



An archaeological gradiometer and resistance survey

Land at Lee Abbey,
Lynton and Lynmouth, Devon

Centred on NGR (E/N): 270060,149440 (point)

Report: 1705LEE-R-1

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8 August 2017

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Project archive

Report	Adobe PDF format
Copies of report figures	Adobe PDF format
Raw and processed grid & composite files.....	DW Consulting TerraSurveyor 3 formats
Minimal processing data plots and metadata	DW Consulting TerraSurveyor 3 formats
Final data processing data plots and metadata.....	DW Consulting TerraSurveyor 3 formats
GIS project, shape files and classification schema	
GIS project.....	Manifold 8 '.map' file
GIS shape files	ESRI standard
GIS classification schema	Adobe PDF format
AutoCAD version of the survey interpretation.....	AutoCAD DXF

Website: substrata.co.uk

For an overview of Substrata, our archaeological geophysical surveying techniques and the results we obtain.

1 Survey description and summary

1.1 Survey

Type: magnetometer; twin-sensor fluxgate gradiometer
twin-probe resistance
Dates: magnetometer survey: 18 May 2017
resistance survey: 19 and 22 May 2017
Area: magnetometer survey: 0.92ha
resistance survey: 1.00ha
Lead surveyor: Mark Edwards
Author: Ross Dean

1.2 Client

Exmoor National Park Authority, Exmoor House, Dulverton, Somerset TA22 9HL

1.3 Site information

Site: Land at Lee Abbey
Civil Parish: Lynton and Lynmouth
District: North Devon
County: Devon
NGR: SS 7006 4944 (point)
NGR E/N: 270060,149440 (point)
Post code: EX35 6JJ
Historic Environment Entry: MDE11247
Known associated project documents: Riley (2017)

1.4 Archive

OASIS number: substrat1-292207
Archive: At the time of writing, the archive of this survey will be held by Substrata. Depending on local authority policy, an archive of the unprocessed data may be deposited with the Archaeological Data Service

1.5 Introduction

This report was commissioned by The Exmoor National Park Authority. It presents the results of an archaeological magnetometer and resistance survey at Lee Abbey and is part of a larger project which focussed on part of a multiperiod field system at Lee Abbey recorded on the Exmoor HER as site MDE11247. A possible circular feature was recorded on the National Mapping Programme (NMP) transcription in this field and appeared to survive as a slight earthwork. The survey was required to inform this part of the England Coast Path route which is proposed to cross this field. The survey area is shown in Figure 1.

1.6 Summary

The magnetic and resistance responses were sufficient to be able to differentiate anomalies representing possible archaeological features.

A total of nine magnetic anomaly groups and twenty-six resistance anomaly groups were mapped as representing archaeological deposits and features. A number of magnetic and resistance anomalies coincide with, and most likely represent, an extant prehistoric bank, elements of a relict bronze age field system, a section of post-medieval estate boundary wall, an extant ploughed over circular mound and an extant sub-circular platform. These last two features may have prehistoric or later origins and could relate to World War II search light emplacements. From the survey data, however, it would appear that the mound is more likely to be of World War II origin and that the platform has a more typically archaeological structure. Two sub-circular anomaly sets not identified with extant earthworks were identified in the resistance data. One may represent a stony deposit such as a cairn. The other may represent an earthen deposit, possibly with an internal area of heated deposits, suggesting a barrow or an archaeological surface. Two potential pits were recorded in the resistance data. The remaining magnetic and resistance anomalies identified as representing potential

archaeological deposits had characteristics frequently associated with field or enclosure boundaries of unknown date and phase but, in the context of the development of Lee Abbey and its grounds, likely to be medieval or earlier.

2 Survey aims and objectives

2.1 Aims

To establish the presence or absence, extent and character of any archaeological features and deposits within the survey area.

2.2 Objectives

1. To identify any below ground archaeological feature (such as ditches, pits, burning activity, walling etc).
2. To ascertain the nature of the circular feature.
3. To identify any related archaeological features or potential features.
4. To build on the knowledge of surveying sites of this type on Exmoor.
5. To use modern remote sensing techniques including gradiometry and earth resistance.

3 Methodology

The work was undertaken in accordance with the survey methodology statement (Dean, 2017).

The survey grid location information and grid plan was recorded as part of the project in a suitable GIS system (Table 4).

Data processing was undertaken using appropriate software (Table 4), with all anomalies being digitised and geo-referenced. The final report (this document) includes a graphical and textual account of the techniques undertaken, the data obtained and an archaeological interpretation of that data and conclusions about any likely archaeology.

4 Standards

The standards used to complete this survey are defined by the Chartered Institute for Archaeologists (2014a) and Historic England (2010). The codes of approved practice that were followed are those of the Chartered Institute for Archaeologists (2014b) and Archaeology Data Service/Digital Antiquity Guides (undated).

5 Site description

5.1 Landscape and land use

The survey area lies within Church Close, a pasture field of the Lee Abbey Estate Farm. The field slopes north - south from approximately 140m to 100m AOD.

5.2 Geology

The solid geology across the survey area and surrounds is finely-laminated sandstones and mudstones, slates and siltstones of the Devonian Lynton Formation. The superficial geology is Head. Generically, Head is a polymict deposit comprising poorly sorted and poorly stratified deposits of sand and gravel, locally with lenses of silt, clay or peat and organic material. Argillaceous frost-shattered rock debris can be present either in-situ or soliflucted with variable sand and clay content (British Geological Society undated).

6 Archaeological background

6.1 Archaeological background

This section is not designed to provide a comprehensive understanding of the historic environment of the surrounding area and should not be used as a source for further work.

The Exmoor National Park Historic Environment Record was provided by the Exmoor National Park Authority as GIS shape files. Consultation of the Heritage Gateway HER

records (Historic England, undated) was also undertaken. The objective was to gain an appreciation of historic assets pertinent to the geophysical survey data within approximately 500m of the survey area perimeter (Table 1).

Referring to Table 1, the survey area lies within the boundary of Historical Environment Record (HER) entry MDE11247. This entry describes an early bronze age to modern field system, a bronze age hut circle numerous platforms, a stony mound and a modern golf course, the construction of which may have affected some of the monuments. A possible circular feature was recorded on the National Mapping Programme (NMP) transcription in the survey target field and appeared to survive as a slight earthwork. A number of other potential prehistoric and historic assets are recorded in the vicinity in the HER. Some of these are within the Valley of the Rocks, itself a Principal Archaeological Landscape. These landscapes are areas designated by Exmoor National Park Authority for their exceptional archaeological and historic quality and importance (Exmoor National Park Authority, undated).

The survey field was named as Church Close Plantation on the Ordnance Survey 1980-81 1:10,000 map but was not named on earlier Ordnance Survey maps.

On the 1840 Lynton and Lynmouth tithe map and the in the 1839 apportionment the survey area is part of two fields named Great Church Close and Little Church Close. An earlier access road to Lee Abbey is shown as passing through Great Church Close (Riley, 2017).

7 Methodology, results, discussion and conclusions

7.1 Scope and definitions

The two surveys were designed to record magnetic anomalies and resistance anomalies. The analysis of the data sets was designed to highlight anomalies and reflection patterns judged indicative of archaeological deposits, structures, features or past human activity.

The terms 'archaeological deposit', 'structure' and 'feature' refer to any artefacts, material deposits or disturbance of natural deposits thought to be the result of human activity, excluding recent land maintenance and farming.

The reader is referred to section 8.

7.1.1 Magnetometer survey

A magnetic anomaly is a local variation in the Earth's magnetic field. Such variations can result from differences in the chemistry or magnetism of underlying solid geology, superficial geology and other near-surface deposits including those altered and created by past human activities. Near-surface and surface artefacts can also create magnetic anomalies.

7.1.2 Resistance survey

A resistance anomaly is a local variation in the electrical resistance of a soil and is related to its porosity, permeability, saturation, and chemical nature of entrapped fluids (Heimmer and De Vore, 1995:30), all of which can be altered by past human activities. Higher concentrations of ions allow electrical current to pass more easily through the soil, creating a lower electrical resistance.

