definitions are detailed below, taken from Environment Agency report SC040016/R (Environment Agency, 2017):
- **High** – These are high priority groundwater resources that have very limited natural protection. This results in a high overall pollution risk to groundwater from surface activities. Operations or activities in these areas are likely to require additional measures over and above good practice pollution prevention requirements to ensure that groundwater is not impacted.
 - **Medium - High** – These are high priority groundwater resources that have limited natural protection. This results in a medium-high overall pollution risk to groundwater from surface activities. Activities in these areas may require additional measures over and above good practice to ensure they do not cause groundwater pollution.
 - **Medium** – These are medium priority groundwater resources that have some natural protection resulting in a moderate overall groundwater risk. Activities in these areas should as a minimum follow good practice to ensure they do not cause groundwater pollution.
 - **Medium - Low** – These are lower priority groundwater resources that have some natural protection resulting in a moderate to low overall groundwater pollution risk. Activities in these areas should follow good practice to ensure they do not cause groundwater pollution.
 - **Low** – These are low priority groundwater resources that have a high degree of natural protection. This reduces their overall risk of pollution from surface activities. However, activities in these areas may be a risk to surface water due to increased run-off from lower permeability soils and near-surface deposits. Activities in these areas should be adequately managed to ensure they do not cause either surface or groundwater pollution.
- 3.9.7 Permeability data presented in the Project WebGIS indicates that the permeability is very high for the Lincolnshire Limestone Formation and Blisworth Limestone Formation, low to medium for the Rutland Formation and low to high for the superficial Till deposits.

Source Protection Zones

- 3.9.8 In terms of identifying the risk of contamination from potential polluting activities in a given area to groundwater sources (wells, boreholes and springs) used for supplying public drinking water, the Environment Agency identifies Source Protection Zones (SPZ) (Environment Agency, 2019). These show the extent of a groundwater source catchment and are divided into three zones, definitions of which are outlined below:
- **SPZ1** – Defined by a 50-day travel time from any pollution below the water table to the groundwater source, with a minimum radius of 50 m. It is the area immediately around an abstraction point for domestic / food supply purposes and is where groundwater is the most vulnerable to pollution.
 - **SPZ2** – Defined by a 400-day travel time from a point below the water table, with a minimum radius of 250 – 500 m, depending on the size of the abstraction.
 - **SPZ3** – Defined as the area around a groundwater source where all groundwater is presumed to end up at the abstraction point, covering the entire catchment area based on the volume abstracted and effective rainfall.
- 3.9.9 The Site lies within an SPZ3. SPZ data obtained from the Defra MAGiC Map web viewer (Defra, accessed June 2026) indicates that the closest SPZ1 is located approximately 275m north of the Site.

Licensed Groundwater Abstractions

- 3.9.10 With reference to the Project WebGIS, there is one Licensed Groundwater Abstraction within a search radius of 1km of the Site, a historical abstraction located on-site (SK 98250 24680) operated by PM Bradley Farms Ltd from a well at Corby Glen for general farming and domestic purposes. This approximately correlates with the well recorded on historical maps from 1904 (see Section 4.1).

3.10 Hydrology

Surface Water Courses and Drainage

- 3.10.1 With reference to the Project WebGIS, Environment Agency flood risk map for planning (Environment Agency, 2026), long-term flood risk map (Environment Agency, 2026) and Defra MAGiC Map web viewer (Defra, accessed June 2026), an unnamed stream crosses the northern part of the Site, and flows in an easterly direction towards the West Glen River. The Groundsure Data set identifies two ponds in the south of the Site (SK 97952 23680 and SK 97991 23670), close to an existing electricity pylon.
- 3.10.2 An unnamed watercourse flows 630m south of the DF2 Rev B boundary. The watercourse is shown to flow east towards the West Glen River. A small branching stream located 230m to the south flows southeast towards this watercourse, with a confluence to the south of the Site along field boundaries.
- 3.10.3 The nearest Water Framework Directive-relevant surface watercourse/feature to the Site is the West Glen River located approximately 230m east of the northeastern spur of the Site at its closest point, flowing in a southerly direction.

- 3.10.4 With reference to the Environment Agency's Catchment Data Explorer (Environment Agency, 2026), the 'West Glen – Upper' surface water body (GB105031055510) has an ecological 'Poor' status and chemical 'Fail' status.
- 3.10.5 Springs were recorded on the 1887 and 1888 historical maps of the Site (see Section 4.1) in the eastern area of the Site adjacent to the on-site property, at SK 98253 24670. Rises were recorded on the 1950 and 1958 historical maps of the Site 196m east of the Site.

Licensed Surface Water Abstractions

- 3.10.6 No Licensed Surface Water Abstractions have been identified within a search radius of 250m of the Site.

Risk of Flooding from Surface Water

- 3.10.7 The Environment Agency flood risk map for planning (Environment Agency, 2026) and long-term flood risk map (Environment Agency, 2026) were reviewed alongside the Groundsure flood zone data .
- 3.10.8 The Site and the majority of the surrounding area within 250m lies within Flood Zone 1, with regards to flooding from rivers, with the exception of an area in the northern part of the Site around the unnamed stream and extending off-site to the east (see Section 3.9), and surrounding a field track and in the northern part of the Site which lie within Flood Zones 2 and 3. With reference to the long-term flood risk map, the risks on site are negligible. The area around the unnamed stream off-site to the east is at Low to High risk. A Low risk is defined as 'between 0.1% and 1% chance of flooding each year', whilst a High risk is defined as a 'greater than 3.3% or greater chance of flooding each year'. Therefore, the Site is not considered to be susceptible to fluvial flooding.
- 3.10.9 The surface water (i.e. pluvial) flooding risk is negligible across the majority of the Site and surrounding area within 250m. There are various isolated areas of Low to High risk of surface water flooding in areas where the topography is low-lying such as around the linear valley trending across the Site from the southwest to the northeast, the unnamed stream and field track in the north of the Site and minor incised features along field boundaries are susceptible to higher levels of risk. A Low risk is defined as 'between 0.1% and 1% chance of flooding each year', whilst a High risk is defined as a 'greater than 3.3% or greater chance of flooding each year'.

4. Historical and Planned Development

4. Historical & Planned Development

4.1 Historical Ordnance Survey Mapping and Aerial Photographs

- 4.1.1 Historical Ordnance Survey (OS) maps of the Site and the wider environs were provided in the Groundsure Map Insight Report (scales 1:2,500, 1:10,560 and 1:10,000) and from Google Earth Pro and these are reviewed in this section. The historical OS maps obtained with the Groundsure Report date between 1887 and 1994.
- 4.1.2 Table 4.1 presents a summary of the main features present on and within approximately 250m radius of the Site boundary. AAJV notes that only indicative map scales are provided. Where dates are stated, these refer to the dates of maps on which the features are present, have changed use or are no longer annotated, and do not necessarily refer to the exact dates of existence of a particular feature. Development that may have occurred between map editions is recorded as occurring on the latter published map, hence there are some limitations to the accuracy to the date of development unless supplementary evidence is available.
- 4.1.3 AAJV notes that the available Groundsure mapping was obtained for the DF2.0A Site Boundary. This provides coverage of the full DF2 Rev B Site Boundary and the area within 250m of the red line boundary shown in Figure 1 within Appendix A, taken from the Project WebGIS Layer DF2 REV B Draft Order Limits (18/06/2026).

Table 4.1 Summary of History

Time Period (Scale)	Key Features On-site	Key Features within approximately 250m
1887 (1:10,560) 1888 (1:2,500)	The Site is largely undeveloped, comprising several agricultural fields. On the 1:2,500 scale map, the field boundaries and footpath within the central and southern areas of the Site are shown as having streams running parallel to them. The following features were observed, listed clockwise from the north of the Site. A road is present crossing the northern part of the Site (following the alignment of the present-day Colsterworth Road). An embankment associated with the adjacent railway encroaches into the eastern extent of the Site. A footpath passes through the Site approximately orientated north-south close to the eastern boundary. An unnamed property is located close to the eastern boundary of the Site (centred on SK 98258 24617). A road is present crossing the southern part of the Site (following the alignment of the present-day A151). An old gravel pit (identified as Townshend Lodge Gravel Pit in Section 3.7 of this report) and old limekiln are located in the central-southern part of the Site close to the western boundary (SK 97835 23984). A total of 11 small ponds are located at the following approximate grid references: • Pond 1: SK 98253 24670 (adjacent to the unnamed property, with a spring also shown), • Pond 2: SK 97656 24693 (central section of the Site),	The surrounding area is largely undeveloped, comprising several agricultural fields. The following features were observed, listed clockwise from the north of the Site. A small pond is located 21m north (SK 97504 25539) of the central part of the northern site boundary. A small pond is located 35m north (SK 97508 25561) of the central part of the northern site boundary. The road crossing the northern part of the Site passes under a railway line. A railway is present adjacent to the east of the central part of the Site (following the present-day alignment). The railway is shown to be situated on an embankment along the northern section of the eastern boundary, pass through cuttings on the central section and be situated on an embankment along the southern section of the eastern boundary and passes over the road adjacent to the southeast corner of the Site. An old stone pit is located 233m east of the central part of the eastern site boundary. An area of worked ground is located 26m east of the central part of the eastern site boundary, on the opposite side of the railway. An unlabelled building is located 32m east of the corner on the eastern site boundary between the A151 and the railway line. Railway sidings are located 48m east of the corner on the eastern site boundary between the A151 and the railway line. A cluster of buildings are located adjacent to the railway, 111m east of the corner on the eastern site boundary between the A151 and the railway line (understood to be the former Corby Glen Station).

Time Period (Scale)	Key Features On-site	Key Features within approximately 250m
	• Pond 3: SK 97863 24666 (central part of the Site), • Pond 4: SK 97681 24828 (northern part of the Site). • Pond 5: SK 97950 23685 (southern part of the Site), • Pond 6: SK 98058 23812 (southern part of the Site), • Pond 7: SK 98159 23637 (southern part of the Site), • Pond 8: SK 97345 24791 (western part of the Site), • Pond 9: SK 97366 25378 (northern part of the Site), • Pond 10: SK 97856 25261 (northern part of the Site).	Two small unlabelled buildings are located 42m southeast of the corner on the eastern site boundary between the A151 and the railway line. A small pond is located 241m south (SK 98518 24243) of the corner on the eastern site boundary between the A151 and the railway line. Heath Farm, a property comprising several buildings is located adjacent extending to 70m east of the southern part of the Site south of the A151, with an associated pond located adjacent to the east. A small pond is located 34m east (SK 98403 23904) of the southern part of the eastern site boundary. A small pond is located 137m east (SK 98565 23637) of the southern part of the eastern site boundary. Dodsey Wood is shown present adjacent to the southwest corner of the Site boundary, mapped as a wooded area. A small pond is located 101m west (SK 97786 23662) of the southern part of the western site boundary. A small pond is located 183m west (SK 97703 23643) of the southern part of the western site boundary. Townshend Lodge, a property comprising two buildings is located adjacent to the west of the southern part of the western site boundary. A small pond is located 232m west (SK 96904 23986) of the central part of the western site boundary. A small pond is located 144m west (SK 97122 24407) of the central part of the western site boundary. A small pond is located 60m west (SK 97243 24537) of the central part of the western site boundary. Great Osgrove Wood is located 15m west of the central part of the western site boundary.

Time Period (Scale)	Key Features On-site	Key Features within approximately 250m
		A small pond is located 95m west (SK 97183 25336) of the northern part of the western site boundary. A small pond is located 105m west (SK 97142 25390) of the northern part of the western site boundary. A small pond is located 136m north (SK 97101 25775) of the western part of the northern site boundary.
1903 and 1905 (1:10,560) 1904 (1:2,500)	Pond 9 in the northern part of the Site at SK 97366 25378 is no longer present. A well is present at the unnamed property centred on SK 98258 24617; the spring is no longer shown. The westernmost building is no longer shown on the map. Some field boundaries in the southern section of the Site are no longer shown as having streams running parallel to them. The old gravel pit & old limekiln at SK 97835 23984 are no longer marked.	The pond 35m north (SK 97508 25561) of the central part of the northern site boundary is no longer present. The railway adjacent to the east of the central part of the eastern site boundary is labelled as the 'Great Northern Railway'. The old stone pit 233m east of the central part of the eastern site boundary is no longer labelled but still marked on the map. The area of worked ground located 26m east of the central part of the eastern site boundary is no longer marked on the map. A cluster of buildings labelled 'W.M.' are located 101m east of the corner on the eastern site boundary between the A151 and the railway line. The building 32m east of the corner on the eastern site boundary between the A151 and the railway line is labelled as a signal box. A crane is located 66m east of the corner on the eastern site boundary between the A151 and the railway line. A small rectangular pond is present 44m southeast of the corner on the eastern site boundary between the A151 and the railway line. An additional building is present 14m east of the Site and a well is present 65m east of the Site adjacent to Heath Farm located east of the southern part of the Site south of the A151. Three small ponds are located 31m west (SK 97805 23699), 104m west (SK 97750 23645) and 43m east (SK98475 23770) of the southern part of the western site boundary.

Time Period (Scale)	Key Features On-site	Key Features within approximately 250m
		The pond located 60m west (SK 97243 24537) of the central part of the western site boundary is no longer present.
1930 (1:2,500) and 1931 (1:10,560)	No significant change. <i>Partial coverage of the western part of the Site only.</i>	No significant change. <i>Partial coverage of the area to the west of the Site only.</i>
1950 (1:10,560)	Field boundaries within the Site are no longer shown as having streams running parallel to them. Pond 10 located in the northern part of the Site at SK 97856 25261 is no longer shown on the map. Pond 4 located at SK 97681 24828 in the northern part of the Site is no longer shown on the map. Pond 3 located in the central section of the Site at SK 97863 24666 is no longer shown on the map Pond 1 at SK 98253 24670 adjacent to the unnamed property on-site is no longer shown on the map.	Rises are labelled 196m east of the northern part of the eastern site boundary. The crane located 66m east of the corner on the eastern site boundary between the A151 and the railway line is no longer shown on the map.
1958 and 1959 (Provisional Scale)	No significant change.	No significant change.
1977 (1:2,500)	Electricity pylons and an associated overhead line are present with the pylons located at SK 97265 25622, SK 97383 25305, SK 97537 24881, SK 97639 24606, SK 97639 24606, SK 97749 24284, SK 97888 23919 and SK 97991 23640, resembling their current position. The footpath approximately orientated north-south passing through the Site close to the eastern boundary is not shown.	The rises are no longer labelled 196m east of the northern part of the eastern site boundary. The area of worked ground located 26m east of the central part of the eastern site boundary is again marked on the map. The small rectangular pond 44m southeast of the corner on the eastern site boundary between the A151 and the railway line is no longer shown on the map. A small rectangular building is located 70m east of the corner on the eastern site boundary between the A151 and the railway line.

Time Period (Scale)	Key Features On-site	Key Features within approximately 250m
	Pond 11 is present in the eastern (SK 97903 24840) part of the Site. Pond 4 located at SK 97681 24828 is shown again on the map. The buildings comprising the unnamed property centred on SK 98258 24617 have been replaced by one larger square building. Pond 1 at SK 98253 24670 adjacent to the unnamed property is shown again on the map. A small rectangular structure is present at SK 98203 24330. Pond 12 is present in the southern (SK 97988 23681) part of the Site. Pond 2 located in the central section of the Site (SK 97656 24693) is no longer shown on the map. Pond 8 located in the western part of the Site (at SK 97345 24791) is no longer shown on the map. Some field boundaries in the central and western areas of the Site have been repositioned or removed.	A property comprising several buildings is located between 80m and 105m east of the corner on the eastern site boundary between the A151 and the railway line. A large rectangular building is located 101m east of the corner on the eastern site boundary between the A151 and the railway line. The signal box 32m east, railway sidings 48m east and cluster of buildings comprising former Corby Glen Station 111m southeast of the corner on the eastern site boundary between the A151 and the railway line are no longer shown on the map. A well is located in proximity of the buildings at Heath Farm. An additional building is present at the farm 53m east of the southern part of the Site south of the A151. A disused pit is located 17m east of the southern part of the Site south of the A151, north of Heath Farm. The pond 34m east (SK 98403 23904) of the southern part of the eastern site boundary is no longer shown on the map. The pond 137m east (SK 98565 23637) of the southern part of the eastern site boundary is no longer shown on the map. A pond is located 131m south of the southern site boundary (SK 98359 23418). The pond 101m west (SK 97786 23662) of the southern part of the western site boundary is no longer shown on the map. The pond 144m west (SK 97122 24407) of the central part of the western site boundary is no longer shown on the map. The three small ponds 31m west (SK 97805 23699), 104m west (SK 97750 23645) and 43m east (SK98475 23770) of the southern part of the western site boundary are no longer shown on the map. The pond 95m west (SK 97183 25336) of the northern part of the western site boundary is no longer shown on the map.

Time Period (Scale)	Key Features On-site	Key Features within approximately 250m
		The pond 136m north (SK 97101 25775) of the northern part of the western site boundary is no longer shown on the map.
1982 (1:10,000)	The map label for the disused pit previously recorded 17m east is shown on-site. Pond 4 located at SK 97681 24828 in the northern part of the Site is no longer shown on the map. Pond 6 located at SK 98058 23812 in the southern part of the Site is no longer shown on the map.	The pond 21m north (SK 97504 25539) of the central part of the northern site boundary is no longer shown on the map. The pond 241m southeast (SK 98518 24243) of the corner on the eastern site boundary between the A151 and the railway line is no longer shown on the map. The pond 232m west (SK 96904 23986) of the central part of the western site boundary is no longer shown on the map.
1994 (1:2,500)	Pond 4 located at SK 97681 24828 in the northern part of the Site is shown again on the map. Pond 6 located at SK 98058 23812 in the southern part of the Site is shown again on the map.	The pond 21m north (SK 97504 25539) of the central part of the northern site boundary is shown again on the map. The pond 241m southeast (SK 98518 24243) of the corner on the eastern site boundary between the A151 and the railway line is shown again on the map. The map label for the disused pit east of the southern part of the Site south of the A151 is again shown 50m south. The pond 232m west (SK 96904 23986) of the central part of the western site boundary is shown again on the map.
1999 (Google Earth aerial imagery)	The Site resembles its current configuration. An area of disturbed ground is visible at the unnamed property centred on SK 98258 24617.	The surrounding area approximately resembles its current configuration. The old stone pit located 233m east of the central part of the eastern site boundary is covered by trees and vegetation. The area of worked ground located 26m east of the central part of the eastern site boundary is covered by trees and vegetation. An area of land from 114m east of the corner on the eastern site boundary between the A151 and the railway line, previously occupied by former Corby Glen station, is used for timber storage with a building located 198m east (identified as a sawmill in Section 6 of this report).

Time Period (Scale)	Key Features On-site	Key Features within approximately 250m
		There is no clear evidence of the disused pit east of the southern part of the Site south of the A151 recorded on the 1994 historical map.
2000 (Google Earth aerial imagery)	No significant change.	No significant change.
2005 (Google Earth aerial imagery)	No significant change.	The land 114m east of the corner on the eastern site boundary between the A151 and the railway line around the sawmill is being used to store larger amounts of timber and other unidentified materials. An additional building is present 108m east of the Site boundary and an additional area of land to the east of the sawmill (from 181m east of the Site boundary) is now also in use as a storage area.
2010 and 2012 (Google Earth aerial imagery)	No significant change.	No significant change.
2016 (Google Earth aerial imagery)	The small rectangular structure at SK 98203 24330 is no longer present.	No significant change.
2018, 2020, 2021 and 2024 (Google Earth aerial imagery)	No significant change.	No significant change.

4.2 Unexploded Ordnance Risk

Wartime Land-use

- 4.2.1 Based on a review of pre-World War II historical maps (1931, 1:10,560), the Site was located within a rural area of Lincolnshire during Wartime Britain and based on CIRIA C681 is unlikely to have been close to aerial bombing. The land-use of the Site was undeveloped farmland. Based on the historical mapping information, the Site was not located near any wartime sites of interest such as military bases, ports or industrial centres.

Post War Development

- 4.2.2 An analysis of the post war historical map (1950, 1:10,560) does not show redevelopment of buildings within the area, which indicates that the potential of historical aerial bombing is unlikely.

Unexploded Ordnance Mapping.

- 4.2.3 The regional Unexploded Bomb Risk Map published by Zetica show the Site lies within a Low risk area for World War Two bombing, which is defined by Zetica as an 'area indicated as having 15 bombs per 1000 acres or less'. Decoy sites were located approximately 2km south and 3.5km east and an airfield is located approximately 2.5km southeast. It is noted that these maps only include information on potential for bombing to have occurred in the area, and do not include all potential sources of UXO such as historical land use.
- 4.2.4 A preliminary UXO Assessment was undertaken by Fellows International Group (June, 2026). The assessment concluded that a detailed UXO Risk Assessment is required to manage potential UXO risks on site. The Preliminary Study has flagged a Military Airfield, two bombing decoy sites and a Munitions factory or ordnance store within 5km of the Sites red line boundary.
- 4.2.5 At the time of writing, AAJV is awaiting the detailed UXO information, which will be incorporated in the planning process prior to the commencement of any intrusive investigation works.

5. Review of Historical Site Investigation

5. Review of Historical Site Investigation

- 5.1.1 AAJV has undertaken a high-level review of a list of historical ground investigation reports noted to be on the National Grid Enterprise Content Management (ECM) portal. None of the reviewed reports are considered relevant to the Site at the time of writing. If relevant historical reports become available, this report or subsequent reporting should be updated to include associated findings.

6. Regulated Activities and Statutory Consultation

6. Regulated Activities and Statutory Consultation

6.1 Introduction

- 6.1.1 The key relevant features that characterise the Site and surrounding area are summarised in this section, along with an indication of the risk to the land quality of the Site.
- 6.1.2 Information on groundwater abstractions is detailed previously in Section 3.9 and is not repeated here.
- 6.1.3 Generally, any regulated activities within 250m of the Site could, depending upon their nature, represent potential off-site sources of contamination. Therefore, a 250m search area has been adopted.

6.2 Regulatory Database Review

- 6.2.1 Table 6.1 summarises information on regulated processes contained in the Project WebGIS which collates data from a variety of sources including the Environment Agency and the BGS. All data suppliers are referenced in the dataset.
- 6.2.2 Regulatory information is excluded from the table below where it is not within the specified distances, where there is no information for the given topic or where entries are duplicated.

