A9 DUALLING
PERTH TO INVERNESS

Appendix 15.2

Geophysical Survey Report

TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

ATKINS mouchel

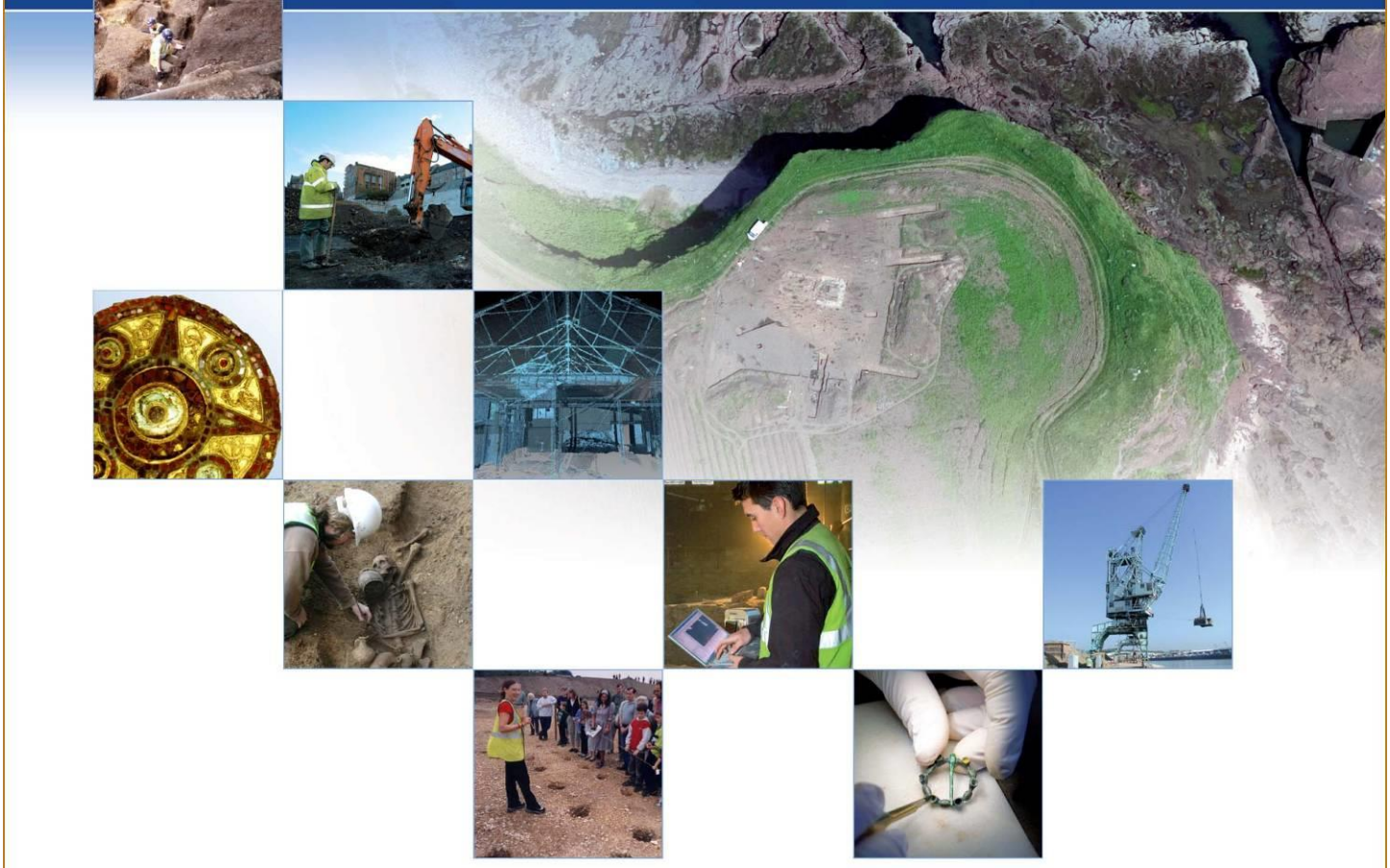
A9 Dualling – Northern Section: Tomatin to Moy

Archaeological Geophysical Survey

National Grid Reference Number: NH 79778 29806 & NH 78484 32591

AOC Project No: 51695

Date: 22nd March 2017



AOC Archaeology Group

ARCHAEOLOGY | HERITAGE | CONSERVATION

A9 Dualling – Northern Section: Tomatin to Moy

Archaeological Geophysical Survey

On Behalf of:	**Becky Remmer** **Senior Heritage Consultant** **Mouchel** **St Johns House** **2-10 Queen Street** **Manchester** **M2 5JB**
National Grid Reference (NGR):	**NH 79778 29806 & NH 78484 32591**
AOC Project No:	**51695**
Prepared by:	**Kimberley Teale & James Lawton**
Illustrations by:	**Kimberley Teale**
Date:	**March 2017**

This document has been prepared in accordance with AOC standard operating procedures.