7.2 Results

The interpretations of the magnetometer and resistance surveys are summarised together in Figure 2 and individually in Figures 3 and 4. All three figures include the designations of the anomaly groups identified as possibly relating to archaeological and other deposits. Tables 2 and 3 are extracts of the detailed analysis of the magnetometer and resistance survey data sourced from the attribute tables of the GIS project provided in the project archive.

Figures 2 to 4, Table 2 and Table 3 comprise the analysis of the survey data.

Various plots of the processed data as specified in Tables 5 and 6 are provided in Figures 5 to 8.

Figures 9 and 10 are plots of the unprocessed magnetometer data and the unprocessed resistance data respectively.

7.3 Discussion

7.3.1 General points

Discussion scope

Not all magnetic and resistance anomaly groups or radar reflection patterns identified in the figures and tables specified in Section 7.2 are necessarily discussed below. All identified anomaly groups are recorded in the GIS project held the survey archive.

Data collection

Although much of the ground had been cleared in preparation for the survey, the nature of the ground made it inevitable that data collection was occasionally restricted by trees and thick vegetation.

Data collection during the magnetometer survey was restricted as shown in the relevant figures due to the presence of relatively modern magnetic materials along boundaries and elsewhere within the survey area. Strong magnetic responses are likely to relate to these materials except where otherwise indicated in Figures 2 and 3.

Anomaly characterisation and mapping

There are a number of magnetic and resistance anomaly groups that could be interpreted as relating to large postholes or pits although most will have natural origins. Anomalies of this sort are only mapped as potential archaeology if they are clustered in groups or otherwise form recognisable patterns.

Anomalies thought to relate to natural features and recent man-made objects were only mapped where they comprised significant magnetic responses across the dataset that needed clarification.

Numerous dipole magnetic anomalies are scattered across the magnetometer data set. These are likely to represent recent ferrous objects. They are only mapped if they could influence the analysis of anomaly groups thought to have an archaeological origin.

Data trends

A number of data trends were recorded in both the magnetometer and resistance data. It is likely that groups m101 (Figure 2), r102 and r103 (Figure 4) reflect relatively recent ploughing whereas group r101 may relate to historical ridge-and-furrow cultivation.

7.3.2 Magnetometer survey (Figures 2, 3, 5 and 6, Table 2)

Magnetic anomaly group m1 coincides with resistance anomaly group r2 (Section 7.3.3) and represents deposits associated with an extant bank recorded in a recent assessment and metric survey of archaeological features at Lee Abbey (Riley, 2017). Thought to be prehistoric in origin with use as a field boundary into post-medieval times, it was removed in the mid-19th century (ibid). Group m2 may also relate to group m1 and the extant bank but may reflect ridge-and-furrow ploughing as discussed above with regards to resistance anomaly trend r101.

Group m3 coincides with an earthwork bank thought to be part of a former field system (ibid) but only reflects a small part of the extant bank and so is classified as 'possibly' representing an archaeological feature.

Group m5, two relatively short, parallel, linear magnetic anomalies coincide with an extant, ploughed over mound some 12m in diameter and up to 1.2m high and thought to be a bronze age barrow, cairn or possibly a World War II search light position (ibid). The anomaly group probably results from ploughing disturbance through magnetically enhanced material which leaves all the above options open but some clarification is provided in the resistance data (anomaly groups r8 and r9 in Section 7.3.7).

Anomaly group m6 includes responses indicative of relatively recent ferrous material along with rubble. This suggests that the group reflects a now removed recent fence line or disturbed service trench but an archaeological origin cannot be ruled out.

Group m9 is clear in the data and may represent archaeological deposits, possibly with a heated constituent. It coincides with resistance anomaly group r24 and is discussed further in Section 7.3.3.

Groups m4, m7 and m8 have magnetic characteristics often associated with remnant field and enclosure boundaries of unknown date or phase.

7.3.3 Resistance survey (Figures 2, 4, 7 and 8, Table 3)

Resistance anomaly groups r1, r4, r5 and r6 approximately coincide, with and probably represent, deposits associated with a group of ploughed over banks and scarps thought to be fragments of a recently mapped relict bronze age field system (Riley, 2017). Magnetic anomaly group m3 may also relate to this group of earthworks (Section 7.3.2). Resistance groups r10, r11, r13 and r14 are also most likely to reflect parts of this field system (ibid). The higher resistance anomalies are more likely to reflect stony deposits and the lower resistance anomalies earthen deposits such as may be found in bank-and-ditch features.

Resistance groups r2 and r3 coincide with magnetic anomaly group m1 (Section 7.3.2) and represent deposits associated with an extant bank thought to be prehistoric in origin, with use as a field boundary into post-medieval times and removed in the mid-19th century (ibid).

Groups r8 and r9 coincide with magnetic anomaly group m5 (Section 7.3.2) and with an extant, ploughed over mound some 12m in diameter and up to 1.2m high and thought to be a bronze age barrow or cairn, or possibly a World War II search light position (ibid). Group r8 is indicative of a stony deposit and possibly concrete. When considered along with groups r9 and m5, the pattern could be indicative of a search light or gun emplacement.

Groups r18 and r19 coincide with a ploughed over, sub-circular platform approximately 15m by 10m with a 0.8m northern facing front scarp and a 0.8m cut into the slope to the south (ibid). Previously interpreted as a hut platform (HER MDE11247 at approximately SS 7011 4944 in Table 1) it was not identified as being ploughed over on 1946-47 aerial photographs. This suggests that the platform is of 20th century origin. The resistance anomalies, however, suggest a semi-circular stony deposit with a disrupted ditch to the north. The anomaly trend r102 suggests that ploughing has taken place across the feature although a very recent origin for this ploughing is feasible. On balance, the resistance anomaly groups leave open the possibility of a prehistoric origin for the platform although later disturbance cannot be ruled out.

Group r23 is a relatively high-resistance circular anomaly indicative of stony deposits. Speculatively, the group may represent an archaeological deposit such as the remnants of a cairn although recent origins cannot be ruled out.

Group r24 coincides with magnetic anomaly group m9 which may represent formerly heated deposits (Section 7.3.2). Taken together, the groups may represent the remains of a former barrow, surface or similar archaeological deposit although recent origins cannot be ruled out without further archaeological investigations.

Groups r25 and r26 coincide with remains of a drystone wall which formed part of the mid-19th century estate boundary (ibid).

Groups r7, r20, r21 and r22 have characteristics often associated with remnant field and enclosure boundaries of unknown date or phase.

Groups r12 and r17 may represent pits although natural origins are equally likely.

7.4 Conclusions

The magnetic and resistance responses were sufficient to be able to differentiate anomalies representing possible archaeological features.

A total of nine magnetic anomaly groups and twenty-six resistance anomaly groups were mapped as representing archaeological deposits and features. A number of magnetic and resistance anomalies coincide with, and most likely represent, an extant prehistoric bank (anomaly groups m1, r2, r3 and possibly m2), elements of a relict bronze age field system (r1, r4, r5, r6, m3, and r10, r11, r13, r14), a section of post-medieval estate boundary wall (r25 and r26), an extant ploughed over circular mound (m5, r8 and r9) and an extant sub-circular platform (r18 and r19). These last two features may have prehistoric or later origins and could relate to World War II search light emplacements. From the survey data, however, it would appear that the mound is more likely to be of World War II origin and that the platform has a more typically archaeological structure. Two sub-circular anomaly sets not identified with extant earthworks were identified in the resistance data. One may represent a stony deposit such as a cairn (r23). The other may represent an earthen deposit, possibly with an internal area of heated deposits, suggesting a barrow or an archaeological surface (m9 and r24). Two potential pits were recorded in the resistance data (r12 and r17). The remaining magnetic and resistance anomalies identified as representing potential archaeological deposits had characteristics frequently associated with field or enclosure boundaries of

unknown date and phase but, in the context of the development of Lee Abbey and its grounds, likely to be medieval or earlier.

