# The Keadby 3 Low Carbon Gas Power Station Project

**Document Ref: 6.3**

**PINS Ref: EN010114**

**The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order**

**Land at and in the vicinity of the Keadby Power Station site, Trentside, Keadby, North Lincolnshire**

# Environmental Statement
# Volume II - Appendix 15C: Geophysical Survey Fieldwork Report

**The Planning Act 2008**

**The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017**

**Applicant: Keadby Generation Limited**

**Date: May 2021**

## DOCUMENT HISTORY

| | |
|---|---|
| **Document Ref** | 6.3.31/Appendix 15C |
| **Revision** | VP1.0 |
| **Document Owner** | AECOM |

magnitude surveys

# Geophysical Survey Report

**For**

# Keadby, North Lincolnshire

**For**

**Trent & Peak Archaeology**

**On behalf of**

**AECOM**

**Magnitude Surveys Ref: MSSE906**

**April 2021**

**Unit 17, Commerce Court**

**Challenge Way**

**Bradford**

**BD4 8NW**

**01274 926020**

**info@magnitudesurveys.co.uk**

**Issue Date:**

23 April 2021

# Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 23.62ha area of land across two areas at Keadby, North Lincolnshire. A fluxgate gradiometer survey has been successfully undertaken across the survey area. Anomalies likely related to the construction of a sub-station in the north of the survey area and the construction of a car park in the south, may have obscured weaker underlying anomalies, if any were present. However, the rest of the survey area exhibits a relatively quiet magnetic background and anomalies of possible archaeological origin and relating to the current and historical land use of the survey area have been detected. Natural variations have also been detected and are likely produced by the high groundwater within the clayey soils. Besides the anomalies relating to the sub-station and car park, modern activity is limited to magnetic disturbance at the field edges.

# Contents

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# 1. Introduction

1.1. Magnitude Surveys Ltd (MS) was commissioned by Trent & Peak Archaeology to undertake a geophysical survey over a c. 23.62ha area of land across two areas at Keadby, North Lincolnshire (SE 81989 12107 & SE 80853 11101).

1.2. The geophysical survey comprised hand-pulled cart-mounted GNSS-positioned fluxgate gradiometer survey. Magnetic survey is the standard primary geophysical method for archaeological applications in the UK due to its ability to detect a range of different features. The technique is particularly suited for detecting fired or magnetically enhanced features, such as ditches, pits, kilns, sunken featured buildings (SFBs) and industrial activity (David *et al*., 2008).

1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David *et al*., 2008), the Chartered Institute for Archaeologists (CIfA, 2020) and the European Archaeological Council (Schmidt *et al.,* 2015).

1.4. It was conducted in line with a WSI produced by MS (Cantarano, 2021).

1.5. The survey commenced on 12/04/2021 and took three days to complete.

# 2. Quality Assurance

2.1. Magnitude Surveys is a Registered Organisation of the Chartered Institute for Archaeologists (CIfA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society for Archaeological Prospection).

2.2. The directors of MS are involved in cutting edge research and the development of guidance/policy. Specifically, Dr Chrys Harris has a PhD in archaeological geophysics from the University of Bradford, is a Member of CIfA and is the Vice-Chair of the International Society for Archaeological Prospection (ISAP); Finnegan Pope-Carter has an MSc in archaeological geophysics and is a Fellow of the London Geological Society, as well as a member of GeoSIG (CIfA Geophysics Special Interest Group); Dr Kayt Armstrong has a PhD in archaeological geophysics from Bournemouth University, is a Member of CIfA, the Editor of ISAP News, and is the UK Management Committee representative for the COST Action SAGA; Dr Paul Johnson has a PhD in archaeology from the University of Southampton, is a Fellow of the Society of Antiquaries of London, has been a member of the ISAP Management Committee since 2015, and is currently the nominated representative for the EAA Archaeological Prospection Community to the board of the European Archaeological Association.

2.3. All MS managers, field and office staff have degree qualifications relevant to archaeology or geophysics and/or field experience.

# 3. Objectives

3.1. The objective of this geophysical survey is to assess the subsurface archaeological potential of the survey area.

# 4. Geographic Background

4.1. The survey area was located c. 1.3km west of Keadby, North Lincolnshire (Figure 1). Gradiometer survey was undertaken across two areas located 1km from each other. The northern part of the survey area was a field under pasture bounded by arable land to the north, a power sub-station to the east and Scunthrope Sea Cadets Boat Station to the south and west. The southern part of the survey area was bounded by the Sheffield and South Yorkshire Navigation Stainforth And Keadby Canal to the north, arable land to the east and south and by a power station track to the west. An area c. 0.4ha was not able to be surveyed due to unsuitable ground conditions.

