Great North Road Solar and Biodiversity Park

Environmental Statement Report

Volume 4 – Technical Appendices

TA A10.3 – Desk Study and Preliminary Risk Assessment Study - Area 3

Document reference – EN010162/APP/ 6.4.10.3

Revision number 1

June 2025

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, APFP Regulation 5(2)(a)

Contents

A10.3.1. INTRODUCTION

A10.3.1.1 PREAMBLE

1 RPS Consulting Services Ltd (RPS) was commissioned by Elements Green Trent Ltd to undertake a Phase 1 Desk Study and Preliminary Risk Assessment (DTS and PRA) of The Great North Road Solar and Biodiversity Park (GNR; "the Development"), within the Order Limits. The report has been commissioned prior to the submission of the application for DCO consent for the Development.

2 The Development would be located to the north-west of Newark, in the Newark and Sherwood district, Nottinghamshire, East Midlands. The Development would be within an area bound by the Order Limits. The Order Limits are to the west of the A1, north of the A617, east of Eakring, and south of Egmanton, to the north and north-west of Staythorpe. The Development essentially consists of discrete land parcels proposed to be occupied by solar PV panels, BESS and associated infrastructure, and connected by cable route areas. The eastern side of the Development runs from the north of Norwell to Egmanton in the north (with additional parcels of land for mitigation/enhancement around North Muskham). The western side of the Development runs north-west from Staythorpe Power Station and then splits at Maplebeck, with spurs running to Eakring in the north-west and Kneesall to the north-north-east, then connecting with the eastern side of the Development.

3 A plan showing the location and Order Limits for the Development is provided as Figure 10.1: Site Desk Study Zoning Plan in Volume 2 Chapter 10 – Ground Conditions and Land Contamination [EN010162/APP/6.2.10]. In order to provide sufficient detail for the PRA, the Development has been subdivided by RPS into eight study areas (referenced as Study Areas 1 – 8). It should be noted that the split of the Study Areas are based on the previous Order Limits for PEIR and therefore the DTS and PRA presents an assessment of an area that is inclusive of the current Order Limits. It should be noted that where cable routes extend beyond the Study Area, along existing public highway, these cable routes have not been subject to specific desk based review or considered within the conceptual site model on the basis that these public highways would have been constructed to adoptable standards and therefore are not considered to represent potentially contaminated areas.

4 This report presents the Desk Top Study (DTS) information and Preliminary Risk Assessment (PRA) for Study Area 3 as shown in Figure A10.3.1: Study Area 3 Boundaries. Study Area 3 comprises Field Parcel ID's 209, 210, 211, 236, 238, 239, 274, 374, 375, 383, 384, 385, 387, 447, 449, 505, 507, 508, 510, 511, 549 and 603, and are shown on Figure A10.3.2: Study Area 3 Field Boundaries.

5 The wider areas within and surrounding the Order Limits are generally composed of agricultural land, interspersed by occasional woodlands. Surrounding villages and hamlets are connected by rural roads and public rights of way. Smaller fields and tree cover are more common close to the villages and along water courses, with larger and more open fields set

further away. The total area of the Development Site is approximately 1,765 hectares (ha), the majority of which is currently used for arable crops or pasture.

6 The Desk Study assessment is based upon a review of published information available from local, regional, and national agencies. The desk study information is derived from Insight Reports provided by Groundsure, Ref. GSIP-2024-16448-21124_E_1 and GSIP-2024-16448-21123-5 which are presented in Volume 4 Technical Appendix A10.11 – Desk Study and Preliminary Risk Assessment Groundsure Data [EN010162/APP/ 6.4.10.11]. Please note the terms and conditions attached to the supply of data from Groundsure. It should be noted that the Study Area boundaries presented within the Groundsure Insights Reports are based on the previous Preliminary Environmental Information Report site boundary which was provided at the time of purchasing the Groundsure data. Only information relating to the Study Areas and a data search buffer of 250 m, where relevant, has been included within this assessment.

A10.3.1.2 OBJECTIVES

7 The principal objectives of this assessment were as follows:

- Establish from published sources the geological sequence for Study Area 3 and potential for ground instability to occur through development proposals.
- To assess potential sources of contamination associated with historical and current land uses both on Study Area 1 and within a data search area of 250 m radius.
- To review the environmental setting to assess the sensitivity of the surrounding area to contamination/pollution.
- To produce an outline Conceptual Site Model (CSM) detailing how any contamination may impact the identified receptors via pollutant linkages; and
- To conclude on the likely requirement for any further assessment and ground investigation required in support of the DCO application.

8 The PRA methodology utilised in the preparation of this assessment is presented in detail in Annex B.

A10.3.1.3 LEGISLATION AND GUIDANCE

9 The assessment has been undertaken in general accordance with British Standard BS EN ISO 21365:20201 and is considered suitable to meet the initial requirements of planning as outlined within the National Planning Policy Framework (NPPF)2. The assessment also reflects the

[1] British Standards Institution (2020). BS EN ISO 21365:2020 soil quality. Conceptual site models for potentially contaminated sites. Available at: https://standardsdevelopment.bsigroup.com/projects/2017-02617 (accessed 21.05.2025).
[2]Ministry of Housing, Communities and Local Government, National Planning Policy Framework (Dec 2024/ Amended Feb 2025) Available at: https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf (accessed 21.05.25).

recommendations of Environment Agency guidance, Land Contamination: Risk Management, (LCRM 2023)3.

