Cottam Solar Project

Environmental Statement Appendix 13.2:

Archaeological Geophysical Survey Reports (Part 1 of 13)

Prepared by: Lanpro Services

January 2023

PINS reference: EN010133

Document reference: APP/C6.3.13.2

APFP Regulation 5(2)(a)

Cottam
SOLAR PROJECT

Contents

Issue Sheet

Report Prepared for: Cottam Solar Project Ltd.

Cottam Solar Project Archaeological Geophysical Surveys

Prepared by:

Name: Alice James BA (hons) MSc MCIfA

Title: Associate Archaeologist

Approved by:

Signature:

Name: Mitchell Pollington BA (hons) MA MCIfA

Title: Director (Archaeology and Heritage)

Date: November 2022

1 Introduction

1.1 This document has been prepared by Lanpro Services Ltd on behalf of Cottam Solar Project Limited ('the Applicant'). It provides an overview of the methodology and the results of the archaeological geophysical (magnetometer) surveys undertaken across the whole of the Cottam Solar Project ('the Scheme') in support of an application for a Development Consent Order (DCO). The Scheme consists of three electricity generating stations each with a capacity of over 50 megawatts (MW) consisting of ground mounted solar arrays and 'Associated Development'; comprising of energy storage, grid connection infrastructure, cable routes and other infrastructure integral to the construction, operation and maintenance of the Scheme.

1.2 The geophysical surveys were informed by the results of archaeological desk-based assessments (Lanpro 2022a, Lanpro 2022b, Lanpro 2022c, Lanpro 2022d).

1.3 The geophysical survey methodology conforms to nationally recognised standards, as well as local guidance for archaeological works in Nottinghamshire and Lincolnshire. The geophysical surveys were undertaken by Archaeological Services WYAS (ASWYAS), Northern Archaeological Associates (now Ecus Archaeology) and Wessex Archaeology. All of which are registered with Charted institute for Archaeologists (CIfA).

1.4 The geophysical surveys were undertaken between July 2021 and November 2022, and identified clear concentrations of magnetic anomalies within the scheme that are indicative of possible prehistoric, Roman and medieval activity. Evidence of agricultural activity, including ridge and furrow, former field boundaries, land drains and ploughing, as well as anomalies of a modern and geological origin have also been mapped.

1.5 The results of the geophysical survey, along with supplementary non-intrusive surveys including air photo and LiDAR mapping and interpretation, have been used to inform a programme of evaluation trial trenching undertaken between June and November 2022, and agreed in advance with the Lincolnshire County Council Historic Environment Team (Cottam Solar Project 2022 b).

2 Survey Areas

2.1 Six phases of geophysical survey have been undertaken as part of the proposed Cottam Solar Project (Figure 13.2-1):

- **Cottam 1 Solar Site** (Appendix 1)
- **Cottam 2 Solar Site** (Appendix 2)
- **Cottam 3 Solar Site** (Appendix 3)
- **Cottam Cable Route Corridor** running from the north of Stow Park Road to the proposed Cottam solar sites (Appendix 4)
- **Shared Cable Route Corridor** running from fields to the south of Marton to the Cottom Pawer Station (Appendix 5)
- **Shared Cable Route Corridor** comprising fields directly to the south of Stow Park Road (Appendix 6)

2.2 The location details for each section within Cottam Cable Route Corridor are tabulated below.

Phase	NGR	Parishes	Height above Ordnance Datum (aOD)
Cottam 1 Solar Site	Parcel A: SK 91696 86033 Parcel B: SK 93056 86440 Parcels C: SK 91833 84760 Parcel D: SK 91445 81601 Parcel E: SK 89718 82646 Parcel F: SK 89297 84141 Parcel G: SK 92406 81859	Parcel A: Fillingham Parcel B: Fillingham Parcels C: Fillingham, Willingham and Stow Parcel D: Cammeringham, Thorpe in the Fallows, Sturton by Stow and Stow Parcel E: Stow Parcel F: Stow and Willingham Parcel G: Willingham	6m – 26m aOD
Cottam 2 Solar Site	SK 8847 9207	Corringham	15m aOD
Cottam 3 Solar Site	SK 8700 9560	Laughton Bylton Pilham	
Cottam Cable Route Corridor	SK 87970 92465	Marton (Lincs) Stow (Lincs) Willingham (Lincs) Cammeringham (Lincs) Thorpe in the Fallows (Lincs) Sturton by Stow (Lincs) Ingham (Lincs) Fillingham (Lincs) Kexby (LincS) Glentworth (Lincs) Upton (Lincs) Heapham (Lincs) Springthorpe (Lincs) Corringham (Lincs) Pilham (Lincs) Blyton (Lincs)	15m – 25m aOD
Shared Cable Route Corridor	SK 82940 80916	Rampton and Woodbeck (Notts) Treswell (Notts) South Leverton (Notts) Cottam (Notts) North Leverton with Habblesthorpe (Notts) Marton (Lincs) Brampton (Lincs)	3m – 23m aOD