Table 6.1 Summary of Regulatory Information

Subject	Number present		Details
	On site	0-250m	

Licensed Waste Management Facilities and Industrial Land Uses

Waste Exemptions	4	5	There are four waste exemptions on-site (WEX297196 at SK 97598 24133, WEX295886 at SK 97831 24071, WEX349347 at SK 98066 24741 and WEX344199 at SK 98252 24625), all relating to storage of sludge on a farm. Further waste exemptions are present off-site as follows: - WEX417247 located 74m east of the Site, relating to storage of sludge on a farm. - WEX431471 located 125m east of the Site, relating to use of waste in construction on a farm.
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Subject	Number present		Details
	On site	0-250m	
			- WEX298099 located 145m east of the Site, relating to storage of sludge on a farm. - WEX230623 and WEX234665 located 241m west of the Site, relating to storage of sludge on a farm.
Recent Industrial Land Uses	7	5	There are seven records for recent industrial land uses on-site relating to existing pylons located at SK 97265 25622, SK 97383 25305, SK97537 24881, SK 97639 24606, SK 97749 24284, SK 97888 23919 and SK 97991 23640. Disused workings are located 15m east of the Site. Two records for a sawmill and concrete products (ABC Concrete) are located 225m east of the Site. Two pylons are located 158m south and 214m north of the Site.
Historic Industrial Land Uses	11	24	There are eleven records on-site: one relating to an old lime kiln (dated 1887) and an old gravel pit (dated 1887). These correlate with the features identified through review of historical maps although are also visible on maps dated 1888 (see Section 4.1). A third on-site record relates to an unspecified disused pit (dated 1982), which is also recorded on maps dated 1977 and 1994 but is labelled as being off-site. The remaining on-site records relate to cuttings and railway sidings encroaching on the eastern boundary. The off-site records relate to an unspecified pit recorded as being present 42m east of the Site in 1982 (review of historical maps (see Section 4.1) identified it as being present on maps dated 1887-1903 and 1977-1994), and an unspecified ground working / disused quarry recorded as being present 88m northeast of the Site in 1905 and 1982. A railway building (dated 1931-1950) is located 208m east of the Site. An unspecified disused quarry / unspecified ground workings (dated 1905-1982) is located 220m east of the Site. The remaining off-site records relate to the cuttings, railway sidings, buildings and stations identified through review of historical maps.
Historic Railway Features	3	1	The on-site records relate to railway sidings (dated 1905, 1950 and 1959) encroaching on the southern section of the eastern boundary. The off-site record relates to railway sidings (dated 1887) located 35m east of the Site.

Subject	Number present		Details
	On site	0-250m	

These correlate with the features identified through review of historical maps (see Section 4.1).

Sensitive Land Uses

Listed Buildings	0	3	There are three Grade II listed buildings located to the east of the Site, a milestone located 18m from the Site, a forge, waggon hovel and loose boxes at Heath Farm located 32m east of the Site and Heath Farmhouse 85m east.
Nitrate Vulnerable Zone	2	2	The Site and surrounding area within 250m are located within the Glen surface water Nitrate Vulnerable Zone and the Lincolnshire Limestone groundwater Nitrate Vulnerable Zone.

Agri-Environment Schemes

Environmental Stewardship Scheme Agreement	4	6	Areas of Entry Level plus Higher Level Stewardship cover the majority of the central and southern parts of site and extend off-site to the west and south. Further areas of Entry Level plus Higher Level Stewardship are located 28m east of the Site.
Countryside Stewardship Scheme Agreement	4	6	Areas of Countryside Stewardship (Middle Tier) cover part of the southern and northern areas of the Site and extend off-site to the southeast and west. Parts of the Site close to the western and southern boundaries are also covered by Woodland Management Plans, the former extending off-site to the west. A further area covered by a Woodland Management Plan is located 242m southwest of the Site.
Tree Felling Licences	0	2	Selective Fell/Thin (Conditional) Tree Felling licences cover part of the area of Ancient Woodland located 15m northwest of the Site and an area 211m west of the northern part of the Site.

- 6.2.3 An area of Ancient & Semi-Natural Woodland is located 15m northwest of the Site and is also recorded as a Priority Habitat. Within this is located an area of Ancient Replanted Woodland 118m northwest of the Site. It is referred to as 'Great Osgrove Wood' on historical maps of the area (see Section 4.1). A further area of Ancient Woodland is located 211m west of the northern part of the Site. A Habitat Network Enhancement Zone 2 is located 45m northeast of the Site. However, information relating to environmental designations (for example, Sites of Special Scientific

Interest (SSSI) and Ancient Woodland) will be reviewed separately and had therefore not been taken forward for further assessment in this report.

- 6.2.4 No entries were recorded for the following: Contaminated Land Register Entries and Notices, Discharge Consents, Prosecutions Relating to Controlled Waters, Enforcement and Prohibition Notices, Integrated Pollution Controls, Integrated Pollution Prevention and Control, Local Authority Integrated Pollution Prevention and Control, Local Authority Pollution Prevention and Controls, Local Authority Pollution Prevention and Control Enforcements, Pollution Incidents to Controlled Waters, Prosecutions Relating to Authorised Processes, Registered Radioactive Substances, Substantiated Pollution Incident Register, Water Industry Act Referrals, Active or Recent Landfills, Historical Landfills, Licensed Waste Sites, Contemporary Trade Directory Entries, Fuel Stations, Control of Major Accident Hazards Sites (COMAH), Explosive Sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning Hazardous Substance Consents, Planning Hazardous Substance Enforcements and Scheduled Ancient Monuments.

6.3 Regulatory Consultation

Planning Information

- 6.3.1 The South Kesteven District Council web-based planning portal (South Kesteven District Council, 2026) was reviewed to identify whether there are existing planning conditions which relate to the Site area. Details of planning applications considered to be relevant to the Site have been reviewed and summarised within Table 6.2 below.
- 6.3.2 Lincolnshire County Council deals with planning applications for waste management and minerals extraction and related development. A postcode search of the web-based planning portal (Lincolnshire County Council, 2026) did not identify any applications in the vicinity of the Site.

Table 6.2 Summary of Planning Information

Application Number	Details	Approximate Distance and Direction	Decision Date	Decision
S25/2274	Submission of details reserved by condition 3 (operational site management plan) of planning permission S24/2193 - Change of use of land and buildings at former sawmill to mixed commercial uses.	105m east	N/A	Awaiting decision
S24/2193	Change of use of land and buildings at former sawmill to mixed commercial uses	105m east	September 2025	Approved conditionally
S24/0538	Use of the property for Class B2/B8/E purposes	105m east	n/a	Withdrawn

Application Number	Details	Approximate Distance and Direction	Decision Date	Decision
S11/1768	Replace existing 11 kV overhead line with Aluminium Core Steel Reinforced Conductor (150acsr)	On-site	August 2011	No objections made
S05/0441	Units for B1, B2 and B8 use (outline)	175m east	May 2005	Refused
S04/0144	B1, B2 & B8 development	175m east	March 2004	Refused
S00/0038	Use of land for wood chip storage compound	180m east	March 2000	Approved conditionally
S00/0037	Erection of wood storage building	105m east	March 2000	Approved conditionally
S99/1067	Erection of log cutting and sawdust collection building	100m east	December 1999	Approved conditionally
S99/0756	Erection of timber storage building	100m east	September 1999	Approved conditionally
S99/0492	Change of use of land to timber storage yard	175m east	July 1999	Approved conditionally
SK.98/0542	Erection of sawmill, machinery and office	100m east	November 1998	Approved conditionally
S98/0929	11kV overhead line	On-site	October 1998	Approved without conditions
SK.97/0402	Change of use of disused railway goods yard to timber storage area	100m east	December 1997	Approved conditionally
SK.92/0760	Use of land for lorry park and open storage	100m east	September 1992	Approved conditionally

7. Site Reconnaissance

7. Site Reconnaissance

- 7.1.1 This Desktop Study has been prepared to support the Development Consent Order (DCO) scoping and preliminary assessment stages. An inspection of the Site was undertaken by a pair of suitably qualified and experienced AAJV Engineers on 15th April 2026, one engineer being a geo-environmental specialist and the other representing geotechnical. The aim of the visit was to:
- Identify the range of activities carried out on the Site.
 - Identify any obvious potential sources of ground contamination (e.g., visual evidence of spills, asbestos, stressed vegetation) or geotechnical issues (e.g., karst depressions, slope instability).
 - Identify potential access issues for future ground investigation work.
 - Validate the provisional risk ratings presented in the first issue of this report.
- 7.1.2 The site reconnaissance generally confirmed the agricultural setting of the Site and the presence of the main structures observed from desktop data, including the railway and embankment encroaching on the eastern part of the Site, unnamed property at SK 98258 24617 (identified as a barn) and sawmill 105m east of the Site observed through review of historical maps and aerial imagery (see Section 4.1).
- 7.1.3 Site reconnaissance was undertaken to the agreed DF1.5 boundary and did not include the additions of land parcels to the south or east of the Site. It was restricted to agreed access routes across the DF1.5 boundary due to land access constraints. Features including the potential well adjacent to the barn, area of worked ground 26m east of the Site, surface watercourse crossing the northern part of the Site and historical pit recorded 88m northeast of the Site were not observable from the permitted access route.
- 7.1.4 Table 7.1 identifies the principal observations made during the visit and contextualises them using desk based information obtained for this study, a summary of the key observations is provided below. A photographic record of the visit is included as Appendix D, along with the original uncontextualized site observations. GGP-GI-Pt refers to walkover feature – see summary Table 7.1

7.2 Geo-environmental Observations

- 7.2.1 The key geo-environmental observations were:
- Evidence of farm machinery, miscellaneous waste and several Intermediate Bulk Container (IBC) tanks and barrels were observed at the barn. No obvious evidence of asbestos-containing materials (ACM) was observed in the waste; however, it was considered likely that the barn roof and walls may be constructed of asbestos sheets or asbestos cement materials. The IBC appeared empty, but its previous contents and the contents of barrels are unknown.
 - An old open oil tank was observed behind a fence adjacent to the northeast site boundary. No effect on the surrounding vegetation was observed.

- At the corner of a field in the northeast of the Site (approximate location SK 97864 25246), evidence of potential spill or ponding was observed close to the existing electricity tower as rings of dark brown / black colouration on dry ground around the edges of shallow depressions (likely tractor tracks) in the ground. There was no olfactory evidence of contamination. It was considered likely that this could be residual organic matter / other debris that was present within a puddle which had since dried out; however, there is the potential for it to relate a limited amount of hydrocarbon spillage e.g. from a tractor or other machinery.
- Manure stockpiles with evidence of run-off were observed in the northeast of the Site (approximate location SK 97719 25392), in the northwest of the Site (approximate location SK 96858 24788) flowing into a drainage ditch adjacent to the track, and in the central-northern part of the Site (approximate location SK 97076 24895) flowing into a drainage ditch adjacent to the track.
- A large patch of disturbed land, shown through uneven surface rutting approximately 20m long x 10m wide was located on the south of the by-way (approximate location SK 96798 24747).
- No evidence was observed of the former presence of Townshend Lodge Gravel Pit or the disused pit observed on historical maps as being present either on-site or 17m east of the Site.
- In the centre of the Site adjacent to a field boundary (approximate location SK 98108 24452), potential evidence of Made Ground in the form of bricks and concrete boulders was observed, appearing to form part of a path running adjacent to the west of the field boundary.
- The pond observed from historical maps dated 1977 as being present in the northeastern area of the Site (SK 97903 24840) was observed to be approximately 20m long x 10m wide, heavily vegetated around the banks and pond itself, with no evidence of odour, oil or gas bubbles.
- The historical pond observed to be present in the central section of the Site from 1887 to 1950 (SK 97863 24666) was observed as a shallow dry depression approximately 5m long x 2m wide forming part of the field boundary drainage channel. No evidence of Made Ground was observed.
- Dry depressions (up to 1.5m deep) were observed at the location of the historical pond observed at SK 97656 24693 from 1887 to 1977.

7.2.2 These observations have been considered within the development of the initial Conceptual Site Model presented as Section 9. All risk ratings presented herein are provisional and based on a precautionary assessment of available desktop data and walkover observations from the accessible areas of the Site. These will be reviewed and updated within the Ground Investigation Report (GIR) following the completion of the intrusive investigations.

7.3 Geotechnical Observations

7.3.1 The key geotechnical considerations were;

- The ephemeral valley feature was confirmed present on site with sloping sides, no water was shown as present within the central channel. Whilst topographical features can be indicative of Karstic features no exposure of the bedrock, sharp

depressions, or spalling of bedrock were found that would indicate instability within the surface of the Site.

- From the walkover only limited expression of surface settlement within areas of noted historical quarrying were identified such as GGP-GI-Pt-30 (Photo 30a/30b in Appendix D) where Historical Pit and Old limekiln (SK 97835 23984) presented depressions (approx. 3m depth max) located in an area of identified historical pit in Section 3.7.
- At GGP-GI-Pt-24, in the centre of the Site adjacent to a field boundary (approximate location SK 98108 24452), potential evidence of Made Ground / a relict structure in the form of bricks and concrete boulders was observed, appearing to form part of a path running adjacent to the west of the field boundary. This feature was not identified within published information for the Site.
- At GGP-GI-Pt-73, a large patch of disturbed land through surface rutting approximately 20m long x 10m wide located on the south of the by-way (approximate location SK 96798 24747). This feature was not identified within published information for the Site.
- At GGP-GI-Pt-88 depicted areas of dry depressions (max 1.5m deep and 3m diameter) but showed no evidence of Iron resource area/mining during the walkover.
- Within the southeast of the Site Bridge ID ECM1/235 has limited height and width. (GGP-GI-Pt-27 and GGP-GI-Pt-31).
- Access road to the north of the Site is a restricted byway for vehicles and works would need to be planned for vehicular access (GGP-GI-Pt-71)
- Utilities were confirmed as present across site marked by at surface marker posts; GGP-GI-Pt-83, GGP-GI-Pt-85, and GGP-GI-Pt-87. Overhead lines were confirmed at; GGP-GI-Pt-3, GGP-GI-Pt-5, and GGP-GI-Pt-56. A drainage feature within the railway embankment c.0.75m diameter was recorded at GGP-GI-Pt-9.

Table 7.1 Summary of key walkover findings

Walkover Feature ID	Feature Category	Report Feature Ref.	Contextualized Walkover Notes	Walkover Photo Ref.
GGP-GI-Pt-03	Utility	Overhead Services	Overhead services adjacent to the right of access track when looking North. Approximately 5m at its closest.	3a, 3b
GGP-GI-Pt-04	Infrastructure / Potential Contamination Source	Railway adjacent to the east of the Site from OS maps 1887 (1:10,560) and 1888 (1:2,500) onward	An active railway on an embankment runs adjacent to the left of the access track when looking north, as marked on current mapping. Embankment slopes were vegetated and not observed in close proximity. No evidence of slope instability was observed.	4a
GGP-GI-Pt-05	Utility	Overhead Services	Overhead electricity services crossing access path c.5m above ground.	5a
GGP-GI-Pt-06	Potential Contamination Receptor	Potential well / historical abstraction at SK 98250 24680 adjacent to the barn	The potential well was not observable from the permitted walkover access path.	6a
GGP-GI-Pt-07	Structure / Potential Contamination Source	Barn at SK 98258 24617 from OS maps 1887 (1:10,560) and 1888 (1:2,500) onward	The presence of the barn confirmed as shown on mapping. Evidence of farm machinery and miscellaneous waste, however no obvious ACM in waste. Barn likely constructed from asbestos sheets or ACM materials.	7a, 7b, 7c
GGP-GI-Pt-08	Potential Contamination Source	-	An open oil tank labelled "Tellus Oil" was observed behind a fence adjacent to the railway. The tank appeared old with no effect on surrounding vegetation observed. This feature was not identified within published information for the Site.	8a

Walkover Feature ID	Feature Category	Report Feature Ref.	Contextualized Walkover Notes	Walkover Photo Ref.
GGP-GI-Pt-9	Infrastructure	Railway adjacent to the east of the Site from OS maps 1887 (1:10,560) and 1888 (1:2,500) onward	Drainage tunnel running underneath railway embankment. Approximately 0.75m diameter.	9a, 9b
GGP-GI-Pt-11	Potential Contamination Source	Area of worked ground 26m east of the Site, from OS maps 1887 (1:10,560) and 1888 (1:2,500)	The area of worked ground was not visible from the walkover route.	11a
GGP-GI-Pt-13	Surface Water Feature	Pond at SK 97903 24840, from OS maps 1977 (1:2,500) onward	The pond observed on historical maps dating from 1977 as being present in the northeastern area of the Site was observed to be present in a dense copse of trees. It was estimated to be approximately 20m long x 10m wide, heavily vegetated around the banks with aquatic vegetation and algae across the pond itself. The water was turbid with no evidence of odour, oil or gas bubbles.	13a
GGP-GI-Pt-16	Potential Contamination Source	-	At the corner of a field in the northeast of the Site (approximate location SK 97864 25246), evidence of potential spill or ponding was observed close to the existing electricity tower as rings of dark brown / black colouration on dry ground around the edges of shallow depressions (likely tractor tracks) in the ground. There was no olfactory evidence of contamination. It was considered likely that this could be residual organic matter / other debris that was present within a puddle which had since dried out; however, there is also the potential for it to relate a limited amount of hydrocarbon spillage e.g. from a	16a, 16b

Walkover Feature ID	Feature Category	Report Feature Ref.	Contextualized Walkover Notes	Walkover Photo Ref.
			tractor or other machinery. This feature was not identified within published information for the Site.	
GGP-GI-Pt-19	Potential Contamination Source	-	A manure pile with evidence of run-off from the pile was observed 20m north of the northern extent of the walkover path (approximate location SK 97719 25392). This feature was not identified within published information for the Site	19a
GGP-GI-Pt-20	Surface Water Feature / Potential Contamination Source	Unnamed stream unspecified ground working / disused quarry 88m northeast from Groundsure 'Historical Industrial Land Use' dataset	The surface watercourse crossing the northern part of the Site and historical ground working / disused quarry recorded 88m northeast of the Site were not visible from walkover route.	20a
GGP-GI-Pt-21	Surface Water Feature	Historical Pond (SK 97863 24666) from OS maps 1887 (1:10,560) and 1888 (1:2,500) to 1950 (1:10,560)	The historical pond observed to be present in the central section of the Site from 1887 to 1950 (SK 97863 24666) was observed as a shallow dry depression approximately 5m long x 2m wide forming part of the field boundary drainage channel. No evidence of Made Ground was observed, excluding in dense nettle patches where observation was not possible.	21a, 21b, 21c
GGP-GI-Pt-22	Potential Contamination Source	Pond at 97656 24693 from OS maps 1977 (1:2,500) onward	Pond and evidence of Ironstone Resource Area not visible from current walkover route. Corresponds to feature reported in GGP-GI-Pt-88.	22a

Walkover Feature ID	Feature Category	Report Feature Ref.	Contextualized Walkover Notes	Walkover Photo Ref.
GGP-GI-Pt-23	Mining / Potential Contamination Source	Townshend Lodge Gravel Pit	Location of disused pit is now agricultural land with no evidence or presence of surface depressions indicating poor backfilling (image 23b taken facing west). Field boundary drainage is approx. 3m deep with dense vegetation adjacent to the proposed location of the disused pit (image 23d facing east).	23a, 23b, 23c, 23d
GGP-GI-Pt-24	Structure / Potential Contamination Source	-	In the center of the Site adjacent to a field boundary (approximate location SK 98108 24452), potential evidence of Made Ground / a relict structure in the form of bricks and concrete boulders was observed, appearing to form part of a path running adjacent to the west of the field boundary. This feature was not identified within published information for the Site.	24a, 24b, 24c
GGP-GI-Pt-25	Potential Contamination Source	Barn at SK 98258 24617 from OS maps 1887 (1:10,560) and 1888 (1:2,500) onward	Several IBC tanks and barrels were observed behind the barn. The IBC appeared empty, but its previous contents and the contents of the barrels were unknown. Photograph taken facing northeast from walkover route.	25a
GGP-GI-Pt-26	Relict Structure/obstruction	Relict structure at SK 98203 24330.from OS	No evidence of an historical structure identified in the DTS as being located in the southwest corner of the field. Image taken facing south from walkover route. View and observation were limited due to distance.	26a
GGP-GI-Pt-30	Depression / Potential Contamination Source	Historical Pit on OS Map	Depressions (approx. 3m depth max) located in area of identified historical pit in DTS, otherwise no other evidence.	30a, 30b
GGP-GO-Pt-36	Infrastructure	Overhead Lise	General view of overhead line infrastructure bisecting fields	36a, 36b

Walkover Feature ID	Feature Category	Report Feature Ref.	Contextualized Walkover Notes	Walkover Photo Ref.
GGP-GI-Pt-50	Infrastructure	Railway identified from OS maps 1887 (1:10,560) and 1888 (1:2,500) onward	General view of overhead line and railway infrastructure adjacent to field boundary looking north	50a
GGP-GI-Pt-55	Infrastructure / Slope	Railway identified from OS maps 1887 (1:10,560) and 1888 (1:2,500) onward	General view of railway embankment. Embankment slopes were vegetated and not observed in proximity.	55a
GGP-GI-Pt-56	Utility	Overhead Line	General view of existing overhead infrastructure.	56a, 56b
GGP-GI-Pt-69	Potential Contamination Source	A Sawmill is located from 105m east of the Site, formerly railway sidings / goods yard	The presence of the sawmill was confirmed at the location shown on the planning information and aerial imagery. There is a suitable lay-by for parking for site access at this location.	69a, 69b
GGP-GI-Pt-73	Potential Contamination Source	-	Large patch of surface rutting approximately 20m long x 10m wide located on the south of the by-way (approximate location SK 96798 24747). This feature was not identified within published information for the Site.	73a
GGP-GI-Pt-74	Surface Water Feature/Contamination Source	-	Approximately 200m run-off from large manure pile located on the offsite (northern) side of restricted by way. Flowing into drainage ditch adjacent to the road.	74a, 74b, 74c, 74d
GGP-GI-Pt-80	Wildlife/ Vegetation	-	View of bull signage looking west towards agricultural field.	80a
GGP-GI-Pt-83	Utility	-	Buried services indication.	83a

Walkover Feature ID	Feature Category	Report Feature Ref.	Contextualized Walkover Notes	Walkover Photo Ref.
GGP-GI-Pt-86	Utility	-	Confirmation of buried services.	86a, 86b
GGP-GI-Pt-87	Utility	-	Confirmed buried pipeline at this location.	87a
GGP-GI-Pt-88	Surface Water Feature / Potential Contamination Source	Historical Pond at SK 97656 24693 from OS maps 1887 (1:10,560) and 1888 (1:2,500) to 1977 (1:2,500)	Dry depressions (max 1.5m deep and 3m diameter) at the location of a “pond” identified on OS mapping. No evidence of Iron resource area/mining.	88a, 88b

8. Preliminary Ground Model

8. Preliminary Ground Model

8.1 Introduction

- 8.1.1 The anticipated ground model presented in this Section is preliminary and will require confirmation through a site-specific intrusive ground investigation. The results of this investigation will inform the detailed design and development of the Site. As part of this, a site-specific assessment of the risks posed by geotechnical hazards (presented in Appendix F) will also be undertaken and updated.

8.2 Preliminary Ground Model

- 8.2.1 Based on the review of published geological and hydrogeological information, a selection of historical BGS borehole records and the ground conditions within the Site are considered to comprise the following sequence presented in Table 8.1 The borehole elevations from records on site ranged from 64.9mAOD to 85.3mAOD. The ground model has been produced with estimated depth to base of strata using elevations to account for the varying topography.
- 8.2.2 There is a lack of boreholes to significant depth/detail within the Site to provided typical descriptions and thickness for each stratum within the ground model. Therefore, historical borehole records have been utilised from off-site where these stratum outcrop or are encountered at a shallow depth, however it is noted that due to the distance of these historical records they may not accurately reflect the stratum beneath the Site.