10 This report has been produced in general accordance with:

- Contaminated Land (England) Regulations 2006 (as amended);
- DEFRA Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance (2012);
- Environment Agency (2023) Land Contamination: Risk Management (LCRM 2023);
- National Planning Policy Framework (2024);
- CIRIA Document C665: Assessing Risks Posed by Hazardous Ground Gases to Buildings;
- British Standard requirements for the 'Investigation of potentially contaminated sites – Code of practice' (ref. BS10175:2011+A1:2017);
- British Standard requirements for the 'Code of practice for ground investigations' (ref. BS5930:2015+A1:2020); and,
- British Standard requirements for the 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings' (ref BS8485:2015+A1:2019).

11 Details of the limitations of this type of assessment are described in Annex C.

A10.3.2. DESCRIPTION OF STUDY AREA 3 AND DESK STUDY

12 Study Area 3 comprises the southern part of the Development Site to the south of the Kelham Hills. To the east is the village of Kelham and to the west is Mickleborough Hill and Flash Farm. It extends south into Staythorpe linking to Staythorpe sub-station.

13 Irregular in plan, Study Area 3 covers an approximate area of 200 hectares and currently comprises hedge and tree bounded undeveloped agricultural fields. The A617 passes from north-west to south-east, through the centre of Study Area 3.

14 Study Area 3 is located on relatively low-lying and flat ground at approximately 13 m Above Ordnance Datum (AOD) within the valley of the River Trent. Beyond the north-eastern boundary, ground elevations rise sharply to between roughly 50 m AOD and 70 m AOD.

15 Study Area 3 is indicated to comprise the following land uses, shown in Table A10.3.1, below:

Table A10.3.1: Current On-site Land Uses

Location	Description
General Area	Undeveloped agricultural land
South	Staythorpe Sub Station

[3] Environment Agency (2023). Land Contamination: Risk Management (LCRM). Available at: https://www.gov.uk/government/publications/land-contamination-risk-management;lcrm (accessed on 25.01.2025).

16 Given the absence of potentially significant contaminative land uses / sources, as identified from environmental data searches, within the Study Area, a targeted site inspection has not been required of this Study Area.

17 Study Area 3 is located in an area of mixed agricultural, residential, and commercial land use. Based on the images reviewed the surrounding land uses, within 250 m, are summarised in Table A10.3.2 below:

Table A10.3.2: Neighbouring Land Uses within 250 m

Direction	Description
north-west	Study Area 2
west	Slurry Bed and Slurry Pit (Flash Farm)
north-east	Agricultural Land, Frog Abbey Wood
east	Agricultural Land, Averham Park
south and south-west	Staythorpe, railway line

A10.3.2.1 THE DEVELOPMENT

A10.3.2.1.1 The Great North Road Solar and Biodiversity Park (GNR) ("the Development")

18 Full details and a detailed description of The Development are outlined in Environmental Statement (ES) Volume 2 Chapter 5 - Development Description [EN010162/APP/6.2.5].

A10.3.2.1.2 Study Area 3

19 The majority of this Study Area comprises fields allocated as Work Area No 2 cable corridors and cable areas linking to a BESS/400 kV Substation in the east (Field No's 374, 375, 387, 447 and 505). The BESS/400 kV compound would include transformers and other electrical equipment to combine the electricity from the Intermediate Substations, potentially storing it temporarily in the batteries that comprise the BESS. Immediately west of the BESS (Work Area No 5a) is the location of a proposed 400 kV Substation (Work Area No 5b) in field No 238, and cable route to connect to the National Grid Staythorpe Substation.

A10.3.2.2 SITE HISTORY

A10.3.2.2.1 Historical Map Review

20 The following review is based on past editions of readily available historical Ordnance Survey (OS) maps. These include scales of 1:1,250, 1:2,500, 1:10,560 and 1:10,000 dated 1884 to 2024. Volume 4 Technical Appendix A10.11 – Desk Study and Preliminary Risk Assessment Groundsure Data [EN010162/APP/ 6.4.10.11]. Historical site uses are presented in Table A10.3.3, below:

Table A10.3.3: Historical Site Uses within Study Area 3

Study Area 3 Land Use and Features	Dates
Backfilled Ponds (Field No's 387, 447, 505)	1899-1992
Agricultural Land	1883-2024

21 Pertinent historical site uses within 250 m of Study Area 3 are presented, in Table A10.3.4, below.

Table A10.3.4: Historical Neighbouring Land Uses within 250 m

Surrounding Land Use	Orientation	Distance	Dates	
			From	To
Embankment (Ollerton Road)	west	10 m	1883	1970
Power Station (Staythorpe Power Station)	south-east	140 m	1972	Present

A10.3.2.2.2 Planning History

22 There is one planning record associated with Study Area 3 available on the Newark and Sherwood District Council planning website.

- **24/SCO/00003 Staythorpe Power Station -** Environmental Impact Assessment (EIA) Scoping Opinion request for Staythorpe Power Station – approved 04/06/2024.

A10.3.2.3 ENVIRONMENTAL SETTING

23 The Groundsure Insight Reports used in preparation of the environmental setting assessment are presented within Volume 4 Technical Appendix A10.11 – Desk Study and Preliminary Risk Assessment Groundsure Data [EN010162/APP/ 6.4.10.11].