2.3 The results of the various environmental studies (including non-archaeological surveys) have been used to inform changes to the Scheme design including the removal of areas from the final redline boundary and adjustments to the proposed cable route. Redline boundaries provided for the geophysics survey reports, appended to this document, reflect the original redline boundaries used for the initial environmental scoping studies. The final redline boundary for the Scheme is shown in Figure 1. Where required, the geophysical survey area has been adjusted to reflect changes to the redline boundary to ensure maximum coverage of accessible land within the Scheme.

2.4 Where areas could not be surveyed, i.e. due to above ground obstacles making survey impossible or unlikely to yield meaningful results, these have been qualified within the individual geophysical survey reports.

Cottam 1 Solar Site (Appendix 1)

2.5 All accessible land within the Scheme was targeted with geophysical survey.

2.6 The Cottam 1 Solar Site comprises approximately 812ha of arable land spread across seven parcels (Parcels A-G) centred on the hamlet of Coates in the West Lindsey District of Lincolnshire (Figure 13.2-2).

2.7 Fields D1, D4, D5, D6, D24, D25, E3, E4, F4 and F5 were all removed from the redline boundary following the completion of the geophysical survey report.

2.8 The recorded bedrock geology across the Cottam 1 proposed development site (PDS) consists of mudstone, siltstone, limestone and sandstone of the Lias Group (BGS 2022).

2.9 The recorded superficial geology (BGS 2022) for each parcel in Cottam 1 is tabulated below.

Parcel	Superficial Geology
A	Till – Diamicton (to E) / Alluvium - Clay, Silt and Sand (to W)
B	Till - Diamicton
C	Alluvium - Clay, Silt and Sand (to N) / Till – Diamicton (to S and E)
D	None recorded (to W) / Alluvium - Clay, Silt and Sand (to centre) / Till – Diamicton (to E)
E	None recorded
F	None recorded
G	None recorded

2.10 ASWYAS were used as the geophysical contractor for the Cottam 1 Solar Site.

Cottam 2 Solar Site (Appendix 2)

2.11 All accessible land within the proposed solar site was targeted with geophysical survey.

2.12 The Cottam 2 Solar Site comprises approximately 132ha of agricultural land located c. 456m to the east of Corringham, approximately 5km to the east/north-east of Gainsborough in the West Lindsey District of Lincolnshire (Figure 13.2-3).

2.13 The recorded bedrock geology across the Cottam 2 PDS consists of interbedded mudstone and limestone of the Scunthorpe Mudstone Formation overlain by superficial deposits of diamicton (BGS 2022).

2.14 ASWYAS were used as the geophysical contractor for the Cottam 2 Solar Site.

Cottam 3 Solar Site (Appendix 3)

2.15 All accessible land within the proposed solar site was targeted with geophysical survey.

2.16 The Cottam 3 Solar Site comprises approximately 244ha, divided across two parcels of land: Cottom 3a and Cottam 3b, within the West Lindsey District of Lincolnshire (Figure 13.2-3).

2.17 Field K15 and the north of Field K2 were removed from the redline boundary following the completion of the geophysical survey report.

2.18 The recorded bedrock geology across the Cottam 3 Solar Site consists of interbedded mudstone and limestone of the Scunthorpe Mudstone Formation overlain by superficial deposits of diamicton (BGS 2022).