8 Disclaimer and copyright

The description and discussion of the results presented in this report are the authors, based on his interpretation of the survey data. Every effort has been made to provide accurate descriptions and interpretations of the geophysical data set. The nature of archaeological geophysical surveying is such that interpretations based on geophysical data, while informative, can only be provisional. Geophysical surveys are a cost-effective early step in the multi-phase process that is archaeology. The evaluation programme of which this survey is part may also be informed by other archaeological assessment work and analysis. It must be presumed that more archaeological features will be evaluated than those specified in this report.

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9 Acknowledgements

Substrata would like to thank Shirley Blaylock, Conservation Officer (Historic Environment), of the Exmoor National Park Authority for commissioning Substrata to complete the survey.

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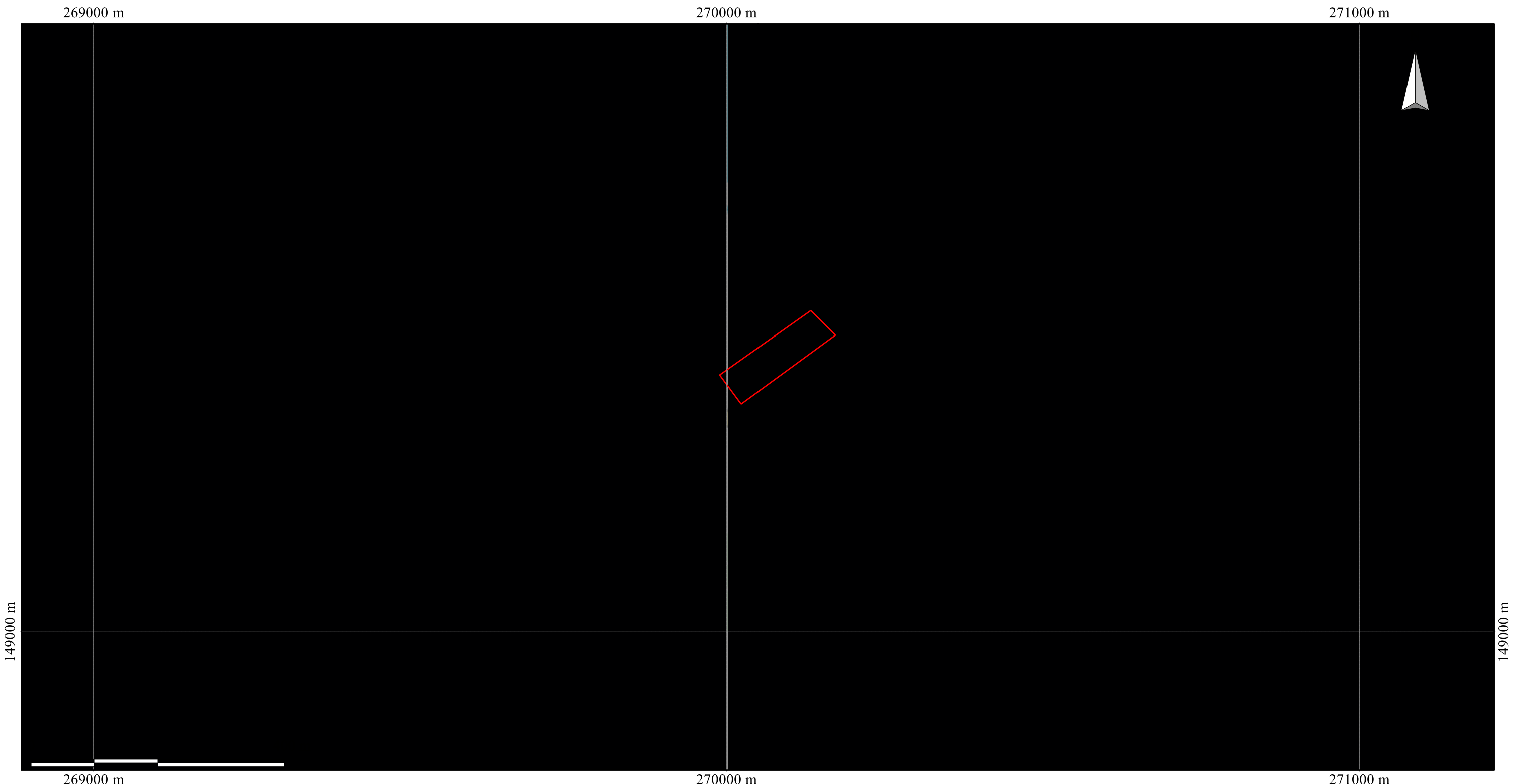
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Appendix 1 Figures



British Grid
 centre X: 270049.18 m, centre Y: 149371.27 m

Scale: 1:6000 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 1: location of survey area

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British Grid
 centre X: 270077.99 m, centre Y: 149435.22 m

Scale: 1:800 @ A3. Spatial Units: Meter. Do not scale off this drawing

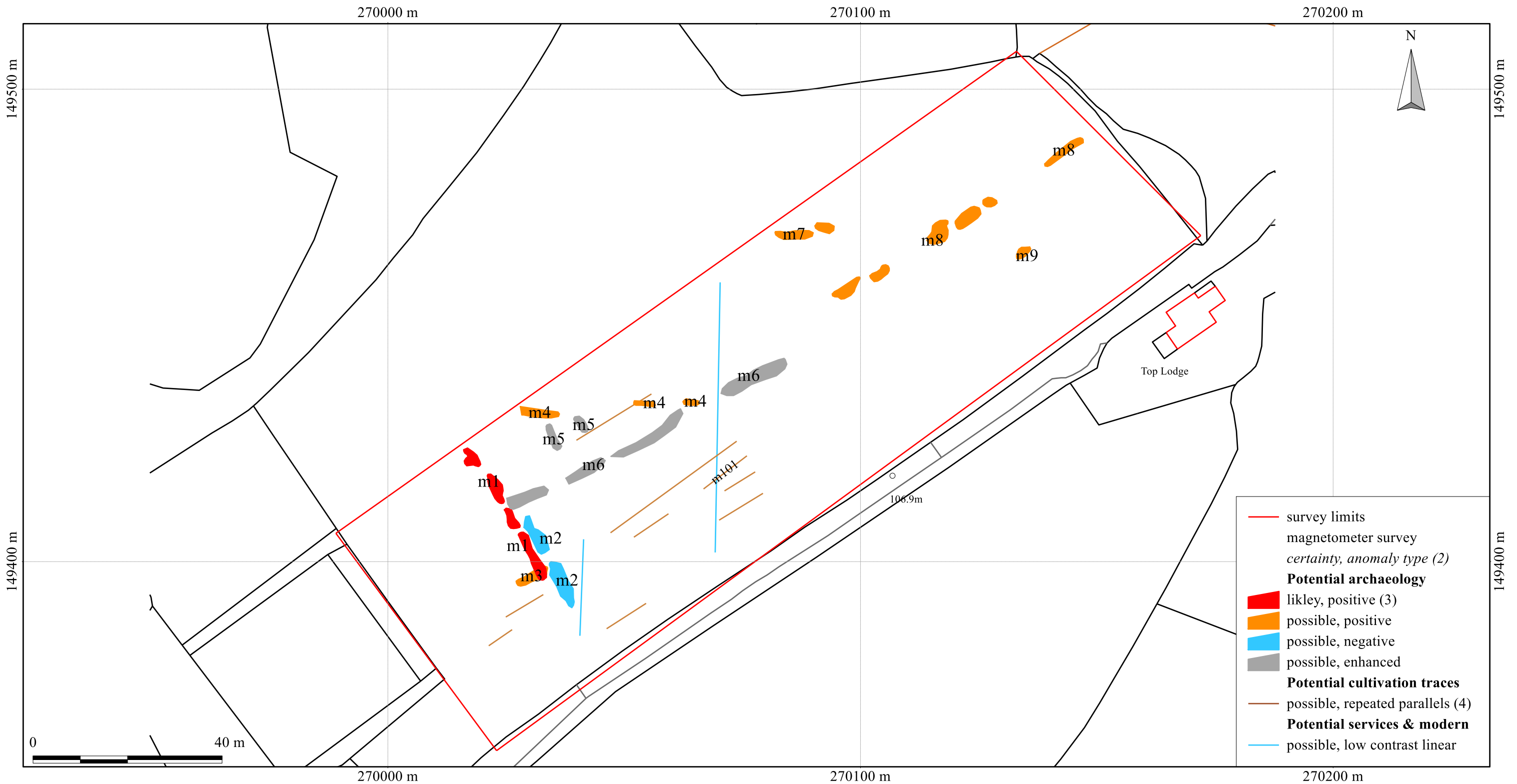
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- Notes:
1. All interpretations are provisional and represent potential archaeological deposits.
 2. 'Anomaly type' is a description of the magnetic anomaly. See the report text or GIS for an archaeological characterisation.
 3. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.
 4. Not all instances are mapped.
 5. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