4.2. Survey considerations:

| Survey Area | Ground Conditions | Further Notes |
|---|---|---|
| 1 | The area consisted of a flat arable field with cereal crop. | The area was bounded by a wooden fence to the north and west, and ditches to the south and east. |
| 2 | The area consisted of a flat arable field with young crop. | The area was bounded by a wooden fence to the north, and ditches to the east, south, and west. |
| 3 | The area consisted of a flat arable field. | The area was bounded by a wooden fence to the north, a ditch to the west, and had no physical boundary to the south and east. |
| 4 | The area consisted of a flat pasture field. | The area was bounded by a road to the south, and by a drain to the north. A ditch orientated north to south was in the west of the survey area. |
| 5 | The area consisted of a flat pasture field. | The area was bounded by ditches to the east and west, a road to the south, and no physical boundary to the north, |
| 6 | The area consisted of a flat pasture field. | The area was bounded by tall vegetation to the west, vegetation, and temporary metallic fencing to the south, and no physical boundary to the west and north. |

4.3. The underlying geology comprises mudstone from the Mercia Mudstone Group. Superficial deposits comprise Warp deposits made up of clay and silt. (British Geological Survey, 2021).

4.4. The soils consist of loamy and clayey soils of coastal flats with naturally high groundwater, across the whole survey area. (Soilscapes, 2021).

# 5. Archaeological Background

5.1. The following is a summary of a Cultural Heritage Desk Based Assessment produced by AECOM (Sadarangani et al, 2020) and provided by Trent & Peak Archaeology.

5.2. Assessment of borehole and test-pit logs from previous geotechnical surveys east of Keadby 2 Power Station, combined with the Keadby Wind Farm cores and the identification of cropmarks [MLS22755] has indicated the presence of a paleochannel of the river Trent, running NE-SW beneath the footprint of Keadby 1 Power Station.

5.3. Between the existing power station and Keadby village, a 1982 field-walking survey identified a scatter of over 100 sherds of Romano-British pottery, interpreted as representative of a small Romano-British settlement [MLS17311]. The assemblage included Greyware and Dalesware pottery, which is dated from the 2nd to 4th century A.D., alongside a scatter of shell and bone, and a roof tile. Additionally, three Roman copper-alloy coins were recovered, dated to the 3rd and 4th centuries A.D. [MLS17335]. However, a geophysical survey conducted south of the field did not detect any additional anomalies associated with the settlement.

5.4. Approximately 270m north of the Northern Area, a complete Romano-British female 'bog body' was discovered [MLS71]. Her shoes were of the style of the Northern provinces of the Roman Empire dated to the late 3rd to 4th centuries.

5.5. A complex of 'warping' systems were created within the area during the post-medieval period (1540A.D. to 1900A.D.) and can be seen as a network of cropmarks [MLS18404] [MLS21088], [MLS21639], [MLS24691] [MLS24602], [MLS24703], [MLS17470]. Such systems enabled a controlled flooding of lands utilising tidal fluctuations of the river. Temporary drains and banks would be created to trap fluvial silts from the Trent to enrich the soil, a process that would take around three years. In the Enclosure Acts of the 1790s, a clause was included allowing drains to be used for warping in Amcotts, Owston, Haxey, Epworth and Belton.

# 6. Methodology

## 6.1. Data Collection

6.1.1. Magnetometer surveys are generally the most cost effective and suitable geophysical technique for the detection of archaeology in England. Therefore, a magnetometer survey should be the preferred geophysical technique unless its use is precluded by any specific survey objectives or the site environment. For this site, no factors precluded the recommendation of a standard magnetometer survey. Geophysical survey therefore comprised the magnetic method as described in the following section.

6.1.2. Geophysical prospection comprised the magnetic method as described in the following table.

6.1.3. Table of survey strategies:

| Method | Instrument | Traverse Interval | Sample Interval |
|---|---|---|---|
| Magnetic | Bartington Instruments Grad-13 Digital Three-Axis Gradiometer | 1m | 200Hz reprojected to 0.125m |

6.1.4. The magnetic data were collected using MS' bespoke hand-pulled cart system – positioned system.

6.1.4.1. MS' cart system was comprised of Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a multi-channel, multi-constellation GNSS Smart Antenna RTK GPS outputting in NMEA mode to ensure high positional accuracy of collected measurements. The RTK GPS is accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

6.1.4.2. Magnetic and GPS data were stored on an SD card within MS' bespoke datalogger. The datalogger was continuously synced, via an in-field Wi-Fi unit, to servers within MS' offices. This allowed for data collection, processing and visualisation to be monitored in real-time as fieldwork was ongoing.