2.19 ASWYAS were used as the geophysical contractor for the Cottam 3 Solar Site.

Cottam Cable Route Corridor (Appendix 4)

2.20 Geophysical survey for the Cottam Cable Route Corridor comprised a 100m survey corridor centred on the initial proposed cable route running between the three solar sites within the Cottam Scheme. It comprises c. 160ha of agricultural land traversing 16 parishes in the West Lindsey district of Lincolnshire (Figures 13.2-2 and 13.2-3).

2.21 The Cottam Cable Route Corridor starts to the north of Stow Park Road and runs north-east towards the south of Normanby by Stow, where it joins Parcel F of the proposed Cottam 1 Solar Site. From the north of the Cottam 1 Solar Site (Parcel C), the corridor runs northwards, across fields to the east of Heapham, Springthorpe and Corringham, then south of the Cottam 2 Solar Site. From the north of the Cottam 2 Solar Site, the corridor runs to the east of Aisby and Pilham, to the south of the Cottam 3b Solar Site. The final part of the corridor runs from the north of the Cottam 3b Solar Site across fields adjacent to The Fields Farm and Top Farm to the south of the Cottam 3a Solar Site.

2.22 The Cottam Cable Route Corridor also links the various parcels that form the Cottam 1 Solar Site. The corridor runs south-east from Parcel A, to the west of North Farm, to a field to the north-east of Side Farm in Parcel C. The corridor then runs southwards from Parcel B to Parcel C, from a field to the north-west of Fillingham Grange (Parcel B) to the west of Greystones Farm (Parcel C). The corridor runs east-west between Parcel C and Parcel G between Lowfield Farm and Moor Farm. The corridor crosses fields to the north-west of Normanby Gorse woodland between Parcels F and G. The corridor runs southwards between Parcels F and Parcel E crossing Ingham Lane at Stow Pastures. Parcel E is joined to Parcel D by a short corridor section running southwards to the east of Fleets Lane. A further section of the corridor joins Parcel C to Parcel D with a southward route that runs to the west of Coates Gorse (Parcel C) across Ingham Lane to a field to the north of Cold Harbour farmstead (Parcel D).

2.23 The section of the proposed Cottam Cable Route Corridor running between Fields D2 and D7 was surveyed as part of the geophysical survey of the Cottam 1 Solar Site. Consequently, data for this section of the cable route is produced and assessed within the Cottam 1 Solar Site geophysical survey report (Appendix 1; ASWYAS 2022a).

2.24 The recorded bedrock geology of the Cottam Cable route Corridor primarily consists of interbedded mudstone and limestone of the Scunthorpe Mudstone Formation with superficial deposits of Mid Pleistocene Diamicton Till (BGS 2022). A small area of superficial sand and gravel river terrace deposits occurs near Parcel G. No superficial deposits are recorded to the west of the proposed Cottam 1 Solar Site. The geology adjacent to watercourses comprises Charwouth Mudstone Formation with recorded drift geology of clay, silt, sand and gravel alluvium.

2.25 ASWYAS were used as the geophysical contractor for the Cottam Cable Route Corridor.

Shared Cable Route Corridor (Appendices 5 – 6)

2.26 The Shared Cable Route Corridor comprises 158.5ha distributed across eight parishes in the Bassetlaw district of Nottinghamshire and the West Lindsey district of Lincolnshire. The corridor runs north from the south-west of Cottam Power Station towards the Leverton Branch railway line. From the railway line, the corridor heads north-west towards the River Trent between the villages of Coates to the north and Cottam to the south. The corridor crosses the River Trent to the south of Trent Port at Marton, following which the corridor runs north-west to the south of Marton towards Stow Park Road, intersecting the road to the west of Marton Grange (Figure 13.2-4).

2.27 The shared cable route corridor is proposed to be used for up to three seperate solar schemes. Initial information accrued from desk-based research indicated that there was a high potential for substantial concentrations of buried archaeological remains to be present adjacent to the Cottam Power Station in the Bassetlaw district of Nottinghamshire. Consequently, the shared cable route corridor assessed a wider strip of land, which at is narrowest points was c.100 to 150m wide.