A10.3.2.3.1 Geology

24 Based on British Geological Survey (BGS)4 mapping (1:50,000-scale) and the Environment Agency (EA) Groundwater Vulnerability mapping (1:100,000-scale), the stratigraphic sequence and aquifer classifications beneath Development Site are indicated to be as follows:

[4] British Geological Survey (2025). Geoindex Onshore. Available at: https://www.bgs.ac.uk/map-voewers/geoindex-onshore/ (accessed on 21.05.2025).

Table A10.3.5: Descriptions of Geological Strata

Stratum	**Description & approx. thickness (based upon BGS Lexicon of Rock Units)**	**Aquifer Classification**
Made Ground	Made Ground immediately south of Study Area 3 relating to railway line and Staythorpe Power Station.	N/A
Superficial Deposits		
Alluvium	Present as a broad ribbon underlying the south-eastern half of the Study Area (including proposed BESS location) and associated with the River Trent. Generally comprising unconsolidated clay, silt, sand and gravel. Thickness not proven.	Secondary A
Holme Pierrepont Sand And Gravel Member	Present as a broad ribbon underlying the south-eastern half of the Study Area (including proposed BESS location) and associated with the River Trent. Generally comprising pinkish, poorly sorted, immature, sandy, cross bedded river gravels with syndepositional ice-wedge casts. Gravel is dominated by round pebbles of bunter quartz, flints and carboniferous sandstones. Proven to 7.9 m depth.	Secondary A
Bedrock		
Gunthorpe Member - Mudstone, Siltstone And Sandstone	Mudstone, red-brown, with subordinate dolomitic siltstone and fine-grained sandstone, greenish grey,	Secondary B

Stratum	Description & approx. thickness (based upon BGS Lexicon of Rock Units)	Aquifer Classification
	common gypsum veins and nodules.	
Mercia Mudstone Group – Mudstone	Dominantly red, less commonly green-grey, mudstones and subordinate siltstones with thick halite-bearing units in some basinal areas. At outcrop in proposed 400 kV sub-station location.	Secondary B

25 Alluvial Deposits and Holme Pierrepont Sand and Gravel Member underlie the south-eastern half of Study Area 3 and are associated with the River Trent floodplain.

26 BGS borehole records indicate several historical exploratory hole logs (ref's SK75SE/18, SK75SE/19, SK75SE/68, SK75SE/88, SK75SE/191, SK75SE/200 and SK75SE/218), across Study Area 3. The records indicate superficial Alluvium and Holme Pierrepont Sand and Gravel Member deposits are present above Mercia Mudstone Group / Gunthorpe Member mudstone bedrock.

27 The record for exploratory hole log SK75SE/19 located centrally in Study Area 3 shows approximately 7.90 m of 'river gravels' (Holme Pierrepont Sand And Gravel Member), underlain by the Mercia Mudstone Group, which was proven to a depth of more than 9.50 m below ground level. Exploratory hole log SK75SE/18, located approximately 50 m east, recorded 7.60 m of river gravel (Holme Pierrepont Sand And Gravel Member), overlying mudstone (Mercia Mudstone Group).

A10.3.2.3.2 Hydrogeology

28 Superficial deposits (Alluvium and the Holme Pierrepont Sand and Gravel Member) underlying Study Area 3 have been classed, by the EA, as Secondary A Aquifers. The underlying Gunthorpe Member and Mercia Mudstone Group bedrock are classed as Secondary B Aquifers and are described below:

- Secondary A Aquifers represent formations that are formed of permeable layers capable of supporting water supplies at a local scale, in some cases forming an important source of base flow to rivers.
- Secondary B Aquifers represent formations that are generally formed of lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons, and weathering.

29 According to EA data, contained within the Groundsure Insights report, Study Area 3 is not located in a groundwater Source Protection Zone (SPZ).

30 According to EA data there is one groundwater body onsite which is published by the EA under the European Water Framework Directive (2000). This is identified as the Lower Trent Erewash groundwater body, with a chemical rating of 'good'.

31 Information provided by the EA indicates that there is one active licensed groundwater abstraction within 250 m of Study Area 3. This is detailed in Table A10.3.6 below:

Table A10.3.6: Licensed Groundwater Abstractions within 250 m

Licence Holder	Approx distance and direction from Study Area 3	Source	Use
Latham Farms Ltd	20 m south	Groundwater Midlands Region	Spray Irrigation – Direct

A10.3.2.3.3 A10.3.2.3.3. Surface Water

32 There are two watercourses within 250 m of Study Area 3 which are classified within a River Basin Management Plan published by the EA under the European Water Framework Directive (2000). A list of readily identifiable nearby watercourses and water bodies is presented in Table A10.3.7, below:

Table A10.3.7: Nearby Watercourses and Water Bodies

Watercourse/Body	Quality Classification (2019)	Approx Distance and direction from Study Area 3
Trent Bifurcation Pingley Dyke to Winthorpe	Moderate	15 m east
Upper Pingley/Rundell Dyke (trib of Trent)	Moderate	Onsite

33 In addition there are a number of ponds and minor drainage ditches crossing the northern half of the Study Area, draining offsite to the east and eventually feeding into the River Trent.