Author: Kimberley Teale	**Date: 17th March 2017**
Approved by: Graeme Cavers	**Date: 20th March 2017**
Report Stage: Final Draft	**Date: 22nd March 2017**

Enquiries to: AOC Archaeology Group
The Raylor Centre
James Street
York
YO10 3DW

Tel. 01904 413404
e-mail. york@aocarchaeology.com

Contents

List of Figures

List of Plates

Non-Technical Summary

AOC Archaeology Group was commissioned by Atkins Mouchel Joint Venture (AMJV) to undertake an archaeological geophysical (gradiometer and earth resistance survey) to investigate the potential for buried archaeological remains on the proposed corridor of the Northern section of the A9 Dualling Programme.

The total allocated survey area measured 7.2 hectares, which was split over two areas across five small fields, consisting of a mixture of pasture and moorland scrub. The first area in the southern part of the scheme is located at the Proposed Grade Separated Junction at Tomatin (NH 79778 29806). The second area in the northern part of the scheme is located at the Proposed Left in Left Out Junction at Dalmagarry, Moy (NH 78484 32591).

The results of the survey at the southern area at Tomatin were a success. At this location magnetometry was undertaken over the full area to the south of the existing A9. However to the north of the A9 only a small proportion of the area was surveyed due to a combination of unsurveyable woodland, scrub and terrain. The northern most section of this area was located over a very steep bank which was deemed too dangerous to survey. The results were also significantly affected by the presence of an underground bunker. The earth resistance survey likewise was undertaken over a large area to the south of the A9, however ground conditions to the north of the A9 were unsuitable for earth resistance survey.

The results of the gradiometer survey at the proposed Junction at Tomatin identified some discrete linear and curvilinear trends that could be archaeological in origin. Two linear features running alongside patches of magnetic disturbance have identified the location of the reputed General Wade's Military Road running through between the survey areas. A large amount of magnetic disturbance was identified to the north of the A9 in the land surrounding the underground bunker. A number of geophysical trends that are most likely related to geological processes were also detected throughout. The results of the earth resistance survey have similarly identified a number of anomalies most likely related to geological variations, as well as some areas of high resistance areas that could be archaeological in origin.

The results of the survey at the proposed Junction at Dalmagarry in the north of the scheme were also successful. The full area was surveyed using magnetometry and two areas of earth resistance were also completed. The combination of both techniques was useful in determining possible archaeological remains.

The results of the gradiometer survey identified a possible building platform or building in the northern survey area, adjacent to a spread of partially magnetic material which is likely to be associated with this anomaly. A number of tentative discrete trends and pits were also identified which may be of an archaeological nature. Ploughing trends were also observed in the south of the northern survey area, along with a number of spreads of magnetic disturbance and patches of geology. The results of the earth resistance survey have similarly identified the location of the anomaly most likely to be a house platform or building with an area of high and medium resistance readings. Geological variations have also been identified as high resistance in the data, as well as some waterlogged areas, showing as low resistance.

1 Introduction

1.1 AOC Archaeology Group were commissioned by Atkins Mouchel Joint Venture (AMJV) to undertake an archaeological geophysical survey as part of the proposed upgrade and dualling of the Northern Section of the A9 Dualling scheme. This work is part of a wider scheme of archaeological assessment being undertaken along the proposed dualling section.

1.2 The survey was carried out to provide information on the extent and significance of potential buried archaeological remains on the sites.

2 Site Location and Description

2.1 The two allocated survey areas are located either side of the present A9 approximately 15 miles south of Inverness. The survey areas total 7.2ha and represent the footprint of two junctions as part of the proposed dualling of the A9 (see Figure 1).