2.28 The geology to the west and immediate east of the River Trent within Section 1 is recorded as Mercia Mudstone Group. Superficial deposits of clay, silt and gravel alluvium occur along watercourses such as the River Trent and its various tributaries, otherwise the drift geology is recorded as Holme Pierrepont Sand and Gravel Member. To the east of the River Trent, a small bank of mudstone of Penarth Group with no recorded drift geology runs through the east of Marton towards Brampton. The geology in the east of Section 1 is recorded as interbedded mudstone and limestone of the Scunthorpe Mudstone Formation with no recorded superficial deposits (BGS 2022).

2.29 Wessex Archaeology were used as the main geophysical contractor for the Shared Cable Route Corridor (Appendix 5) and surveyed c. 200.5 ha. Two fields surveyed as part of the separate West Burton Solar Scheme, which are located within the shared cable route of the Cottam Solar Scheme, were surveyed by Northern Archaeological Associates totalling 23.43 (NAA 2022; Appendix 6).

3 Archaeological and Historical Background

3.1 Archaeological and historical background information for the Scheme is provided in a series of archaeological desk-based assessments, which should be referred to in parallel to this document (Lanpro 2022a;2022b; 2022c; 2022d; see ES Chapter Appendix 13.1). The individual geophysical survey reports also provide an overview of the archaeological background to the relevant Sites.

3.2 There are no designated heritage assets within the Cottam Solar Sites or the Cottam Cable Route Corridor.

4 Aims and Objectives

4.1 The overall aim of the archaeological geophysical surveys was to obtain sufficient information to establish the presence/absence, and where possible, character of any archaeological remains within the proposed development site. This has enabled an informed programme of trial trench evaluation (Cottam Solar Project 2022b, CFA 2022a, CFA 2022b and CFA 2022c) and allowed reasoned and informed recommendations to be made on the application for development of the site and requirements for further mitigation.

4.2 This aim was achieved through completion of the following objectives:

- To survey a 100% sample of all accessible areas within the scheme.
- To determine the location, extent, and where possible, character of any magnetic anomalies identified within surveyed areas.
- To assess the archaeological potential of magnetic anomalies using available supporting evidence.
- To identify concentrations of possible archaeological features to inform the Scheme design and any requirements for further archaeological investigation.
- To create a detailed report with illustrations and compile an appropriately packaged digital archive to ensure the long-term survival of the collected data.

4.3 The programme of archaeological geophysical survey was carried out with the aim of addressing the general research parameters and objectives defined in the regional archaeological research framework the *East Midlands Historic Environment Research Framework* (EMHERF 2022).

Standards and Guidance

4.4 All work was undertaken to fully meet the requirements of all nationally recognised guidance for such work, including standards laid down by the International Society of Archaeological Prospection, the European Archaeological Council (EAC), the Lincolnshire Council Historic Environment Team, Historic England and the Chartered Institute for Archaeologists (CIfA).

4.5 The programme of geophysical survey was managed in line with the standards laid down in the Historic England guideline publication *Management of Research Projects in the Historic Environment (MoRPHE): Project Managers Guide* (2015a), as well as to meet the requirements of the National Planning Policy Framework (NPPF; Chapter 16: 'Conserving and enhancing the historic environment'; revised 2021).

4.6 Guidance of particular relevance to the programme of works were:

- *Code of Conduct* (CIfA 2022)
- *EAC Guidelines for the Use of Geophysics in Archaeology* (Schmidt *et al.* 2015)
- *Archaeology Handbook* (Lincolnshire County Council 2019)

- *Standards and guidance or archaeological geophysical survey* (CIfA 2020a)
- *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives* (CIfA 2020b)
- *Management of Research Projects in the Historic Environment: PPN3: Archaeological Excavation* (English Heritage 2008)

5 Methodology

Data Collection

5.1 The geophysical survey comprised a magnetic survey technique. Magnetic surveys are generally considered to be the most cost-effective and successful technique for identifying a wide range of different archaeological features. Geophysical surveys undertaken for the Cottam Solar Scheme successfully detected potential human activity that appears to date from a range of different time periods. It can therefore be inferred that the soils and type of archaeological features within the areas surveyed are conducive to a magnetic survey technique and that the correct geophysical survey technique was utilised for the Scheme.