6.1.4.3. A navigation system was integrated with the RTK GPS, which was used to guide the surveyor. Data were collected by traversing the survey area along the longest possible lines, ensuring efficient collection and processing.

## 6.2. Data Processing

6.2.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to the EAC and Historic England guidelines for 'minimally enhanced data' (see Section 3.8 in Schmidt *et al.*, 2015: 33 and Section IV.2 in David *et al.,* 2008: 11).

Sensor Calibration – The sensors were calibrated using a bespoke in-house algorithm, which conforms to Olsen *et al*. (2003).

Zero Median Traverse – The median of each sensor traverse is calculated within a specified range and subtracted from the collected data. This removes striping effects caused by small variations in sensor electronics.

Projection to a Regular Grid – Data collected using RTK GPS positioning requires a uniform grid projection to visualise data. Data are rotated to best fit an orthogonal grid projection and are resampled onto the grid using an inverse distance-weighting algorithm.

Interpolation to Square Pixels – Data are interpolated using a bicubic algorithm to increase the pixel density between sensor traverses. This produces images with square pixels for ease of visualisation.

## 6.3. Data Visualisation and Interpretation

6.3.1. This report presents the gradient of the sensors' total field data as greyscale images, as well as the total field data from the lower sensors. The gradient of the sensors minimises external interferences and reduces the blown-out responses from ferrous and other high contrast material. However, the contrast of weak or ephemeral anomalies can be reduced through the process of calculating the gradient. Consequently, some features can be clearer in the respective gradient or total field datasets. Multiple greyscale images of the gradient and total field at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plot (Figure 9, 12, and 15). XY trace plots visualise the magnitude and form of the geophysical response, aiding anomaly interpretation.

6.3.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historical maps, LiDAR data, and soil and geology maps. Google Earth (2021) was also consulted, to compare the results with recent land use.

6.3.3. Geodetic position of results – All vector and raster data have been projected into OSGB36 (ESPG27700) and can be provided upon request in ESRI Shapefile (.SHP) and Geotiff (.TIF) respectively. Figures are provided with raster and vector data projected against OS Open Data.

# 7. Results

## 7.1. Qualification

7.1.1. Geophysical results are not a map of the ground and are instead a direct measurement of subsurface properties. Detecting and mapping features requires that said features have properties that can be measured by the chosen technique(s) and that these properties have sufficient contrast with the background to be identifiable. The interpretation of any identified anomalies is inherently subjective. While the scrutiny of the results is undertaken by qualified, experienced individuals and rigorously checked for quality and consistency, it is often not possible to classify all anomaly sources. Where possible, an anomaly source will be identified along with the certainty of the interpretation. The only way to improve the interpretation of results is through a process of comparing excavated results with the geophysical reports. MS actively seek feedback on their reports, as well as reports from further work, in order to constantly improve our knowledge and service.

## 7.2. Discussion

7.2.1. The geophysical results are presented in combination with satellite imagery and historical maps (Figures 4).

7.2.2. The fluxgate gradiometer survey has generally responded well to the environment of the survey area. Ferrous debris, which are likely related to the construction of the sub-station in the north of the survey area and the construction of a car park in the south, may have obscured weaker underlying anomalies, if any were present (Figure 3). However, the rest of the survey area exhibits a relatively quiet magnetic background and anomalies of possible archaeological origin and relating to the current and historical land use of the survey area have been detected. Weak natural variations have also been detected and are likely produced by the high groundwater within the clayey soils. Besides the anomalies relating to the sub-station and car park, modern activity is limited to magnetic disturbance at the field edges.

7.2.3. Possible isolated enclosures have been identified in the north and south of the survey area (Figures 9 and 12). Their weak magnetic signal and lack of context did not allow for a more confident classification. However, these anomalies could not be discounted due to the nearby finds of Romano-British origin (see Section 5.) including a complete Romano-British female ‘bog body’ discovered c. 270m north of Area 6.

7.2.4. Linear anomalies matching cropmarks have been identified in the south of the survey area (Figure 4). These cropmarks are recorded as being part of Post-medieval warping drainage systems which enabled a controlled flooding of lands utilising tidal fluctuations of the river (see section 5.5.). The magnetic signal of the anomalies is consistent with what would be expected from the trapping of fluvial silts along temporary drains.