Table 8.1 Preliminary Ground Model for Substation A Site

Topsoil	Typical Description	Anticipated Thickness (m)	Depth to Base (m AOD)*
Topsoil	Topsoil, anticipated to be present side wide owing to the Site's current usage as agricultural land.	c. 0.3 - 0.90	71.3 to 93.4
Glacial Till	The soil description from logs is limited to soil and clay or boulder clay.	0.3 to 7.9	61.6 to 92.7
Blisworth Limestone Formation	Not encountered in boreholes. Only mapped locally in the northeastern corner of the Site.	0.0-5.0 (based on 1:50k map sheet)	-

Topsoil	Typical Description	Anticipated Thickness (m)	Depth to Base (m AOD)*
Rutland Formation	The material description from logs is limited describing as clay (occasionally yellow or grey), sand, marl, and clay and limestone (mixed). Encountered within boreholes records shown off site Mapped within the northeast and south of the Site	1.2 to 11.6	80.2 to 92.6
Upper Lincolnshire Limestone	The material description from logs is limited describing as Limestone (encountered within the three logs located on site (SK92SE29, SK92SE30, and SK92SE82) A more detailed description is provided in one record offsite (SK92SE143) 700m east comprising undifferentiated Lincolnshire limestone described the strata as Oolitic limestone buff coloured in upper part grey coloured in lower part. Hard and soft bands and thin clays encountered throughout.	5.1 to 30.5	46.3 to 62.2
Lower Lincolnshire Limestone	The material description from logs is limited describing as Limestone, Rock or Ragstone. The formation was encountered within the three logs located on site (SK92SE29, SK92SE30, and SK92SE82) One record offsite provides a more detailed description of the strata (SK92SE143 located 700m east), comprising undifferentiated Lincolnshire limestone described the strata as Oolitic limestone buff coloured in upper part grey coloured in lower part. Hard and soft bands and thin clays encountered throughout.	2.0 to 10.7	35.7 to 55.2
Grantham Formation	The material description from logs ranges from clay, silt, and sandy clay. Anticipated below entire area of the Site , more extensive from surface in the southern site area	0.6 to 3.0	40.5 to 69.2
Northampton Sand	The material description from logs ranges from Ironstone, grey and green sandy ironstone, sandstone , light and dark grey oolite, and limestone. Anticipated below entire area of the Site in sequence. Strata mined historically for metalliferous resources.	3.0 to 7.0	40.1 to 89.3

Topsoil	Typical Description	Anticipated Thickness (m)	Depth to Base (m AOD)*
Whitby Mudstone Formation	The material description from logs is limited describing as clay (SK92SE82) or blue clay (SK92SE51). Anticipated below entirety of site	Base not encountered. Up to 8.2m.	30.5 to 50.6

* from BGS site records

8.3 Preliminary Groundwater Conditions

- 8.3.1 Groundwater was encountered within one borehole located on site (SK92SE82) at 14.3mbgl, 50.3mAOD within the Upper Lincolnshire Limestone formation. Note, that these records data between 1971 to as early as 1925, therefore may not represent the current water regime on site.
- 8.3.2 A summary of the local borehole records that encountered groundwater during drilling is presented within Table 8.2, groundwater strikes were encountered within the Upper and Lower Lincolnshire Limestone and Grantham Formation. In addition, within borehole records SK92SE21 and SK92SE15 resting water levels overnight were recorded at 32.3m and 38.1mAOD respectively within the undifferentiated Lincolnshire Limestone.

Table 8.2 Summary of groundwater strikes

Borehole	Distance	Date	Ground Level (mAOD)	Strike Depth (m)	Strike Depth (mAOD)	Interpreted Strata of Strike
SK92SE82	On site East	Nov-1925	64.9	14.3	50.6	Upper Lincolnshire Limestone
SK92SE98	100m Southwest	Jun-1951	80.8	11.3	69.5	Lower Lincolnshire Limestone
SK92SE83	180m South	Apr-1941	94.5	28.7	65.8	Upper Lincolnshire Limestone
SK92SE60	650 North West	Aug-1963	96.3	24.4	71.9	Lower Lincolnshire Limestone
SK92SE143	700m East	Oct-1971	71.54	23.8 28.95	47.8 42.6	Lincolnshire Limestone undifferentiated Grantham Formation
SK92SE88	800m West	ND	96.0	31.7	64.3	Boundary of Lincolnshire Limestone undifferentiated and Grantham Formation

9. Conceptual Site Model and Preliminary Risk Assessment

9. Conceptual Site Model and Preliminary Risk Assessment

9.1 Introduction

- 9.1.1 The initial Conceptual Site Model has been developed to identify potentially complete contaminant linkages that may require further investigation to assess their existence and/ or potential significance. The potential sources of contamination on or in the vicinity of the Site, receptors on or near the Site, and pathways on or near the Site are discussed within the following sub-sections.
- 9.1.2 A summary of the applicable legislative and planning framework, and AAJV's approach to assessment used in the following sections is presented in Appendix E.

9.2 Sources of Potential Contamination

- 9.2.1 Based on the Site setting, history and land-uses described in preceding sections, the following sources of contamination and contaminants of potential concern (CoPC) listed in Table 9.1 have been identified.
- 9.2.2 The CoPC are based on information provided in the Department of Environment Industry Profiles (Department of Environment, 1995), known contamination identified at the Site and AAJV's industry experience.

Table 9.1 Potential Sources of Contamination

Source	Description	CoPC
Made Ground	On-site Associated with development at the unnamed property centred on SK 98258 24617 and the structure at SK 98203 24330; road crossing the Site and railway embankment encroaching into the eastern area of the Site; disturbed land at SK 96798 24747; potential evidence of Made Ground (bricks and concrete boulders) at SK 98108 24452. Off-site Railway embankment located adjacent to eastern site boundary.	Metals and metalloids, cyanides (total, free), semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), total petroleum hydrocarbons Criteria Working Group (TPH CWG), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCBs), pH, asbestos-containing material (ACM)/asbestos. Ground gas (methane (CH ₄), carbon dioxide (CO ₂)).
Infilled Land	On-site Associated with the former Townshend Lodge Gravel Pit at SK 97835 23984 and the five former ponds at SK 97366 25378, SK 97856 25261, SK 97656 24693, SK 97863 24666 and SK 97681 24828 in the northern part of the Site and the former pond at SK	Metals and metalloids, cyanides (total, free), SVOCs, VOCs, TPH CWG, PAH, PCBs, pH, ACM / asbestos Ground gas (CH ₄ , CO ₂).

	97345 24791 in the western part of the Site. Off-site Ponds 35m and 136m north, 31m, 60m, 95m, 101m, 104m and 144m west, 34m, 43m, 44m and 137m east of the Site, area of worked ground 26m east of the Site and disused pits located 15m east, 17m east, 88m northeast and 233m east of the Site.	
Agricultural Land	On-site The Site largely comprises arable fields. Farm machinery, miscellaneous waste and several IBC tanks and barrels at the barn, an old oil tank and three manure stockpiles were observed during the walkover to be present on-site. Off-site The surrounding area within 250m largely comprises arable fields and scattered farm buildings.	TPH (anticipated to be minimal), ammoniacal nitrogen, herbicides and pesticides.
Storage of sludge	On-site Associated with waste exemptions at SK 97598 24133, SK 97831 24071, SK 98066 24741 and SK 98252 24625 relating to storage of sludge on a farm. Off-site Associated with waste exemptions relating to storage of sludge on a farm located 74m and 145m east of the Site.	Metals and metalloids, cyanides (total, free), SVOCs, VOCs, TPH, PCBs, nitrate, sulphate, sulphide, pH, ACM/asbestos, ammoniacal nitrogen, pathogens Ground gas (CH₄, CO₂).
Old Limekiln	On-site Present historically at the Site of the former Townshend Lodge Gravel Pit at SK 97835 23984.	PAH, high pH.
Easton Mine	On-site/off-site Extent of workings currently unknown (see Section 3.7).	Mine gas (CH ₄ , CO ₂).
Railway Land	Off-site Railway line located adjacent to eastern site boundary, former sidings 48m east, former Corby Station 111m east of the Site and railway building 208m east of the Site.	Metals and metalloids, SVOCs, VOCs, PAH, PCBs, sulphate, ACM/asbestos, herbicides, glycols.
Sawmill	Off-site Former sawmill located from 105m east of the Site.	Metals and metalloids, SVOCs, VOCs, PAH, sulphate.

Ground Gas Sources

- 9.2.3 The identified sources of ground gas within Section 9.2 above have been further characterised in Table 9.2 below using BS 8576:2013 “Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)” – Figure 6 to determine the ground gas generation potential of the sources.

Table 9.2 Potential Sources of Ground Gas Contamination

Source	BS 8576 Ground Gas Generation Potential	Justification
Made Ground	Very Low to Low	Due to the nature of the features on-site which are likely to lead to the presence of Made Ground (on-site farm buildings and section of the railway embankment) the risk from ground gas generation is considered to be Very Low in accordance with BS 8576, as it is likely that the Made Ground present is of low biodegradable organic content (<5% organic matter). Dependent on the nature of material placed the risk of potential generation of ground gas associated with the Made Ground may be slightly elevated in some areas. However, in line with BS 8576 the maximum generation potential for Made Ground is still anticipated to be Low.
Infilled land	Very Low to Low	The ponds on-site were infilled prior to 1977 and were approximately 6-12m in diameter and the gravel pit on-site was infilled prior to 1903 and measured approximately 50m across. The ponds located 35m and 136m north, 31m, 60m, 95m, 101m, 104m and 144m west, 34m, 43m, 44m and 137m east of the Site, ponds 167m and 186m north and 121m and 147m south of the northeastern spur of the Site were infilled prior to 1977 and were approximately 6-23m in diameter. The area of worked ground 26m east of the Site was potentially infilled after 1994 however this is not certain from the available aerial imagery. It measured approximately 109m across. The disused pits 75m northeast, 47m north and 32m north of the northeastern spur of the Site were potentially infilled after 1994 however this is not certain from the available aerial imagery where they are covered by trees. They measured between approximately 40-195m across. The disused pit located 17m east of the Site was infilled between 1994 and 1999; the dimensions of the pit are unknown. Given the lack of information regarding the fill that may have been placed at these locations and based on BS 8576, the maximum generation potential for Made Ground is still anticipated to be Low.
Storage of sludge	Low to Moderate	From the landfill waste exemption entries, the details of the sludge, the containment used, the potential for it to have been used on-site and whether it is of sewage origin or not are unknown. In accordance with BS5876 the presence of sewage sludge results in a Moderate ground gas generation potential.

Mine Gas

- 9.2.4 In October 2021, Contaminated Land Applications in Real Environments (CL:AIRE) published updated guidance on mine gas risk assessment: 'Good Practice for Risk Assessment for Coal Mine Gas Emissions' (CL:AIRE, 2021). Whilst this guidance is principally concerned with the risk assessment of gas emissions from former coal mine workings in the UK, the guidance states that the principles could also be applied to other types of mines. Given the lack of information available relating to Easton Mine, a simplified approach has been taken here considering the key questions posed within the guidance.
- 9.2.5 From the information presented in Section 3.7, the Site is encroached along the northern boundary by an area with planning permission for ironstone and overlying minerals. However, it is not clear from the available information whether the mine workings extend onto the Site. The historical mapping and mining information reviewed has not indicated the presence of mine entries on-site or within 50m. Several faults cross the Site as described in Section 3.2 which could represent a pathway from mine workings (if present) to surface. Therefore, based on the lack of information available a precautionary approach has been used, and it has been included as a potential relevant source.

9.3 Potential Receptors

- 9.3.1 Potential receptors associated with the Site are shown in Table 9.3.

Table 9.3 Potential Receptors

Receptor Group	Receptor	Description
Human Health	Construction and Ground Investigation Workers	Workers involved in the GI and construction phases.
	Maintenance Workers	Maintenance workers visiting the substation during its operational phase.
	Adjacent Site Users	Walkers on public footpath (footpath assumed to be re-routed around the Site perimeter). Farmers accessing areas of open fields in the surrounding area. Local residents (closest residential properties located 42m east of the Site off of the A151). Workers/visitors at commercial properties (at former sawmill from 105m east of the Site).
Controlled Waters	Secondary (Undifferentiated) Aquifer (Superficial)	Glacial Till.
	Principal Aquifer (Bedrock)	Blisworth Limestone Formation. Lincolnshire Limestone Formation, including the valley feature on-site (Lower Lincolnshire Limestone Member) likely associated with a stream sink and karst terrains.

Receptor Group	Receptor	Description
	Secondary B Aquifer (Bedrock)	Rutland Formation.
	Surface waters	Unnamed stream flowing through the northern part of the Site.
		Unnamed watercourse 630m south of the site.
		West Glen River 230m east.
Property	Crops	Crops in fields in the surrounding area.
	Buildings & Infrastructure: Concrete	Concrete foundations associated with the substation.
	Buildings & Infrastructure: Structures with enclosed spaces	Substation buildings on-site. Adjacent properties (closest located 42m east of the Site off of the A151).
	Buildings & Infrastructure: Services	Underground services passing beneath the Site associated with the new substation.

9.4 Potential Pathways

Potential pathways associated with the proposed development are shown in Table 9.4.

Table 9.4 Potential Pathways

Pathway Group	Pathway
Human Health	Ingestion of soil and dust.
	Ingestion of groundwater.
	Inhalation of dust – indoor and outdoor.
	Dermal contact – indoor and outdoor.
	Vapour intrusion and inhalation – indoor and outdoor.
	Gas migration through ground and/or via faults to surface and ingress – explosive atmosphere.
	Gas migration through ground and/or via faults to surface and ingress – inhalation.
Controlled Waters	Leaching and vertical migration through unsaturated zone.
	Lateral migration in groundwater.
	Vertical migration in groundwater.
	Direct run-off to surface water.
	Baseflow from groundwater to surface water.

Pathway Group	Pathway
	Migration via preferential pathways – underground services, pipes and granular material.
	Migration via preferential pathways – on-site valley stream sink and karst terrains.
Property	Crop uptake via root system.
	Gas migration through ground and/or via faults to surface and intrusion – explosion.
	Direct contact – corrosion.

9.5 Discounted Sources / Pathways / Receptors

- 9.5.1 The receptor Ancient Woodland was not included as it will be assessed in a separate report.

9.6 Preliminary Risk Assessment

- 9.6.1 AAJV's approach to the preliminary risk assessment follows the guidance outlined in CIRIA C552 (CIRIA, 2001) and is described in further detail in Appendix E
- 9.6.2 The qualitative preliminary risk assessment of the possible linkages of the above sources, exposure and transport pathways and receptors is provided in Table 9.5 below.

Table 9.5 Summary of Initial Conceptual Site Model and Risk Assessment

Source	Receptor		Exposure Pathway	Probability	Consequence	Risk Category	Justification
On-site Made Ground Infilled Land Agricultural Land Limekiln Easton Mine Storage of sludge	Human Health – On-site	Construction and Ground Investigation Workers	Ingestion of soil and dust. Ingestion of groundwater. Inhalation of dust – indoor and outdoor. Dermal contact – indoor and outdoor.	Unlikely	Medium	Low	On-site sources and their associated contaminants are listed in Table 9.1. The Site is primarily undeveloped agricultural land. Made Ground is anticipated to be present in limited areas due to the presence of structures on-site and the railway embankment to the east which encroaches into the Site. Infilled land is associated with small ponds and the former gravel pit infilled prior to 1903. These are considered unlikely to present a substantial source of contamination. For construction workers the risk is typically slightly increased above that for other onsite receptors (see below). It is anticipated that soils and groundwater will be disturbed during the GI and construction phases, as well as the potential for workers to enter confined spaces (such as excavations). However, due to the nature of the on-site sources which are
		Maintenance Workers	Ingestion of soil and dust. Ingestion of groundwater. Inhalation of dust – indoor and outdoor. Dermal contact – indoor and outdoor.	Unlikely	Medium	Low	
	Human Health – Off-site	Adjacent Site Users	Inhalation of dust – indoor and outdoor.	Unlikely	Medium	Low	

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						unlikely to present a substantial source of contamination, the risk is considered to be Low. It is unlikely for maintenance workers to come into direct contact with the soils or groundwater, with building and hardstanding surface coverage within the proposed development limiting the likelihood of soil disturbance and particulates becoming airborne. The lack of disturbance of the soils is also considered to limit the risk to off-site receptors of inhalation of dust particulates. It should be noted that during GI and construction phases the possibility of dust becoming airborne and travelling offsite (particularly on windy days) is more possible, however it is anticipated that mitigation of this through barriers and use of dust suppressants will be in place where/when necessary (see Appendix).
	Adjacent Site Users	Ingestion of groundwater.	Unlikely	Medium	Low	The Groundsure report identifies the presence of a

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						historical abstraction, but no details are available regarding its purpose. Its use remains unknown, although it may be associated with private wells shown on historical maps, which could potentially supply drinking water. However, given the low level of contamination anticipated on-site and the minimal likelihood of migration off-site, the risk is considered low
Human Health – On-site	Construction and Ground Investigation Workers	Gas migration through ground and/or via faults to surface and ingress – explosive atmosphere. Gas migration through ground and/or via faults to surface and ingress – inhalation.	Unlikely	Severe	Moderate / Low	No sources of ground gas generation or volatile vapours are noted to be associated with the presence of agricultural land. For Made Ground and infilled land, in accordance with BS 8576 the potential for gas generation is classified as ‘very low to low’. The potential for gas generation associated with the storage of sludge is considered to be ‘low to moderate’. There is the potential for mine gas associated with Easton Mine to affect the Site, if workings extend beneath the Site,
	Maintenance Workers	Gas migration through ground and/or via faults to surface and ingress – explosive atmosphere.	Unlikely	Severe	Moderate / Low	

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
		Gas migration through ground and/or via faults to surface and ingress – inhalation.				however this is currently unknown. For construction workers, there is the potential for workers to enter confined spaces (such as excavations) where ground gases could accumulate.
Human Health – Off-site	Adjacent Site Users	Gas migration through ground and/or via faults to surface and ingress – explosive atmosphere. Gas migration through ground and/or via faults to surface and ingress – inhalation.	Unlikely	Medium ¹	Low	Maintenance workers could come into contact with ground gases if entering buildings within the proposed development where ground gases could accumulate. Some buildings are noted 250m of the Site, resulting in the presence of enclosed spaces for ground gas to accumulate. Due to the gas generation potential of the sources identified, the risk in line with CIRIA C522 is considered to be Moderate / Low.
Human Health – On-site	Construction and Ground Investigation Workers	Vapour intrusion and inhalation – indoor and outdoor.	Unlikely	Medium	Low	For vapour intrusion associated with the Made Ground and infilled land, Made Ground is associated with the structures on-site and the railway embankment
	Maintenance Workers	Vapour intrusion and inhalation –	Unlikely	Medium	Low	

Source	Receptor		Exposure Pathway	Probability	Consequence	Risk Category	Justification
			indoor and outdoor.				to the east which encroaches into the Site, and infilled land is associated with small ponds and the former gravel pit infilled prior to 1903. These are considered unlikely to present a substantial source of vapours and therefore the risk is considered to be Low.
	Human Health – Off-site	Adjacent Site Users	Vapour intrusion and inhalation – indoor and outdoor.	Unlikely	Medium	Low	
On-site Made Ground Infilled Land	Controlled Waters	Principal Aquifers (Bedrock)	Leaching and vertical migration through unsaturated zone. Vertical migration in groundwater.	Low	Medium	Moderate / Low	The majority of the bedrock across the Site (Blisworth Limestone Formation and Lincolnshire Limestone Formation) is classified as a Principal Aquifer. These aquifers are typically more permeable and productive, supporting water supply or baseflow to rivers and are therefore generally more vulnerable to pollution. The limestone bedrock on-site is generally of very high permeability and high vulnerability to pollution.
Agricultural Land		Migration via preferential pathways – on-site valley stream sink and karst terrains	Migration via preferential pathways – on-site valley stream sink and karst terrains.	Low	Medium	Moderate / Low	
Limekiln Storage of sludge		Secondary B Aquifer (Bedrock)	Leaching and vertical migration through unsaturated zone. Vertical migration in groundwater.	Low	Medium	Moderate / Low	There is the potential for preferential migration via on-

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
	Secondary (Undifferentiated) Aquifer (Superficial)	Leaching and vertical migration through unsaturated zone.	Low	Medium	Moderate / Low	site buried valley/karst feature. Groundwater flow within karst systems differs from typical flow through the rock mass, as rapid flow can occur through connected karst void spaces within the rock. The Rutland Formation, which outcrops in the north / northeast of site is classified as a Secondary B Aquifer. These aquifers typically have a limited water resource value and are unlikely to transmit potential contamination quickly or widely due to their low permeability. The Rutland Formation bedrock on-site is generally of low to medium permeability and high vulnerability to pollution. The superficial Till deposits are classified as a Secondary (Undifferentiated) Aquifer. Undifferentiated aquifers have variable characteristics and the potential to have the properties of either Secondary A or B aquifers. The superficial deposits on-site are generally of low to

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						very high permeability and high vulnerability to pollution. Due to the lack of significant superficial deposits across much of the Site, infiltrating groundwater would be expected to enter the bedrock aquifers near the surface. However, the substation development is likely to create large areas of hardstanding surface cover which would reduce the potential for infiltration to areas of soft landscaping only. As noted above, the identified on-site sources are considered unlikely to present substantial sources of contamination, therefore a Low likelihood has been assessed. The risk to the groundwater from the Made Ground, infilled land and agricultural land is therefore considered to be Moderate/Low. The risk to the groundwater within Secondary (Undifferentiated) aquifers from the Made Ground, infilled land and agricultural

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						land is considered to be Low. These sources are considered unlikely to present a substantial source of contamination.
	Unnamed stream flowing through the northern part of the Site	Lateral migration in groundwater. Baseflow from groundwater to surface water.	Unlikely	Medium	Low	The risks to surface water receptors depend on the proximity and gradient (groundwater base flow) of the source to the surface water feature and the ground conditions (permeability of the near-surface geology). An unnamed stream flows through the northern part of the Site. Groundwater is anticipated to flow towards the southeast towards the West Glen River and may therefore not flow towards this receptor across the majority of the Site. However, there is a lack of information on groundwater levels and flow directions to confirm the groundwater flow direction. There is the potential for preferential migration via the on-site buried valley/karst feature. Groundwater flow within karst systems differs
		Direct run-off to surface water.	Unlikely	Medium	Low	
	Unnamed surface watercourse 630m south of the site.	Lateral migration in groundwater. Baseflow from groundwater to surface water.	Unlikely	Medium	Low	
		Direct run-off to surface water.	Unlikely	Medium	Low	
	West Glen River	Lateral migration in groundwater. Baseflow from groundwater to surface water.	Low	Medium	Moderate / Low	

Source	Receptor		Exposure Pathway	Probability	Consequence	Risk Category	Justification
			Direct run-off to surface water.	Unlikely	Medium	Low	from typical flow through the rock mass, as rapid flow can occur through connected karst void spaces within the rock.
			Migration via preferential pathways – on-site valley stream sink and karst terrains.	Baseflow from groundwater to surface water.	Unlikely	Medium	Low The presence of crops across the area to the east between the Site and the receptor is anticipated to limit overland flow, however there is the potential for flow towards the receptors via field drainage channels, however considering that the topography of the Site slopes downwards from north to south, overland flow towards the on-site receptor is considered to be unlikely. Given the distance to the off-site receptors, the likelihood is considered to be unlikely.
On-site Made Ground Infilled Land Limekiln Storage of sludge	Property	Crops	Crop uptake via root system.	Unlikely	Mild	Very Low	Crops are present in fields surrounding the Site. There is the potential for plant uptake from airborne dust deposited from the Site onto adjacent areas and from contaminants leaching into groundwater and migrating off-site. However as stated above the hardstanding cover present across the majority of the Site