34 Information provided by the EA indicates that there are no records of active licensed surface water abstractions on-site or within 250 m of Study Area 3.

A10.3.2.3.4 Ecologically Sensitive Sites

35 Natural England data indicates that there no ecologically sensitive sites as defined within Table 1 of the DEFRA Environmental Protection Act 1990:

Part 2A - Contaminated Land Statutory Guidance (2012)5 within Study Area 3.

A10.3.2.3.5 Radon

36 According to the online Indicative Atlas of Radon in England and Wales published by the UK Health Security Agency (UKHSA)6 and BGS, Study Area 3 lies within kilometre grid squares with maximum radon potential of less than 1 %. The Indicative Atlas is based upon Radon Potential Data and classifies areas based upon the likelihood of a property having a radon action level at or above the Action Level of 200 Bq m3 based upon a dataset of over 500,000 records provided by the UKHSA and geology provided by the BGS. The Radon Potential is calculated from statistics (geometric mean and geometric standard deviation) of indoor radon measurements collected over each geological unit.

37 The higher resolution Radon Potential dataset, as included within the Groundsure GeoInsight report, provides a more accurate assessment of the level of risk and the requirements for inclusion of preventative measures during construction based upon BGS Geology (1:50,000 scale) geological map data. This indicates a maximum radon potential of less than 1 % with less than 1 % of properties having a radon level at or above the Action Level in Great Britain.

A10.3.2.3.6 Mining Remediation Authority

38 The Interactive Map Viewer on the Mining Remediation Authority7 website indicates that Study Area 3 is not located in a coal mining reporting area.

A10.3.2.3.7 Non-Coal Mining

39 BGS sources indicate that Study Area 3 is located within an area of recorded non-coal mining (vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and ‘other’ commodities including ball clay, jet, black marble, graphite and chert). Entries are given for two disused brickworks on-site several disused brickworks, brick yards, unspecified pits and ground workings within 250 m of Study Area 3. However, no further details are provided.

A10.3.2.3.8 Brit Pits

40 BGS sources indicate a single ‘BritPit’ onsite, named Kelham Hills Pit (clay and shale) as well as five unnamed ‘BritPits’ for sands, gravels and clay within 250 m of Study Area 3.

[5] DEFRA (2012). Contaminated Land Statutory Guidance. Available at: www.gov.uk/government/publications/contaminated-land-statutory -guidance (accessed on 21.05.2025).
[6] UK Health Security Agency (2022). UK maps of radon. Available at: https://www.ukradon.org/information/ukmaps (accessed 21.05.2025).
[7] Mining Remediation Authority (2025). Map Viewer. Available at: https://datamine-cauk.hub.arcgis.com (accessed 21.05.25).

A10.3.2.3.9 BGS Ground Stability Hazard Ratings

41 BGS Ground Stability Hazard ratings for the Study Area are summarised, in Table A10.3.8, below:

Table A10.3.8: BGS Ground Stability hazards

Ground Stability Hazard	BGS Risk Rating
Collapsible Ground	Negligible – Very Low
Compressible Ground	Moderate (Alluvium) – Negligible
Ground Dissolution	Negligible
Landslide	Very low
Running Sand	Negligible – Low
Shrinking or Swelling Clays	Negligible – Very low

42 A moderate ground stability hazard in relation to compressible ground has been identified for Study Area 3 associated with the alluvial deposits on the eastern periphery. This relates to compressibility and uneven settlement hazards, which are potentially present. The BESS/400 kV Substation construction should consider specifically the compressibility and variability of the ground conditions at this location.

A10.3.2.4 AUTHORISED PROCESSES AND POLLUTION INCIDENTS

A10.3.2.4.1 Landfill and Waste Sites

43 Data provided by the EA, Local Authority and BGS indicates that there are no recorded licensed historical or active landfill sites located on or within 250 m of Study Area 3.

44 Data within the Groundsure report indicates that there is a single entry for an historical waste site recorded within 250 m to the south-west, identified as an Ash Disposal Works.

A10.3.2.4.2 Environmental Permits

45 EA and Local Authority data indicates that there are no current processes regulated by an Environmental Permit (under the Environmental Permitting Regulations (2010)) within 250 m of Study Area 3.

A10.3.2.4.3 Licenced discharges to controlled waters

46 There are no records of active/current licenced discharge to controlled waters in Study Area 3.

A10.3.2.4.4 COMAH Sites

47 There are no records of any operations under the Control of Major Accident Hazards (COMAH) Regulations 1999, located within 250 m of Study Area 3.

A10.3.2.4.5 Pollution Incidents

48 Environment Agency data indicates that there are no records of 'major' or 'significant' pollution incidents within 250 m of Study Area 3.

A10.3.2.5 UNEXPLODED ORDNANCE

49 CIRIA Report C6818 (Stone et al., (2009)) outlines recommendations for dealing with the potential risk associated with the legacy of Unexploded Ordnance Risk, largely relating to WWII bombing and military sites.

50 A detailed desk based UXO Risk Assessment was undertaken by Tetra Tech RPS Energy for The Development dated 28th August 2024. The findings of the assessment identify that Study Area 3 is in a low risk UXO area. No further measures are considered necessary other than the provision of tool box talks during site inductions for construction staff and inclusion of UXO in Risk Assessments and emergency plans at pre-construction stage. The Tetra Tech RPS Energy UXO Risk Assessment report is presented in Volume 4 TA A10.10 – Detailed Desk Study (Stage 2) for Potential UXO Contamination [EN010162/APP/6.4.10.1].