Although the anomalies detected may not be contemporaneous with each other, it can be suggested with confidence that these systems are from the Post- Medieval period when land reclamation for agricultural use was extensive. Further anomalies of agricultural origin comprise former field boundaries recorded on historical maps, ploughing trends, a footpath visible on satellite imagery and extensive drainage features in a variety of orientations (Figures 6, 9, and 12).

7.2.5. Anomalies relating to the construction of the sub-station have been detected in the north of the survey area (Figure 12). Further to the ferrous debris spread in the near surface discussed in 7.2.2., weak linear anomalies have been detected cutting through the area of debris in the direction of the sub-station. Although their exact usage is difficult to assess, they could relate to former tracks used during the construction of the sub-station.

7.2.6. A couple of linear anomalies have been detected in the north and south of the survey area and have been classified as 'Undetermined' (Figures 6 and 12). Although the morphology of these features could indicate an archaeological origin, the proximity to anomalies of similar magnetic signal of agricultural origin in the south, and of modern origin in the north, mean that a more confident classification could not be assigned.

## 7.3. Interpretation

### 7.3.1. General Statements

7.3.1.1. Geophysical anomalies will be discussed broadly as classification types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.

7.3.1.2. **Data Artefact** – Data artefacts usually occur in conjunction with anomalies with strong magnetic signals due to the way in which the sensors respond to very strong point sources. They are usually visible as minor 'streaking' following the line of data collection. While these artefacts can be reduced in post-processing through data filtering, this would risk removing 'real' anomalies. These artefacts are therefore indicated as necessary in order to preserve the data as 'minimally processed'.

7.3.1.3. **Ferrous (Spike)** – Discrete dipolar anomalies are likely to be the result of isolated pieces of modern ferrous debris on or near the ground surface.

7.3.1.4. **Ferrous/Debris (Spread)** – A ferrous/debris spread refers to a concentration of multiple discrete, dipolar anomalies usually resulting from highly magnetic material such as rubble containing ceramic building materials and ferrous rubbish.

7.3.1.5. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures, typically including fencing, pylons, vehicles and service pipes, have been classified as 'Magnetic Disturbance'. These magnetic 'haloes' will obscure weaker anomalies relating to nearby features, should they be present, often over a greater footprint than the structure causing them.

7.3.1.6. **Undetermined** – Anomalies are classified as Undetermined when the origin of the geophysical anomaly is ambiguous and there is no supporting contextual evidence to justify a more certain classification. These anomalies are likely to be the result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally distinct from those caused by ferrous sources.

### 7.3.2. Magnetic Results - Specific Anomalies

7.3.2.1. **Possible Archaeology –** weak linear and rectilinear anomalies have been detected across Areas 3 and 6 (Figures 10 and 12). These anomalies are suggestive of infilled cut features and suggest possible partial enclosures. Their weak magnetic signal and lack of further context within the data prevent a more confident classification, however, due to the archaeological potential in this area (Section 5.3) an archaeological origin cannot be excluded.

7.3.2.2. **Agricultural –** A collection of weak positive linear anomalies have been identified throughout Areas 1, 2, 3, and 4 [**1a, 3c, 3d and 4b**] (Figure 5 and 6). An extensive warping system has been recorded in the area (Section 5.5) and the anomalies detected correspond with the recorded cropmarks visible in satellite imagery (Figure 4). The anomalies possess a weak positive magnetic signal with soft edges which is consistent with a silt infilled ditch characteristic of warping systems. Although it is not possible to establish whether [**1a, 3c, 3d and 4b**] are contemporaneous with each other, they are likely to relate to the Post-medieval warping systems.

7.3.2.3. **Agricultural –** Weak and strong linear anomalies [**4a, 6a, 6b, 6c**] have been detected in Areas 4 and 6, which have been identified on historic mapping as former field boundaries (Figures 8 and 14). Several straight linear anomalies of a weak magnetic signal have been detected running across Areas 4 and 6 (Figures 11 and 14). These anomalies are typical of agricultural trends and correspond with modern ploughing direction visible on satellite imagery (Figure 4). A weak linear anomaly crossing Area 6 in a southwest-northeast direction (Figure 14) correlates with a footpath identified on satellite imagery (Figure 4).

7.3.2.4. **Drainage Feature –** Extensive linear anomalies have been detected across the survey area in a variety of orientations and lengths (Figure 6, 9 and 12). These are characteristic of drainage features and appear to belong to multiple systems of drains.