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Figure 2: magnetometer and resistance survey interpretation
 (archaeology only)

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Figure 3: magnetometer survey interpretation

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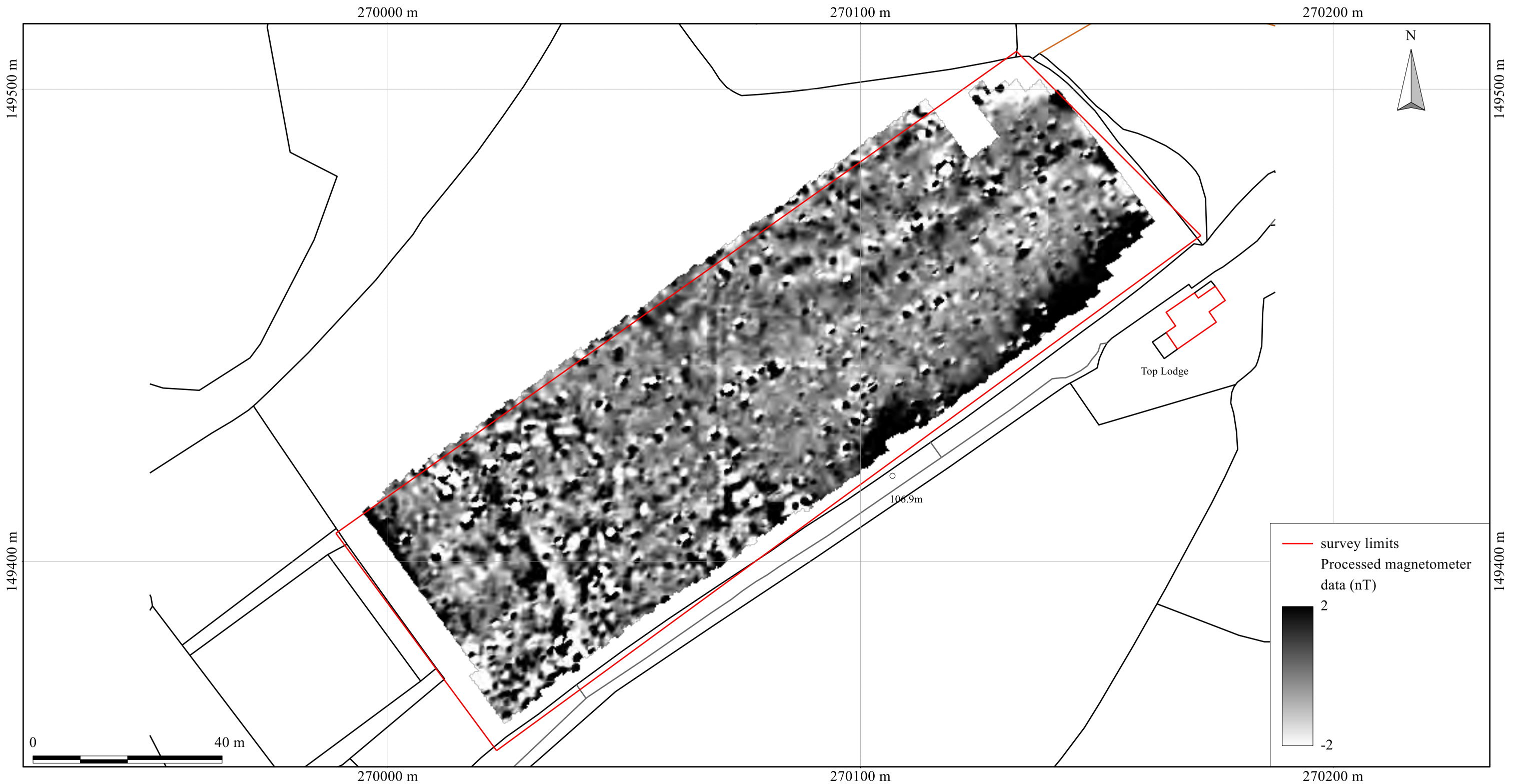
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Figure 4: resistance survey interpretation

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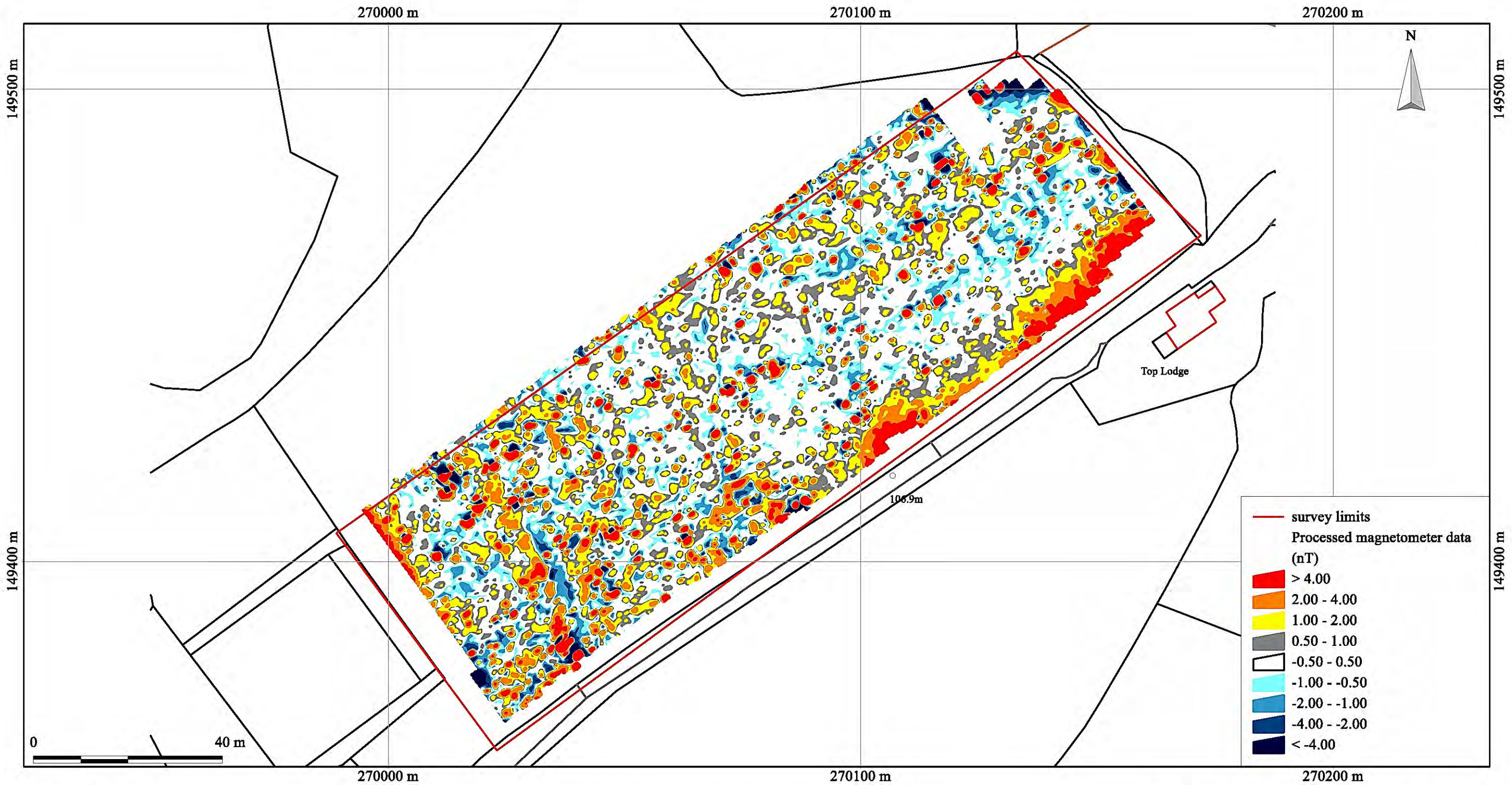


