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APPENDIX 14.3

ARCHAEOLOGICAL & CULTURAL HERITAGE - GEOPHYSICAL REPORT

RECEIVED: 08/07/2024

# Geophysical Survey Report

## Gortlusky, Boula, Co. Galway

Detection Device Number: 24R0048

Donald Murphy

March 2024

Report Status: Final


ACSU Ref.: 2405



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## PROJECT DETAILS

Project	Geophysical Survey at Gortlusky, Boula, Co. Galway
Report Type	Geophysical Survey Report
Licence No.	24R0048
Townland(s)	Ballynaheskeragh, Coolpowra, Coolnageeragh and Gortlusky
RMP/SMR No.	N/A
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ITM Ref.	582444, 708888
Consultant	Archaeological Consultancy Services Unit, 21 Boyne Business Park, Greenhills, Drogheda, County Louth
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### VERSION CONTROL

Revision	Date	Description	Status	Author	Reviewed	Approved
1.0	04.03.2024	Geophysical survey results	Final	D.M & J.R	M.L	D.M

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## NON-TECHNICAL SUMMARY

This report details the results of a Geophysical Survey carried out at Ballynaheskeragh, Coolpowra, Coolnageeragh and Gortlusky, Co. Galway (ITM 582444, 708888). The geophysical survey was requested in advance of the proposed development. The site consisted of pasture fields measuring c. 50 hectares and consists of lands to the west of the N65 between Portumna and Killimor (Fields 1-20).

There are no monuments within the site, the nearest such monument is Mound (GA117-104----), located c. 0.85km to the southeast. There are no Protected Structures within the site, as listed in the *Galway County Development Plan 2022 – 2028*.

The site was not subject to archaeological investigations previously, and there are no investigations listed within the townlands of Ballynaheskeragh, Coolpowra, Coolnageeragh and Gortlusky on the excavations.ie database.

The geophysical survey was conducted by Donald Murphy, Robert Breen and Jeanne Rochford of Archaeological Consultancy Services Unit Ltd. (ACSU) under licence 24R0048 issued by the Department of Housing, Local Government and Heritage. A full detailed gradiometer survey was undertaken throughout the application area using a Bartington GRAD 601-2 dual-sensor fluxgate gradiometer cart system.

Potential spread/pit remains and curvilinear features of archaeological significance have been recorded in Fields 3, 4-5, 7, 11, 16 and 18. An archaeological interpretation for responses in these areas is highly tentative, and a natural soil/geological or recent land-use origin for these anomalies should be considered. A sample of these responses should be assessed by means of test trenching.

Features depicted on the examined Ordnance Survey mapping were also detected, including numerous linear anomalies corresponding with former field boundaries. Linear anomalies that are not recorded field boundaries were also detected. They likely represent early field system, drains or paths/access. Anomalies marked as Cultivation represent furrows/plough marks or possible land drains.

It is recommended that anomalies identified are targeted during a future test trenching programme. Features exposed shall be sufficiently sectioned in order to assess their depth, nature, and significance. This must be carried out by a licence-eligible archaeologist prior to any groundworks commencing. Once test trenching is complete, further mitigation might include preservation in situ (avoidance), excavation (preservation by record), and/or monitoring. The Department of Housing, Local Government, and Heritage shall be consulted in this regard.

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## 1. INTRODUCTION

This report details the results of a Geophysical Survey carried out on a site located within the townlands of Ballynaheskeragh, Coolpowra, Coolnageeragh and Gortlusky, Co. Galway (ITM 582444, 708888; Figures 1 - 2). The geophysical survey was requested in advance of the proposed development. The site consisted of pasture fields measuring c. 50 hectares and consists of lands to the west of the N65 between Portumna and Killimor (Fields 1-20).

There are no monuments within the site, the nearest such monument is Mound (GA117-104----), located c. 0.85km to the southeast. There are no Protected Structures within the site, as listed in the *Galway County Development Plan 2022 – 2028*.

A full detailed gradiometer survey was undertaken throughout the application area using a Bartington GRAD 601-2 dual-sensor fluxgate gradiometer cart system. The geophysical survey was conducted by Donald Murphy, Robert Breen and Jeanne Rochford of Archaeological Consultancy Services Unit Ltd (ACSU) under licence 24R0048 issued by the Department of Housing, Local Government and Heritage.