5.2 All survey work was completed to appropriate standards, as outlined by professional guidelines (CIfA 2020a; Schmidt *et al.* 2015). All survey works was completed by appropriately experienced operators working in line with the CIfA Code of Conduct (2022). The magnetometer survey was undertaken using an appropriate magnetometer system (either cart-based or handheld) with a resolution no coarser than 1m by 0.25m. All data was located using Real Time Kinematic (RTK) differential GPS equipment with a positional accuracy of ±0.1m. Detailed survey methodologies are detailed within final reports.

5.3 The geophysical survey covered all accessible land within the proposed cable route; where areas were not considered suitable for survey this was justified in the final reports.

Data Processing and Interpretation

5.4 Data processing and interpretation was undertaken by a competent geophysicist who is well versed in the characterisation of magnetic anomalies.

5.5 Data was sufficiently processed using appropriate software. All processes applied to data was detailed and justified in final reports.

5.6 Interpretation was undertaken with consideration to available supporting evidence, including, but not limited to, geological, documentary, cartographic, LiDAR and aerial sources. Consideration should also be given to site/ground conditions, topography and features present in the landscape at the time of survey.

Geophysical Survey Reports

5.7 The results of the geophysical surveys are presented in fully illustrated reports.

- Appendix 1: **Cottam 1 Solar Site**
- Appendix 2: **Cottam 2 Solar Site**

- Appendix 3: **Cottam 3 Solar Site**
- Appendix 4: **Cottam Cable Route Corridor**
- Appendix 5: **Shared Cable Route Corridor** (fields to the south of Marton to the Cottom Pawer Station)
- Appendix 6: **Shared Cable Route Corridor** (fields directly to the south of Stow Park Road)

Repeatability

5.8 Three control areas were established to assess data integrity between the different geophysical survey contractors employed to undertake the work.

5.9 Control areas were selected that contained features of different origin (i.e. archaeological, agricultural, modern, and geological etc) in order to demonstrate the repeatability of the magnetic survey techniques, as well as consistency between the different magnetometer systems operated by the geophysical contractors used for the Scheme.

5.10 Data collected in the control areas is reproduced in Appendix 7.

5.11 Data collected by the different contractors has produced consistent results with features of varying origins being detected and being recorded as anomalies with consistent patterning and increases in magnetic values.

6 Summary of Results

Cottam 1 Solar Site (Appendix 1; ASWYAS 2022a)

6.1 The results of the geophysical survey recorded concentrations of rectilinear and curvilinear anomalies that are likely to be indicative of late prehistoric, Roman period, and medieval activity. A series of anomalies of unknown origin were recorded in the south of Field C5 that correspond with an area in which Roman pottery and possible building stone were recovered in the 1930s (MLI51104) and cropmarks have been mapped from air photos and LiDAR. The form of these geophysical anomalies suggested that these could, at least in part, represent desiccation cracks within the subsoil and so possibly be of a geological nature. In the east of Field C28 to the south of Greystones Farm, an extensive area of rectilinear anomalies was recorded that were interpreted as representing possible prehistoric and/or Roman activity. In the east of Field D1, to the south of Ingham Road, there are several rectilinear and curvilinear geophysical anomalies that potentially extend into Field D2. Less extensive linear anomalies were also identified in Field D14 that possibly extend into Field D13, which were also interpreted as relating to prehistoric and/or Roman activity. A concentration of rectilinear anomalies was recorded in the south of Field F2, and the southern corner of what was suggested to be a possible enclosure was recorded in the north of Field F4. Geophysical survey has identified several rectilinear and curvilinear anomalies in Fields G1 and G4, and these again were interpreted as representing enclosures, trackways and associated occupational features.

6.2 A series of linear and rectilinear anomalies were identified to the east and south of Normanby by Stow, in Fields F1 and F2, that are indicative of medieval activity.

6.3 Anomalies composed of weak increases in magnetic value and poor patterning were identified in Areas C6, C7, C12, D2, D13, D33 and F3. Their origin is unknown, and it was not possible to

ascertain if they denote buried archaeological deposits or are of a modern, agricultural or geological origin.

6.4 Otherwise anomalies were primarily considered to be caused by agricultural activity, including ridge and furrow, former field boundaries, land drains and modern ploughing, as well as modern 'ferrous' material and geological or pedological changes in the substrata.