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Figure 5: shade plot of processed magnetometer data

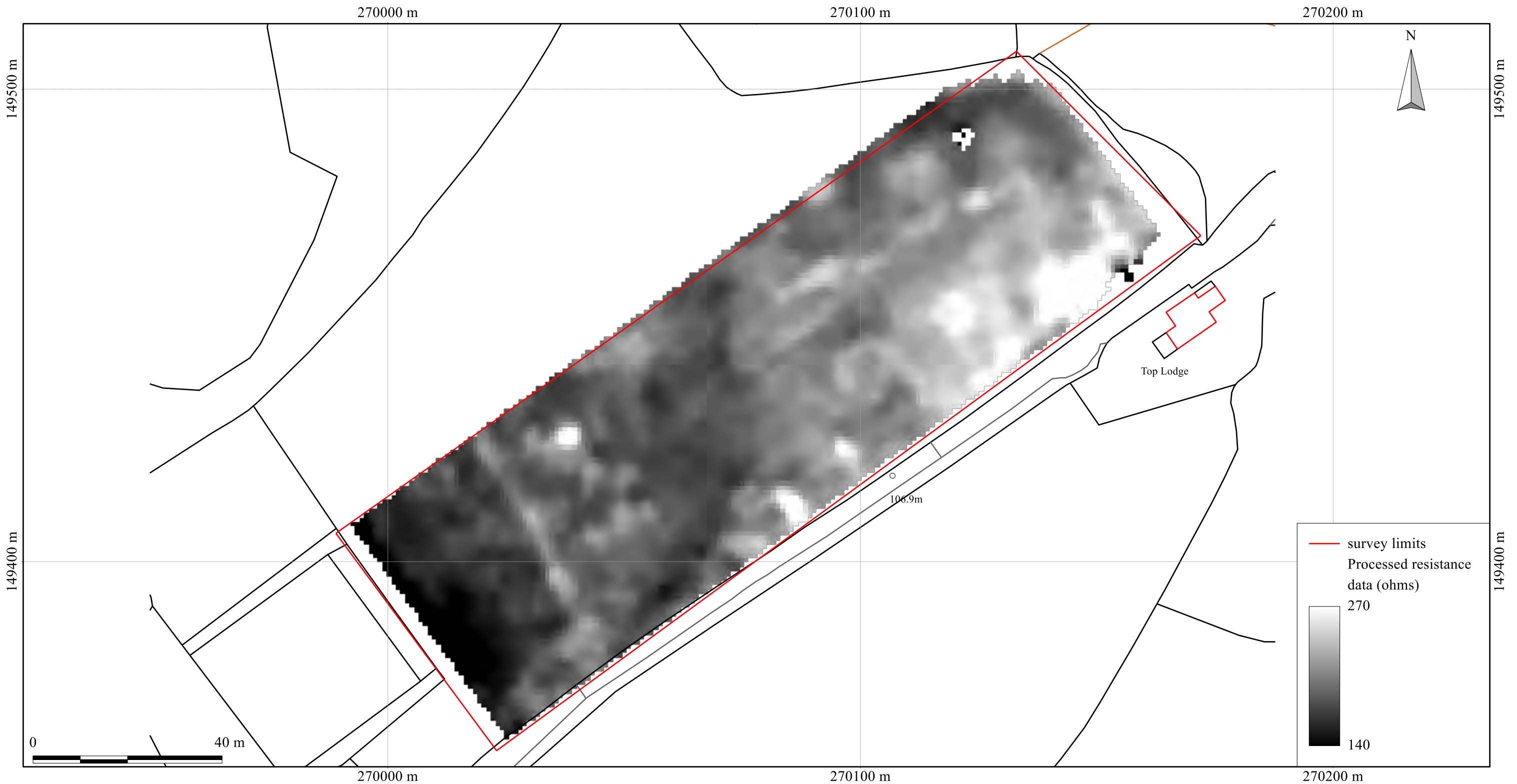


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Figure 6: contour plot of processed magnetometer data