## 2. ARCHAEOLOGICAL CONDITION/REQUIREMENT


The geophysical survey was carried out in advance of the proposed development at the request of the client, which is currently at a pre-planning phase.

## 3. METHODOLOGY

A full detailed gradiometer survey was undertaken throughout the application area using a Bartington GRAD 601-2 dual-sensor fluxgate gradiometer system mounted on a GPS-based non-magnetic cart system with four mounted sensors (see also Appendix 1). A detailed survey was conducted with a sample interval of 0.25m and a traverse interval of 1m for all the survey areas within the site, with variations in the magnetic field between -100nT to +107.834nT.

All work was carried out in accordance with the *IAI Code of Professional Conduct* (Institute of Archaeologists of Ireland 2006) and in accordance with the *EAC Guidelines for the use of Geophysics in Archaeology* (Schmidt et al. 2016), as well as English Heritage's *Geophysical Survey In Archaeological Field Evaluation* (David et al. 2008).



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#### 4. SURVEY OBJECTIVES

The survey aimed to establish the presence of any potentially existing but unknown monuments and any other archaeological features within the site and to inform a future programme of test trenching.

#### 5. SOILS, GEOLOGY AND TOPOGRAPHY

The site has an elevation of c. 49-61m above Ordnance Datum (O.D.). The underlying geology within the survey area consists of dark limestone and shale and is part of the Lucan Formation. The underlying geology is overlaid by deep, well drained mineral (mainly basic) soils. Geological Survey of Ireland).

#### 6. ARCHAEOLOGICAL ASSESSMENT

##### 6.1 Archaeological & Historical Background

The site is located in the townlands of Ballynaheskeragh in the Civil Parish of Killimorbologue, Coolpowra, Coolnageeragh and Gortlusky, in the Civil Parish of Lickmolassy all in the Barony of Longford in County Galway.

Ballynaheskeragh (<https://www.logainm.ie/en/21215>) comes from the Irish Baile na hEisceach which translates to 'Town of the Ridge (of Sand Hills)'. There have been several variations of spelling of the name such as Ballanyscraigh and Ballyneheskeragh from the early 1600s which is the earliest record of the townland name. The Ordnance Survey Name Books dating to the 1830s listed farmhouses, lime kilns, a trigl. station, a portion of fir planting in belts and a small portion of bog as all features within the townland. (<https://heritage.galwaycommunityheritage.org/content/uncategorized/ballynaheskeragh-baile-na-heisceach-town-ridge-sand-hills>). Coolpowra or Cúil Phóire which roughly translates to 'Back of the Beans' was first mentioned in 1577 as 'Coulffurry'. (<https://www.logainm.ie/en/21233>).

Coolnageeragh or Cúil na gCaorach which roughly translates to 'Back of the Sheep' was first mentioned in 1660. The Ordnance Survey Name books described the townland as containing a considerable number of farmhouses, lanes, spring wells, one lime kiln and the road leading from Portumna to Eyre Court, which forms the townlands eastern boundary. Gortlusky or an Ghoirt Loiscthe is described in The Ordnance Survey Name book as containing a few farmhouses, portions of furze, spring wells, a gravel pit and two lime kilns.

There are no Recorded Monuments listed within any of the townlands that the site is located in. The nearest monuments are Mound (GA117-104----) and Designed landscape feature (GA117-090----), located c. 850m to the southeast. There are also two Enclosures (GA117-024----; GA117-063----) located further south of the proposed development site.

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## 6.2 Previous Archaeological Investigations

The site was not subject to archaeological investigations previously, and there are no investigations listed within the townlands of Ballynaheskeragh, Coolpowra, Coolnageeragh and Gortlusky on the [www.excavations.ie](http://www.excavations.ie) database. The closest archaeological assessment conducted to the proposed site was in the viillage of Killimor, north of the site. Test trenching (09E0057; O'Carroll, 2009) was carried out at a greenfield site within the zone of archaeological potential of a Protected Structure; Trinity Chapel (GA107-079). No archaeological features were identified.