[8] CIRIA (2009). Unexploded Ordnance C681: A Guide for the Construction Industry. Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductcode=C681 (accessed on 21.05.2025).

A10.3.3. OUTLINE CONCEPTUAL SITE MODEL

A10.3.3.1 BACKGROUND

51 An outline conceptual site model (CSM) consists of an appraisal of the source-pathway-receptor ‘contaminant linkages' which is central to the approach used to determine the existence of ‘contaminated land' according to the definition set out under Part 2A of the Environmental Protection Act, 1990. For a risk to exist (under Part 2A), all three of the following components must be present to facilitate a potential 'pollutant linkage'.

- **Source** referring to the source of contamination (Hazard).
- **Pathway** for the contaminant to move/migrate to receptor(s).
- **Receptor** (Target) that could be affected by the contaminant(s).

52 Receptors include human beings, controlled waters and buildings / structures. The National Planning Policy Framework, used to address contaminated land through the planning process, follows the same principles as those set out under Part 2A.

53 As part of the assessment, the potential risks to receptors from potential sources, are given one of the following classifications:

- **Low risk** - it is considered unlikely that issues within the category will give rise to significant harm to identified receptors.
- **Moderate risk** - it is possible, but not certain that issues within the category will give rise to significant harm to receptors.
- **High risk** - there is a high potential that issues within the category will give rise to significant harm to identified receptors.

A10.3.3.2 POTENTIAL POLLUTION LINKAGES

54 Each stage of the potential pollutant linkage sequence has been assessed individually on the basis of information obtained during the desk study exercise and are discussed in the following section.

A10.3.3.2.1 Potential Contaminant Sources

55 *Onsite Current*

56 Study Area 3 predominantly comprises agricultural fields. Whilst there is potential for contaminants such as pesticides, fertilisers, and hydrocarbons associated with nearby farms to have been used on-site, it is considered that these would be present as either localised point sources of relatively low concentrations or are likely to quickly break down within the environment and as such do not represent a viable source for further assessment.

57 *Onsite Historical*

58 No historical potentially contaminative uses have been identified for Study Area 3.

59 *Offsite Current*

60 The main Staythorpe Power Station is situated some 140 m to the south-east of the southernmost section of Study Area 3. Contaminants associated

with a power station land usage can include metals, sulphates, asbestos, hydrocarbons, Polycyclic Aromatic Hydrocarbon (PAHs) and Polychlorinated Biphenyls (PCBs) (BRE R&D Publication 66). It is expected that current use, storage and handling procedures of potential contaminants will be strictly controlled through on-site health and safety procedures and regulated pollution prevention measures. Residual Made Ground soils may be associated with construction and operation of the power station as denoted on BGS mapping.

61 Farms, including Flash Farm, have been identified off-site and within the 250 m study area surrounding Study Area 3. All may include sheep dips, slurry beds, storage of fuels, agricultural chemicals and fertilisers as well as plant/vehicle storage that could be prone to leaks and spills in their daily operations. However, these are likely to have been limited in their extent and given the distance from The Development and location on low permeability bedrock strata, are considered to pose little or no risk of lateral migration via shallow groundwater that could impact The Development.

62 *Offsite Historical*

63 The mapped extent of Made Ground (unknown composition) also includes a linear band following the alignment of the railway line immediately south of fields 274 and 603.

64 Former earthworks to the west of Study Area 3 aligned with the proposed cable route may also represent a possible source of Made Ground.

A10.3.3.2.2 Potential Pathways

65 The southern and eastern sections of Study Area 3 have superficial cover deposits of Alluvium and Holme Pierrepont Sand And Gravel Member deposits that are predominantly granular, within which there is potential for mobilisation of gaseous, liquid or leachable contaminants to migrate on or off-site via granular horizons or via shallow groundwater. These may impact controlled waters receptors or on/off-site human heath receptors via dermal contact, ingestion and vapour inhalation pathways.

66 The northern and western areas of Study Area 3 are indicated to be predominantly underlain by low-permeability mudstone strata belonging to the Mercia Mudstone Group. This stratum is considered to be relatively impermeable and is likely to limit the downward or lateral migration of contaminants of concern via shallow groundwater (where present) or as gases/vapours. This would indicate a low risk of mobilisation of contaminants over distance.

67 Pathways for direct contact/ingestion with residual soils or inhalation of airborne dust may exist in areas of soft landscaping associated with the BESS and sub-station development, albeit in the absence of confirmed contaminant sources in these locations the risk is considered to be low.

68 It should be noted that pathways may be modified or exacerbated by disturbance.

A10.3.3.2.3 Potential Receptors

69 Superficial Alluvium and Holme Pierrepont Sand and Gravel Member, situated across the south and east of Study Area 3 are classed as Secondary A Aquifers. The underlying Mercia Mudstone Group bedrock is classed as a Secondary B Aquifer. Study Area 3 is not located within an SPZ however a groundwater abstraction for spray irrigation is present within the 250 m study area, assumed to be utilising shallow groundwater within the superficial deposits as a source.