Cottam 2 Solar Site (Appendix 2; ASWYAS 2022b)

6.5 The results of the geophysical survey within the Cottam 2 Solar Site have identified two concentrations of anomalies in fields to the east of Corringham Grange Farm (Fields H5 and H8), which were interpreted as representing activity of a late prehistoric or Roman period date based on their morphology.

6.6 Anomalies composed of weak increases in magnetic value and poor patterning were identified in Fields H2, H3, H6 and H10. Their origin is unknown, and it is not possible to ascertain if they denote buried archaeological deposits or are of a modern, agricultural or geological origin.

6.7 It is considered likely that land within the Cottam 2 Solar Site has been primarily used for agriculture since the medieval period. The results of the geophysical survey have confirmed this with anomalies being mapped that are associated with ridge and furrow cultivation, modern ploughing, field drains and former field boundaries.

Cottam 3 Solar Site (Appendix 3; ASWYAS 2022c)

6.8 The archaeological geophysical survey undertaken within the Cottam 3 Solar Site has identified several concentrations of anomalies that have been interpreted as representing late prehistoric and/or Roman period enclosures, boundaries and possibly trackways. Isolated curvilinear and linear anomalies that possibly denote ephemeral archaeological features were identified in the north of Field K1, south-west of Field K7 and south-east of Field K9. Anomalies in the north-east of Field K14 and the east of Field K18, which are located to the west of the Roman settlement identified at Abbey Farm (ELI6987; MLI54147), may possibly represent a ladder settlement of late Iron Age and/or Roman date (ASWYAS 2022c). Anomalies in K18 correlate with the location of a concentration of Iron Age/Roman finds recorded within the Portable Antiquities Scheme (PAS) database. A series of rectilinear anomalies were identified in Fields J2 and J3 that were interpreted as possibly representing the remains of a former field system or series of enclosures.

6.9 It is considered likely that land within the Cottam 3 Solar Site has been primarily used for agriculture since at least the medieval period. The results of the geophysics survey have confirmed this with extensive anomalies being mapped that are associated with, ridge and furrow cultivation, modern ploughing, field drains and former field boundaries.

6.10 An area of magnetic disturbance corresponds with the location of the former Blyton Farm, which was destroyed in the mid-20th Century during the construction of RAF Blyton airbase.

6.11 Anomalies composed of weak increases in magnetic value and poor patterning were identified in Fields K1, K6, K7, J2 and J4. Their origin is unknown, and it is not possible to ascertain if they denote buried archaeological deposits or are of a modern, agricultural or geological origin.

6.12 Various areas of magnetic disturbance were identified in the Cottam 3a parcel that are likely to be caused by runways and aircraft dispersal areas associated with the former RAF Blyton airbase.

Cottam Cable Route Corridor (Appendix 4; ASWYAS 2022d)

6.13 One concentration of rectilinear magnetic anomalies was identified that had the potential to indicate prehistoric or Roman activity within the Cottam Cable Route and is located to the south of the A631 in Fields T65 and T66.

6.14 An unnamed post-medieval farmstead first recorded on the 1838 Stow Tithe Map to the east of Fleets Lane, between Cottam 1 Parcels D and E, appears as an area of magnetic disturbance. Land to the east of Fleets Lanes is reported within geophysical survey for the Cottam 1 Solar Site – see Appendix 1.

6.15 Anomalies composed of weak increases in magnetic value and poor patterning were identified in Fields T29 and T81. Their origin is unknown, and it is not possible to ascertain if they denote buried archaeological deposits or are of a modern, agricultural or geological origin.

Shared Cable Route Corridor (Appendices 5 – 6; Wessex 2022; NAA 2022;)