## 6.3 Recorded Monuments

There are no monuments within the site. The nearest such monuments are Mound (GA117-104----) and De- signed landscape feature (GA117-090----, located c. 850m to the southeast.

The following is a list of the recorded monuments located in the environs of the site. These descriptions are derived from the National Monuments Service Archaeological Survey Database (<http://maps.archaeology.ie/historicenvironment/>).

*Table 1: Recorded Monuments in the environs of the site*

<b>GA117-104----</b>	<b>Mound</b>
The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded.	
<b>GA117-090----</b>	<b>Designed landscape feature</b>
The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded.	
<b>GA117-024----</b>	<b>Enclosure</b>
On a hillock in grassland. Marked on the 1838 edition of the OS 6-inch map as a subrectangular enclosure (c. 26m ESE-WNW; c. 18m NNE-SSW) and on the OS 1:2500 plan (surveyed 1912-16) as a roughly circular enclosure (diam. c. 18m). No visible surface trace survives. Compiled by: Galway Archaeological Survey, UCG.	
<b>GA117-063----</b>	<b>Enclosure</b>
In low-lying grassland adjacent to a stream. Poorly preserved rectangular enclosure (39.5m E-W; N-S 32m) defined by two banks and an intervening fosse. The inner bank survives at N and from S to W; elsewhere	

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a scarp forms the enclosing element. Traces of the outer bank survive along the W side. A gap (Wth 4.5m) at SW may be original. Compiled by: Galway Archaeological Survey, UCG.

#### 6.4 Protected Structures and National Inventory of Architectural Heritage

There are no Protected Structures within the site as listed in the *Galway County Development Plan 2022 – 2028*. No such structures or sites are recorded in the townlands Ballynaheskeragh, Coolpowra, Coolnageeragh or Gortlusky.


#### 6.5 Finds listed within the Topographical Files of the National Museum of Ireland

The Topographical Files of the National Museum of Ireland were also consulted to assess the area's archaeological potential. These files list all archaeological artefacts in the care of or known to the museum. Such a record can provide evidence for human settlement or activity in the absence of physical remains or documentary references. No such finds were recorded for the townlands of Ballynaheskeragh, Coolpowra, Coolnageeragh or Gortlusky.

#### 6.6 Cartographic Evidence

A review of available historic mapping for the area was carried out to include the Ordnance Survey (OS) of Ireland, including the 6-inch (1837) and 25-inch (1892). Potential archaeological or cultural heritage features are marked on such maps and provide a useful resource in identifying sites, particularly if they no longer have any above-ground remains.

The townland of Gortlusky has three farmhouses located within the townland on the Ordnance Survey (OS) 6-inch map of 1837. There are far more field divisions depicted than the present layout of the fields. By the time of the OS 25-inch map of 1892, much of the southern area of the townland and the northeast area are overgrown by furze and cropping rock is illustrated. There are only two farmhouses located within this townland by 1892. The field for the proposed development located within the townland of Coolnageeragh, directly west of Gortlusky, is depicted on the 1837 and 1892 maps as several fields. The small square allotment that can be seen presently along the west of the field and within the proposed site, is the original location of a farmhouse that is depicted on the 1837 map. The OS map of 1892 has a spring marked in this field in the townland of Coolnageeragh also. The field within the townland of Coolpowra, in the northwest portion of the

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proposed development was also subdivided further on the 1837 and 1892 maps, an unfenced road is illustrated traversing the site from northwest to southeast.

The townland of Ballynaheskeragh again has fields subdivided further than their present layout. There is a disused limekiln depicted on the 1892 OS map on the edge of one of the fields within the proposed development.

## 6.7 Aerial Photography

In addition to examining the various editions of the OS maps, aerial photographs from the Geological Survey of Ireland, dating from between 1995 and 2013, and the google aerial imagery dating between 2010 and 2023 were consulted.

By the 1995 aerial, a number of field boundaries were removed.

The site has remained unchanged since.

## 7. METHOD OF DATA INTERPRETATION

As outlined above, a detailed gradiometer survey that allows the detection of potential archaeological responses was conducted. The Bartington GRAD 601-2 instrument is a specifically designed gradiometer for use in archaeological prospection. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.01nT, affording diverse applications throughout various archaeological, soil morphological and geological conditions. The survey was geo-referenced with a Trimble R10 unit accurate to within 1cm. The results were interpreted by examining the raw data as greyscale images, X.Y. trace, relief and data plots. Archived raw data is presented in Figure 5, and an interpretation is included in Figure 6.