2.2 The southern survey area is located at Tomatin (centred at NH 79778 29806) and is referred to as the Proposed Grade Separated Junction at Tomatin. The survey area covers approximately 5.5ha across three fields; two to the south of the A9 and one to the north. The southern fields consist of a mixture of grazed pasture and rough terrain separated by a low dry stone wall. The northern field consists of dense scrub and woodland, with the northern most extent of the area located on a steeply sloping bank dropping down to the River Findhorn. A 1960's underground bunker (Canmore ID 173652) and brick aircraft post is also located within the northern part of this survey area.

2.3 The northern survey area is located at the Dalmagarry Junction in Moy (centred at NH 78484 32591) and is referred to as the Proposed Left In Left Out Junction at Dalmagarry. The survey area covers approximately 2ha across two fields to the east of the A9. The southern field consists of pasture with a small stream running through the centre, and the northern field consists of a mixture of pasture, scrub and rough waterlogged terrain, with a small stream running through the south of the area.

2.4 Both survey areas contained level and slightly sloping land and are situated at a height of approximately 310m above Ordnance Datum (aOD) at Tomatin and 270-280m (aOD) at Dalmagarry.

2.5 The survey area at Tomatin is located on a bedrock geology consisting of Findhorn Pluton, Phase 2; made up of Granodiorite and Biotite igneous rocks. The superficial deposits consist of Glaciofluvial sheet deposits made up of gravel, sand and silt, as well as Devensian till made up of Diamicton, Peat and in places River Terrace Deposits (undifferentiated) composed of gravel, sand, silt and clay (BGS, 2017). These are overlain by humus-iron podzols (Scotland's Soils 2017).

2.6 The survey area at Dalmagarry is located on bedrock geology consisting of Dava Subgroup made up of Psammite and Gneissose metamorphic rocks, with superficial deposits of Glaciofluvial Ice Contact Deposits composed of gravel, sand and silt, peat and alluvium made up of clay, silt, sand and gravel, as well as Alluvial Fan Deposits made up of gravel, sand, silt and clay (BGS, 2017). These are overlain by peaty gleyed podzols (Scotland's Soils 2017).

2.7 Gradiometer survey is suggested to provide an average response to this type of geology, although results can vary depending on the formation of the geology especially in Scotland (David et al. 2008, 15).

3 Archaeological Background

3.1 The text below is taken from the background archaeology of the scheme's route within the specification provided by AMJV (WSI, Atkins-Mouchel, 2017), it also includes website sources of CANMAP and PastMap. These results are then used to produce separate site specific descriptions using the known recorded heritage assets.

Prehistoric

3.2 Very little evidence relating to the Palaeolithic and Mesolithic periods survives in the Highlands. No finds dating to the Palaeolithic are recorded on the HER, and those which are assigned a Mesolithic date mainly consist of lithic scatters representing stone tool working sites.

3.3 The lack of Palaeolithic sites may be due to the fact that the end of this period coincides with the retreat of the ice sheet which covered Scotland during the Ice Age.

3.4 The lochs, rivers and topography of the study area would have made it an attractive place for Mesolithic communities although no sites dating from this period are currently known. Mesolithic people are often described as hunter gatherers and were transient in nature, setting up temporary seasonal camps before moving on to the next.

3.5 The transition from Mesolithic to Neolithic saw a gradual preference for more permanent settlement, the keeping of livestock and farming, a tradition that carried on into the Bronze and Iron Ages. Sites dating from Neolithic to the Iron Age are found throughout the study area and consist of settlement sites, field systems and burial monuments.

3.6 Towards the end of the Iron Age (and spanning into the beginning of the Early Medieval), documentary sources make reference to *Picti* or 'painted people'. The Picts produced characteristic carved stones which are found throughout the Highlands and Islands. A Pictish carved stone is located within the study area.

Early Medieval / Pictish & Medieval

3.7 The dominant site types from the Medieval period are churches and administrative/defensive sites such as mottes and castles. Domestic structures do not tend to survive well, or are preserved beneath later rural settlement structures. A number of sites dating to this period survive within the study area, such as the fortified Isle of Moy and Doune Motte.

17th & 18th Centuries

3.8 The main feature dating to this period within the study area is the remains of General Wade's Military Road (Canmore ID 139374). The threat of Jacobite rebellion in Scotland resulted in the militarisation of the country by Government forces. As part of this militarisation hundreds of miles of military roads and associated features (such as bridges and culverts) were constructed to link defensive structures, forts and barracks. The military road in the study area survives in various stretches as a grass track or holloway, although sections of it have been destroyed by later development, most notably the construction of the current A9.