7.3.2.5. **Ferrous Debris/Spread –** Concentrations of dipolar anomalies likely caused by a spread of magnetic material in the topsoil have been detected in the east of Area 5 (Figures 8 and 9), and in the east of Area 6 (Figure 12). Areas 5 and 6 are located directly west of a car park and a sub-station respectively, which suggest that the debris are related to their construction.

7.3.2.6. **Modern –** Weak linear anomalies have been detected within Area 6 (Figure 12), most of which are running in direction of the sub-station which is located directly east of Area 6. The anomalies cut through the area of ferrous debris

spread (see 7.3.2.5). Although it is difficult to assess the exact origin of the anomalies it is likely that they are related to the sub-station. They could have been produced by possible former tracks used during the construction of the sub-station.

7.3.2.7.

7.3.2.8. **Natural –** Weak, discrete anomalies and broad areas of magnetic enhancement have been identified in Areas 1 ,2 and 3 (Figures 8 and 11), which are characteristics of natural variations, likely due to naturally high groundwater within the soils (Section 4.4.).

7.3.2.9. **Undetermined –** A number of weak linear and curvilinear anomalies (Figure 6) have been detected in Areas 2 and 6. The anomalies are not visible on satellite imagery or recorded historical maps, and a lack of clear context or clear pattern precludes a more confident classification. Although, a modern or agricultural origin is more likely, an archaeological origin cannot be ruled out.

# 8. Conclusions

8.1. A fluxgate gradiometer survey has been successfully undertaken across the survey area. The results show anomalies of predominantly agricultural and modern practices along with possible archaeology. Weak natural variations are detected as areas of high groundwater within the soils. Modern interference is minimal and confined to field extents.

8.2. Possible Archaeology has been identified in the form of isolated potential enclosures across the survey area. Their weak magnetic signal and lack of further context prevented a more confident classification.

8.3. Agricultural activity has been detected in the south of the survey area as Post-Medieval warping drainage systems and elsewhere within the survey area as former field boundaries, tracks from ploughing regimes, a footpath and extensive systems of drainage features of varying orientations and relative ages.

8.4. Construction debris and tracks, from the building of a power substation, has been identified as modern industrial anomalies and ferrous debris spread in the near surface.

8.5. Anomalies of undetermined origin were detected across the survey area. These could relate to agricultural, or modern processes, although an archaeological origin cannot be ruled out.

# 9. Archiving

9.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.

9.2. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to any dictated time embargoes.

# 10. Copyright

10.1. Copyright and intellectual property pertaining to all reports, figures and datasets produced by Magnitude Services Ltd is retained by MS. The client is given full licence to use such material for their own purposes. Permission must be sought by any third party wishing to use or reproduce any IP owned by MS.

# 11. References

British Geological Survey, 2021. Geology of Britain. Keadby, North Lincolnshire. [http://mapapps.bgs.ac.uk/geologyofbritain/home.html/]. Accessed 19/04/2021.

Chartered Institute for Archaeologists, 2020. Standards and guidance for archaeological geophysical survey. CIfA.

David, A., Linford, N., Linford, P. and Martin, L., 2008. Geophysical survey in archaeological field evaluation: research and professional services guidelines (2nd edition). Historic England.

Google Earth, 2021. Google Earth Pro V 7.1.7.2606.

Olsen, N., Toffner-Clausen, L., Sabaka, T.J., Brauer, P., Merayo, J.M.G., Jorgensen, J.L., Leger, J.M., Nielsen, O.V., Primdahl, F., and Risbo, T., 2003. Calibration of the Orsted vector magnetometer. Earth Planets Space 55: 11-18.

Sadarangani, F., Scott, G., Wilson, J., 2020. Land at and in the vicinity of the Keadby Power Station site, Trentside, Keadby, North Lincolnshire. Environmental Statement Volume II – Appendix 15A: Cultural Heritage Desk Based Assessment. AECOM.

Schmidt, A. and Ernenwein, E., 2013. Guide to good practice: geophysical data in archaeology (2nd edition). Oxbow Books: Oxford.

Schmidt, A., Linford, P., Linford, N., David, A., Gaffney, C., Sarris, A. and Fassbinder, J., 2015. Guidelines for the use of geophysics in archaeology: questions to ask and points to consider. EAC Guidelines 2. European Archaeological Council: Belgium.