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						is likely to mitigate the generation of dust. It is considered unlikely that concentrations of contaminants are present which could result in a reduction in crop yield or loss of value or a reduction in produce quality. However, there is no groundwater and soil data available for review and therefore the risk cannot be entirely discounted.
On-site Made Ground Infilled Land Agricultural Land Limekiln Storage of sludge	Property Services	Direct contact – corrosion.	Unlikely	Mild	Very Low	The proposed substation development on-site and nearby properties to the east / southeast (anticipated downgradient with respect to shallow groundwater) are likely to have subsurface foundation structures. However, potential concrete corrosion has not been assessed here, as it will be evaluated as part of the geotechnical hazard register. In addition, utilities are expected to be installed in the subsurface to serve the new substation, as well as being present associated with existing off-site properties. It is considered unlikely that

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						aggressive ground conditions that would cause corrosion of building materials are present, however there is no groundwater data available for review and therefore the risk cannot be entirely discounted.
	Structures with enclosed spaces	Gas intrusion – explosion.	Unlikely	Severe	Moderate / Low	The presence of methane within a certain range (limits of flammability, 5-15%) poses an explosion risk within enclosed spaces. Where methane concentrations are encountered between these two ranges there is the possibility of ignition/explosion. No sources of ground gas generation or volatile vapours are noted to be associated with the presence of agricultural land. For Made Ground and infilled land, in accordance with BS 8576 the potential for gas generation is classified as ‘very low to low’. The potential for gas generation associated with the storage of sludge is considered to be ‘low to moderate’. Due to the gas generation potential of the

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification	
						sources identified, the risk in line with CIRIA C522 is considered to be Moderate / Low.	
Off-site Made Ground Infilled Land	Human Health – On-site	Construction and Ground Investigation Workers	Inhalation of dust – indoor and outdoor. Ingestion of groundwater.	Unlikely	Medium	Low	Off-site sources and their associated contaminants are listed in Table 9.1. Made Ground is anticipated to be present in some areas due to the presence of the road to the south and railway embankment to the east. Infilled land is associated with small ponds to the north and south, an area of worked ground and a disused pit. These are considered unlikely to present a substantial source of contamination. For construction workers the risk is typically slightly increased above that for other onsite receptors. However, it is not anticipated that soils associated with off-site sources will be disturbed during the GI and construction phases such that dust generation could occur. Due to the nature of the on-site sources which are
Agricultural Land		Maintenance Workers	Inhalation of dust – indoor and outdoor. Ingestion of groundwater.	Unlikely	Medium	Low	
Railway Land		Construction and Ground Investigation Workers	Gas migration through ground and/or via faults to surface and ingress – explosive atmosphere. Gas migration through ground and/or via faults to surface and ingress – inhalation.	Unlikely	Severe	Moderate / Low	
Sawmill		Maintenance Workers	Gas through ground and/or via faults to surface and ingress –	Unlikely	Severe	Moderate / Low	
Storage of sludge							

Source	Receptor		Exposure Pathway	Probability	Consequence	Risk Category	Justification
			explosive atmosphere. Gas through ground and/or via faults to surface and ingress – inhalation.				unlikely to present a substantial source of contamination, the risk is considered to be Low.
		Construction and Ground Investigation Workers	Vapour intrusion and inhalation – indoor and outdoor.	Unlikely	Medium	Low	
		Maintenance Workers	Vapour intrusion and inhalation – indoor and outdoor.	Unlikely	Medium	Low	
Off-site Made Ground Infilled Land Agricultural Land Railway Land Sawmill Storage of sludge	Controlled Waters	Principal Aquifer (Bedrock)	Leaching and vertical migration through unsaturated zone. Vertical migration in groundwater.	Unlikely	Medium	Low	As described above for on-site sources, the majority of the bedrock across the Site (Blisworth Limestone Formation and Lincolnshire Limestone Formation) is classified as a Principal Aquifer with the Rutland Formation, which outcrops in the north / northeast of site classified as a Secondary B Aquifer. The superficial Till deposits are classified as a Secondary (Undifferentiated) Aquifer.
		Secondary B Aquifer (Bedrock)	Leaching and vertical migration through unsaturated zone. Vertical migration in groundwater.	Unlikely	Medium	Low	
		Secondary (Undifferentiated) Aquifer (Superficial)	Leaching and vertical migration	Unlikely	Medium	Low	

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
		through unsaturated zone.				As noted above, the identified off-site Made Ground and infilled land are considered unlikely to present substantial sources of contamination.
	Unnamed stream flowing through the northern part of the Site	Lateral migration in groundwater. Baseflow from groundwater to surface water.	Unlikely	Medium	Low	The sawmill and railway land are anticipated to be down groundwater gradient of the Site, given that flow is expected to be towards the southeast towards the West Glen River and may therefore flow from the Site towards these sources. However, there is a lack of information on groundwater levels and flow directions to confirm this.
		Direct run-off to surface water.	Unlikely	Medium	Low	The risk to the groundwater and the on-site watercourse from off-site sources is therefore considered to be Low. The likelihood of direct run-off impacted by these sources affecting the on-site watercourse is also considered unlikely given the topography of the Site and surrounding area which slopes downwards from the north of the Site.

Source	Receptor		Exposure Pathway	Probability	Consequence	Risk Category	Justification
Off-site Made Ground Infilled Land Agricultural Land Railway Land Sawmill Storage of sludge	Property	Services	Direct contact – corrosion	Unlikely	Mild	Very Low	The proposed substation development on-site is likely to have subsurface foundation structures. However, potential concrete corrosion has not been assessed here, as it will be evaluated as part of the geotechnical hazard register. In addition, utilities are expected to be installed in the subsurface on-site to serve the new substation. As noted above, the identified off-site Made Ground and infilled land are considered unlikely to present substantial sources of contamination. The sawmill and railway land are anticipated to be down groundwater gradient of the Site, given that flow is expected to be towards the southeast towards the West Glen River, and may therefore flow from the Site towards these sources. However, there is a lack of information on groundwater levels and flow directions to confirm this. It is considered unlikely that aggressive ground conditions

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						that would cause corrosion of building materials are present and could impact the Site, however there is no groundwater data available for review and therefore the risk cannot be entirely discounted.
	Structures with enclosed spaces	Gas intrusion – explosion.	Unlikely	Severe	Moderate / Low	The presence of methane within a certain range (limits of flammability, 5-15%) poses an explosion risk within enclosed spaces. Where methane concentrations are encountered between these two ranges there is the possibility of ignition/explosion. No sources of ground gas generation or volatile vapours are noted to be associated with the presence of agricultural land. For Made Ground and infilled land, in accordance with BS 8576 the potential for gas generation is classified as 'very low to low'. The potential for gas generation associated with the storage of sludge is considered to be 'low to moderate'. Due to the gas

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						generation potential of the sources identified, the risk in line with CIRIA C522 is considered to be Moderate / Low.

10. Review of Geotechnical Risk and Preliminary Engineering Assessment

10. Review of Geotechnical Risk and Preliminary Engineering Assessment

10.1 Introduction

- 10.1.1 A preliminary geotechnical risk register is given in Appendix F which describes the main ground related hazards on the Site (excluding ground contamination) and mitigation measures which may be implemented to eliminate or reduce the risk either through further investigation or during the design phase.
- 10.1.2 The most significant risks are:
- Variable stratigraphy and geotechnical material properties leading to unexpected ground conditions encountered
 - Potential for karst features, risk of voids
 - Potential for mining features
 - The presence of confined groundwater which may result in artesian or sub artesian conditions
 - Buried obstructions and natural hard strata causing obstructions to construction.
 - The Whitby Mustone formation and Glacial Till are known to be principal sulphate and sulphide bearing strata, posing a risk of aggressive ground conditions to buried concrete.
 - Localised slope instability where contrasting permeabilities are present and slope angles are high.
 - Mining / underground voids due to on-site BritPit records with deep made ground and site location near to mineral permission for mine in Easton, evidence of potential excavations on site with legacy mining conditions.
 - The presence of existing utilities / services both buried and overhead at the Site
- 10.1.3 More details regarding geotechnical risks can be found in the Geotechnical Risk Register in Appendix F. The Geotechnical Risk Register is a live document and will be further developed and updated in the following reports with more recent information and upon the Site walkover. These risks should be further explored and updated following site-specific ground investigation.

10.2 Preliminary Engineering Assessment

- 10.2.1 The preliminary engineering assessment is based on the proposed developed at DF2 Rev B civil design for the WMEL-A substation. No intrusive investigations have been completed to support the assessments at the time of writing; therefore, the high-level commentary and preliminary recommendations are reliant on limited publicly available desk-based sources as referenced throughout the document.

Foundations

- 10.2.2 For light to moderate loads, the ground conditions are expected to be suitable for the use of traditional spread foundations founded within the Upper and Lower Lincolnshire Limestone formations. Piled foundations may be considered for structures located in close proximity to existing trees in mudstone deposits or for more heavily loaded structures.
- 10.2.3 Shallow foundations are likely to be feasible in areas of cut and shallow fill for lightly loaded structures or structures with acceptable settlement tolerances, on the assumption that these would bear on stiff or better clay or intact competent bedrock in areas of cut or sufficiently engineered fill that is not at risk of excessive settlement.
- 10.2.4 There may be risk of differential settlement of foundations spanning across geological boundaries of different soils and rock, where boulders are present forming hard spots in the weathering profile of the limestones and in areas where faulting has led to abrupt changes in rock strength and weathering pattern. Incorporation of reinforcement in foundation design could be considered to manage differential settlement risks, or foundations deepened to consistent competent stratum.
- 10.2.5 The risk of voids associated with karst features and interactions with shallow foundations will require due consideration and investigation during the GI, with validation and inspection potentially needing to be undertaken during construction subject to findings of the GI.
- 10.2.6 Foundations constructed in clay soils will require consideration for potential clay heave, including need for heave protection measures and sufficient foundation depths, taking into account also the presence of existing, removed, and proposed trees.
- 10.2.7 Heavily loaded structures may need to be founded on piles. Areas of significant fill may also require piled foundations. The most suitable pile type will be dependent on the weathering profile of the underlying bedrock. At this stage bored piles are likely to be the most suitable, particularly where a strong bedrock profile is encountered within the Upper and Lower Lincolnshire Limestone to allow for end bearing piles. However, risk of voids associated with karst features will require due consideration and investigation during ground investigation and validation testing should be undertaken during construction.
- 10.2.8 Design of piles foundations should consider the impact of settlement of the fill embankment and / or underlying ground will induce negative skin friction down-drag loads on piles should programme require constriction immediately following completion of earthworks. The final foundation selection and design should be confirmed following completion of ground investigation on site.

Excavations / Areas of Cut

- 10.2.9 At this stage it is envisaged that excavations will be required to create a level development platform ahead of construction based on the varying elevations across the Site. It is presently assumed that cuttings are feasible to be undertaken however this will be confirmed from targeted ground investigation at the Site to establish the excavatability of the bedrock and thus inform the excavation technique required. It is envisioned that typical preliminary cut slope angles of 1 in 3 throughout the Site in all soils will be stable, subject to slope stability analysis and the groundwater considerations. The orientation of slope cuts should also be carefully considered to

minimise the risk of shallow slope failure, particularly where the natural dip of the bedrock is unfavourably aligned with the slope face.

- 10.2.10 Ground investigation and subsequent earthworks classification testing will be required to assess suitability of the excavated bedrock for material re-use. In general, where excavations in rock are made, it is anticipated that a greater degree of processing will likely be required to enable re-use as engineered fill e.g. crushing of boulder / cobble sized clasts. The crushed aggregate from Lincolnshire Limestone is noted to be of low strength and poor frost resistance (Harrison et al., 2002) therefore may only be suitable for construction fill or as a sub-base.
- 10.2.11 Shallow excavations for foundations and drainage are anticipated to be stable in the short term within weathered mudstone and locally unstable within weathered limestone or granular soils. Close or continuous support will be required for any manned entry to excavations or battering back to a safe slope angle. Excavation angles should be adjusted according to the anticipated strata and groundwater levels encountered.
- 10.2.12 Cuttings in the north of the Site should anticipate that groundwater may be encountered and depending on flow rates, some level of dewatering may be required during construction and permanent horizontal drains installed in slopes.
- 10.2.13 The limestone is not anticipated to undergo significant re-bound heave following excavation; assuming a granular weathering profile, any heave is likely to be relatively instantaneous and not of a significant concern to the development.

Groundwater Considerations

- 10.2.14 Shallow groundwater may be encountered and may require groundwater control during excavation. From preliminary review of local conditions risk indicate to be low as groundwater strikes were encountered between 14.29 and 31mbgl within the Upper and Lower Lincolnshire Limestone Formations however water may be perched within clay soils of the Till.
- 10.2.15 Surface water features comprising, drainage ditch and small-scale surface water feature are present on site along field boundaries. Therefore, the potential presence of shallow groundwater in continuity with surface waters and local flow events in the valley feature (including springs) cannot be discounted. This is supported by observations during the walkover showing greener vegetation within the valley depression indicating a source of water. Shallow perched groundwater is more likely in the north of the Site, assuming the presence of relatively impermeable clay soils associated with the Rutland Formation.
- 10.2.16 The groundwater flow is expected to flow in a south easternly direction from the unnamed north stream towards the West Glen River therefore becoming shallower where following the topography of the northern valley side. In the south of the Site streams are present along field boundaries suggesting a shallower groundwater table at the Lincolnshire Limestone to Rutland bedrock boundaries. Detailed information regarding the groundwater regime will be available following the ground investigation and subsequent monitoring.

Earthworks / Areas of Fill

- 10.2.17 Topsoil and Made Ground can be highly compressible and will need to be excavated and removed from the proposed fill platform footprint if / where present and proposed

to be loaded with significant loads or sensitive settlement structures. These materials are generally not suitable for use as engineered fill but may potentially be reused in landscaping areas that are not sensitive to settlement to avoid unnecessary off-site cartage.

- 10.2.18 Limestone bedrock is anticipated to primarily underlie embankments; consolidation type settlements of limestone are considered relatively negligible. However, the presence of clays (either of the Rutland Formation or interbedded within the limestone) and potential interactions with karst features will require further assessment. If a significant quantity of completely weathered Rutland Formation or interbedded clays are located at the base of the fill platform / within its loading zone of influence, then these clay soils will likely be subject to consolidation settlement. Settlement assessments will require undertaking and confirmation during the detailed design phase, informed by site-specific GI data.
- 10.2.19 Where fill is to be placed on sloping topography this will need to be benched into the existing slopes to achieve required compaction and tie in. The feasibility of cuttings and sequencing of this will require due consideration in future design and construction and should be informed by GI.

Road Pavements

- 10.2.20 As a part of the development, new access roads will be required. It is anticipated that the shallow soils across the Site may contain pockets of weak material due to lateral variations in the superficial deposits. Proof rolling of the formation level will be required, and any loose or soft spots should be removed and replaced with an engineer fill, in accordance with a suitable specification.
- 10.2.21 Subsurface information required for pavement design, such as California Bearing Ratio (CBR) and subgrade modulus, etc are not currently available and should be confirmed following detailed ground investigation.

Infiltration Drainage

- 10.2.22 The ground conditions from a geotechnical point of view are potentially suitable for the use of infiltration drainage / soakaways within the Upper and Lower Lincolnshire Limestone Formations, subject to the nature of associated discontinuities and fractures. The Rutland Formation in the of the Site is currently assumed likely to be low permeability, therefore infiltration drainage is not recommended in this area of the Site. Testing should be undertaken to identify the infiltration characteristics of the near surface deposits and a detailed assessment of the potential for dissolution features.
- 10.2.23 Due consideration however will need to be given to the point discharge into the limestone if karst features are present and risk of inducing subsidence due to this. It is preliminary recommended that any infiltration devices in limestone are situated 10m away from infrastructure to manage potential subsidence risk (subject to further assessment). Proposed infiltration devices must also avoid point discharge of water into slopes.
- 10.2.24 Should testing find the Site to be unsuitable for soakaways then review of the ground conditions should be undertaken for alternative drainage design, attenuation basins will require the design of cutting slopes and the requirements for liners to prevent uplift should be considered. While no existing watercourses are mapped within the

valley feature, the local low topography suggests the potential for an active flow path. This should be accounted for within the Site drainage strategy, with provision made for diverting flows around the proposed fill embankment or culverted as required and can be confirmed during a site walkover ahead of the ground investigation.

Ground Chemistry

- 10.2.25 The Site is likely to contain sulphide / sulphate bearing strata within the Rutland Formation, Grantham Formation, and Whitby Mudstone Formation (BRE, 2005). In addition, the superficial deposits comprise material from the underlying bedrock which are potentially sulphate rich due to their Jurassic age gravel content. There is a risk of chemical attack for embedded concrete structures within this area. When excavated, the likely sulphide bearing mudstones can oxidise greatly increasing sulphate attack risk for site-won cohesive fill.
- 10.2.26 Sulphate attack can lead to deterioration of foundations if not properly mitigated. This will require further assessment during the site-specific GI and appropriately accounted for in concrete design. Sulphate bearing strata are likely to preclude ground improvement with lime stabilisation at the Site, as this can react with natural sulphates and may lead to ground heave.
- 10.2.27 The limestone is not anticipated to be significantly sulphide / sulphate bearing, although interbedded clay soils could exhibit elevated aggressivity. This would be assessed as part of the GI.

Geotechnical Complexity Class

- 10.2.28 The geotechnical works relate to the construction of a new substation, alongside earthworks to allow for producing a consistent site level and the addition of new access roads.
- 10.2.29 The existing ground investigation information available for the Site is limited, there is uncertainty in the lateral variations in the contents of superficial soils, the depth of bedrock and the groundwater regime across the Site. Further there is the potential for karst features and unrecorded mining features which elevate the geotechnical complexity of the Site.
- 10.2.30 It is recommended that Geotechnical Complexity Class GCC2 is applied to this site in accordance with EC7, with the caveat that this classification must be confirmed with an appropriate ground investigation to explore the geotechnical risks highlighted in this study.

Geotechnical Category

- 10.2.31 Geotechnical structures are classified into a Geotechnical Category that combines the uncertainty and complexity of the ground and ground-structure interaction with the consequence of failure of the structure.
- 10.2.32 The project is currently classified as Geotechnical Category 2 as defined in BS EN 1997 in accordance with CD 622 for the proposals stated in Section 1.1. Geotechnical Category 2 encompasses conventional geotechnical structures with no exceptional risk or difficult ground or soil loading conditions, most earthworks will fall into this category.

11. Conclusions

11. Conclusions

11.1 Geotechnical Conclusions

- 11.1.1 Based on preliminary findings, it is anticipated that, from a geotechnical perspective, earthworks and potential retaining structures will be required to manage ground level changes associated with the development on site. The need and extent of these works will depend on the orientation and final layout of the development, given the sloping topography and the valley feature in the southern part of the Site.
- 11.1.2 The preliminary ground model suggests that the superficial deposits are locally present only within the north and south central area of the Site, while elsewhere topsoil overlies the Upper Lincolnshire Limestone formation, Lower Lincolnshire Limestone Formation, Blisworth limestone and the Rutland Formation which in turn are underlain by the interbedded limestone and mudstone sequence comprising, Grantham Formation, Northampton Sand Formation and Whitby Mudstone Formations. It cannot be discounted that deep extents of made ground may be present locally in proximity to legacy unrecorded mining features. Numerous linear features are present across the Site as mapped by the BGS, most notably the Woodlands Fault, trending northwest southeast through the Site, downthrown to northeast within the Upper Lincolnshire Limestone Member. The fault may impact the integrity of the underlying bedrock and therefore a more fractured zone within this faulted area is likely to be present, allowing a preferential pathway for groundwater flow.
- 11.1.3 The main ground related hazards on the Site are variable stratigraphy, soils high sulphates, natural obstructions, the potential for voids from karst features and mining features, and presence of existing utilities / services both buried and overhead at the Site. The risk of voids associated with karst features and interactions with shallow foundations and earthworks will require consideration, validation and inspection, which may potentially need additional monitoring during construction subject to findings of the ground investigation.
- 11.1.4 The Site lies within a designated Mineral Safeguarding Area with risk of quarrying from pre-medieval period recorded through BritPit, therefore consultation with the mineral planning authority is required and potentially a full mineral assessment ahead of the works.
- 11.1.5 Further assessment and investigation are required to confirm ground conditions, investigation hazards and inform design development as outlined in Section 12.

11.2 Geo-environmental Conclusions

- 11.2.1 Potential sources of contamination have been identified through a review of historical maps within the Site boundary relating to localised areas of Made Ground associated with structures developed in localised areas of the Site and the railway embankment encroaching into the eastern area of the Site and infilled land associated with the former Townshend Lodge Gravel Pit and several former ponds and general

agricultural land use across the majority of the Site throughout its history. Off-site sources have been identified relating to Made Ground associated with the railway embankment and road, infilled land (ponds and old quarries), and the former sawmill to the southeast.

- 11.2.2 Risks from these potential contaminant sources have been reviewed for the following three identified receptor groups:
- Human Health Receptors – Construction and GI workers, maintenance workers and adjacent site users in the local area.
 - Controlled Waters Receptors – Groundwater (Principal Aquifers of the Blisworth Limestone Formation and Lincolnshire Limestone Formation, Secondary B Aquifer of the Rutland Formation and Secondary (Undifferentiated) Aquifer of the superficial Till deposits) and surface waters (unnamed stream to the northeast).
 - Property – Crops in the surrounding fields at risk from uptake from root system and proposed on-site substation and adjacent buildings and infrastructure at risk of ground gas.
- 11.2.3 The PRA has assigned a Moderate / Low risk to the scenarios associated with inhalation of ground gas by human health receptors, gas ingress and explosion risk to enclosed structures, leaching of contaminants and migration in groundwater impacting the superficial and bedrock aquifers underlying the Site and lateral migration in groundwater and baseflow to the West Glen River.
- 11.2.4 Low or Very Low risks have been assigned for all other source-pathway-receptor contaminant linkages assessed. The source-pathway-receptor contaminant linkages that have been assessed and the risks assigned as part of this PRA are based on the information provided and high-level understanding of the development proposals available at the time of the review. Risk ratings may be reviewed as more information on the proposed design is developed and / or as intrusive investigation data provides a more robust characterisation of site conditions.
- 11.2.5 Ground gas sources (identified as Made Ground and infilled land) have been characterised BS 8576:2013 – Figure 6 to determine the ground gas generation potential of the sources. This identified a Very Low to Low ground gas generation potential for Made Ground and Infilled Land, and a Low to Moderate ground gas generation potential associated with the storage of sludge. The radon potential varies across the Site, with the highest potential of 10-30% within the southeast. Specific consideration of full radon protection measures (membrane and underfloor venting) for any occupied buildings (e.g., control rooms, welfare units) located in the northeast sector should be considered.