19th Century

3.9 Throughout the 19th century the intensification of farming has impacted on the landscape, although it has remained rural in nature. At the south of the Dalraddy to Slochd Section two, picturesque designed landscapes have been created. The Highland Railway opened in 1865, opening up the area for tourism and connecting Inverness to Perth to the south, and to Wick and Thurso to the

north. Many features associated with this railway are now listed buildings, including railway stations, bridges and goods sheds.

Proposed Left in Left out junction at Dalmagarry

3.10 In the surrounding area there are records for a cairnfield and Prehistoric hut circle which are marked on historic Ordnance Survey mapping (Canmore ID 14142). The circular stone-walled hut was destroyed when the current A9 was realigned (Canmore, 2017). General Wade's Military Road runs through adjacent to the survey area and is marked on ordnance survey mapping of the wider area (old-maps, 2017). The 18th Century Military Road partially follows the former A9 (Canmore ID 139374).

Proposed Grade Separated Junction at Tomatin

3.11 Within the site boundary there are records of a possible prehistoric field system and hut circles marked on historic Ordnance Survey mapping. The General Wade Military Road is also present within this area and again is marked on Ordnance Survey mapping running directly through the survey area (Canmore ID 139374).

3.12 An underground bunker is present within the survey area north of the A9 (Canmore ID 173652 / HER ID MHG30320). The underground bunker was constructed in the 1960's and consists of brick, metal and concrete, and a brick aircraft post stands less than ten metres to the north west (Canmore, 2017).

4 Aims

4.1 The aim of the geophysical survey was to identify any potential archaeological anomalies that would enhance the current understanding of the archaeological resource within the planned junctions on the proposed A9 dualling scheme.

4.2 Specifically the aims of the gradiometer survey were;

- To locate, record and characterise any surviving sub-surface archaeological remains within the junction locations
- To help determine the next stage of works as part of the current planning application
- To provide an assessment of the potential significance of any identified archaeological remains in a local, regional and (if relevant) national context
- To produce a comprehensive site archive and report.

5 Methodology

5.1 The survey parameters for both Magnetometry (gradiometer) and Earth Resistance were selected that were suitable for the prospective aims of the survey and in accordance with recommended professional good practice for geophysical survey (David et al. 2008, 8).

5.2 The gradiometer survey was carried out using Bartington Grad601-2 fluxgate gradiometer (see Appendix 1 and 2). Data was collected on an east-west alignment using zig-zag traverses, with a sample interval of 0.25m and a traverse interval of 1m.

5.3 A resistance survey was carried out using a Geoscan Research RM15 resistance meter, utilising the MPX15 multiplexer attachment (see Appendix 2). Data was collected in an east-west direction using zig-zag traverses, with a sample interval of 1m, and a traverse interval of 1m.

5.4 For the gradiometer survey, a total of 77 full and partial 30m by 30m grids across both survey areas were completed. This totalled a surveyed area of approximately 4.56 ha with approximately 1ha lost to the north of the A9 at Tomatin due to the steep topography being unsurveyable. The resistance survey consisted of 11 full and partial 30m by 30m grids across selected parts of both survey areas; with approximately 0.63ha covered at the Tomatin Junction and 0.23ha covered at the Dalmagarry Junction. The rest of the area was deemed either unsuitable for earth resistance survey or non-beneficial to the results.

5.5 Attention was taken to attempt to avoid metal obstacles present within the survey area. Gradiometer survey is affected by 'above-ground noise' and therefore avoiding metallic objects improves the overall data quality and results obtained. The nature of the ground surface can also prevent resistance probes from penetrating into the soil and taking suitable readings so time was taken to get good contact at all times.

5.6 All geophysical survey work was carried out in accordance with recommended good practice specified in guideline documents published by English Heritage (David et al. 2008), and the Chartered Institute for Archaeologists Standard and Guidance for archaeological geophysical survey (2014). Data processing, storage and documentation were carried out in accordance with the good practice specifications detailed in the guidelines issued by the Archaeology Data Service (Schmidt and Ernenwein 2011).

5.7 The gradiometer data were downloaded using Bartington Grad601 PC Software v313 and the resistance survey data downloaded using Geoscan Geoplot. The two sets of data from both survey techniques were processed using Geoscan Geoplot v4.0 and details of these processes can be found in Appendices 3 and 4.

5.8 Interpreted point, polyline and polygon layers were created as layers in AutoCAD and technical terminology used to describe identified features can be found in Appendix 5.