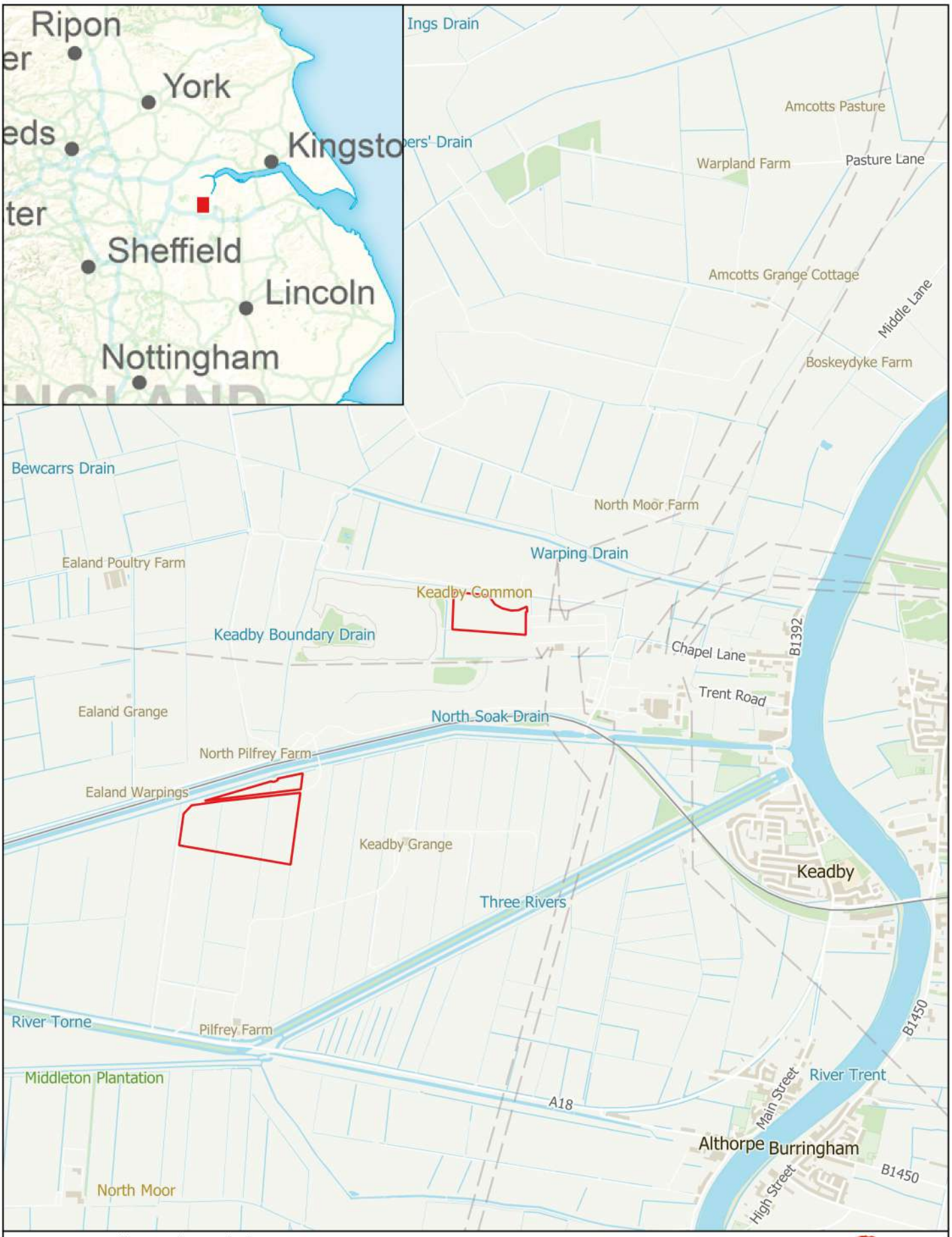
Soilscapes, 2021. Keadby, North Lincolnshire. Cranfield University, National Soil Resources Institute. [http://landis.org.uk]. Accessed 19/04/2021.

# 12. Project Metadata

| | |
|---|---|
| MS Job Code | MSSE906 |
| Project Name | Geophysical Survey Report For Keadby, North Lincolnshire |
| Client | Trent & Peak Archaeology |
| Grid Reference | SE 81989 12107 & SE 80853 11101 |
| Survey Techniques | Magnetometry |
| Survey Size (ha) | 23.62 ha (Magnetometry) |
| Survey Dates | 2021-04-12 to 2021-04-16 |
| Project Lead | Julia Cantarano Ingénieur PCIfA |
| Project Officer | Julia Cantarano Ingénieur PCIfA |
| HER Event No | N/A |
| OASIS No | N/A |
| S42 Licence No | N/A |
| Report Version | 0.2 |