12.Recommendations

12. Recommendations

- 12.1.1 It is recommended that a ground investigation and subsequent interpretative reporting is carried out to confirm the ground and groundwater conditions on the Site, investigate and assess anticipated risks, and inform designs.
- 12.1.2 Consultation with the Mineral Planning Authority (MPA) is required at the pre-application stage to inform a mineral assessment if required for the project, the ground investigation can inform the extent and viability of resources at the Site.
- 12.1.3 The geotechnical elements of the investigation should be designed with consideration to BS EN 1997-1:2004, BS EN 1997-2:2024 (Eurocode 7: Geotechnical Design- Parts 1 and 2), and BS 5930:2015+A1:2020.
- 12.1.4 The geo-environmental investigation should be designed with due consideration of the requirements of BS 10175:2026.
- 12.1.5 In summary, key objectives to be addressed by the investigation include:
- Chemical status of; soil for the purpose of risk assessment to human health, groundwater and for preliminary waste classification to inform disposal / storage and chemical status of groundwater and surface water in order to determine risks to controlled waters.
 - Chemical status of groundwater and surface water in order to determine risks to controlled waters.
 - Confirm the ground model proposed in this desk study and constrain the extent of vertical/lateral variations across the Site.
 - Ground gas assessment following BS 8485:2015+A1:2019 (Code of practice for the design of protective measures for methane and carbon dioxide). Supported by CL:AIRE RB17 to determine the potential risks to the proposed development, surrounding properties, and construction site workers.
 - Confirm the ground water regime at the Site, and the presence of any seasonal variations in ground water levels.
 - In-situ and laboratory thermal resistivity testing to inform cable rating and spacing designs.
 - Verification of anticipated geotechnical hazards.
 - Identification of geotechnical design parameters.
 - Inform design of proposed developments
- 12.1.6 It is recommended that the ground investigation is undertaken in accordance with UK Specification for Ground Investigation 3rd Edition. In brief, the outline scope of works is anticipated to include boreholes, trial pitting, in-situ testing (including Standard Penetration Testing, California Bearing Ratio Tests, Infiltration Tests and Percolation Tests), sampling of soil and groundwater, geotechnical and geo-environmental laboratory testing and groundwater and gas monitoring.

- 12.1.7 Given the elevated risk of karstic features and the potential of mining voids being present beneath the Site, it is recommended that the intrusive investigation is supported by a non-intrusive geophysical survey to identify any potential subsurface hazards that can then be confirmed by intrusive investigation, especially in the region of the valley in the south of the Site. A non-intrusive survey may also assist with tracing bedrock depth between the confirmed locations provided by the intrusive locations.
- 12.1.8 By undertaking an intrusive ground investigation, an assessment of the ground and groundwater profiles may be carried out along with an assessment of the geotechnical and geo-environmental risks associated with the Site. This will allow a refined risk assessment and conceptual site model to be developed in accordance with LCRM methodology. The ground investigation will allow a quantitative assessment as to whether any of the potential risks identified in this study are present and are of material concern to the development.
- 12.1.9 The findings from the ground investigation should be interpreted within an interpretative Ground Investigation Report. This would also inform successive Geotechnical Design Reports as required as the design progresses.
- 12.1.10 Liaison with the existing stakeholders, asset owners, landowners etc. should be undertaken to confirm their requirements and expectations with regard to the proposed works and developments, alongside any constraints.
- 12.1.11 PAS128 Type D, C and B (and A as required) surveys should be undertaken (prior to intrusive investigations), and ground penetrating radar (GPR) and cable avoidance tools used prior to breaking ground. It should be ensured that any existing utilities are identified and fully traced prior to the commencement of GI and construction works if near proposed exploratory hole locations. A hand dug inspection pit will be required, dug to at least 1.20m bgl using insulated hand tools, with cable-avoidance tool (CAT) scanning periodically. Only after this process should mechanical intrusive investigation commence. Procedures to be adopted in the event underground utilities are encountered and these must be detailed in the Risk Assessments and Method Statements (RAMS) for the GI works.
- 12.1.12 At the time of writing AAJV is still awaiting further Detailed UXO information for the Site. AAJV recommends that this Assessment is undertaken prior to the commencement of any intrusive investigation, this recommendation will be reviewed once further UXO information has been obtained

13. References

13. References

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A. Figures

Appendix A Figures

Figure 1 - Site Location Plan

Figure 2 – Topography and Slope

Figure 3 –Superficial, Artificial and Mass Movement Deposits

Figure 4 – Bedrock Geology and Linear Features

Figure 5 – Hydrological Map

Figure 6 – Geotechnical and Geo-environmental Constraint Plan

Figure 7 – Walkover Plan



KEY PLAN

Legend

DF2 Rev B Boundary - WMEL A Substation

NATIONAL GRID INVESTMENT NUMBER: 101746-203470

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AECOM

ARUP

Drawn
AK. KARRAN

Checked
S.LUMACA

Site
Weston Marsh to East Leicestershire - Substation A

Title
Phase 1 Geotechnical and Geo-environmental Desk Study:
Figure 1
Site Location Plan

Purpose of issue
For Information

Status
S3

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WMEL-AAJ-ZZZZ-XXXXXX-DRW-GE-000001

Revision
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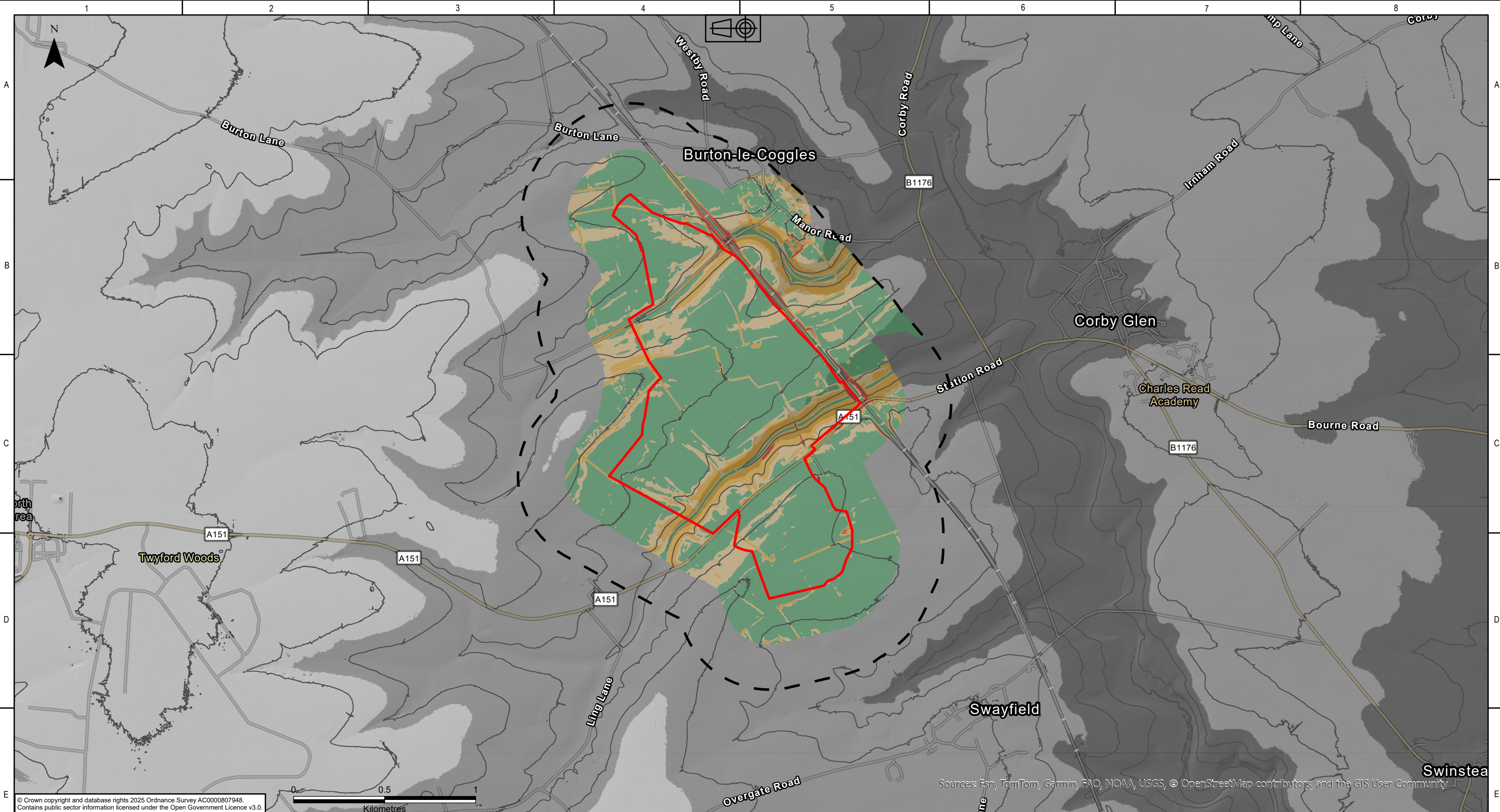
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Approved
J.CHASTNEY

Date
22/06/2026

Scale
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Size
A3



KEY PLAN

Legend

DF2 Rev B Boundary - WMEL A Substation

500m Study Area

Topographic Slope Gradient

Less than 3.5°

3.5° to 5.71°

5.71° to 15°

Greater than 15°

Digital Terrain Model LiDAR (1m)

Elevation (m)

31 - 75

76 - 105

106 - 140

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Weston Marsh to East Leicestershire - Substation A

Title

Phase 1 Geotechnical and Geo-environmental Desk Study: Figure 2 Topography and Slope

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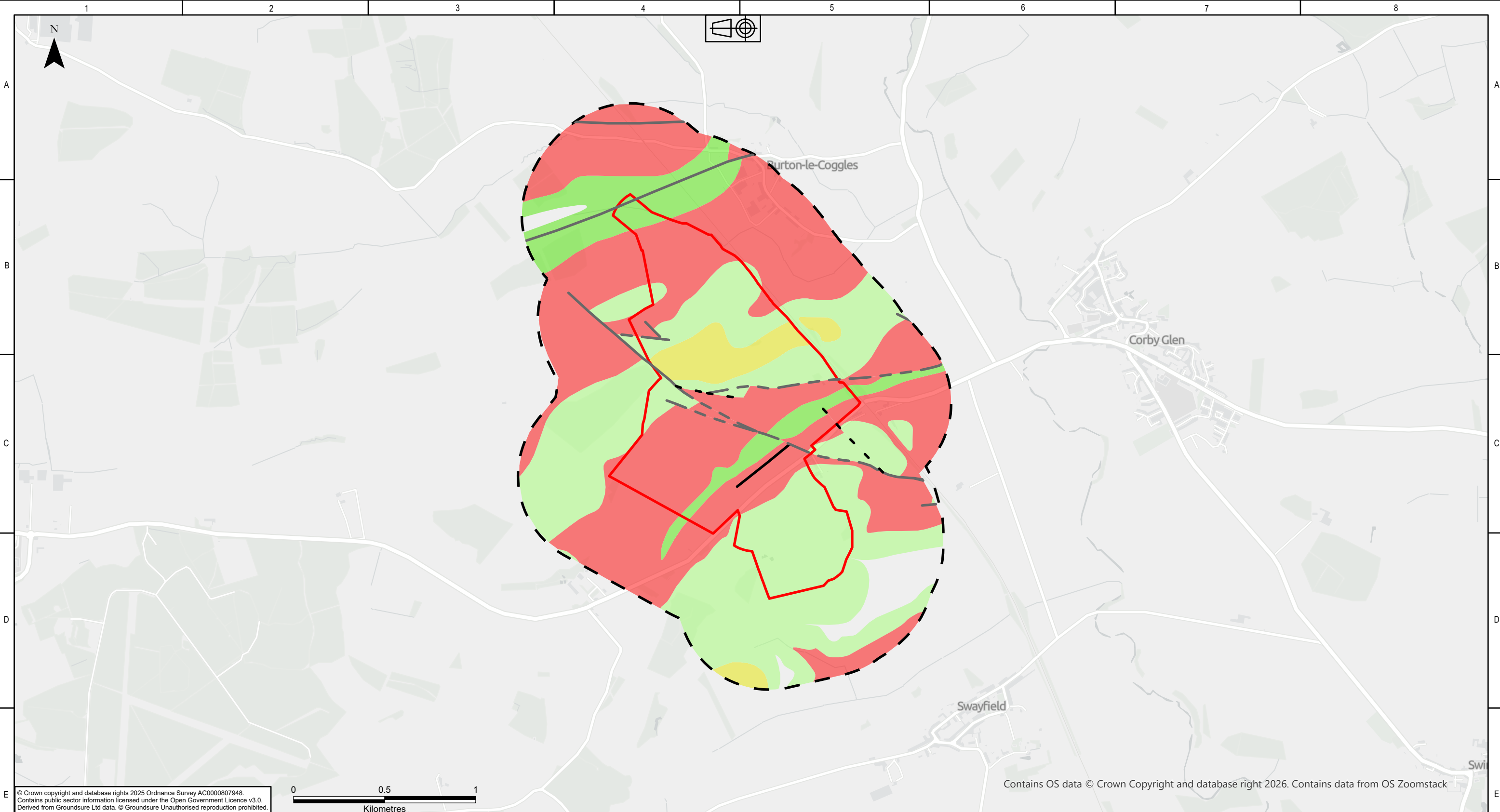
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Scale

1:20,000

Size

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KEY PLAN

Legend

DF2 Rev B Boundary - WMEL A Substation

500m Study Area

Faults Linear Features 50K

Fault, inferred, crossmark on downthrow side, throw in metres

Fault, inferred, displacement unknown

Fault, observed, crossmark on downthrow side, throw in metres

Fault, observed, displacement unknown

Bedrock Geology 50K

Blisworth Limestone Formation-Limestone

Lower Lincolnshire Limestone Member-Limestone

Rutland Formation-Argillaceous rocks with subordinate sandstone and limestone

Upper Lincolnshire Limestone Member-Limestone

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Site

Weston Marsh to East Leicestershire - Substation A

Title

Phase 1 Geotechnical and Geo-environmental Desk Study:
Figure 4
Bedrock Geology and Linear Features

Purpose of issue

For Information

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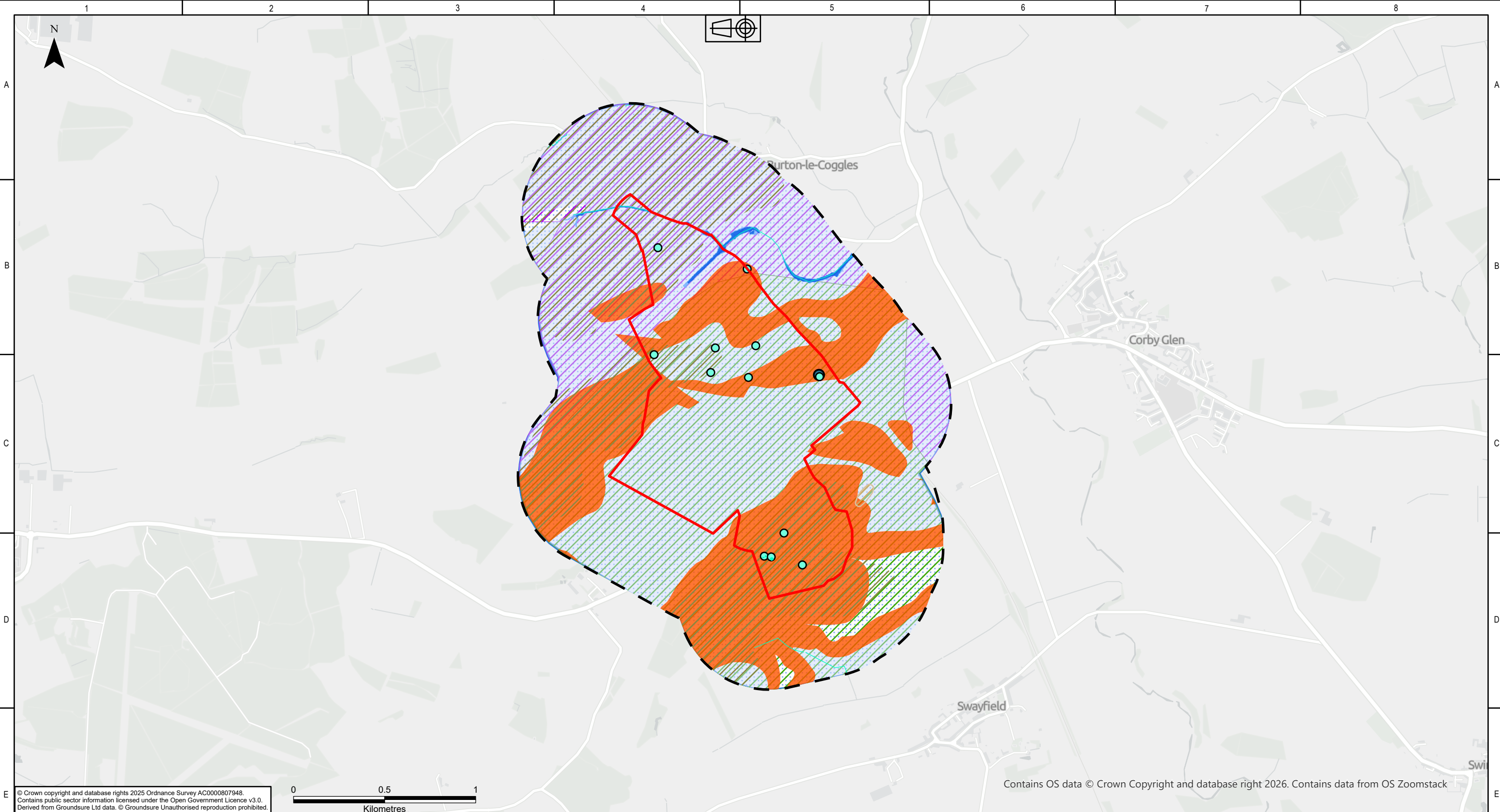
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KEY PLAN

Legend

DF2 Rev B Boundary - WMEL A Substation

500m Study Area

Groundwater Abstractions

Groundwater Vulnerability

Flood Zone 3

Flood Zone 2

Aquifer Classification

Secondary A Superficial Aquifer

Secondary Superficial Aquifer Undifferentiated

Secondary B Bedrock Aquifer

Principal Bedrock Aquifer

Source Protection Zones

Zone III - Total Catchment

Waterbodies

Welland Limestone Unit A

Welland Mid Jurassic Unit

Surface Water Features

Surface Water Features

Ponds

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Site

Weston Marsh to East Leicestershire - Substation A

Title

Phase 1 Geotechnical and Geo-environmental Desk Study: Figure 5 Hydrogeology, hydrology and flood zones

Purpose of issue

For Information

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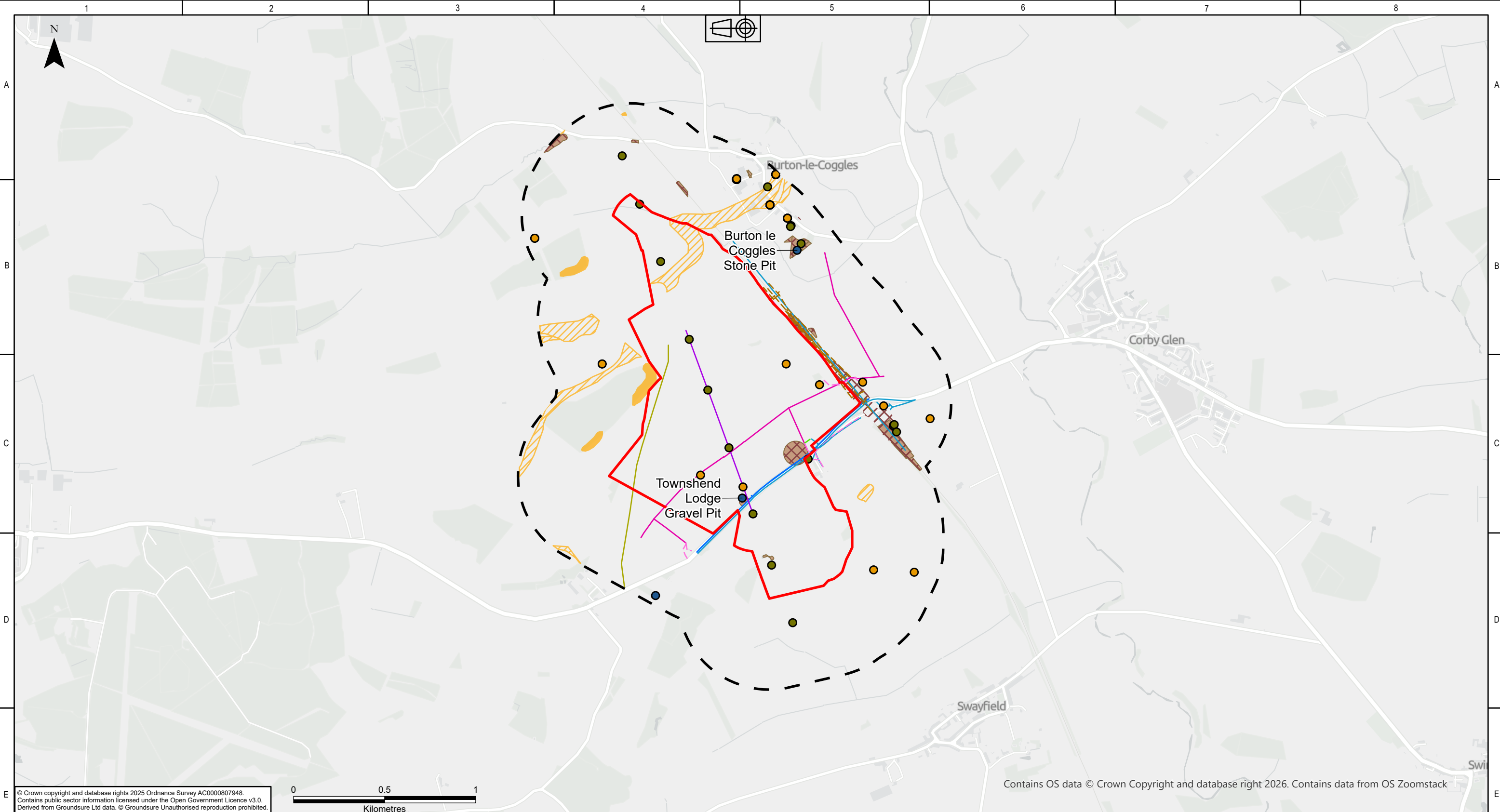
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KEY PLAN

Legend

DF2 Rev B Boundary - WMEL A Substation

500m Study Area

Brit Pits

Recent Industrial Land Uses

Landfill Waste Exemptions

Historic Industrial Land Use

Surface Ground Workings

Ground Dissolution Soluble Rocks

Moderate

Landslides

Moderate

PAS128 Type D Utilities Survey

Electricity Distribution

EHV Electricity

HV Electricity

LV Electricity

Storm Drainage

Fuelling

Water

Telecom

Note: PAS128 Type D Information (Issued 17/02/2026) is displayed for information only and not suitable for construction, this information comes from an incomplete survey dataset that does not cover the full DF2 Rev B Site Boundary. Further utilities may be present within the Site Boundary. Features illustrated have been sourced from Groundsure's Insight product and publicly available datasets. Additional unrecorded hazards and constraints to those shown may be present. Site reconnaissance and ground investigation are required to confirm hazards and constraints.