6 Results and Interpretation

6.1 The gradiometer survey results have been visualised as greyscale plots with raw data plotted at -1nT to 2nT for each survey area (Figures 3 and 8) and processed data plotted at -1nT to 2nT for each survey area (Figures 4 and 9). An interpretation of each area has also been completed and these results are shown in Figures 6 and 11.

6.2 The earth resistance survey results have been visualised as greyscale images plotted on top of the gradiometer images, and this processed data is plotted at -100.09 ohm to 94.64 ohm (Figures 5 and 10). An interpretation of each area has been plotted alongside the individual earth resistance results and can be seen in Figures 7 and 12.

6.3 An individual characterisation of identified anomalies can be found in Appendix 6.

Tomatin (Figures 3 – 7)

Gradiometer Results

Archaeology

6.4 There are no features of a definitive archaeological origin present within the geophysical survey results for Areas 3, 4 and 5.

Discrete linear trends

6.5 There are a number of discrete linear trends running through both Area 4 and Area 5. These anomalies of a linear form are either composed of an increased or decreased signal compared to

background values. It is possible these anomalies belong to structural remains, but poor patterning or response values makes interpretation difficult.

6.6 A linear trend runs south west to north east in the west of Area 4 and could be archaeological in nature (**A1**). Three further, more tentative trends are situated north of this (**A2**) but form no identifiable features.

6.7 Two linear trends run roughly north south in Area 4 and are parallel to the drystone wall present between Area 4 and 5 (**A3**), and these may be an effect of destruction of parts of the wall or ploughing headlands. The drystone wall appears to follow the reputed alignment of the historical General Wade's Military Road, and these anomalies may be related to the construction of this.

Linear trends – possible archaeology

6.8 A number of tentative linear anomalies have been identified in both Areas 4 and 5. These anomalies are composed of a weak change in signal values compared to background reading or are composed of incomplete patterning. Consequently, interpretation is tentative and it is unclear to whether anomalies are of an archaeological nature, or could alternatively reflect natural geological changes in the soils. They are classed as 'possible archaeology' as they are less likely to be archaeological than those classed as discrete linear trends.

6.9 A linear negative anomaly in the west of Area 4 runs in a north south direction (**A4**), and due to the lack of patterning and associated features may represent geological variations.

6.10 Similarly, in Area 5 an east westerly aligned anomaly appears to continue under the drystone wall into Area 4 (**A5**) and may also represent geological variations. However the anomaly cannot be dismissed as natural and further investigation would be required to ascertain this.

6.11 A series of linear trends and a curvilinear to the south of anomaly **A5** may be related and could be archaeological in nature (**A6**). They follow the same east west alignment and cannot be entirely dismissed as being natural in origin.

Pits

6.12 Two anomalies that are typical of pits have been observed in the south west of Area 1 (**A7**). They are typically isolated circular anomalies, composed of an increase in magnetic values with a patterning that is suggestive of buried remains such as the infill of a pit. Due to their proximity to anomalies that could be archaeological in origin they cannot be dismissed as certainly geological.

Magnetic Disturbance – modern?

6.13 Areas 3, 4 and 5 all contain zones of magnetically disturbed ground. Areas of magnetic disturbance are composed of significant increases or decreases in values compared with background readings. It is highly likely that these readings are caused by modern disturbances, such as fencing and modern materials, but interpretation is tentative.

6.14 An area of magnetic disturbance is present in the south of Area 4 (**A8**) and is likely related to the settlement of debris from natural/geological processes, as the area was notably waterlogged at the time of survey.

6.15 Magnetic disturbance is also visible alongside the drystone wall running through the centre of Area 4 and 5, and at the northerly field boundaries of these areas. These magnetic signatures will have been caused by the effect of the stone and any metal fencing that was observed in places along the wall and at the northern field boundaries.

6.16 A significant amount of magnetic disturbance is present throughout the data from Area 3. The large patch in the north of the area relates to the underground bunker and adjacent brick aircraft post (**A9**). The structure was highly magnetic and this is clearly reflected in the results.

6.17 Adjacent areas of magnetic disturbance could be caused by underground services (**A10**), however the geology of the area can also cause a similar geophysical anomaly and so these trends could be natural in their origin.

Geology

6.18 Two patches of geology are visible in the geophysical results from Area 5 and one in Area 3. Geology is identified as areas of disturbance that are composed of irregular significant increase or decreases in values compared with background readings and are likely to indicate natural variations in soil composition.