## 8. SURVEY RESULTS

The geophysical survey was conducted in February 2024 by Donald Murphy, Robert Breen and Jeanne Rochford of ACSU under licence 24R0048 (Figures 5-14). The anomalies identified are listed in Table 2 below.

Table 2: Geophysical survey results


Anomaly No.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
M1	?Archaeology	Possible early field system or structure	Positive linear anomalies along the north boundary in Field 3. This may represent an early field system or remains of a structure. May also be natural in origin.
M2a-d	?Archaeology	Possible pits, spreads, kilns or similar archaeological features.	Three positive anomalies sporadically spread across Field 4 and 5 that may represent cut features of archaeological potential such as pits, posts, or kilns. May also be natural in origin.
M3	?Archaeology	Possible early field system or structure	Faint linear anomaly along the western boundary in Field 7. This may represent an early field system or remains of a structure. May also be natural in origin.
M4	?Archaeology	Possible pits, spreads, kilns or similar archaeological features.	Cluster of positive anomalies within Field 11 that may represent cut features of archaeological potential such as pits, posts, or kilns. May also be natural in origin.
M5	?Archaeology	Linear features	Faint linear and curvilinear trends occurring in the northwest corner of Field 16, these could represent remains of an enclosure that has been heavily ploughed out. May also represent former field divisions and agricultural features not depicted on OS Mapping.
M6	?Archaeology	Linear features	Faint curvilinear trends occurring along the western boundary of Field 18, this could represent remains of an enclosure that has been heavily ploughed out. May also represent former field divisions and agricultural features not depicted on OS Mapping.
M7	?Archaeology	Possible pit, spread, kilns or similar archaeological feature.	A positive anomaly located along the western boundary of field 19, irregular in shape. This might represent a cut feature such as a pit, post, spread, kiln or other type of archaeological feature.

Anomaly No.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
-	Magnetic interference/ increased magnetism	Modern anomalies such as farming equipment, metal boundary fencing, utility poles, etc.	Dipolar responses across Fields 1-11, 14, 15 and 17 representing modern anomalies such as farming equipment, metal boundary fencing, utility poles, etc.
-	Linear features	Former field boundaries	Positive linear anomalies that represent former field boundaries depicted on the Ordnance Survey (OS) maps, including the 6-inch (1837) and 25-inch (1892). These appear in Fields 1, 3-7, 10, 12-14, and 18-19.
-	Early field system?	Linear features	Linear anomalies that may represent early field divisions not depicted on OS mapping, in Fields 1, 6, 11, 16, and 18.
-	Cultivation	Cultivation furrows – agricultural	Consistent linear trends aligned northwest-southeast (Field 2) and aligned NE-SW (Field 4) representing cultivation furrows.
-	Buried service?	Modern service	Bipolar response – clearly defined service or drainage, aligned northwest-southeast in Field 10.
-	Natural/underlying geology	Natural/changes in the underlying geology	Series of sporadically occurring positive anomalies, across Fields 1, 12, 13 and 19, that correlated with a noticeable change in topography during the survey. These likely correspond to changes in underlying geology.

## 9. IMPACT ASSESSMENT

The purpose of this impact assessment was to establish whether or not the site contained any evidence for the presence of unrecorded areas or features of historical, built heritage or archaeological significance and determine the potential impacts that the proposed development may have on such features.

A geophysical survey of the site was carried out under licence 24R0048 and a site visit was conducted in February 2024.

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No definite signs of archaeology were identified during the geophysical survey, however, anomalies of archaeological potential were recorded and these require further assessment, therefore targeted test trenching is recommended.

## 10. CONCLUSIONS & RECOMMENDATIONS

The geophysical survey at Ballynaheskeragh, Coolpowra, Coolnageeragh and Gortlusky, Co. Galway was carried out to assess the site's archaeological potential and inform the planning application. The site consisted of pasture fields measuring c. 50 hectares (Fields 1-20).