70 Surface water features have been identified on and within 250 m of Study Area 3. These include tributaries of the River Trent and it is assumed that any shallow groundwater present in the superficial deposits present would be in continuity with these watercourses.

71 During operation of the Development it is not envisaged that there would be any full-time occupancy, however, it is expected that there would be periodic requirements for maintenance work/checks of the BESS and sub-station. Maintenance workers therefore represent the most likely potential future human health receptor. The risks posed to maintenance workers are considered to be very low given the historical land usage, short-term period of exposure to soils and adoption of safe systems of work such as PPE.

72 Off-site users are unlikely to be adversely impacted by any site derived contaminants given the absence of identified possible historical or current on-site contamination sources.

73 The assessment does not consider the risk to construction workers. These risks would be managed through the appropriate Health & Safety legislation via the H&S At Work Act (1974) and in accordance with Construction Design and Management (CDM, 2015) regulations.

74 Based on the site setting there is not considered to be a significant risk to ecological receptors, crops/vegetation or archaeological receptors from onsite contamination sources.

A10.3.3.3 OUTLINE CONCEPTUAL SITE MODEL

75 An outline CSM has been developed on the basis of the desk study. The CSM is used to identify potential sources, pathways, and receptors (i.e. potential pollutant linkages) post development and is summarised in the table below.

Table A10.3.9: Outline Conceptual Site Model

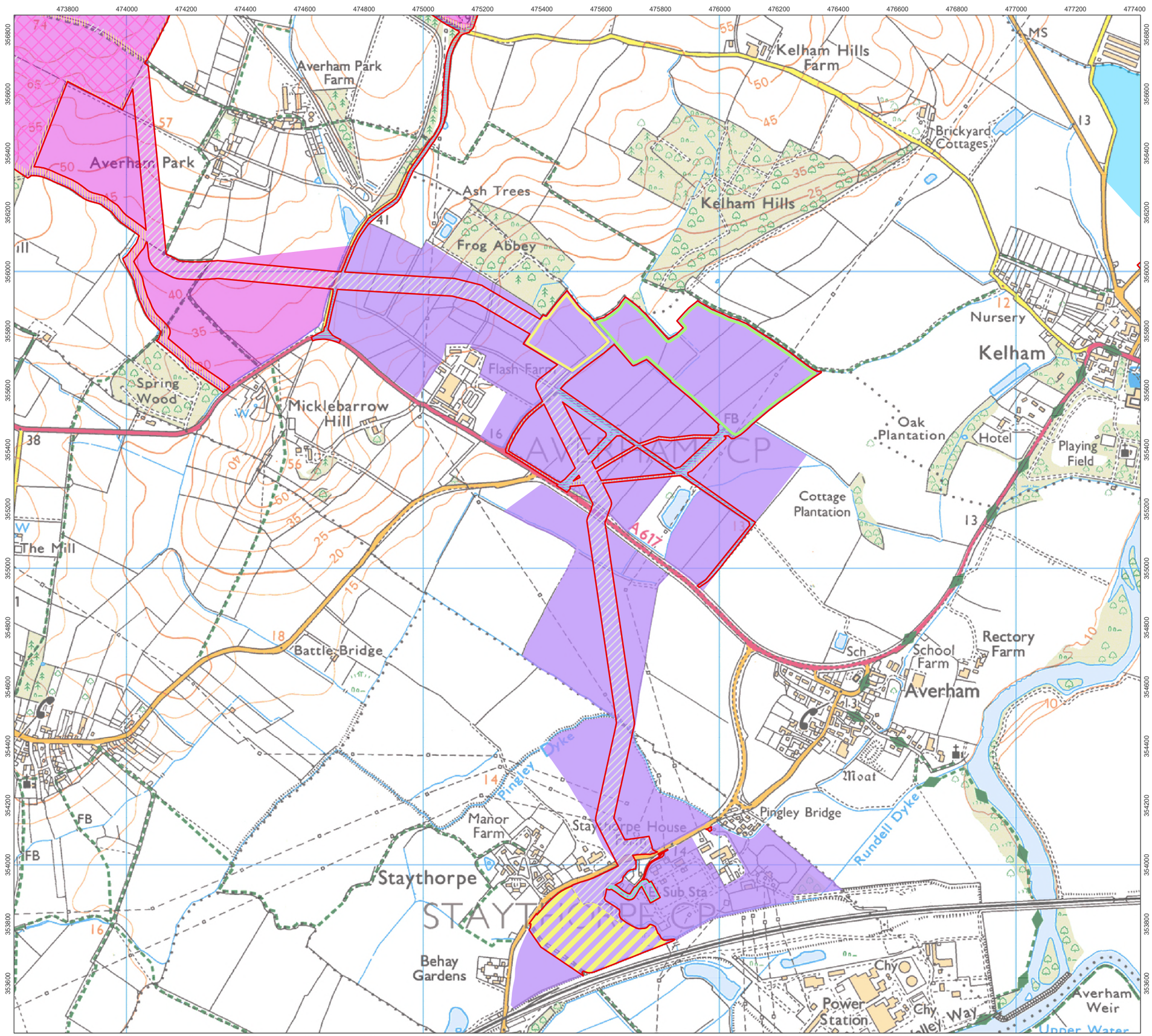
Potential Source	Contaminants Of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors	Qualitative Risk Assessment	Notes
Offsite sources	Made Ground (metals, asbestos, sulphates, PCBs, PAHs), ground gases	Groundwater, Granular Soils	Direct contact, Ingestion, shallow groundwater, vertical or lateral migration in permeable superficial deposits	Yes	Future site users, groundwater (Secondary A aquifers/ abstractions	Low	No long-term occupation post construction. Exposure pathway via groundwater unlikely post construction. Shallow excavations for cables unlikely to vary the groundwater drainage pattern and impact on aquifers. Areas where deeper excavations for BESS or sub-station foundations on outcropping bedrock or margins of superficial deposits.