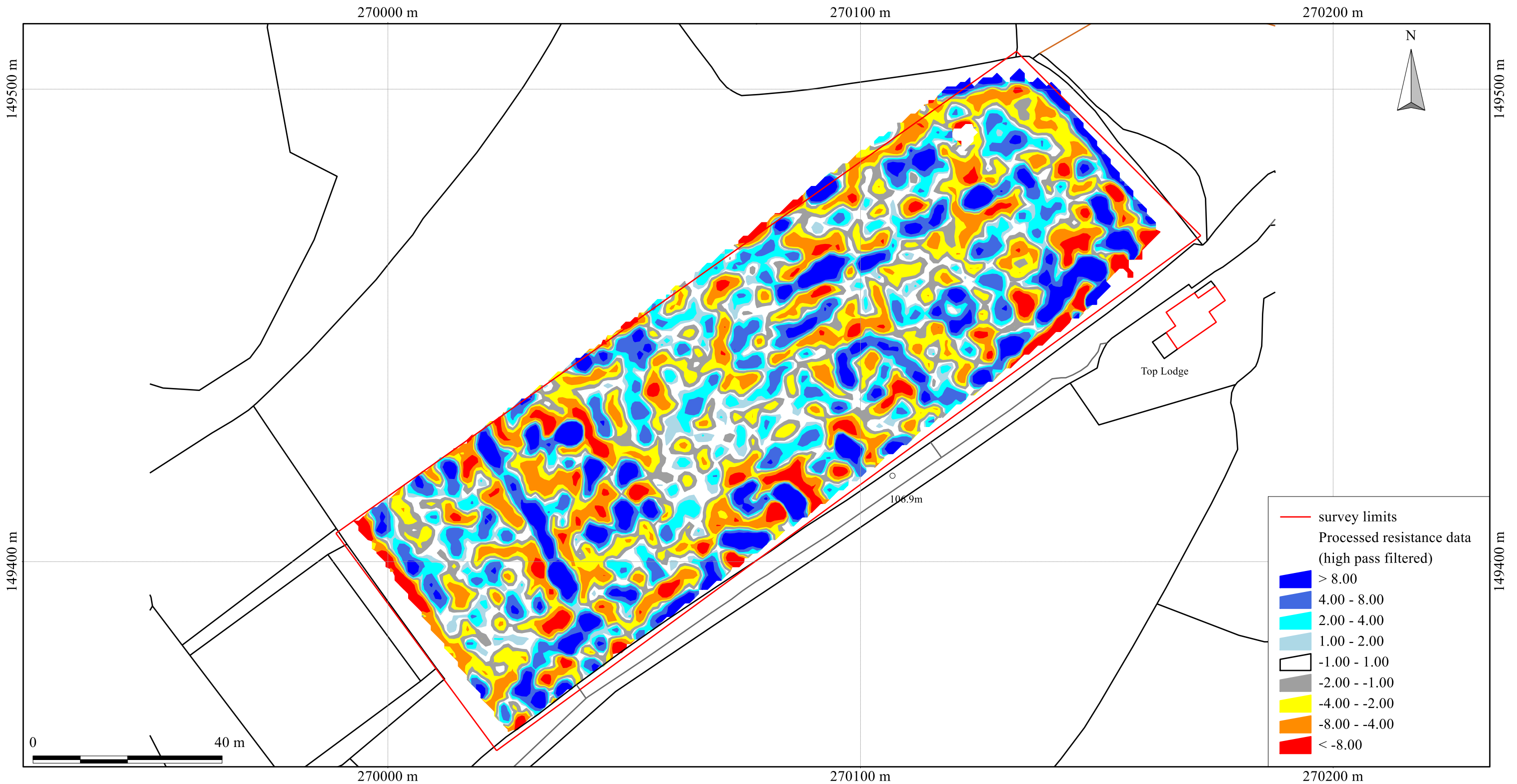


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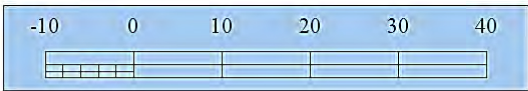
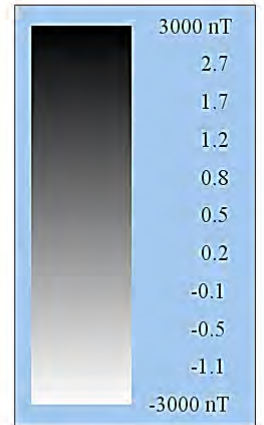
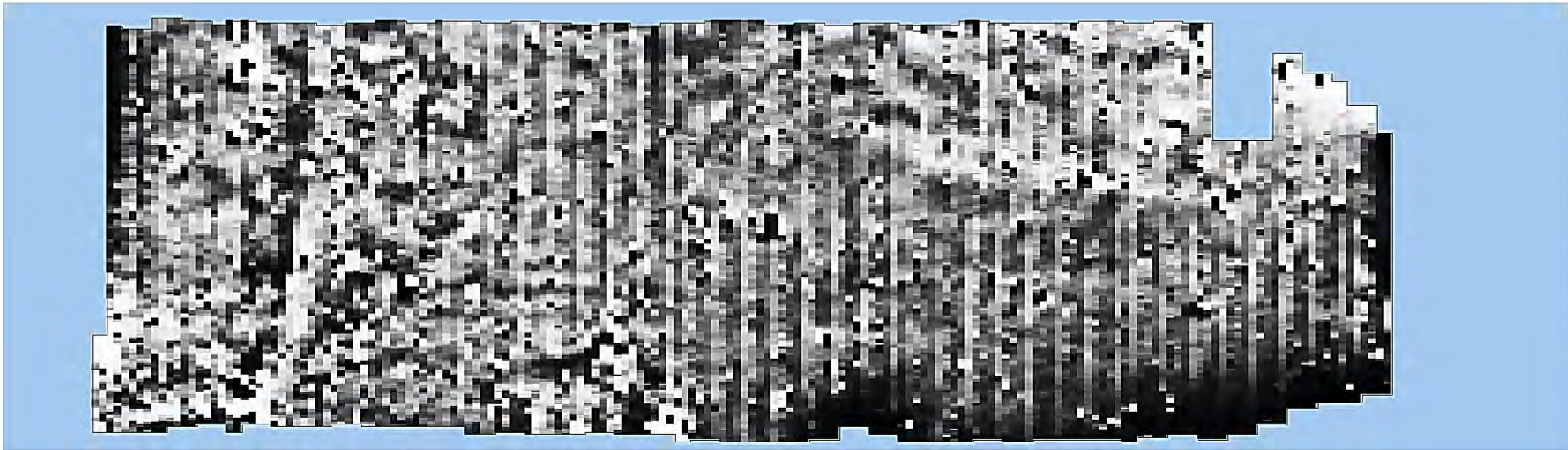
Figure 7: shade plot of processed resistance data



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Figure 8: contour plot of processed resistance data

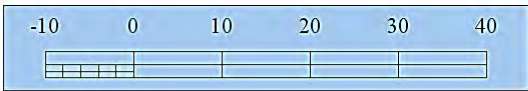
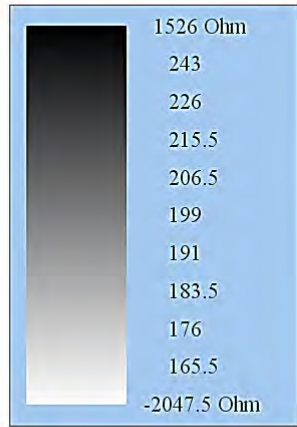
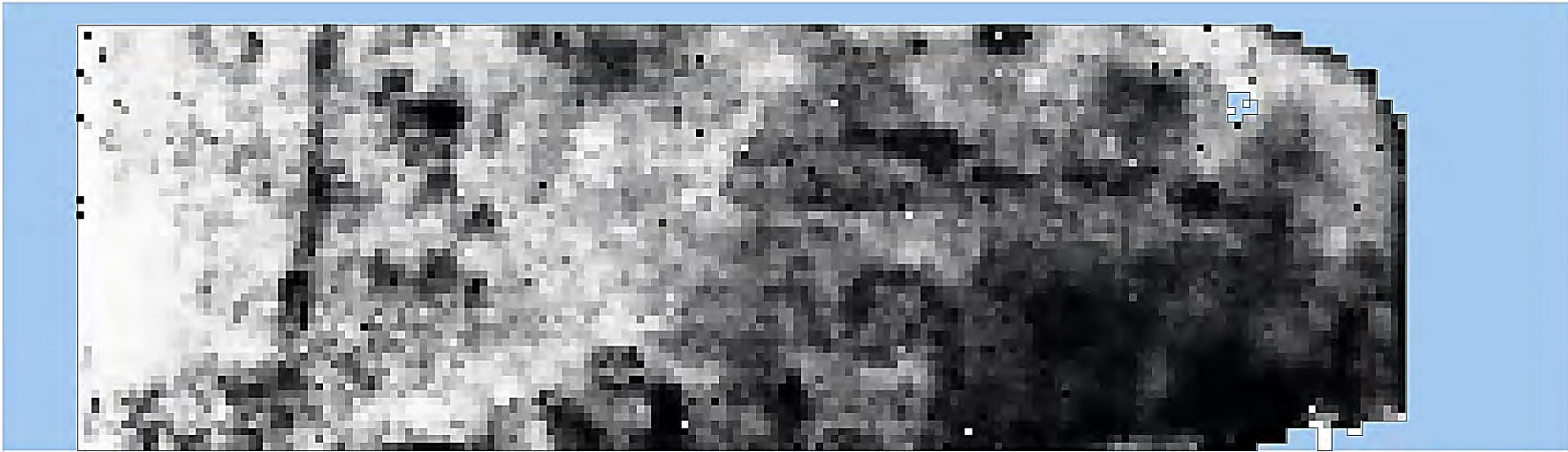
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Instrument type: Bartington grad601-2
Units: nT
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 0.00 m spacing.
Dummy Value: 32702
Dimensions
Grid Size: 30 m x 30 m
X Interval: 0.25 m
Y Interval: 1 m
Stats
Max: 3000.00
Min: -3000.00
Std Dev: 54.37
Mean: 0.37
Median: 0.50
Surveyed Area: 0.91675 ha
PROGRAM
Name: TerraSurveyor
Version: 3.0.31.0

Processes: 1
1 Base Layer

Figure 9: shade plot of unprocessed magnetometer data



Instrument Type:	GeoScan (Resistance)	Processes:	1
Units:	Ohm		1 Base Layer
Direction of 1st Traverse:	0 deg		
Collection Method:	ZigZag		
Sensors:	1		
Dummy Value:	32702		
Dimensions			
Grid Size:	30 m x 30 m		
X Interval:	1 m		
Y Interval:	1 m		
Stats			
Max:	1526.00		
Min:	-2047.50		
Std Dev:	85.34		
Mean:	200.22		
Median:	199.00		
Surveyed Area:	0.9993 ha		
PROGRAM			
Name:	TerraSurveyor		
Version:	3.0.31.0		