6.16 Geophysical survey on the southern end of the Shared Cable Route Corridor has identified several concentrations of magnetic anomalies that are likely to be indicative of late prehistoric and Roman period activity. A series of rectilinear anomalies were identified in Field 103 that possibly continue into the east of Field 104 that were interpreted as being indicative of an Iron Age or Romano-British settlement and field systems. Several anomalies were identified in Field 133a that possibly denote buried ditches. Given the area surveyed, it is not possible to fully characterise the feature(s) these anomalies relate to. An oval anomaly was identified in Field 125 that could be indicative of a small enclosure. A series of magnetic anomalies were identified in Field 132, which correspond with cropmarks identified from air photo and LiDAR mapping and interpretation, that are considered to be indicative of Iron Age or Roman settlement and field systems to the north-west of Cottam. Further magnetic anomalies also considered likely to represent by Iron Age or Romano-British activity were mapped to the south of the Shared Cable Route Corridor (Field 141). Weak linear anomalies were identified in Fields 131, 133 and 136. It was unclear if these were also caused by archaeological features or caused by agriculture activity or geological variations in the substrata. Rectilinear cropmarks and magnetic anomalies, located c. 210m to the west of the Cottam Power Station, were considered likely to be indicative of prehistoric or Roman settlement and field systems (Field 146). A series of anomalies were identified outside the Shared Cable Route Corridor in Field 151 that are likely to be caused by a series of enclosures of an unknown date.

6.17 Several anomalies have been identified of an unknown origin in Fields 107, 113, 115, 116, 134, and 151. It is not known if these anomalies are caused by buried archaeological deposits or are instead of an agricultural, modern or geological origin.

6.18 Evidence of agricultural activity, including ridge and furrow, land drains, former field boundaries and modern ploughing, has been mapped across all areas surveyed and demonstrates the agricultural character of land within the Shared Cable Route Corridor since at least the medieval period.

6.19 Anomalies with broad forms were identified adjacent to the River Trent are likely to be indicative of geological or pedological changes in the substrata and caused by bands of alluvial deposits including clays, silts, sands, and gravels deposited by the river.

7 Discussion

7.1 A magnetic geophysical survey was undertaken across all accessible areas within the Scheme to ascertain the potential for buried archaeological deposits to be present, and where possible suggest their extent and character.

7.2 Three geophysics contractors were used to collect and report on data for the scheme. Repeatability tests were used to scrutinise collected data and have demonstrated the geophysical survey technique chosen for the Scheme has provided meaningful data and that a high level of data integrity was achieved.

7.3 The results of the geophysical survey have identified clear concentrations of magnetic anomalies within the scheme that are indicative of prehistoric, Roman and medieval activity. Evidence of agricultural activity, including ridge and furrow, former field boundaries, land drains and modern ploughing, as well as anomalies of a modern and geological origin have also been mapped.

7.4 Concentrations of geophysical anomalies suggested to be of an archaeological origin were tested by trial trench evaluation between June and November 2022. The trial trench evaluation confirmed the extent and nature of archaeological deposits identified through the geophysical survey (CFA 2022a, CFA 2022b and CFA 2022c). It was noted during the trial trench evaluation that anomalies with good patterning and increases in magnetic value correlated with well-defined features; those with weak increases in magnetic value or informal patterning corresponded with shallow ephemeral features. Magnetic anomalies of an unknown origin were tested in Fields C12, F3 and H10, and were proven to be caused by features of an agricultural and geological origin. Negligible archaeological features were identified in 'blank' areas where geophysical survey had suggested there was a low potential for buried remains to be present. Where isolated features were present, these were ephemeral and often lacked dating material to confirm an archaeological origin. Consequently, it is considered that there is limited potential for buried archaeological remains to be present in areas where geophysical survey has not identified concentrations of anomalies interpreted to be of an archaeological origin.

8 References

ASWYAS 2022a, 'Cottam Solar Project. Cottam 1. Lincolnshire. Geophysical Survey', report no. 3777

ASWYAS 2022b, 'Cottam Solar Project. Cottam 2. Lincolnshire. Geophysical Survey', report no. 3769

ASWYAS 2022c, 'Cottam Solar Project. Cottam 3. Lincolnshire. Geophysical Survey', report no. 3756

ASWYAS 2022d, 'Cottam Solar Project. Cottam Cable Route. Lincolnshire. Geophysical Survey', report no. 3851

BGS 2022, *British Geological Survey website*, www.bgs.ac.uk/data/mapViewers/home.html (last accessed 20th October 2022)

CFA 2022a, Cottam Solar Project, Cottam 1: Interim report. report ref. Y597/22

CFA 2022b, Cottam Solar Project, Cottam 2: Interim report. report ref. Y592/22

CFA 2022c, Cottam Solar Project, Cottam 3: Interim report. report ref. Y598/22

CIfA 2020a, *Standard and guidance for archaeological geophysical survey*

CIfA 2020b, *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives*

CIfA 2022, *Code of Conduct*

Cottam Solar Project 2022a, 'Written Scheme of Investigation for Archaeological Geophysical Survey'