# 13. Document History

| Version | Comments | Author | Checked By | Date |
|---|---|---|---|---|
| 0.1 | Initial draft for Project Lead to Review | LT | JC | 21 April 2021 |
| 0.2 | Corrections from Project Lead. Director Approval | LT & JC | PSJ | 23 April 2021 |



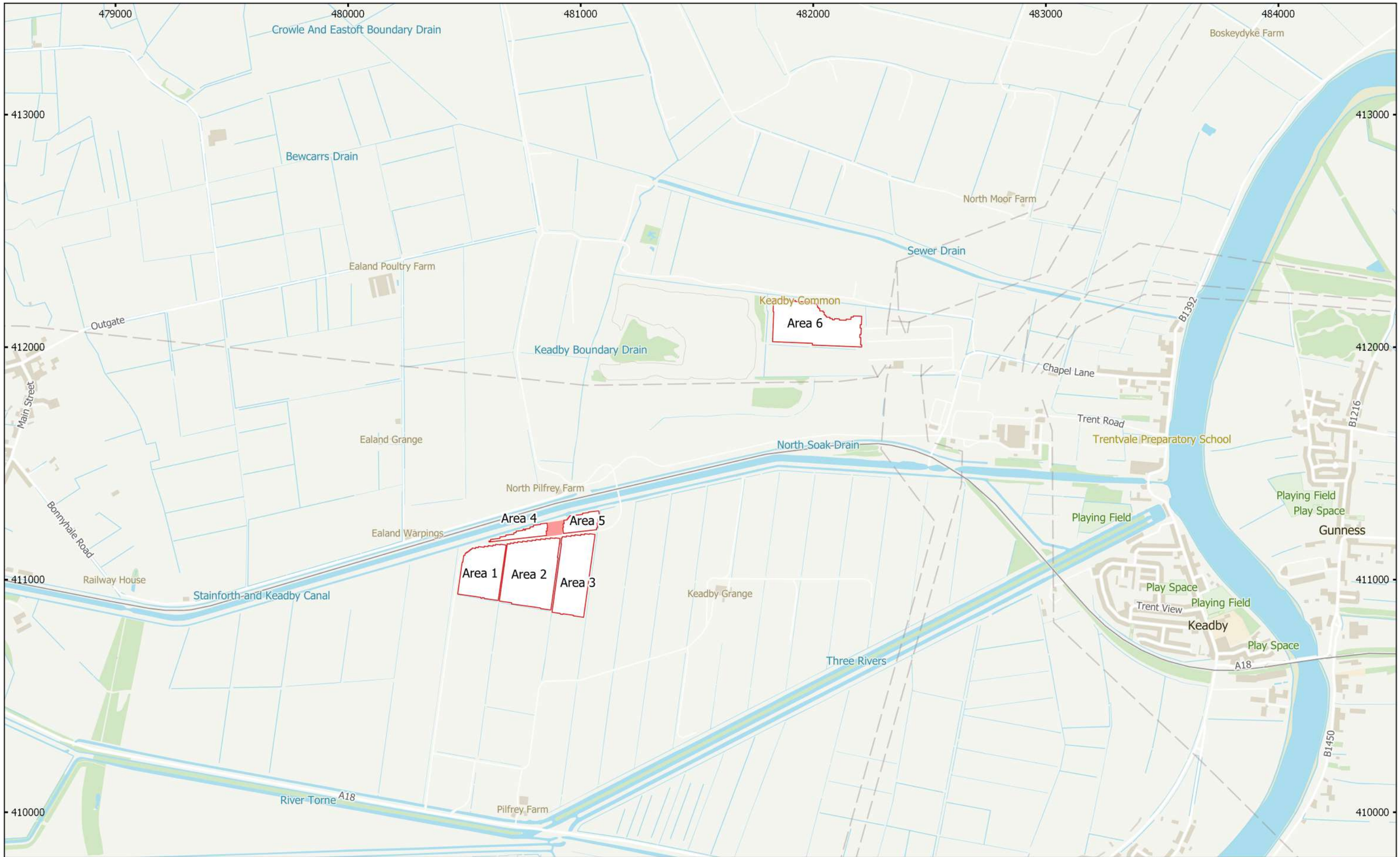

MSSE906 - Keadby, North Lincolnshire
Figure 1 - Site Location
1:25,000 @ A4


Site Boundary

N

0 0.5 1 km

magnitude surveys




MSSE906 - Keadby, North Lincolnshire
Figure 2 - Location of Survey Areas
1:15,000 @ A3