Figure 10: shade plot of unprocessed resistance data

Appendix 2 Tables

HER number	grid reference	designations	type	period	description	distance (m) from site centre	bearing (GN) from site centre
MDE1032	SS 6981 4926	List Entry Number: 1201135 LEE ABBEY, WITH WALLS AND GATEWAY	building CISTERCIAN GRANGE	AD 12th Century to Modern - 1100 AD? to 2050 AD (Possible)	The Cistercian grange of Ley belonged to Forde Abbey in the 12th Century. Its farmhouse was repaired and enlarged as a manor house in 1628. The current buildings, begun in 1850, may include some of the former building's fabric.	308	234
MDE11247	SS 696 492		monument	field system: Early Bronze Age to AD 20th Century - 2500 BC to 1999 AD (Possible) hut circle: Bronze Age - 2500 BC to 701 BC (Possible) platform: Early Bronze Age to AD 20th Century - 2500 BC to 1999 AD (Possible) golf course: AD 20th Century - 1924 AD to 1939 AD (Possible)	A substantial field system is visible on aerial photographs, at Lee Abbey representing the Bronze Age to the present day. However, some of the earthworks may relate to a golf course created at the site in the 20th Century.	519	242
	SS 7011 4944		circular platform	see above	Less well defined circular platform approximately 10 metres in diameter. It is mainly evident as a curved frontal scarp about 0.7 metres high.	50	90
	SS 7007 4935		circular platform	see above	The remains of a well ploughed circular platform about 10 metres in diameter within front and rear scarps 0.6 metres high.	91	174
	SS 7003 4931		rectangular platform	see above	A rectangular platform, levelled into the slight slope, about 22 metres northeast to southwest by 6.5 metres within front and rear scarps 0.7 metres high. Stone could be probing the frontal scarp but none was evident above ground. Most probably a building stance.	133	193
	SS 698 492		field system	see above	The remains of a field system at Lee Abbey. The system was seen by McDonnell as a miscellaneous group of earthworks, parchmarks, linear and ring shaped banks and platforms on aerial photographs	354	227
	SS 698 492		terracing/ lynchets	see above	The fields around Lee Abbey are now under pasture and the much ploughed remains of earlier cultivation are visible as terracing and curvilinear lynchets (up to 1.5 metres high and 3 metres wide) in fields surrounding the main buildings. Also evident are several small levelled areas	354	227
	SS 6983 4911		stony mound	see above	A turf-covered stony mound 7.5 metres diameter and 0.7 metres high. It appears to overlie a large lynchet on its northwest side and is probably a clearance heap.	402	215
	SS 6985 4908		rectangular platform	see above	A well defined modern rectangular platform 20 metres east to west by 9 metres. Its frontal scarp is built up 1.7 metres high onto the steep natural slope and it is cut in to the same depth at the rear.	417	210
	SS 6962 4927		circular platform	see above	Set on a slope the remains of an apparent circular platform about 9 metres in diameter and 0.9 metres high scarp around the front. The rear eastern side merges into the slope.	472	249
	SS 6966 4926		platform	see above	A similar feature to ss 6952 4927 but slightly larger at 10 metres in diameter with frontal scarp 0.5 metres high.	439	246
	SS 6957 4915		platform	see above	Two rectangular platforms about 34 metres east to west by 12 metres and 42 metres east to west by 10 metres fields cut by respectively. They are set into the northern side of the road and their frontal scarps are only about 1 metre high at best.	552	238
	SS 6959 4914					575	239
	SS 6961 4908		sub rectangular platform	see above	At the base of the same wooded slopes some 50 metres to the northeast is a sub rectangular platform about 20 metres east to west by 7 metres internally. Its front and rear scarps are about 1.1 metres high and it is accessed at the open east end.	576	231
	SS 6952 4922		platform	see above	An almost rectangular levelled platform on a gentle west facing slope. It is 23 metres north to south by 4.3 metres internally and built up to 0.7 metres high at the front cut in to 0.5 metres at the rear. It lies parallel with surrounding cultivation terraces and could either be a small plot or a building platform, though there is no evidence of foundations.	583	248
	SS 6956 4906		building platform	see above	A possible building platform, about 6 metres east to west by 2 metres internally, set into the bottom of the steep wooded slopes. Its frontal scarp, overlaid by a large boulder, is about 1 metre high but its rear merges into the natural slope. Its southwest end is approached by an old path and a track skirts its lower front side. Probably relatively modern although no stonework is evident.	628	233
MDE20955	SS 7017 4945		building	AD 19th Century to Modern - 1875 AD to 2050 AD	A detached lodge built c. 1875 and with alterations in the late 20th Century	110	85
MDE1239	SS 7019 4940		find spot	Late Prehistoric - 4000 BC to 42 AD	A saddle quern, said to have been found in situ in the grounds of Lee Abbey, was not located during field investigation in 1993	136	107
MEM23550	SS 6993 4919		monument	Post Medieval - 1540 AD? to 1900 AD	Two possible buildings are depicted within Plot 381 on the Lynton Tithe Map. The buildings are not present on the later First Edition 25 inch Ordnance Survey map.	282	207
MDE21709	SS 7044 4962		monument	Bronze Age - 2500 BC to 701 BC	A possible burial cairn overlooking the Bristol Channel, consists of a compact mound of stones c.5.1 metres in diameter, 0.5 metres high. It has a carefully structured appearance with set boulders defining the edge.	420	65
MDE21708	SS 7043 4966		monument	Late Prehistoric - 4000 BC to 42 AD	A hut circle is located in a sheltered position at the foot of Castle Rock. Its internal diameter is c.5 metres. It is constructed of an inner and outer face of edge set stones with rubble fill.	430	59
MDE20264	SS 7047 4963		circular enclosure	unknown	The most westerly one of a pair of circular pounds in the Valley of Rocks. It is not of modern origin. The enclosure has a diameter of c.15 metres, with a boulder faced rubble wall c.4 metres wide and 0.4 - 0.6 metres high. The west side is incorporated into a field bank. A robbing pit is visible in the bank on the northeast side. There is no apparent evidence of or settlement features.	452	65
MDE21512	SS 7051 4966		hut circle/ cairn	Late Prehistoric - 4000 BC to 42 AD	This is a turf and bracken covered mound of stones about 5 metres in diameter and with a maximum height of 0.5 metres. It is defined by stones set on edge mainly around the northwest. It appears as a small burial cairn or field clearance heap, but it might have originally been a hut which has since been infilled with stone.	501	64
MDE21511	SS 7050 4969		monument	Late Prehistoric - 4000 BC to 42 AD	This feature has been cut through by a modern roundabout and all that is now discernible are a few stones, probably the remains of its east side	506	60
MDE21513	SS 7052 4966		monument	Late Prehistoric - 4000 BC to 42 AD	All that is visible here are a few amorphous stones some set on edge and a scarp on the south side of the area alongside the footpath. The origin and function of this feature is uncertain.	510	64

Table 1: Historical Environment Entries thought relevant to geophysical survey within approximately 500m of survey area edges

Site: An archaeological magnetometer and resistance survey
Land at Lee Abbey, Lynton and Lynmouth, Devon
Centred on NGR (E/N): 270060,149440 (point)
Report: 1705LEE-R-1

anomaly group	associated anomalies	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
m1	m2? r2	likely, positive	disrupted linear	deposits associated with an extant bank	anomaly group coincides with and likely represents elements of an extant bank 65m long, 10m wide and up to 1.3m high	earthworks survey, Riley (2017)
m2	m1? r3?	possible, negative	disrupted linear			
m3		possible, positive	linear		anomaly group coincides with an extant bank thought to be part of a bronze age field system but this may be coincidental	earthworks survey, Riley (2017)
m4		possible, positive	disrupted linear			
m5	r9?	possible, enhanced	parallel linears	ploughing disruption through magnetically enhanced deposits	anomaly group coincides with an extant bank thought to represent a barrow, cairn or WW2 search light position	earthworks survey, Riley (2017)
m6		possible, enhanced	disrupted linear	magnetic response suggests some ferrous material in places - possible modern origin or fence line along an older feature?	anomaly group may be associated with a searchlight emplacement lying just to the east	earthworks survey, Riley (2017)
m7	r21?	possible, positive	disrupted linear	either soil creep or archaeological deposits		
m8		possible, positive	disrupted linear			
m9	r24?	possible, positive	oval	earthen deposit, possibly with heated material	anomaly group may represent an archaeological deposit but a natural origin cannot be ruled out	
m101	r102	possible, repeated parallels		cultivation traces		
m301	r301?	possible, low contrast linear		service trench		
m302	r302	possible, low contrast linear		service trench		