6.19 In Area 5 the sub circular and linear anomalies relate to heavily waterlogged marshy ground that was observed at the time of survey (**A11**).

6.20 In Area 3 the sub-circular anomaly relates to a rocky outcrop that was observed and mostly avoided at the time of survey due to its uneven and steep nature (**A12**). However, some tentative discrete linear trends are observed on this outcrop and these could be archaeological in nature, or as a result of the geology.

6.21 Across the dataset there are a large quantity of isolated dipolar anomalies (iron spikes). These are commonly caused by ferrous or high magnetically susceptible material on the surface or within the topsoil of the site, and it is likely that modern agricultural activity has changed the magnetic properties of the top soil and created a high level of background 'noise' within the data set.

Earth Resistance Results

6.22 A number of areas of high resistance have been observed in the results of the earth resistance survey.

6.23 An area of high resistance is located in the south of the dataset (**R1**) and is situated next to two areas with low resistance. This is most likely to be an area of geological variation, however it could also relate to an area of archaeological potential. This anomaly is not seen within the gradiometer data.

6.24 A small area of high resistance is located south of the drystone wall running through the survey areas (**R2**) and is most likely related to a partial wall collapse and fallen stones which were observed at the time of survey.

6.25 An area of medium to high resistance is observed north of the wall in Area 5 (**R3**) and could either have an archaeological origin or a geological one. This is located in the same area as a number of linear trends of a possible archaeological origin identified in the gradiometer results. This evidence would therefore support the area having potential for archaeological remains.

6.26 A linear band of high resistance is located in the north of Area 5 (**R4**) which is also seen in the gradiometer data as a linear anomaly of possible archaeological origin. However, this could also relate to geological changes within the survey area.

6.27 A band of high resistance is seen running through the centre of the dataset located between survey Areas 4 and 5 (**R5**). This response relates to the drystone wall running through the area and is a response to the resistance of the stones, and could also represent remains related to General Wade's Military Road.

6.28 Two sub-circular areas of high resistance are located south of the drystone wall in Area 4 (**R6**) which could be archaeological in origin. However, these were located on slightly higher ground so could be a response related to the geological changes below.

6.29 A long linear trend of low resistance is seen running alongside anomaly **R5** and is a response to water pooling next to the stone of the drystone wall causing lower resistance readings (**R7**).

6.30 Another long north-east/south-west linear trend of high resistance is seen in the south of Area 4 (**R8**) and most likely relates to a field drain; alternatively this too could be geological in origin. This response is located in a large area of very low resistance (**R9**) which is a response to the area being very waterlogged with low lying topography and would again support response R8 being field drainage.

6.31 An area of low resistance is also seen in the north of Area 5 (**R10**) and is a response to the ground being waterlogged. This was noted at the time of survey and some of this area was not able to be surveyed due to the presence of a deep bog.

6.32 An area of low resistance in the south west of Area 4 is most likely related to the ground being low lying and potentially waterlogged. An adjacent and possibly related trend (**R12**) could be a land drain, or alternatively an archaeological or geological feature which is also seen in the magnetic dataset.

Dalmagarry (Figures 8 - 12)

Gradiometer Results

Archaeology

6.33 There are no features of a definitive archaeological origin present within the geophysical survey results for Areas 1 and 2.

Discrete linear trends

6.34 A number of discrete linear trends are observed across both areas that are likely to be archaeological in origin. In Area 1 two parallel linear trends are visible in the north of the dataset running north south (**A13**) and are seen amongst a geological response. Adjacent to this a further trend runs north south (**A14**) and could be related to the area of disturbance it appears to intersect with.

Discrete magnetic disturbance

6.35 Two areas of magnetic disturbance have been identified in the north of Area 2 that are most likely archaeological in origin. Areas of discrete magnetic disturbance contain anomalies with an increase or decrease in values compared with background reading over a localised area. Poor patterning or weak signal changes creates difficulty in defining the nature of the archaeology and so interpretation is necessarily tentative.

6.36 The more noticeable of the two is a sub-oval area of disturbance (**A15**) that contains a number of linear and curvilinear anomalies that do not appear to form an identifiable structure or enclosure. At the time of survey this was observed as a low-lying, dome-shaped hillock orientated in a roughly north-east/south-west direction. This may represent a possible former building or house platform; further intrusive investigation would be required to understand the nature and extent of the anomaly.