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Site

Weston Marsh to East Leicestershire - Substation A

Title

Phase 1 Geotechnical and Geo-environmental Desk Study: Figure 6 Geotechnical and Geo-environmental Constraint Plan

Purpose of issue

For Information

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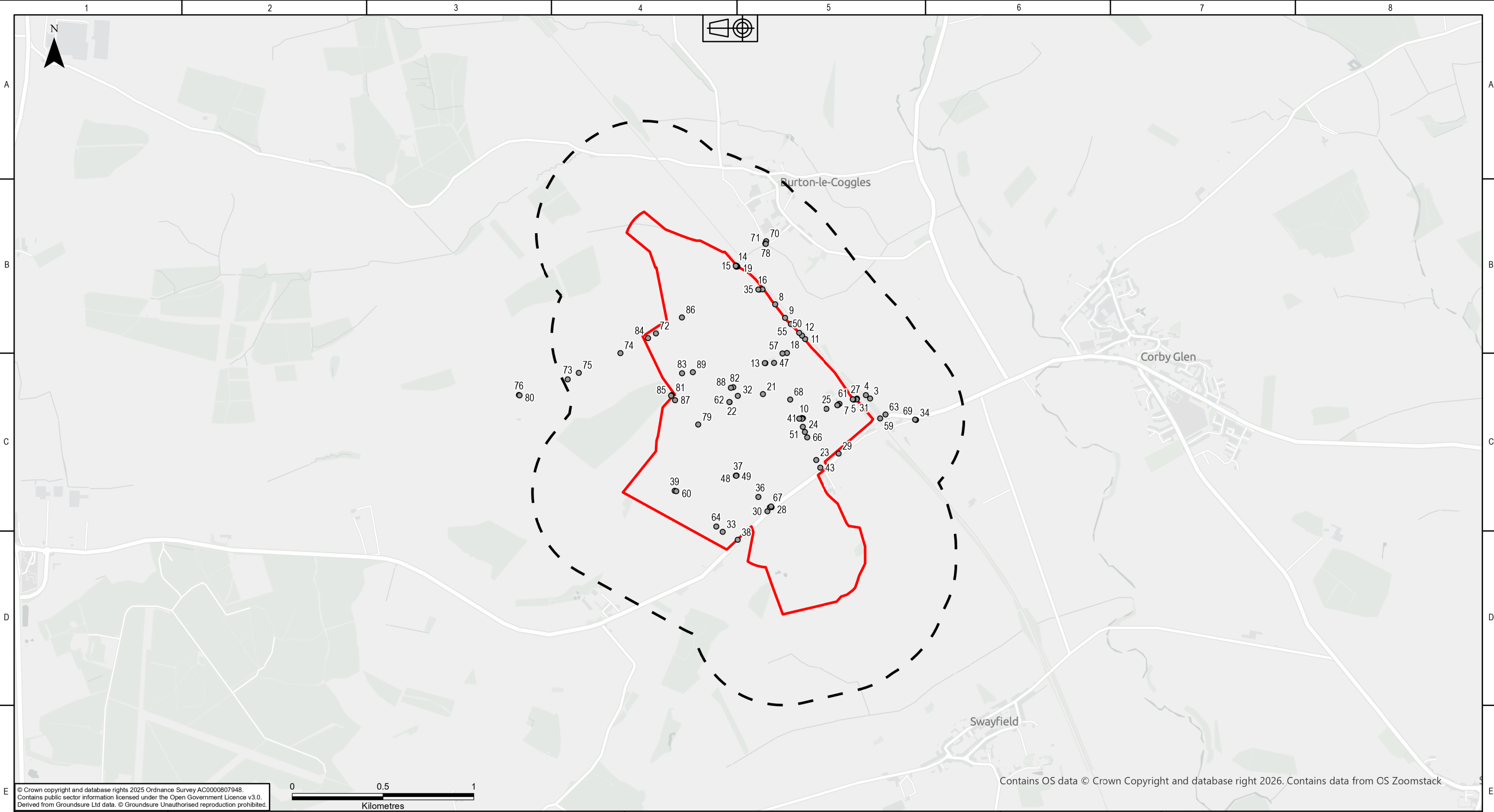
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KEY PLAN

Legend

WMEL A Substation Desk Study Site Boundary (DF2.0A)

500m Study Area

GI Site Walkover

NATIONAL GRID INVESTMENT NUMBER: 100268

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DrawnA.KARRAN

CheckedS.LUMACA

Site

Weston Marsh to East Leicestershire - Substation A

Title

Phase 1 Geotechnical and Geo-environmental Desk Study: Figure 7 Walkover Plan

Purpose of issue

For Information

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Date

23/06/2026

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Size

A3

B. BGS Boreholes

Appendix B BGS Boreholes



SK 92 SE/82
9841 2456

143/27

(For Survey use only)
GEOLOGICAL
CLASSIFICATION
1:50,000 scale

NATURE OF STRATA
If measurements start below
ground surface, state how far...

	THICKNESS		DEPTH	
	feet	inches	feet	inches
Head	11		11	-
Lower Lst.	50		61	-
Lower Lst.	35		96	-
Upper Lst.	9		105	-

Soil & Clay
Limestone
Sandstone
Clay

143

x



166
RECORD OF WELL (SHAFT OR BORE)

At Cosby Heath

Town or Village

County Lincoln Six-inch quarter sheet 13/SE(W)

For Mr. Paravicini 9842 2456
9839 2455

Exact site of well (Tracing on 143/27D) SK 92SE (9842 2456)

29 d.
143/27D
Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) 213 feet.

Is well-top at ground level? Yes If not, state how far above; 213 feet.
below;

Shaft ft., diameter ft. Details of headings

Bore ft.; diameter of bore: at top ins.; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes 15 x 5"

Water struck at depths, below well-top, of (feet)

TEST DETAILS Rest-level of water 47 ft. above well-top. Suction at ft. Yield on hours' days' pumping 600 gallons per hour (max. capacity of pump g.p.h.),
Month Nov with depression of feet. Recovery to in mins. hours.
Year 1925

WORKING CONDITIONS Rest-level of water in (month), (year), ft. above well-top.
Highest " in (month), (year), ft. above below "
Lowest " in (month), (year), ft. above below "
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins. hours

Quality of water (attach copy of analysis if available)

Well made by J. T. BARNES & son, Date of well Nov 1925

Information from SLEAFORD.

do
ADDITIONAL NOTES.

Test pump down 72 ft.
Water struck in sandstone near bottom.
No 2 Bore.

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map. on 6" Map.	
		<u>143</u>	<u>70</u>	<u>○</u>	<u>○</u>



(For Survey use only) GEOLOGICAL CLASSIFICATION F.S.A. with x.44	NATURE OF STRATA If measurements start below ground surface, state how far... ..	THICKNESS		DEPTH		
		Feet	Inches	Feet	Inches	
		...	...	...	...	
Head	Soil & Clay	11		11	—	
Lower Lst	Limestone	50		61	—	
Lower Limestone	Sandstone	35		96	—	
Upper Lst	Clay	9		105	—	x

Contact BGS: ngdc@bgs.ac.uk



①

For Institute use only Licence No.

N. N

143 SK 92/3
420

RECORD OF WELL

At No 3 BOREHOLE (OBS)
NOM SK 9896 2513.

Town or Village BURTON COSSGARS

County LINCOLNSHIRE

Six-inch County Sheet LINCS 131 SE/W

Six-inch National Grid sheet and reference SK 92 NE

For WELLS 947 v NANNIE RIVER AUTHORITY

State whether owner, tenant, builder, contractor, consultant, etc.:—

Address (if different from above) Oscar 412 Peterborough

Level of ground surface above sea level (O.D.) ft (..... m)

If well top is not at ground level, state how far above* ft (..... m)
below: ft (..... m)

SHAFT ft (..... m); diameter ft (..... m);

HEADINGS (please attach details—dimensions and directions)

BORE 102 ft (31 m); diameter: at top in (152 mm); at
bottom in (152 mm)

Full details of permanent lining tubes (position, length, diameter, plain, slotted, etc.)
5.50 m x 152 mm plain

Water struck at depths of ft (..... m) below well top

Rest level of water ft (..... m) above* well top. Suction at ft (..... m)
below

Yield on hours* test pumping at galls (..... m³) per with
days

depression to ft (..... m) below well top. Recovery to rest level in mins*
hours

Capacity of pump g.p.h. (..... m³/h)

Date of measurements 16 Dec

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Motive power

Capacity galls (..... m³) per hour. Suction at ft (..... m)
below well top. Amount pumped galls (..... m³) per day. Estimated
consumption galls (..... m³) per week

Well made by FARRODS LTD Date of sinking Oct 1971

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

Received from FARRODS LTD

Date 21.8.1971

Observation well

Recorder

E.R. log

Site marked on
1" map
6" map
(use symbol)

Copy to D.G. e.x.s.m.d.s

Date

LOG OF
STRATA
OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES,
WATER DEPARTMENT,
SOUTH KENSINGTON,
LONDON, S.W.7.



(For Institute use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far.	143/420 THICKNESS			DEPTH		
		Foot	Inches	Metres	Foot	Inches	Metre
		METRES			METRES. FT.		
starts near top of Upper lincs. LST.	Brown Top soil with limestone cobbles	0	30		0	30	
	Limestone Buff coloured in upper part, grey coloured in lower part						
	Hard & soft bands and thin clays encountered	28	05		28	35	
	Very hard grey limestone clay	1	20		29	55	
? base of lincs. LST. on LE		1	45		31	00	10.2
P.P. A HORTON 14.5.74							

ADDITIONAL INFORMATION SHEET

Date of completion
of well catalogue

Date of publication

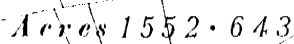
Licence No.

143/420 SK92|3

Additional Sheet No.

DATE	*	ADDITIONAL INFORMATION	INIT.		
14.8.78		100MM X 31.8M STEEL REPLACED BY ABS 125MM X 5.8M (PL), 20.4m (PERF), 2.8m (PL), 0.3m (BASAL PLUG). REAMING OUT & RELINING BY W.F. PETTIFER LTD.			
FILMED	* INSERT WELL REFERENCE LETTER, IF MORE THAN ONE WELL AT SITE		P.T.O		
Section 6	Pumping test	Observ. well	Recorder	E.R. log	GEOLOGICAL SURVEY, WATER DEPARTMENT SOUTH KENSINGTON, LONDON, S.W.7.

Additional Information Sheet No. Commenced.....





Sk 92/3





DAILY SITE BORING RECORD

SK92/3

BOREHOLE No. 3.

DATE 4 11 71

SITE BURTON COSSLES

CLIENT DEER - WELAND RIVER AUTHORITY

DEPTH	THICK	STRATA	SAMPLE Depth	TYPE	No. BLOWS REMARKS
0.30	0.30	Brown Top Soil with Limestone cobbles			
28.35	28.05	Oolitic Limestone Buff coloured in upper part - grey coloured in lower part. Hard and soft bands and thin clays encountered			
29.55	1.20	Very hard grey Limestone			
31.00		CLAY.			

SHOW SAMPLE THUS

☒ UNDISTURBED

☐ DISTURBED

☐ S.P.T.

☐ WATER

WATER OBSERVATIONS

WATER LEVEL

STRUCK 23.75 METERS - DAMP

SEALED 28.95 METERS CELESTIAL

STRUCK 29.00 METERS LOST CIRCULATION

SEALED

STRUCK

SEALED

CLIENT'S SIGNATURE

CASING IN 5.50 m of 150 mm.

CASING REMOVED

REMARKS OR DETAILS OF DELAYS

200 mm boring to 5.50 m.
150 mm boring to 31.00 m.

BORING CLEAN

SK 92/3

Burton Coggles Borehole.

SK 990 251

Depth ? , diameter 150 mm, lined to 5.0 m.

TV log by M. Fleet, 15.2.73.

Mud was observed on the walls in patches down to about 8 m.

Small horizontal fissures observed at 9.3 m, 10.0 m, and 10.3 m depth.
A large fissure was seen at 11.3 m.

At 12.2 m, much broken rock was observed, apparently around a large horizontal fissure.

Mud was present on the walls at about 13 m depth.

Some broken rock was seen at 13.8 m depth.

At 14.5 m, a large fissure with much shattered and broken rock was observed. ~~Most~~ Many of the rock fragments were apparently balanced ready to slip into the borehole, so it was decided to lower the camera no further.

The large fissure at 11.3 m was examined with the radial lens, but little could be seen due to inadequate lighting. Technical difficulties prevented further use of this lens.



WATER RESOURCES BOARD WELL RECORD		W.R.B. REF. No. SK 92/3
SHEET 1		R.A. LICENCE No.
1. WELL IDENTITY		
NATIONAL GRID REFERENCE SK 990 251		
Well at Burton Coggles	I.G.S. REF. No.	
	RIVER AUTHORITY Welland & Nene	
Town	HYDROMETRIC AREA 31	
County	SUB-CATCHMENT	
Owner of well Welland & Nene R.A.		
Well made by	Date of sinking 4-11-71	
Information from Welland & Nene R.A.	Date received 28-2-73	
2. WELL DESCRIPTION		
Level of ground surface 71.537 m. If well top is not at above* m.		
above sea level (O.D.) ft. ground level how far below ft.		
Shaft m. deep; Diameter at top mm. ; at bottom mm.		
ft. ; at bottom in.		
Bore 31 m. deep; Diameter at top 200 mm. ; at bottom 150 mm.		
ft. ; at bottom in.		
Details of headings		
DETAILS OF PERMANENT LINING TUBES		
Length 5.50 m. ; Diam. 150 mm. Length Slotted m. ; Diam. mm. ; Top 0.00 m. above* surface		
Plain ft. ; Diam. in. ; Top ft. below surface		
Length m. ; Diam. mm. Length Slotted m. ; Diam. mm. ; Top m. above* surface		
Plain ft. ; Diam. in. ; Top ft. below surface		
Length m. ; Diam. mm. Length Slotted m. ; Diam. mm. ; Top m. above* surface		
Plain ft. ; Diam. in. ; Top ft. below surface		
Details of well screen		
DETAILS OF REST WATER LEVELS DURING CONSTRUCTION		
Water struck at depths of 23-75, 28-95 m. below well top		
Rest level of water m. above* O.D.* m. deep. Date		
ft. below well top when bore ft.		
Rest level of water m. above* O.D.* m. deep. Date		
ft. below well top when bore ft.		
Rest level of water on completion of bore m. above* O.D.* m. deep. Date		
ft. below well top when bore ft.		
Method of drilling 2 airflush		
Brief details of well development e.g. acid treatment etc.		

* delete as applicable

(18127/1)

[illegible]



WATER RESOURCES BOARD WELL RECORD		W. R. B. REF No. <i>SK 92/3</i>
SHEET 2		R. A. LICENCE No.
4. HYDROGEOLOGY		
Topography AT WELL SITE		
Local depression ☐ , Flat surface ☐ , Hill top ☐ , Hillside ☐ , Valley bottom ☐ , Terrace ☐		
MAJOR AQUIFER <i>Lincolnshire Limestone</i>		Lithology <i>limestone and clay bands</i>
Depth to top of aquifer <i>0-30</i> m. ft.		Thickness penetrated <i>30-70</i> m. ft.
Top of aquifer <i>ADD*</i> ft.		Total thickness of aquifer <i>30-70</i> m. ft.
Coefficient of storage		Transmissivity $\frac{\text{m}^2/\text{day}^*}{\text{galls/day/ft.}}$
MINOR AQUIFER		Lithology
Depth to top of aquifer m. ft.		Thickness penetrated m. ft.
Top of aquifer m. ft.		Total thickness of aquifer m. ft.
Coefficient of storage		Transmissivity $\frac{\text{m}^2/\text{day}^*}{\text{galls/day/ft.}}$
ADDITIONAL NOTES: <i>Observation borehole, Welland & Nene R.A. Television run by M. Fleet, 15.2.73 :</i>		

* delete as applicable

[illegible]



GEOLOGICAL SURVEY OF GREAT BRITAIN **DECLASSIFIED**

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

15

Name and Number given by owner:

NW 241

For whom made *United Steel Co. Ltd.*

Town or Village *Sneyfield* County *Lincs.*

Exact site: (Attach a tracing from a map, or a sketch-map, if possible.)

Purpose for which made *Intake*

Ground Level at *shaft* relative to O.D. *290.2 ft* If not ground level give O.D. of beginning of shaft bore

Made by Date of sinking *17.11.59*

Information from Date received

Examined by

6-inch Map Registered No.

SK/92 SE/15

Nat. Grid Reference

9902.2292

1" N.S. Map No.	1" O.S. Map No.	Confidential or not
<i>143</i>		<i>Yes</i>

GEOLOGICAL LOG					DRILL LOG		
Depth Feet From	To	Thick. Ft.	Description	Geological Horizon	CROWTHER USED		
0.0	3.0	3.0	Topsoil	Recent	Size	No.	Feet
3.0	20.0	27.0	Upper Estuarine Series	Ch. Vol. Series	131	Ord	32.0
30.0	124.0	94.0	Oolitic Limestone	Inferior Oolite Series	116	MOB	80.0
124.0	125.0	1.0	Clay		116	594508	22.5
125.0	130.0	5.0	Limestone		101	594859	18.5
130.0	134.5	4.5	Grey clay.		REAGERS USED		
134.5	148.0	13.5	Grey Sandy Ironstone. Northampton Sands		Size	No.	Feet
			Bed		116	594509	22.5
148.0	153.0	5.0	Blue Clay.	Upper Lias	CARRS USED		
			Upper Lias Clay		Size	Set (Ft.)	Revised (Ft.)
			R. Cassal not recorded.		128	30.0	30.0
					Water Used 22,000		
					Rack Water Level 125'		
					LEVELS		
					Surface	290.2	
					Top Ft.	155.7	
					Bottom Ft.	148.2	
					Signed R.J.M. DIXON.		



DECLASSIFIED

NW 241

SK/92 SE/15

134'6" - 134'10"

Fragments of grey ophacoiditic clay

134'10" - 136'6"

largely dark grey - brown ferruginous mudstone
or very silty mudstone with many scattered very
pale green oolites and many voids.

136'6" - 137'9"

Dark brown oolitic ironstone - oxidised oolites in
semi-oxidised matrix.

NSJ
(13'6")

137'9" - 140'3"

Slightly bluish-green grey even-grained oolite

140'3" - 143'0"

grey very fine-grained compact, strong slightly
calcareous sandstone; becoming less fine-
grained and more calcareous below 143'0";
very occasional very small pebbles from 146'6".

143'0" - 148'6"

grey silty micaceous clay [ULi]

R.T.W.

DECLASSIFIED

6-inch Map Registered No.

21

SK/92 SE/21

NW 254

Nat. Grid Reference

9795. 2279

United Steel Co. Ltd

Swayfield County Lincoln

Attach a tracing from
a map, or a sketch-
map, if possible.

1st N.S. Map

1" O.S. Max

Confidential

143

42

Ironstone

280.9 μ

Date of sinking 9.11.51

Date received

C.B.H. 32896- WC 41054 - Pd P 5.41.3000. 8/58.



NW 254.

SK/92SE/21

117'6" - 118'2"

Dark grey very sandy clay with some black } LE
carbonaceous fragments

118'2" - 120'10"

Grey-brown strong oolitic ironstone; abundant
small pale green oolites in pale brown fine-
grained well indurated matrix.

120'10" - 126'3"

Grey-buff even-grained oolitic ironstone (many
oolitic voids); becoming greenish or bluish-
green from 122'6"; much cryptolitic calcite
at times.

126'3" - 126'9"

Very hard very fine-grained sandstone with
scattered pale green oolites

NSI
(15'10")

126'9" - 134'0"

Top 1in. charged with calcite pyrite; fine-
grained calcareous sandstone; in basal 3in.
many mudstone pebbles and large masses of
brown silty mudstone with some green oolites; also
some angular lumps of pale grey silty clay (basement
bed).

134'0" - 134'6"

Grey silty micaceous clay [ULi]

R.J.W.

DECLASSIFIED



GEOLOGICAL SURVEY OF GREAT BRITAIN
RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

28

Name and Number given by owner:

P. 3

For whom made *United Steel Co. Ltd.*

Town or Village *Sheffield* County *Northants.*

Exact site *(Attach a tracing from a map, or a sketch map, if possible.)*

Purpose for which made *Ironstone*

Ground Level at *shaft* relative to O.D. *262.12 ft.* If not ground level give O.D. of beginning of *shaft* bore

Made by *(Date of sinking 22/4/23-27/4/23)*

Information from *U.S.C. Ltd.* Date received *1960*

Examined by

(For Survey use only)

6-inch Map Registered No.

DECLASSIFIED
SK/92 SE/28

Nat. Grid Reference

9741.2361

1" N.S. Map No.

143

1" O.S. Map No.

Confidential or not

Yes

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only)

GEOLOGICAL CLASSIFICATION

DESCRIPTION OF STRATA

THICKNESS

FT

IN.

DEPTH

FT

IN.

Limestone

60

0

60

0

Argillaceous

18

0

78

0

L. Etienne clay

5

0

83

0

Ironstone

19

0

102

0

Old

1

0

103

0

GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

(For Survey use only)

6-inch Map Registered No.

Name of Shaft or Bore given by Geological Survey:

29

DECLASSIFIED

Name and Number given by owner:

P: 4

Nat. Grid Reference

9789. 2404

For whom made United Steel Co. Ltd.

Town or Village Swayfield County Northants.

Exact site Attach a tracing from
a map or a sketch-
map, if possible.

1" N.S. Map
No.

1" O.S. Map
No.

Confidential
or not

Purpose for which made..... *Donation*

Ground Level at ~~shaft~~^{base} relative to O.D. 280.1 ft If not ground level give O.D. of beginning of ~~shaft~~^{base}.

Made by _____ Date of sinking 28/4/43 - 30/4/43

Information from U.S. G. Lef. Date received 1960

Examined by.....

SPECIMEN NUMBERS AND ADDITIONAL NOTES

[illegible]

GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

(For Survey use only)

6-inch Map Registered No.

Name of Shaft or Bore given by Geological Survey:

31

DECLASSIFIED

Name and Number given by owner:

SL 18

Nat. Grid Reference

9828. 2353

For whom made United Steel Co.

United Steel Co.

Town or Village.....*Hayfield*

Grayfield

County Lincoln

Lumia

Exact site

Attach a tracing from a map, or a sketch-map, if possible.

1st N.S. Map
No.

1" O.S. Map
No.

**Confidential
or not**

Purpose for which made.

Inmate

Ground Level at shaft
bore relative to O.D. 309.38 ft.

309.38 μ

If not ground level give O.D. of beginning of shaft bore.

Made by

Date of sinking 19.6.43. - 24.6.43.

Information from

U.S.C. 152

Date received

1960

Examined by.

SPECIMEN NUMBERS AND ADDITIONAL NOTES

[illegible]

GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

36

Name and Number given by owner:

Sol 19

For whom made United Steel Co. Ltd.

Town or Village Springfield County Dane

Exact site Attach a tracing from a map, or a sketch-map, if possible.

Purpose for which made Janitor

Ground Level at shaft bore relative to O.D. 272.78 ft. If not ground level give O.D. of beginning of shaft bore _____

Made by _____ Date of sinking 25.6.43 - 29.6.43

Information from U. S. G. Ltd. Date received 1760

Examined by _____

(For Survey use only)

6-inch Map Registered No.

DECLASSIFIED

SK/92 SE/36

Nat. Grid Reference

9855. 2315

1" N.S. Map
No.

143

1" O.S. Map
No.