Table 2: magnetometer survey data analysis

Site: An archaeological magnetometer and resistance survey
Land at Lee Abbey, Lynton and Lynmouth, Devon
Centred on NGR (E/N): 270060,149440 (point)
Report: 1705LEE-R-1

anomaly group	associated anomalies	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
r1	r4, r5, r6	likely, low	linear	bank deposits	anomaly group coincides with and likely represents extant earthworks of a relict field system	earthworks survey, Riley (2017)
r2	r3 m1	likely, low	disrupted linear	bank deposits	anomaly group coincides with and likely represents an extant, ploughed over bank some 65m long, 10m wide and up to 1.3m tall	earthworks survey, Riley (2017)
r3	r2 m2?	likely, high	linear	bank deposits	anomaly group coincides with and likely represents an extant, ploughed over bank some 65m long, 10m wide and up to 1.3m tall	earthworks survey, Riley (2017)
r4	r1, r5, r6	likely, low	linear	bank deposits or cultivation disturbance	anomaly group coincides with and likely represents extant earthworks of a relict field system	earthworks survey, Riley (2017)
r5	r1, r4, r6	likely, high	linear	bank deposits or cultivation disturbance	anomaly group coincides with and likely represents extant earthworks of a relict field system	earthworks survey, Riley (2017)
r6	r1, r4, r5	likely, high	linear	bank deposits or cultivation disturbance	anomaly group coincides with and likely represents extant earthworks of a relict field system	earthworks survey, Riley (2017)
r7		possible, low	linear			
r8		likely, high	oval	stony (concrete?) archaeological or recent deposits	anomaly group coincides with and likely represents extant earthworks of a possible barrow, cairn or WW2 searchlight platform	
r9	m5?	likely, low	semi-circular	earthen deposits	anomaly group coincides with and likely represents extant earthworks of a possible barrow, cairn or WW2 searchlight platform	
r10	r11	likely, low	curvilinear	bank deposits	anomaly group coincides with and likely represents extant earthworks of a relict field system	earthworks survey, Riley (2017)
r11	r10	likely, high	linear	bank deposits	anomaly group coincides with and likely represents extant earthworks of a relict field system	earthworks survey, Riley (2017)
r12		possible, low	oval	pit or natural deposit		
r13	r14	likely, low	curvilinear	bank deposits	anomaly group coincides with and likely represents extant earthworks of a relict field system	earthworks survey, Riley (2017)
r14	r13	likely, high	linear	bank deposits	anomaly group coincides with and likely represents extant earthworks of a relict field system	earthworks survey, Riley (2017)
r15	r16	likely, low	curvilinear	bank deposits	anomaly group coincides with and likely represents extant earthworks of a relict field system	earthworks survey, Riley (2017)
r16	r15	likely, high	linear terminal	bank deposits	anomaly group coincides with and likely represents extant earthworks of a relict field system	earthworks survey, Riley (2017)
r17		possible, low	oval	pit or natural deposit		
r18	r19	likely, low	disrupted curvilinear	bank deposits	anomaly group coincides with and likely represents extant earthworks of a WW2 searchlight platform	earthworks survey, Riley (2017)
r19	r18	likely, high	sub-circular		anomaly group coincides with and likely represents extant earthworks of a WW2 searchlight platform	earthworks survey, Riley (2017)
r20		possible, low	disrupted curvilinear			
r21	m7?	possible, low	disrupted curvilinear			
r22		possible, low	disrupted rectilinear			
r23		possible, high	subcircular	stony deposit - archaeological or natural	anomaly group may represent archaeological deposits or fortuitously arranged natural deposits	
r24	m9?	possible, low	subcircular	earthen deposit - archaeological or natural	anomaly group may represent archaeological deposits or fortuitously arranged natural deposits	
r25	r26	likely, high	disrupted linear	wall footings	anomaly group coincides with and likely represents the visible footings of a mid-19th century dry stone wall estate boundary	earthworks survey, Riley (2017)
r26	r25	likely, low	linear	wall footings	anomaly group coincides with and likely represents the visible footings of a mid-19th century dry stone wall estate boundary	earthworks survey, Riley (2017)
r101		possible, repeated parallels		cultivation traces - possible ridge-and-furrow		
r102	m101	possible, repeated parallels		cultivation traces		
r103		possible, repeated parallels		cultivation traces		
r301	m301?	possible, linear		service trenches or non-ferrous pipes		
r302	m302	possible, linear		service trenches or non-ferrous pipes		

Table 3: resistance survey data analysis

<p>Grid <i>Method of Fixing:</i> DGPS and RTK set-out using pre-planned survey grids and Ordnance Survey coordinates. <i>Composition:</i> 30m by 30m grids <i>Recording:</i> Geo-referenced and recorded using digital map tiles.</p>	
<p>Magnetometer Equipment <i>Instrument:</i> Bartington Instruments grad601-2 <i>Firmware:</i> version 6.1</p>	<p>Magnetometer Data Capture <i>Sample Interval:</i> 0.25-metres <i>Traverse Interval:</i> 1 metre <i>Data capture:</i> automatic data logger <i>Traverse Method:</i> zigzag <i>Traverse Orientation:</i> GN324</p>
<p>Resistance Equipment <i>Instrument:</i> Geoscan Research RM15 multi-probe resistance meter <i>Configuration:</i> twin probe <i>Mobile probe spacing:</i> 0.5-metres</p>	<p>Resistance Data Capture <i>Sample Interval:</i> 1 metre <i>Traverse Interval:</i> 1 metre <i>Data capture:</i> automatic data logger <i>Traverse Method:</i> zigzag <i>Traverse Orientation:</i> GN324</p>
<p>Data Processing, Analysis and Presentation Software QCAD Professional DW Consulting TerraSurveyor3 Manifold System 8 GIS Microsoft Corp. Office Excel 2013 Microsoft Corp. Office Publisher 2013 Adobe Systems Inc Adobe Acrobat 9 Pro Extended</p>	

Table 4: methodology information

Instrument	
Type:	Bartington Grad 601
Units:	nT
Direction of 1st Traverse:	0 deg
Collection Method:	ZigZag
Sensors:	2 @ 1.00 m spacing.
Dummy Value:	32702
Program	
Name:	TerraSurveyor
Version:	3.0.31.0
<u>Figures 5 and 6</u>	
Statistics	Processes: 6
Max: 55.24	1 Base Layer
Min: -54.50	2 Clip at 1.00 SD
Std Dev: 3.64	3 De Stagger: Grids: All Mode: Both By: -1 intervals
Mean: 0.16	4 De Stagger: Grids: a1.xgd a4.xgd a5.xgd a2.xgd a3.xgd a6.xgd Mode: Both By: -1 intervals
Median: 0.00	5 DeStripe Median Traverse: Grids: a8.xgd a9.xgd a12.xgd a13.xgd a7.xgd a10.xgd a11.xgd a14.xgd
Surveyed Area: 0.91045ha	6 DeStripe Median Sensors: Grids: a1.xgd a4.xgd a5.xgd a2.xgd a3.xgd a6.xgd

Table 5: magnetometer survey - processed data metadata

Instrument Type: Geoscan Research RM15 Units: resistance data (ohms) normalised about a near-zero mean Direction of 1st Traverse: 0 deg Collection Method: ZigZag Sensors: 2 @ 1.00 m spacing. Dummy Value: 32702 PROGRAM Name: TerraSurveyor Version: 3.0.31.0	
<u>Figure 7</u> Statistics Max: 340.00 Min: 120.00 Std Dev: 30.98 Mean: 201.19 Median: 198.67 Surveyed Area: 0.9993ha	Processes Processes: 5 1 Base Layer 2 Despike Threshold: 1 Window size: 3x3 3 Despike Threshold: 1 Window size: 3x3 4 Clip from 120.00 to 340.00 Ohm 5 Low pass Gaussian filter: Window: 3 x 3
<u>Figure 8</u> Statistics Max: 75.44 Min: -69.15 Std Dev: 7.29 Mean: -0.01 Median: -0.52 Surveyed Area: 0.9993ha	Processes Processes: 6 1 Base Layer 2 Despike Threshold: 1 Window size: 3x3 3 Despike Threshold: 1 Window size: 3x3 4 Clip from 120.00 to 340.00 Ohm 5 High pass Gaussian filter: Window: 10 x 10 6 Low pass Gaussian filter: Window: 3 x 3

Table 6: resistance survey - processed data metadata