6.37 The larger spread of magnetic disturbance to the east of this anomaly (**A16**) is most likely related to this possible structure, and may represent a spread of material from the associated structure having been ploughed out across the field during agricultural works. The spread contains a large number of

ferrous anomalies which could be stone or fired material, though further investigation of these would be required to confirm this.

Linear trends – possible archaeology

6.38 Several linear and curvilinear trends that may be archaeological in nature are observed in the southern half of the data from Area 2.

6.39 A linear trend runs north east to south west (**A17**), parallel to the small stream running through the area, to which it could be related. The anomaly may represent a ploughing headland or could be a geological variation associated to the stream.

6.40 Linear and curvilinear trends to the south of the stream (**A18**) could be archaeological in origin, however they could also be from the effects of the stream possibly flooding the area leaving debris.

Magnetic disturbance – possible archaeology

6.41 A sub-circular area of magnetic disturbance is observed in the north of Area 1 (**A19**) and could possibly be archaeological in origin. At the time of survey, this area in particular was observed as a low lying steep sided undulating hillock which could be geological in origin, however the magnetic signal is notably different to the geology identified within the same area. Further investigation would be required to ascertain if this anomaly is similar to the one observed in Area 2 and could likewise potentially represent a house platform or building.

Pits

6.42 A spread of sub circular anomalies in the centre of Area 2 have been identified as pits (**A20**). They are located south of the spread of magnetic disturbance of an archaeological origin and could be related, however they could also be of a geological origin.

Linear trends – agricultural

6.43 A series of linear trends that are most likely agricultural in origin are observed in the south of Area 2 (**A21**). The trends run north east to south west and are closely spaced and are mostly likely related to ploughing trends.

Linear trend – modern?

6.44 A positive linear trend runs down the west of Area 1 and into Area 2 in a north south direction (**A22**). A smaller similar trend bisects this in Area 1 at a north east south west angle. This is most likely to be a modern service or drain, however due to the proximity to the proposed location of the historic General Wade's Military Road, further investigation would be required to ascertain this.

Magnetic Disturbance – modern?

6.45 A number of trends most likely relating to modern magnetic disturbance are observed throughout both Areas 1 and 2. It is highly likely that most of these readings were caused by modern disturbances, such as manhole covers, piles of discarded fencing and rubble, all of which were observed at the time of survey.

6.46 A small stream / drain runs through the centre of Area 2 in a north east south west direction and is visible as a linear spread of magnetic disturbance (**A23**).

6.47 North of this in Area 2, a field gate and associated entranceway is also seen as a magnetic spread of disturbed ground (**A24**).

6.48 In Area 1 at the very north of the survey area, a fence dividing the field is accountable for the linear spread of magnetic disturbance (**A25**).

6.49 Around most of the field edges of both survey areas, magnetic disturbance is seen, and this is likely the effect of modern fencing and modern gateways observed at the time of survey.

6.50 Across the data set there are a large quantity of isolated dipolar anomalies (iron spikes). These are commonly caused by ferrous or high magnetically susceptible material on the surface or within the topsoil of the site, and it is likely that modern agricultural activity has changed the magnetic properties of the top soil and created a high level of background 'noise' within the data set.

Geology

6.51 Anomalies relating to geological variations have been observed in Area 1 (**A26**). These relate to waterlogged ground and rocky outcrops that were observed in this location at the time of survey.

Earth Resistance Results

6.52 An area of high resistance containing features of a higher resistance is located in the north of Area 2 (**R13**) and is also seen in the gradiometer survey results as a spread of discrete magnetic disturbance, most likely of an archaeological origin. Earth resistance has shown up the features clearly and it is proposed that this anomaly possibly relates to a former building, housing platform or monument. This feature is surrounded by an area of low resistance (**R18**) which could either relate to a lower topography surrounding the feature (which is built up) or water pooling against buried features causing a notable difference in resistance.

6.53 An area of very high resistance is observed in the centre of the area (**R14**) and this relates to an area of land which affected the earth resistance machine and consequently affected the survey. Extremely high resistance readings were beginning to show on the survey instrument, and after the machine's parameters were altered in response to this, the survey was halted here as it was deemed inefficient to continue in that particular area, since the instrument was obtaining readings over range. It is possible that the inclement weather during the survey was affecting the ground conditions and the earth resistance meter.

6.54 An area of high resistance was observed south east of this (**R15**) and it was decided that it would not have been beneficial to survey any land further north of this as the weather conditions were deteriorating.