►

Confidential
or not

SPECIMEN NUMBERS AND ADDITIONAL NOTES

[illegible]



GEOLOGICAL SURVEY OF GREAT BRITAIN
RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

38

Name and Number given by owner:

Sd 17a

For whom made

United Steel Co. Ltd.

Town or Village

Longfield

County

Derby.

Exact site

(Attach a tracing from a map, or a sketch-map, if possible.)

Purpose for which made

Ironstone

Ground Level at shaft bore

relative to O.D. 305.7 ft.

If not ground level give O.D. of beginning of shaft bore

Made by

Information from

U.S.Co. Ltd.

Examined by

(For Survey use only)

6-inch Map Registered No.

DECLASSIFIED

SK/92SE/38

Nat. Grid Reference

9856.2257

1°N.S. Map No.

143

1°O.S. Map No.

Confidential or not

Yes

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only)
GEOLOGICAL CLASSIFICATION

DESCRIPTION OF STRATA

THICKNESS

Ft

M.

DEPTH

Ft

M.

UES

Boulder Clay

- ?VE

16.0

16.0

Clay

2.0

18.0

limestone

7.0

25.0

Clay

13.0

38.0

limestone

92.0

131.0

LL

Clay (stony) (very lumpy)

3.0

134.0

Regione

5.0

139.0

LB

L. Limestone clay

7.0

146.0

NSE

Ironstone

15.0

161.0

ULL

Clay

4.0

165.0

GEOLOGICAL SURVEY OF GREAT BRITAIN
RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

51

Name and Number given by owner:

NW 231

For whom made United Steel Co. Ltd.

Town or Village Swayfield

County..... *Lincoln*

Exact site

Attach a tracing from a map, or a sketch-map, if possible.

Purpose for which made Iron ore (Northants. Land)

Ground Level at shaft base relative to O.D. 302.7 ft

If not ground level give O.D. of beginning of shaft bore

Made by U. S. G. Ltd.

Date of sinking 6-11-59 - 12-4-59

Information from U.S. G. L. L.

Date received 18.3.80

Examined by

SPECIMEN NUMBERS AND ADDITIONAL NOTES

DECLASSIFIED

[illegible]



Notific. No:- 5N12556

SK/92SE/60

ORE MINING BRANCH of THE UNITED STEEL COS. LTD. Colsterworth/Scunthorpe			EXPLORATION RECORD		Hole No. GH 191		
O.S. Sheet Ref. L 131/14		Lease Cholmeley		Area Easton Mine		Date Started 1.8.63.	
Position O.S. 211 96522468 East of Easton Wood					Date Completed 18.8.63.		
GEOLOGICAL LOG					DRILL LOG		
Depth From	Feet To	Thick. Ft.	Description	Geological Horizon	CROWNS USED		
0.0	15.3	15.3	Boulder Clay	Recent	Size	No.	Feet
15.3	32.0	16.7	Lincs Limestone) Upper Lincs Limestone	Inferior Oolite Series	131	HMB	18.0
32.0	35.0	3.0	R.Crossi)		116	HMB	16.0
35.0	76.7	31.7	Lincs. Limestone) Lower		101	HMB	58.0
76.7	77.5	0.8	Clay Parting) Lincs		101	620397	28.0
77.5	87.0	9.5	Ragstone) Limestone				
87.0	95.0	8.0	Lower Estuarine Clay				
95.0	108.0	13.0	Light & Dark grey oolite) Northants	Upper Lias	REAMERS USED		
108.0	109.0	1.0	Light grey sandy beds) Sands Bed		Size	No.	Feet
109.0	113.5	4.5	Light Grey limey beds)				
113.5	114.0	0.5	Basal Beds)				
114.0	120.0	6.0	Upper Lias Clay		CASING USED		
					Size	Set (Ft.)	Recovered (Ft.)
					128	30.0	30.0
					Water Used 10,000		
					Rest Water Level		
					80'		
					LEVELS		
					Surface	316.4	
					Top 1'st.	221.4	
					Bottom 1'st.	202.4	
					Signed		
					R.J.M. Dixie		

OMB, 108, P. & H. 11/63.



HOLE No. CH 191				ASSAY RECORD						DRY ANALYSIS		
Lab. No.	% Core Recovery	Type	Thick. of Type	Depths		Loss %	Iron %		Alumina %	Lime %	Silica %	Sulphur %
				From	To		Total	Ferrous				
1.				95'	96'		23.9			3.9	30.2	1.759
2					97'		28.0			4.9	20.2	1.683
3					98'		34.4			6.1	9.0	.371
4					99'		35.9			4.9	8.4	.625
5					100'		34.2			5.3	8.7	.192
6					101'		34.0			4.9	9.9	.137
7					102'		35.2			4.2	8.3	.007
8					103'		35.0			4.2	10.1	.014
9					104'		33.1			5.2	11.5	.055
10					105'		32.5			4.3	13.8	.027
11					106'		29.9			3.9	18.5	.131
12					107'		27.0			3.5	27.3	.728
13					108'		22.1			2.6	37.9	.584
14					109'		13.6			7.5	46.9	.261
15					110'		9.3			23.2	30.3	.309
16					111'		22.4			15.7	13.7	.474
17					112'		22.0			17.7	12.0	.701
18					113'		15.2			24.7	14.9	.632
19				113'	114'		16.6			17.1	22.1	1.031
Date Logged _____ Date Analysed _____ Signed <u>R. J. M. Dixie</u>				TOTALS								
				Top								
				Middle								
				Bottom								
				TOTAL								
AVERAGES	Top		Thick.	From	To							
	Middle											
	Bottom											
	TOTAL											



SK 92 SE/81

982 240

143/27 C

For strata use only
GEOLOGICAL
CLASSIFICATION
F.B.A. with X 41

NATURE OF STRATA

If measurements start below
ground surface, state how far...

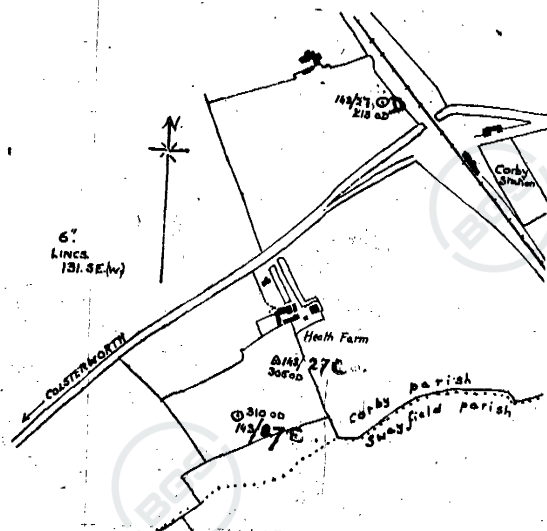
THICKNESS DEPTH
Feet inches Feet inches

Soil
Clay
Sand
Limestone
Sandstone
Clay
Sandstone
Clay

2
4
6
100
30
10
10
4
2
6
12
112
142
152
162
166

143

DECLASSIFIED





RECORD OF WELL (SHAFT OR BORE)

At Cowby Heath

Town or Village

County Leics Six-inch quarter sheet 131 SE (W)

For Mr. Paravicini

Exact site of well (Tracing)
4 1/2 ft. NW SK 92SE 9823 2404

a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) 305 feet.

Is well-top at ground level? Yes If not, state how far above ; 305 feet.
below ;

Shaft ft., diameter ft. Details of headings

Bore ft. ; diameter of bore : at top ins. ; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes

Water struck at depths, below well-top, of (feet)

TEST DETAILS Rest-level of water ft. above well-top. Suction at ft. Yield on hours' days' pumping gallons per (max. capacity of pump g.p.h.),
Year 1925 with depression of feet. Recovery to in mins. hours.

WORKING CONDITIONS Rest-level of water in (month), (year), ft. above well-top.
Highest in (month), (year), ft. above below
Lowest in (month), (year), ft. above below
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins. hours

Quality of water (attach copy of analysis if available)

Well made by J. T. BARNES & son, Date of well Oct 1925

Information from SLEAFORD

do
ADDITIONAL NOTES.

Failure.

No. 1 Bore.

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.	Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map. on 6" Map.	
			<u>143</u>	<u>70</u>	<u>Δ</u>	<u>Δ</u>

(For Survey use only)

GEOLOGICAL CLASSIFICATION

F&A with X+1

NATURE OF STRATA

If measurements start below ground surface, state how far... ..

	THICKNESS		DEPTH	
	Feet	Inches	Feet	Inches
Soil	2	-	2	-
Boulder Clay	4	-	6	-
? at bottom Mud. pebbly	6	-	12	-
Lincs. Lst.	100	-	112	-
Mud's Sand (w. bit n. Iron)	30	-	142	-
Upper Linc.	10	-	152	-
[Limestone]	10	-	162	-
Clay	4	-	166	-



SK 92 SE 83
9817 2394

143/27 =

(For Survey use only)
GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

If measurements start below
ground surface, state how far...

THICKNESS
~~Feet~~ ~~Inches~~
... FT ... FT

DEPTH
~~Feet~~ ~~Inches~~
... FT ... FT

Soil
Boulder clay
U. Limestone
Limestone
F.A.O.W.

Clay
Mud
Rock

1	1
26	27
4	31
80	111



RECORD OF WELL (SHAFT OR BORE)

NGR SK 92 SE (8) 9816 2394

At Heath Farm

Town or Village Cotby

County Lincs Six-inch quarter sheet 131 SE/W

For Mr. Col. P.F. de C. Panavicius Birkholme House.

Exact site of well [Tracing on map] [c. 740 yds SW of dy station and 230 yds S.W. of farm yard, in a field]

Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) 310 feet.

Is well-top at ground level? If not, state how far above ; feet.

Shaft ft., diameter ft. Details of headings

Bore /// ft. ; diameter of bore : at top ins. ; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes

Water struck at depths, below well-top, of (feet)

TEST DETAILS Rest-level of water — 94 ft. — above (F.B.A.W.) well-top. Suction at ft. Yield on 8 hours' pumping — 900 — gallons per hour * (max. capacity of pump g.p.h.),
Month with depression of feet. Recovery to in mins. hours.

WORKING CONDITIONS Rest-level of water in (month), (year), ft. above well-top.
Highest in (month), (year), ft. above well-top.
Lowest in (month), (year), ft. above well-top.
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins. hours.

Quality of water (attach copy of analysis if available)

Well made by J.E. Nettle, Thimby, Broom Date of well April 1941

Information from J.E.N. per F.B.A. Welch

ADDITIONAL NOTES.

* "Has now gone down to 200 g.p. L.V. (J.E.N. over 41). But former was F.B.A.W. but on 8 hrs. but with 2 3/4" pipe the yield was 350 g.p. L.V."

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked on 1" Map.	(use symbol) on 6" Map.
17.8.41		143			

Contact BGS: ngdc@bgs.ac.uk

For Survey use only)

GEOLOGICAL
 CLASSIFICATION
 F.B.A. Welch x 41

Bo. clay 6' }
 1/2" silt clay, 10' }
 Limer - Lst
 almost nothing
 Lr Est. Clay
 North ^{to} Sandh. Ironr.
 Up Lins

NATURE OF STRATA.

If measurements start below
ground surface, state how far... ..

Clay
Rock
Clay
Sandstone
Clay

THICKNESS

Feet Inches

16
86
4
15
27

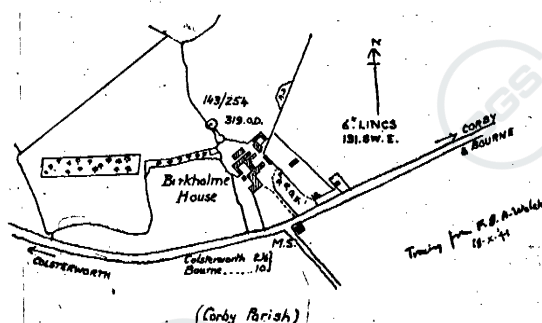
REPORT

feet inches

16
102
17.
121
148

SK 92 SE/88

9684 · 2359





RECORD OF WELL (SHAFT OR BORE)

SK92/19A

143

254A

At _____
Town or Village Cowby (Birkholme hamlet)
County Lincoln Six-inch quarter sheet 131 SW(E)
For Mr. Col. Paravicini

Exact site of well (Tracing) A & B NW SK 92 SE 9683 2359

(Attach a tracing from a map, or a sketch-map, if possible.)

Level of ground surface above sea-level (O.D.) 315 feet.

Is well-top at ground level? _____ If not, state how far above ; _____ feet.
below ; _____ feet.

Shaft _____ ft., diameter _____ ft. Details of headings _____

Bore _____ ft. ; diameter of bore : at top _____ ins. ; at bottom _____ ins.

Lengths, diameters, perforations, etc., of lining tubes 47' x 1 1/2" (1/2")

Water struck at depths, below well-top, of (feet) _____

TEST DETAILS { Rest-level of water 104 ft. ~~above~~ below well-top. Suction at _____ ft. Yield on _____ hours' days'
Month _____ pumping _____ gallons per _____ (max. capacity of pump _____ g.p.h.),
Year _____ with depression of _____ feet. Recovery to _____ in _____ mins. hours.

WORKING CONDITIONS { Rest-level of water in _____ (month), _____ (year), _____ ft. above below well-top.
Highest „ in _____ (month), _____ (year), _____ ft. above below „
Lowest „ in _____ (month), _____ (year), _____ ft. above below „
Suction at _____ ft. Rate of pumping _____ galls. per _____ for _____ hours per day.
with average depression of _____ ft. Recovery to _____ in _____ mins. hours

Quality of water (attach copy of analysis if available) _____

Well made by J. T. BARNES & son, Date of well 1921
SLEAFORD-
Information from _____

ADDITIONAL NOTES.

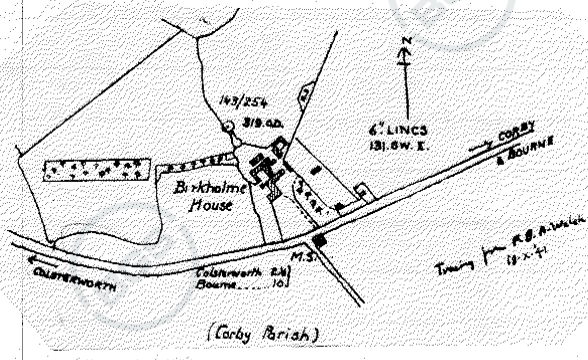
see Tracing overleaf.
Only source of water - supplies several houses.
1000 gals/week.
Very hard water.
Never has run dry but gets lower in dry periods.
Visited site checked on June 131 SW(E)
H651 CS
Owner Squadron Leader J. H. Lewis
O.D. 315

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map. on 6" Map.	
		143		○	○



(For Survey use only) GEOLOGICAL CLASSIFICATION y F.O.A. Walk x 4	NATURE OF STRATA If measurements start below ground surface, state how far... ..	THICKNESS		DEPTH	
		Feet	Inches	Feet	Inches
Bo. Clay 6' } Up. Br. Clay 10' }	Clay	16		16	—
Lines - Lutr (abundantly thin)	Rock	86		102	
Lo. Est. Clay	Clay	4		106	
N. M. S. S. Int.	Sandstone	15		121	
Up. Lins	Clay	27		148	
					



NGRC
BOREHOLE RECORDS
ADJUSTMENT FORM

QUARTER SHEET SK92 SE

BH REGISTRATION NUMBER 95 - 101

~~NUMBER NOT USED~~ / ~~! LOG MISSING !~~
(Delete as appropriate)

Records entered and held in Wallingford

BH REGISTRATION NUMBER(S)



1063 W.L. 22438/0384 10m 7/45 (51) F.&S.

RECORD OF WELL (SHAFT OR BORE)

At Col. de PARAVI^CINI CORLEY

Town or Village BIRK HOLME

County Six-inch quarter sheet

For Mr. _____

Exact site of well _____

(For Survey use only)

1-inch Map Registered No.

143 SK92/19
254

Attach a tracing from
a map, or a sketch-
map, if possible.

Level of ground surface above sea level (O.D.) _____ ft. If well-top is not at ground level, state how far _____ (above; Below; _____ ft.)

SHAFT _____ ft.; diameter _____ ft. Details of headings _____

BORE _____ ft.; diameter of bore: at top _____ ins.; at bottom _____ ins. Lengths, diameters, perforations, etc., of lining tubes _____

Water struck at depths below well top, of (feet) _____

Rest-level of water _____ ft. above well-top. Suction at _____ ft. Yield on _____ hours' pumping, _____ gal. per _____ with depression to _____ ft. below well-top. Capacity of pump _____ g.p.h. Recovery to rest level in _____ mins. Date of measurements _____ Date of well 1941

Quality of water (attach copy of analysis if available) _____

Well made by NOBLE of Thimbley

Information from ditto

Additional notes in space overleaf.

(For Survey use only)

GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

THICKNESS

DEPTH

Feet Ins.

Feet Ins.

If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far

Soil
Clay
sand
Rock

1
26
4
80

1
27
31
111

Continued over leaf

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date
received

504

Correspond-
ence File No.

1" N.S. Map
No.

143

1" O.S. Map
No.

Site marked (use symbol)
on 1" Map on 6" Map



NGRC
BOREHOLE RECORDS
ADJUSTMENT FORM

QUARTER SHEET SK92 SE

BH REGISTRATION NUMBER 95 - 101

~~NUMBER NOT USED~~ / ~~! LOG MISSING !~~

(Delete as appropriate)

Records entered and held in Wallingford

BH REGISTRATION NUMBER(S)

NW SK 92 SE 9750 2356.

CORBY

3. At Birkholme Cottages, 1 mile S.W. of Heath Farm, 265 feet above O.D.
Communicated by Mr. Preston.
Contained 1 foot of water.

prob. lower	Lincolnshire Limestone	about	Ft.
est. series	Upper Lias Clay	about	35
			2
			37½

143
35
SK92/20

At Sharps Farm.

Only used for watering stock.

House gets water from Birkholme Reservoir.

O.D. 287.

Information from a farmer near of Heath Farm.

Visited noted by O on lines 131 SW/E.

20.6.51. C.S.

N



NGRC
BOREHOLE RECORDS
ADJUSTMENT FORM

QUARTER SHEET SK92 SE

BH REGISTRATION NUMBER 95 - 101

~~NUMBER NOT USED~~ / ~~! LOG MISSING !~~
(Delete as appropriate)

Records entered and held in Wallingford

BH REGISTRATION NUMBER(S)



RECORD OF WELL (SHAFT OR BORE)		For Survey use only	
(attach copy of analysis if available)		N. <u>143</u> SK92/36	
At <u>Corby Glen Railway Station</u>		<u>407</u>	
EXACT SITE OF WELL	Town or Village <u>Corby</u>		
	County <u>Lincs</u>	Six-inch quarter sheet <u>131 SE W.</u>	
	For <u>British Transport Commission</u> State whether owner, tenant, builder, contractor, consultant, etc. :- <u>Region</u>		
	Address (if different from above) <u>c 240/150?</u>		
	Level of ground surface above sea-level (O.D.) <u>200</u> ft.	If well-top is not at ground (above ; level, state how far <u>below</u> <u>3.9</u> ft.	
	SHAFT <u>94</u> ft. ; diameter <u>4</u> ft. ;	Details of headings	
	BORE <u>110</u> ft. ; diameter of bore : at top <u> </u> ins. ; at bottom <u> </u> ins.		
	Details of permanent lining tubes		
	Water struck at depths of <u> </u> ft. below well-top.		
TEST CONDITIONS	Rest-level of water <u>85.9</u> ft. <u>above</u> well-top. Suction at <u> </u> ft. Yield on <u>one</u> hours' test pumping at <u>334.8</u> galls. per <u>hour</u> with depression to <u>86.9</u> ft. below well-top.		
	Recovery to rest-level in <u>30</u> mins. Capacity of pump <u>300</u> g.p.h. Date of measurements <u>21.8.54</u>		
NORMAL CONDITIONS	Description of permanent pumping equipment :		
	Make and/or type <u>Submersible Pump</u> Motive power <u>Electricity</u>		
	Capacity <u>300</u> gallons per hour. Suction at <u>110</u> ft.		
	Amount pumped <u>66</u> galls. per day. Estimated consumption <u>400</u> galls. per week.		
	Well made by <u> </u> Date of well <u> </u>		
	Information from <u>Brit. Transport Commission - Eastern - N.E. Region</u>		
	ADDITIONAL NOTES <u>WG/GW7 Cdr</u> <u>date 2/11/54</u>		
	<u>36 Return 1962.</u> <u>Pumping plant abandoned and well filled in</u> <u>on 14 January 1962.</u> <u>WGS 1/11/63</u>		
LOG OF STRATA OVERLEAF.			
GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.		Date Received <u>3/11/54</u>	1" O.S. Map No. <u> </u> Site marked (use symbol) on 1" Map <u> </u> on 6" Map <u> </u>

Contact BGS: ngdc@bgs.ac.uk



BGS ID: 246651 : BGS Reference: SK92NE42
British National Grid (27700) : 497710,325390

GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

42

Name and Number given by owner:

Ch. 29

For whom made United Steel Co. Ltd.

Town or Village Parish of Burton Coggles County Lincolnshire

Exact site	Attach a tracing from a map, or a sketch-map, if possible.
------------	--

Purpose for which made. *To prove iron ore (Northants. Ironstone)*

Ground Level at ^{shaft} ~~here~~ relative to O.D. 242.4 ft. If not ground level give O.D. of beginning of ^{shaft} ~~here~~

Made by ^{bore} *United Steel Cos. Ltd.*

Information from United Steel Cos. Ltd.

Examined by..

(For Survey use only)

6-inch Map Registered No.

131 58

SK/92NE/42

Nat. Grid Reference

9771. 2539

17 N.S. Map	1 O.S. Map	Confidential
No. DECLASS	No.	or not

D643

Dist. in shaft

Date of sinking

Date received

SPECIMEN NUMBERS AND ADDITIONAL NOTES

[illegible]



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

30

(For Survey use only)

6-inch Map Registered No.

DECLASSIFIED

Name and Number given by owner:

Pi 5

Nat. Grid Reference

9829. 2463

For whom made

United Steel Co. Ltd.

Town or Village

Hayfield

County

Northants.

Exact site

(Attach a tracing from a map, or a sketch-map, if possible.)

1" N.S. Map No.

143

1" O.S. Map No.

Confidential or not

Purpose for which made

Ironstone

Ground Level at shaft bore relative to O.D.

247.4 ft

If not ground level give O.D. of beginning of shaft bore

Made by

Date of sinking 15/43 - 5/5/43

Information from

U.S.G. Ltd.

Date received

1960

Examined by

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only)
GEOLOGICAL
CLASSIFICATION

DESCRIPTION OF STRATA

THICKNESS

Ft

in.

DEPTH

Ft

in.

Limestone

80

0

80

0

Regstone

14

0

94

0

L. Etanria

4

0

98

0

Ironstone

18

0

116

0

Uli

1

0

117

0

GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

48

Name and Number given by owner:

CL. 28.

For whom made United Steel Co. Ltd.

Town or Village *Parish of Burton Coggles* County *Lincolnshire*

Exact site Attach a tracing from
a map, or a sketch-
map, if possible.

Purpose for which made To prove iron ore (Rustic. Ironstone)

Ground Level at ~~shaft~~^{base} relative to O.D. 266.2 ft. If not ground level give O.D. of beginning of ~~shaft~~^{base}

Made by ^{Done} United Steel Co. Ltd.

Information from United Steel Co. Ltd.