Survey Area
Not Surveyed

N

0 400 800 1200 m

magnitude surveys

480525
481025
481525
482025
411975
411425
410875
482525

Area 1
Area 2
Area 3
Area 4
Area 5
Area 6

MSSE906 - Keadby, North Lincolnshire
Figure 3 - Magnetic Total Field (Lower Sensor) (Overview)
1:6,000 @ A3


48997 nT 49005

N

0 150 300 450 m

magnitude surveys


MSSE906 - Keadby, North Lincolnshire
Figure 4 - Magnetic Interpretation Over Historic Mapping and Satellite Imagery (Overview)
1:6,000 @ A3


- Archaeology Possible (Weak)
- Agricultural (Strong)
- Agricultural (Weak)
- Modern
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Weak)
- Agricultural (Trend)
- Data Artefact
- Drainage Feature
- Ferrous (Spike)

N

0 150 300 450 m

magnitude surveys

410800
410900
411000
411100
411200
411300
480600
480800
Area 1
Area 2
Area 4
-1
nT
2
0
25
50
75 m
N
magnitude surveys

MSSE906 - Keadby, North Lincolnshire
Figure 5 - Magnetic Gradient (Areas 1, 2 (West) and 4 (West))
1:1.500 @ A3

410800
410900
411000
411100
411200
411300
480600
480800
Area 1
Area 2
Area 4
1a
2a
4a
4b

MSSE906 - Keadby, North Lincolnshire
Figure 6 - Magnetic Interpretation (Areas 1, 2 (West) and 4 (West))
1:1.500 @ A3


- Archaeology Possible (Weak)
- Agricultural (Strong)
- Agricultural (Weak)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Undetermined (Weak)
- Agricultural (Trend)
- Data Artefact
- Drainage Feature
- Ferrous (Spike)

N

0 25 50 75 m

magnitude surveys

410800
410900
411000
411100
411200
411300
480600
480800
Area 1
Area 2
Area 4
N
0
25
50
75 m
magnitude surveys

MSSE906 - Keadby, North Lincolnshire
Figure 7 - XY Trace Plot (Areas 1, 2 (West) and 4 (West))
10nT/cm at 1:1.500 @ A3

410800
410900
411000
411100
411200
411300
480800
481000
Area 2
Area 3
Area 4
Area 5
-1 nT 2
0 25 50 75 m
N
magnitude surveys

MSSE906 - Keadby, North Lincolnshire
Figure 8 - Magnetic Gradient (Areas 2 ( East), 3, 4 (East) and 5)
1:1,500 @ A3

410800
410900
411000
411100
411200
411300
480800
481000
Area 2
Area 4
Area 5
Area 3
3a
3b
3c
3d

MSSE906 - Keadby, North Lincolnshire
Figure 9 - Magnetic Interpretation (Areas 2 ( East), 3, 4 (East) and 5)
1:1,500 @ A3


- Archaeology Possible (Weak)
- Agricultural (Strong)
- Agricultural (Weak)
- Natural (Weak)
- Natural (Zone)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Weak)
- Agricultural (Trend)
- Data Artefact
- Drainage Feature
- Ferrous (Spike)

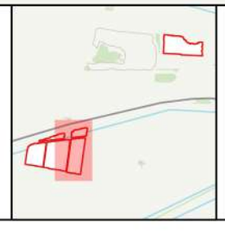
N

0 25 50 75 m

magnitude surveys

410800
410900
411000
411100
411200
411300
480800
481000
Area 2
Area 3
Area 4
Area 5

MSSE906 - Keadby, North Lincolnshire
Figure 10 - XY Trace Plot (Areas 2 ( East), 3, 4 (East) and 5)
10nT/cm at 1:1,500 @ A3

N

0 25 50 75 m

magnitude surveys

481800

482000

482200

412200

412100

412000

Area 6

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Figure 11 - Magnetic Gradient (Area 6)
1:1,500 @ A3


-1 nT 2

N

0 25 50 75 m

magnitude surveys

481800
482000
482200
412200
412100
412000

Area 6
6a
6b
6c

MSSE906 - Keadby, North Lincolnshire
Figure 12 - Magnetic Interpretation (Area 6)
1:1,500 @ A3


- Archaeology Possible (Weak)
- Agricultural (Strong)
- Agricultural (Weak)
- Modern
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Undetermined (Weak)
- Agricultural (Trend)
- Drainage Feature
- Ferrous (Spike)

N

0 25 50 75 m

magnitude surveys

481800

482000

482200

412200

412100

412000

Area 6

MSSE906 - Keadby, North Lincolnshire
Figure 13 - XY Trace Plot (Area 6)
10nT/cm at 1:1,500 @ A3


N

0 25 50 75 m

magnitude surveys