Potential spread/pit remains and curvilinear features of archaeological significance have been recorded in Fields 3, 4-5, 7, 11, 16 and 18. An archaeological interpretation for responses in these areas is highly tentative, and a natural soil/geological or recent land-use origin for these anomalies should be considered. A sample of these responses should be assessed by means of test trenching.

Features depicted on the examined Ordnance Survey mapping were also detected, including numerous linear anomalies corresponding with former field boundaries. Linear anomalies that are not recorded field boundaries were also detected. They likely represent early field system drains or paths/access. Anomalies marked as Cultivation represent furrows/plough marks or possible land drains.

It is recommended that anomalies identified are targeted during a future test trenching programme. Features exposed shall be sufficiently sectioned in order to assess their depth, nature, and significance. This must be carried out by a licence-eligible archaeologist prior to any groundworks commencing. Once test trenching is complete, further mitigation might include preservation in situ (avoidance), excavation (preservation by record), and/or monitoring. The Department of Housing, Local Government, and Heritage shall be consulted in this regard.

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## 11. REFERENCES

David, A., Linford, N. & Linford, P. 2008. Geophysical Survey in Archaeological Field Evaluation. English Heritage, Swindon

Institute of Archaeologists of Ireland (2006) *IAI Code of Professional Conduct*. IAI, Dublin.

O'Carroll, E, 2009, '2009:406 – GARRYAD AND GARRYDUFF, KILLIMOR, GALWAY'. Excavation Summary

(<https://excavations.ie/report/2009/Galway/0020747/>), accessed January 2024

Schmidt, A., Linford, P., Linford N., David A., Gaffney C, Sarris A. Fassbinder J. 2016 EAC Guidelines for the use of Geophysics in Archaeology, European Archaeological Council

## Other Sources

Extract from the First edition Ordnance Survey (OS) 6-inch map, 1837-1841.

Extract from the Third edition Ordnance Survey (OS) 25-inch map, 1892-1894.

Galway County Development Plan 2022-2028

Galway County Heritage Office

(<https://heritage.galwaycommunityheritage.org/content/uncategorized/ballynaheskeragh-baile-na-heiscreach-town-ridge-sand-hills>)

National Inventory of Architectural Heritage (<http://www.buildingsofireland.ie/>).

National Library of Ireland, 7–8 Kildare Street, Dublin 2.

Placenames Database of Ireland, developed by Fiontar & Scoil na Gaeilge (DCU) and The Placenames Branch (Department of Culture, Heritage and the Gaeltacht). ([www.logainm.ie](http://www.logainm.ie))

Record of Monuments and Places (RMP), the Heritage Service, 7 Ely Place, Dublin 2. <https://heritagedata.maps.arcgis.com/apps/webappviewer/>

Summary Accounts of Archaeological Excavations in Ireland ([www.excavations.ie](http://www.excavations.ie)).

The Schools Collection, national Folklore Collection, UCD (<https://www.duchas.ie/en/cbes>).

Topographical files of the National Museum of Ireland



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## 12. APPENDIX 1 – SUMMARY TECHNICAL INFORMATION & GLOSSARY OF TERMS

**Fluxgate Gradiometer Survey** is a non-intrusive method of archaeological prospection that is most often used in Irish Archaeology. This method allows for rapidly mapping archaeological objects, structures, deposits and other features, including geological anomalies, that survive beneath the ground. It allows the most rapid ground coverage and records a variety of anomalies caused by human activity and changes in the natural subsoil. The results are presented as a greyscale map of anomalies detected that are interpreted by an experienced archaeologist.

Surveys are undertaken using GPS-based lightweight Bartington Grad 601-2 mounted on the Bartington Cart system. Ground cover must be 0.30m or less. The instrument used is operated by an experienced, skilled geophysical survey technician. The data is collected by hand-wheeling the cart over the survey area in evenly spaced parallel transects. The equipment was specifically designed for archaeological prospection. It includes highly stable sensors, minimising requirements for excess data processing. The instrument has a vertical 1 m sensor separation permitting finite resolution of buried archaeological features. Surveys can be undertaken in a scan or detailed (zig-zag traverse) modes for reconnaissance or high-density mapping. The fluxgate enables reliable flexibility during fieldwork. Regular realignment of the instruments and zero drift correction ensure constant high data quality. These extremely sensitive instruments can detect variations in soil magnetism to 0.01nT, affording diverse applications throughout a variety of archaeological, soil morphological and geological conditions.