Examined by..

(For Survey use only)

6-inch Map Registered No.

DECLASSIFIED

131 SW

SK/92JE/48

Nat. Grid Reference

9718. 2493

1" N.S. Map
No.

1" O.S. Map
No.

Confidential
or not

143

16.

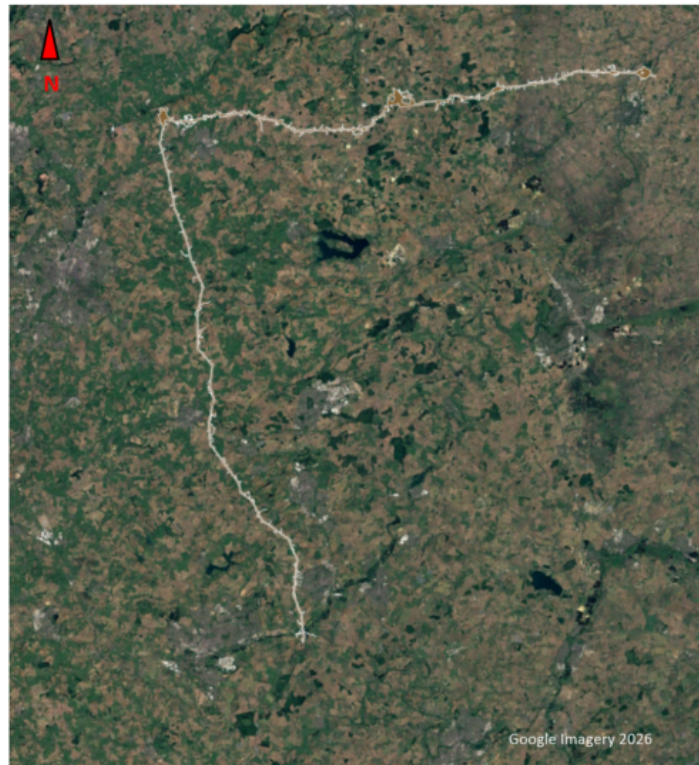
Yes.

SPECIMEN NUMBERS AND ADDITIONAL NOTES

[illegible]

C. UXO Desk Study

Appendix C Preliminary UXO Deskstudy Report



Preliminary UXO Risk Assessment

FIG Reference: 4363R

Client: AECOM

Project: Surfleet

Site Location: Surfleet

Date: 23 June 2026

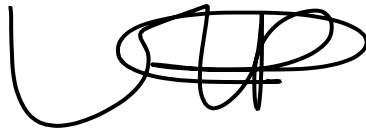
Document Control

Version Date	Version	Author	Reviewer	Comments
23 Jun. 26	1.0	Mark Khan AIEspE	Vicky Harper	Original

Quality Check

Version Date	Version	Approved by	Comments
23 Jun. 26	1.0	Carl Parnell MIEspE	QC / format check

Document Approval

	Reviewed by	Approved by
Signature		
Print Name	Vicky Harper	Carl Parnell MIEspE
Date	23 June 2026	23 June 2026

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4. UXO Risk Analysis	4
5. Identified Potential UXO Risk at this Site.....	5
6. Risk Mitigation Options.....	7

1. References

- A. CIRIA Report C681 – UXO – A guide for the construction industry (2009)
- B. CIRIA Report C785 – UXO risk management guide for land projects (2019)

2. Site Location

The site comprises an electric cable route with associated infrastructure running from Northamptonshire in the south, north through Leicestershire and east through Lincolnshire.

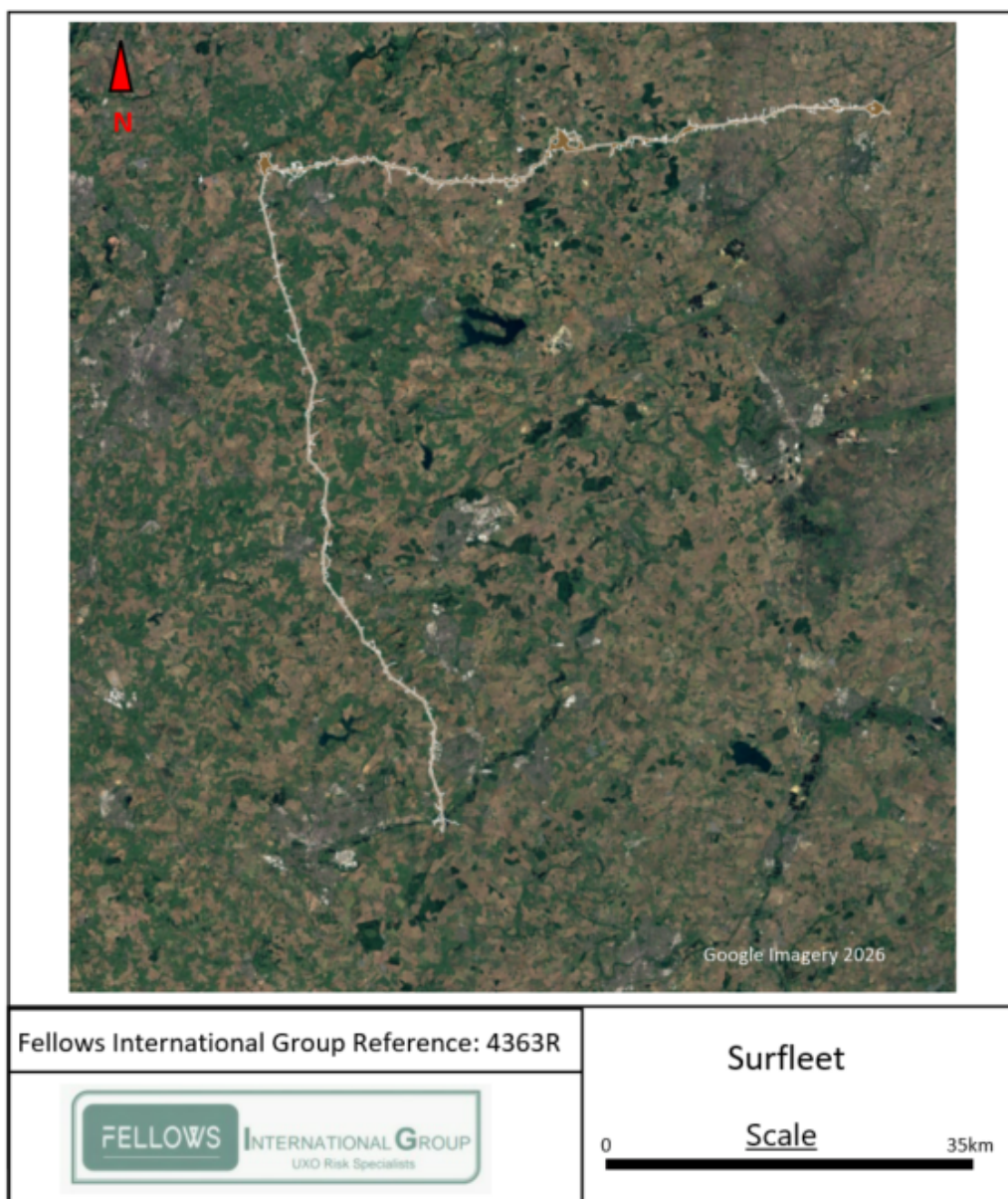


Figure 1. Showing the site area. (Google Earth).

3. Introduction

The purpose of this Preliminary UXO Risk Assessment is to establish the likelihood of encountering ~Unexploded Ordnance (UXO) on this site. If a UXO risk is identified, risk mitigation recommendations will be provided to allow the client to make an informed decision as to future procedures which will reduce the UXO risk to as low as reasonably practicable (ALARP).

4. UXO Risk Analysis

Fellows International Group Ltd utilises a research methodology using extensive archival (internal and public domain) content as well as a wide range of other available resources.

This includes the use of:

- Satellite imagery
- Historic Mapping
- Air Photography
- Historical Resources
- Archival Materiel
- Specialist Publications
- First world War UK Bombing Data
- Second World War UK Bombing Data.

This methodology identifies military or other potential UXO related activity that may influence risk of encounter with UXO. What are deemed to be potential UXO influences that may directly affect the site are identified within a 5km buffer of the site.

FIG does not use any form of artificial intelligence (AI) in relation to research carried out to produce this report.

5. Identified Potential UXO Risk at this Site

Potential UXO Source	Remarks
WW2 Aerial Bombing	Bombing activity gives rise to the potential existence of undiscovered unexploded bombs. Initial research has identified WW2 bombing in proximity to the site.
Military Training Areas/Firing Ranges	Military Training Areas/Firing Ranges are used for various types of military training and practice with various types of weapons systems. Initial research has identified WW2 firing range in proximity to the site.
Military Airfields	Military airfields were sometimes subjected to attack and are also related to military activity. This can result in potential encounter with UXO in areas located in proximity to an airfield site. Four military airfields have been identified in proximity to the site.
Bombing Decoy Sites	RAF and Royal Navy decoy sites were constructed in the vicinity of legitimate targets to deceive and decoy enemy bombers. For obvious reasons, such sites were often built in remote and uninhabited areas. Some were more successful than others and received relatively high bombing rates. Three decoy sites have been identified in proximity to the site.
Explosive Ordnance Clearance (EOC) Tasks & Reports	EOC tasks are potential indicators of the existence of legacy munitions. There are records of five post-war explosive ordnance clearance tasks and in proximity to the site.
Ordnance Factory/Ordnance Storage Facilities	Ordnance factories were responsible for the manufacture of arms and ammunition, and ordnance storage facilities were used for storing of live munitions. An ordnance factory and an ordnance storage facility have been identified in proximity to the site.

Table 1. Summary of potential UXO risk Identified.

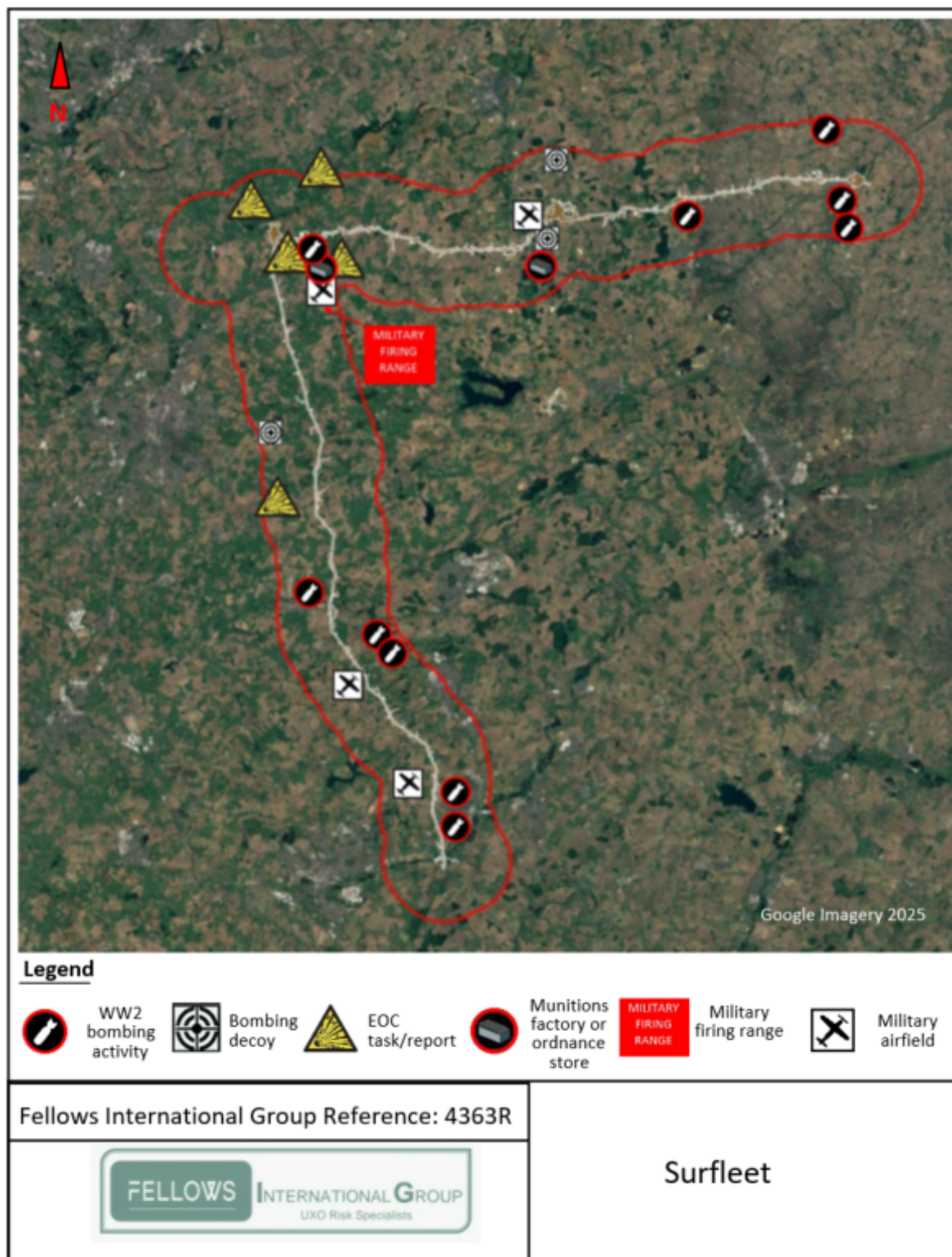


Figure 2. Showing the location of potential UXO risk Identified in proximity to the site. The 5km buffer is shown in red.

6. Risk Mitigation Options

It is assessed that there is a potential risk of encountering UXO at this site.

We recommend that a Detailed UXO Risk Assessment be produced for this site. Fellows International Group Ltd. would be pleased to offer a proposal with quotation to undertake these works and any further UXO risk mitigation processes required for this project.

This assessment has been produced for AECOM and has been completed without the benefit of knowing the exact intentions of third parties and should therefore not be used by such organisations without prior consultation with Fellows International Group Ltd.

Our assessment relies upon the accuracy of the information contained in the documents and resources consulted on the date of production. Fellows International Group can in no way be held responsible for the accuracy of such information or data supplied or for any hazard encountered at the site due to import of materials after this date.

Fellows International Group is recognised as one of the leading UXO Risk Management companies specialising in UXO Risk Assessments, Site Survey, Ground Investigation Support and UXO Awareness Training.

Conducting these operations requires not only the most experienced field staff, but also dedicated and experienced project management. Careful planning and co-ordination are needed from start to finish, backed up by detailed operational procedures. With many years' experience, Fellows International Group has built up a reputation for reliability, whatever the risk. In recognition of our commitment to the quality of our work and the health and safety of our workforce.

D. Walkover Record

Appendix D Walkover Record

The Great Grid Upgrade

Weston Marsh to East Leicestershire

Appendix D - Site Survey Report

Geotechnical and Geoenvironmental Walkover

April 2026

nationalgrid

1. Introduction

1.1 Purpose of this document

- 1.1.1 This document presents an Fieldview output table, showing the photos and field notes captured during a walkover by AAJV Engineers. The field observations are contextualised against the desk-based risks as apart of Section 7 in the AAJV Phase 1 Geotechnical and Geo-environmental Information Report.
- 1.1.2 This report is not a standalone document, it is to be read as an Appendix to the AAJV Phase 1 Geotechnical and Geo-environmental Information Report for WMEL Substation A.

1.2 Site Reconnaissance Output

- 1.2.1 The walkover was undertaken on by a pair AAJV engineers on the 15th of April 2026, one engineer being a geo-environmental specialist and the other representing geotechnical.
- 1.2.2 Walkover Features are labelled in the format GGP-GI-Pt-XX, with XX representing a feature number. Locations of walkover records are show in Figure 7, labelled with their corresponding feature number.
- 1.2.3 The proposed site reconnaissance route was developed to DF1.5 Boundaries and was agreed with landowners prior to issue of DF2.0A. Site reconnaissance was undertaken following the access routes agreed by AAJV with the respective landowners, with the only deviation being due to site engineers being unable to access the western most agreed route due to the land parcel being used to keep livestock (Bull signage).
- 1.2.4 Weather during site reconnaissance was noted as being a moderate temperature and outcast, but with no rain.
- 1.2.5 Table D.1 reports the observations made by AAJV staff on the field, using the FUSE Fieldview platform, alongside photos taken during the walkover. See Section 7 of the AAJV Phase 1 Geotechnical and Geo-environmental Information Report for more detailed discussion on the observations, with further context from desk-based research and discussion on their relevance to the site
- 1.2.6 GGP-GI-Pt-1 and GGP-GI-Pt-2 have been excluded from Table D.1 as they were utilised to check the operation of the Fieldview software prior to the walkover, therefore didn't contain any relevant information on the site. Namely:

Table D.1 Site Reconnaissance Output

Walkover Feature ID	Feature Category	Field Notes	Photo ID	Photo
GGP-GI- Pt-3	Utility	Overhead services adjacent to the right of access track when looking North. Approximately 5 m at its closest.	3a	

GGP-GI-Pt-3	Utility	Overhead services adjacent to the right of access track when looking North. Approximately 5 m at its closest.	3b
-------------	---------	---	----



GGP-GI-Pt-4	Infrastructure / Potential Contamination Source	A railway (active railway) embankment runs adjacent to the left of the access track when looking north, as marked on current mapping.	4a
-------------	---	---	----



GGP-GI-Pt-5

Utility

Overhead electricity
services crossing access
path c.5m above ground.

5a



GGP-GI-Pt-6	Potential Contamination Receptor	Potential well no observable from permitted walkover access path.	6a
-------------	----------------------------------	---	----



GGP-GI-Pt-7	Structure / Potential Contamina tion Source	Barn confirmed present as shown on mapping. Evidence of farm machinery and miscellaneous waste, however no obvious ACM in waste. Barn likely constructed from asbestos sheets.	7a
-------------	--	--	----



GGP-GI-Pt-7	Structure / Potential Contamina tion Source	Barn confirmed present as shown on mapping. Evidence of farm machinery and miscellaneous waste, however no obvious ACM in waste. Barn likely constructed from asbestos sheets.	7b
-------------	--	--	----



GGP-GI-Pt-7	Structure / Potential Contamina tion Source	Barn confirmed present as shown on mapping. Evidence of farm machinery and miscellaneous waste, however no obvious ACM in waste. Barn likely constructed from asbestos sheets.	7c
-------------	--	--	----



GGP-GI-Pt-8	Potential Contamination Source	Open oil tank "Tellus Oil". Appears old with no effect to surrounding vegetation. Behind fence adjacent to the railway.	8a
-------------	--------------------------------	---	----



GGP-GI-Pt-9

-

Drainage tunnel running
underneath railway
embankment.
Approximately 0.75m
diameter.

9a



GGP-GI-Pt-9

-

Drainage tunnel running
underneath railway
embankment.
Approximately 0.75m
diameter.

9b



GGP-GI-Pt-10	Other	General view of agricultural land. Sloping upwards. Picture taken North from walkover route.	10a
--------------	-------	--	-----



GGP-GI-Pt-11	Potential Contamination Source	Potential worked ground not visible from walkover route.	11a
--------------	--------------------------------	--	-----



GGP-GI-Pt-12	Other	Active bird scarer, facing towards walkover route/path. Pass with caution.	12a
--------------	-------	--	-----



GGP-GI-Pt-13	Surface Water Feature	Dense Copse of Trees and Pond. Picture taken looking east. Approx 20m *10m. The pond is shown on aerial mapping and matches mapped location. Shallow downwards sloping banks towards the water. Most banks heavily vegetated. Turbid water. No evidence of odour, oil, gas bubbles etc. Dense aquatic vegetation and algae present.	13a
--------------	-----------------------	---	-----



GGP-GI-Pt-14	Access	Public footpath access to walkover route. Restricted byway to the east and west of northern extent of the walkover route.	14a
--------------	--------	--	-----



GGP-GI-Pt-
15

Other

Permanent “shooting in
progress” sign, advising
to keep to public
footpaths.

15a



GGP-GI-Pt-
16

Potential
Contamina
tion Source

Evidence of potential
spill/ponding. Proximate
to existing electricity
tower.

16a



GGP-GI-Pt-
16

Potential
Contamina
tion Source

Evidence of potential
spill/ponding. Proximate
to existing electricity
tower.

16b



GGP-GI-Pt-17	Access	Continuation of public access to the North (Lincolnshire County Council).	17a
--------------	--------	---	-----



GGP-GI-Pt-
18

-

Public footpath access
(Lincolnshire County
Council). Picture taken
facing north.

18a



GGP-GI-Pt-19	Potential Contamination Source	Manure Pile. Evidence of run-off. Twenty meters north of northern extent of walkover path.	19a
--------------	--------------------------------	--	-----



GGP-GI-Pt-20	Surface Water Feature / Potential Contamination Source	Surface watercourse and historical pit identified in DTS not visible from walkover route.	20a
--------------	--	---	-----



GGP-GI-Pt-
21

Surface
Water
Feature

Evidence of a shallow
dried-up pond (approx.
2*5m) which is part of the
field boundary drainage
channel at the location of
an “historical pond”
identified in DTS. No
evidence of made
ground, excluding dense
nettle patches.

21a



GGP-GI-Pt-
21

Surface
Water
Feature

Evidence of a shallow
dried-up pond (approx.
2*5m) which is part of the
field boundary drainage
channel at the location of
an "historical pond"
identified in DTS. No
evidence of made
ground, excluding dense
nettle patches.

21b



GGP-GI-Pt-
21

Surface
Water
Feature

Evidence of a shallow
dried-up pond (approx.
2*5m) which is part of the
field boundary drainage
channel at the location of
an “historical pond”
identified in DTS. No
evidence of made
ground, excluding dense
nettles patches.

21b



GGP-GI-Pt-22	Potential Contamination Source	Pond and evidence of Ironstone Resource Area not visible from current walkover route. Picture taken facing north. This may be superseded when accessing the walkover route on the other side of the hedgerow.	22a
--------------	--------------------------------	---	-----



GGP-GI-Pt-23	Mining / Potential Contamination Source	Location of disused pit is now agricultural land with no evidence or presence (image 23b taken facing west). Field boundary drainage is approx. 3m deep with dense vegetation adjacent to the proposed location of the disused pit (image 23d facing east).	23a
--------------	---	---	-----



GGP-GI-Pt-23	Mining / Potential Contamination Source	Location of disused pit is now agricultural land with no evidence or presence (image 23b taken facing west). Field boundary drainage is approx. 3m deep with dense vegetation adjacent to the proposed location of the disused pit (image 23d facing east).	23b
--------------	---	---	-----



GGP-GI-Pt-23	Mining / Potential Contamination Source	Location of disused pit is now agricultural land with no evidence or presence (image 23b taken facing west). Field boundary drainage is approx. 3m deep with dense vegetation adjacent to the proposed location of the disused pit (image 23d facing east).	23c
--------------	---	---	-----



GGP-GI-Pt-23	Mining / Potential Contamination Source	Location of disused pit is now agricultural land with no evidence or presence (image 23b taken facing west). Field boundary drainage is approx. 3m deep with dense vegetation adjacent to the proposed location of the disused pit (image 23d facing east).	23d
--------------	---	---	-----



GGP-GI-Pt-24	Structure / Potential Contamination Source	Evidence of bricks and concrete boulders. Appears to be part of a path running adjacent to the west of the field boundary. Potential evidence of made ground or remanence of a structure	24a
--------------	--	--	-----



National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com