76 N.B. If a Moderate or High Qualitative Risk Rating is identified further assessment is recommended

A10.3.4. CONCLUSIONS AND RECOMMENDATIONS

77 The outline CSM produced upon completion of the desk study assessment has identified few potential pollutant linkages that may be active upon the redevelopment of Study Area 3. Those that have been identified are considered to represent a low risk and no further assessment is considered necessary.

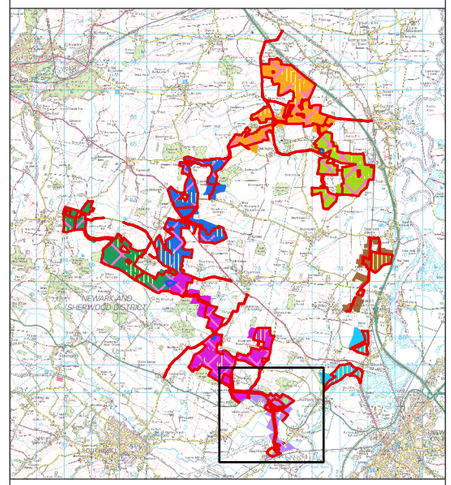
ANNEX A – FIGURES



- Order Limits
- Study Area 3
- Study Area 2
- Study Area 4

Works Areas

- Works Area 1 Solar PV
- Works Area 2 Cable
- Works Area 3 Mitigation
- Works Area 5a BESS
- Works Area 5b 400kV Substation
- Works Area 6 National Grid Substation
- Works Area 7 Staythorpe BESS Connection
- Works Area 8 Access