Cottam Solar Project 2022b, 'Written Scheme of Investigation for Archaeological Evaluation Trenching'

EMHERF 2022, *East Midlands Historic Environment Research Framework, https://*researchframeworks.org/emherf, (last accessed 20th Feb 2022)

English Heritage 2008, *Management of Research Projects in the Historic Environment (MoRPHE). PPN 3: Archaeological Excavation*

Historic England, 2015, *Management of Research Projects in the Historic Environment. The MoRPHE Project Managers' Guide*

Lincolnshire County Council 2019, *Archaeology Handbook*

Lanpro 2022a, 'Archaeological Desk-Based Assessment: Cottam 1, Cottam Solar Project, Lincolnshire', report ref: 2892H/01

Lanpro 2022b, 'Archaeological Desk-Based Assessment: Cottam 2, Cottam Solar Project, Lincolnshire', report ref: 2892H/02

Lanpro 2022c, 'Archaeological Desk-Based Assessment: Cottam 3, Cottam Solar Project, Lincolnshire', report ref: 2892H/03

Lanpro 2022d, 'Archaeological Desk-Based Appraisal: Cottam Cable route Corridor, Cottam Solar Project, Lincolnshire', report ref: 2892H/04

NAA 2022, 'Geophysical Survey Report. West Burton Three, West Burton Solar Scheme, Lincolnshire', report ref. NAA 21/54

Schmidt, A. Linford, P. Linford, N. David, A. Gaffney, C. Sarris, A. and Fassbinder, J. 2015, *EAC Guidelines for the Use of Geophysics in Archaeology. EAC Guidelines 2*. Belgium: Europae Archaeologiae Consilium.

Wessex 2022, 'Shared Cable Route Corridor, Nottinghamshire and Lincolnshire', report no 257661.03

9 Figures

Cottam
SOLAR PROJECT

Cottam 3

Cottam 2

Cottam 1

Cottam 1b

Cottam 1a

Cottam 1c

Cottam 1g

Cottam 1d

- Proposed Solar Site
- Proposed Cable Route Corridor
- Figure 13.2-2
- Figure 13.2-3
- Figure 13.2-4

N

0 1 2 3 4 km

Date: 09/11/2022 Version: 1.0 Ref: 2892/GEO/13.2-1

Figure App.13.2-1
Location of the Cottam Solar Scheme development sites

Cottam
SOLAR PROJECT

Proposed Solar Site

Proposed Cable Route Corridor

Geophysics anomalies: 'archaeology'

Geophysics anomalies: 'possible archaeology'

N

0 250 500 750 1,000 1,250 m

Date: 09/11/2022 Version: 1.0 Ref: 2892/GEO/13.2-2

Figure App.13.2-2
Location of survey areas within Cottam 1 Site and adjcent Cottam Cable Route Corridor with anomalies considered to have an archaeological potential

Cottam
SOLAR PROJECT

Cottam 3

Cottam 2

Cottam 3b

- Proposed Solar Site
- Proposed Cable Route Corridor
- Geophysics anomalies: 'archaeology'
- Geophysics anomalies: 'possible archaeology'

N

0 250 500 750 1,000 1,250 m

Date: 09/11/2022 Version: 1.0 Ref: 2892/GEO/13.2-3

Figure App.13.2-3
Location of survey areas within Cottam 2 and 3 Sites and adjcent Cottam Cable Route Corridor with anomalies considered to have an archaeological potential

Cottam
SOLAR PROJECT

Proposed Solar Site

Proposed Cable Route Corridor

Geophysics anomalies: 'archaeology'

Geophysics anomalies: 'possible archaeology'

N

0 250 500 750 1,000 1,250 m

Date: 09/11/2022 Version: 1.0 Ref: 2892/GEO/13.2-4

Figure App.13.2-4
Location of survey areas within the Cottam and Shared Cable Route Corridors with anomalies considered to have an archaeological potential

Appendix 1

Cottam 1 Solar Site Geophysics Report (ASWYAS 2022a)