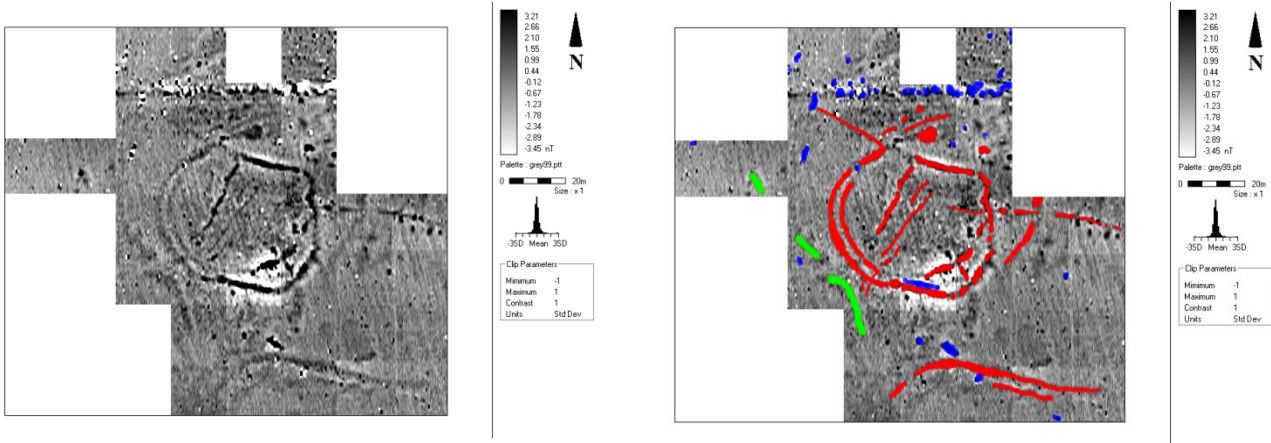
The instrument can be employed in both commercial and research-based investigations allowing for the completion of projects within short timescales. Regular grid sample densities from standard 1600 readings to 12800 readings per 20m by 20m grid are permitted. A constant high quality of data is assured by experienced field staff operating in accordance with EAC *Guidelines for the use of Geophysics in Archaeology* (Schmidt et al. 2015) and English Heritage's *Geophysical Survey In Archaeological Field Evaluation* (David et al. 2008).



**Bartington Grad 601-2 mounted on Bartington Cart**

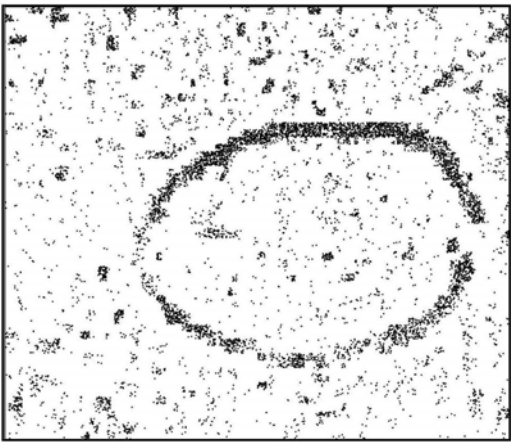
Data Display Format

**Greyscale:** The greyscale format assigns a cell to each datum according to its location on the grid. The display of each data point is conducted at very fine increments, allowing the full range of values to be displayed within the given data set. This display method also enables the identification of discrete responses that may be at the limits of instrument detection.



Early medieval enclosure – greyscale

**Dot Density Plot:** Each datum is assigned a cell in which the intensity or number of dots displayed is proportional to the magnitude of the individual response. The visibility or presentation of responses within a given survey area is governed by numeric parameters specific to both soil morphological and archaeological conditions observed on site. Typically, the range of weak to strong responses is manifested by a low to a high level of dot density. The format is useful for displaying gradiometer and resistance data, particularly for identifying low-level responses.



Dot Density plot of an oval-shaped enclosure