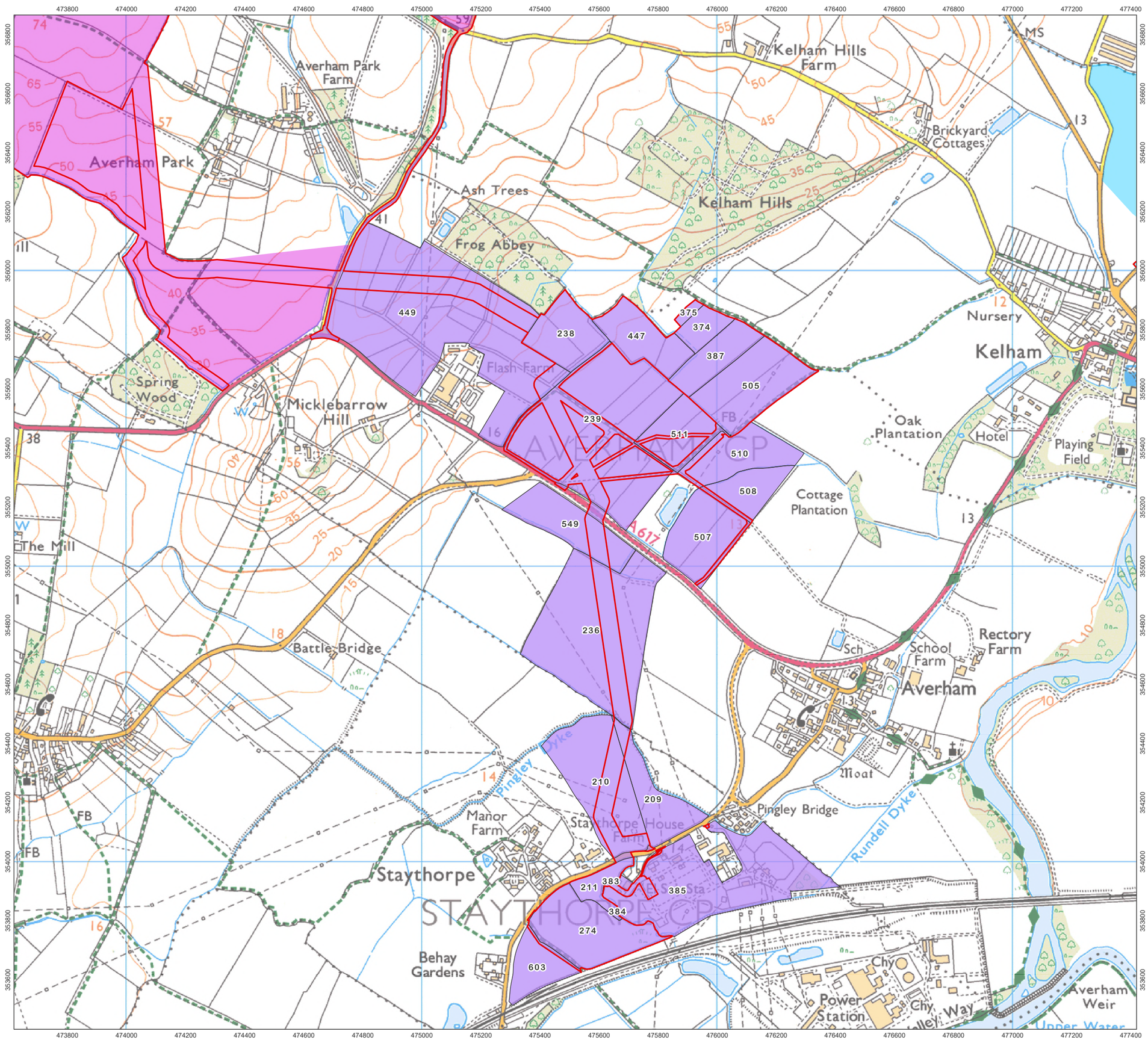
1:12,500 Scale @ A3

0 0.1 0.2 0.4 km

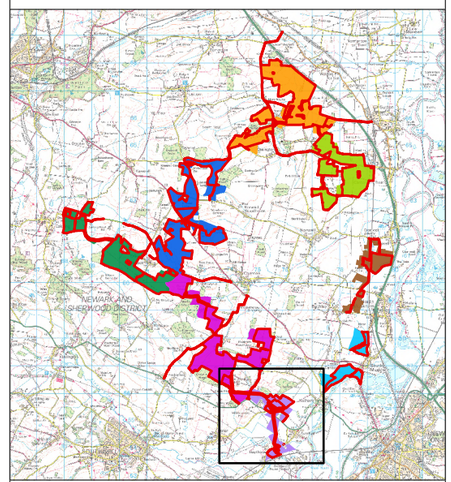
Ref: NP12850 | Date: 11/06/2025

Study Area 3
Figure A10.3.1

Great North Solar and Biodiversity Park Environmental Statement



Order Limits
Field Boundaries
Study Area 3
Study Area 2
Study Area 4



1:12,500 Scale @ A3

0 0.1 0.2 0.4 km

Ref: NP12850 | Date: 11/06/2025

Study Area 3 Field Boundaries
Figure A10.3.2

Great North Solar and Biodiversity Park
Environmental Statement

ANNEX B - PRA METHODOLOGY

INTRODUCTION

78 This report provides available factual data for the site obtained only from the sources described below and related to the site on the basis of the location provided by the Applicant. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.

79 This report is written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information and changes in legislation may necessitate a re-interpretation of the report in whole or in part after its original submission. The report is provided for sole use by the client and is confidential to them and their professional advisors. No reliance whatsoever is provided to any party other than the Applicant unless otherwise agreed.

INFORMATION SOURCES

Current and Historical Land Use

80 This section establishes the former and current uses of the Study Area and within a 250 m data search radius, which could have caused contamination. Details of the Development including current land use and location provided by the Applicant.

81 Information about the history of the Study Area and a 250 m radius, has been obtained through an inspection of historical maps at 1:10,000, 1:10,560, 1:2,500 and 1:1,250 scales and historical aerial photographs (where available). The accuracy of maps cannot be guaranteed, and it should be recognised that different conditions on-site may have existed between, and subsequent to, the map survey dates.

Regulatory Records

82 Regulatory records including landfills, pollution incidents (‘major’ and ‘significant’ only), industry authorisations and licensed water abstractions are derived from information purchased from Groundsure Ltd (unless otherwise specified).

Environmental Setting

83 The geological sequence underlying the Study Area and the approximate depths of strata are provided by maps published by the British Geological Survey (BGS) 1:50,000 scale and available borehole records held by the BGS.

84 The hydrogeological classification is obtained from Groundwater Vulnerability mapping by the BGS/EA/National Resources Wales (NRW). The vulnerability of groundwater is determined from this mapping and geological information.

85 The location of surface watercourses has been obtained from an inspection of current OS maps. Flood risk details and information on groundwater

Source Protection Zones were obtained from readily available EA/NRW information published on-line and supplied by Groundsure Ltd.

86 Details of sensitive ecosystems/habitats and coal mining areas were supplied by Natural England and the Coal Authority respectively via Groundsure Ltd and inspection of the MAGIC website.

87 Radon is a radioactive gas produced naturally by certain types of geology. This report uses the Indicative Atlas of Radon in England and Wales (2007) produced by the Health Protection Agency (HPA) and the British Geological Survey (BGS) to determine whether the Study Area is located in an area at risk from radon gas. Where potential issues are identified, a site-specific radon report is obtained from the HPA and BGS to provide a more accurate estimate of the probability of the site being affected by radon gas ingress.

A10.3.5. ANNEX C – ASSUMPTIONS AND LIMITATIONS

89 A "desk study" means that no site visits have been carried out as part of an assessment, unless otherwise specified.

90 This report provides available factual data for the Study Area obtained only from the sources described in the text and related to the Study Area and a 250 m radius, where relevant, on the basis of the location information provided by the Applicant.

91 The desk study information is not necessarily exhaustive and further information relevant to the Study Area may be available from other sources.

92 The accuracy of maps cannot be guaranteed, and it should be recognised that different conditions within the Study Area may have existed between and subsequent to the various map surveys.

93 No sampling or analysis has been undertaken in relation to this desk study.

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

95 Where any data supplied by the Applicant or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS for inaccuracies in the data supplied by any other party.

96 This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or in part after its original submission.