6.55 **R16** is an area of medium to high resistance and matches trends noted in the gradiometer survey which have been identified as possible archaeology. Due to the topography of the area noted at the time of survey, it is likely that this relates to geological trends in the area. However due to its proximity to the features to the north, an archaeological origin cannot be ruled out.

6.56 A similar anomaly south of this (**R17**) also matches the topography of the area and is a likely response to geological variations which were also observed as a trend in the gradiometer data results.

7 Conclusion

Gradiometer Survey

7.1 The gradiometer survey has identified no anomalies or features of a definitive archaeological origin.

7.2 A number of discrete linear trends have been identified across all survey areas, however due to their poor patterning only a tentative interpretation can be offered. Of interest are the anomalies located in Area 2 which may relate to a former house platform or building. Some of these are most likely located to General Wade's Military Road running between survey Areas 4 and 5.

7.3 A number of trends that could be of a possible archaeological origin have also been identified across the datasets, but again a lack of patterning can only offer a tentative interpretation.

7.4 A number of pits have been identified in Areas 2 and 4 which could be of an archaeological origin.

7.5 Agricultural trends have been observed in Area 2 which are most likely related to former ploughing regimes.

7.6 Magnetic disturbance, most likely of a modern date is observed across all survey areas, in particular in Area 3 where an underground bunker and adjacent aviation building was located.

Earth Resistance Survey

7.7 The earth resistance survey has identified no anomalies or features of a definitive archaeological origin.

7.8 A number of areas of high resistance have been identified which correlate with areas of high magnetism identified within the gradiometer results. Notable are those in Area 2, which could relate to a former building or house platform; and in Areas 4 and 5 where General Wade's Road is reputed to run.

7.9 Other areas of low resistance most likely relate to waterlogged ground within the survey area, most of which were observed at the time of survey.

8 Statement of Indemnity

8.1 Although the results and interpretation detailed in this report have been produced as accurately as possible, it should be noted that the conclusions offered are a subjective assessment of collected data sets.

8.2 The success of a geophysical survey in identifying archaeological remains can be heavily influenced by several factors, including geology, seasonality, field conditions, the technique used and the properties of archaeological features being detected. Therefore geophysical survey may only reveal certain archaeological features and not create a complete plan of all the archaeological remains within a survey area.

9 Bibliography

AtkinsMouchel, *A9 Dualling – Tomatin to Moy: WSI for Archaeological Geophysical Survey*, 2017

Bartington Instruments, 2007 User Manual

BGS, 2017 British Geological Survey website, http://www.bgs.ac.uk/data/mapViewers/home.html (last accessed 27th February 2017)

Canmore, https://canmore.org.uk/, (last accessed 14th March 2017)

CIfA 2014 *Standards and Guidance for archaeological geophysical survey*

Clark, A., 1996 *Seeing Beneath the Soil: Prospecting Methods in Archaeology*, Second Edition. London

David, A. Linford, N. Linford, P., 2008 *Geophysical Survey in Archaeological Field Evaluation*, Swindon

Gaffney, C. and Gater, J., 2003 *Revealing the Buried Past Geophysics for Archaeologists*. Stroud: Tempus Publishing Ltd.

Heron, C. and Gaffney, C., 1987 'Archaeogeophysics and the site: ohm sweet ohm? in C. Gaffney and V. Gaffney (eds.) *Pragmatic Archaeology: Theory in crisis?* British Archaeological Report, British Series 167:71-81.

Highland HER, http://her.highland.gov.uk/, (last accessed 14th March 2017)

Kearey, P. and Brooks, M. 1991 *An Introduction to Geophysical Exploration (2nd ed.)*

Lowe, K.M. and Fogel, A.S., 2010 'Understanding Northeastern Plains Village sites through archaeological geophysics', *Archaeological Prospection*, Volume 17, Issue 4, pages 247–257

Schmidt, A. and Ernenwein, E., 2009 *Guide to Good Practice: geophysical data in archaeology*

Scollar, I., Tabbagh, A., Hesse, A. and Herzog, I., 2011 *Archaeological prospecting and remote sensing*

Scotland's Soils, 2017. *1:250,000 National Soil Map of Scotland.* http://www.soils-scotland.gov.uk/data/soil-survey (last accessed 27th February 2017).

Sharma, P.V., 1997 *Environmental and Engineering Geophysics*

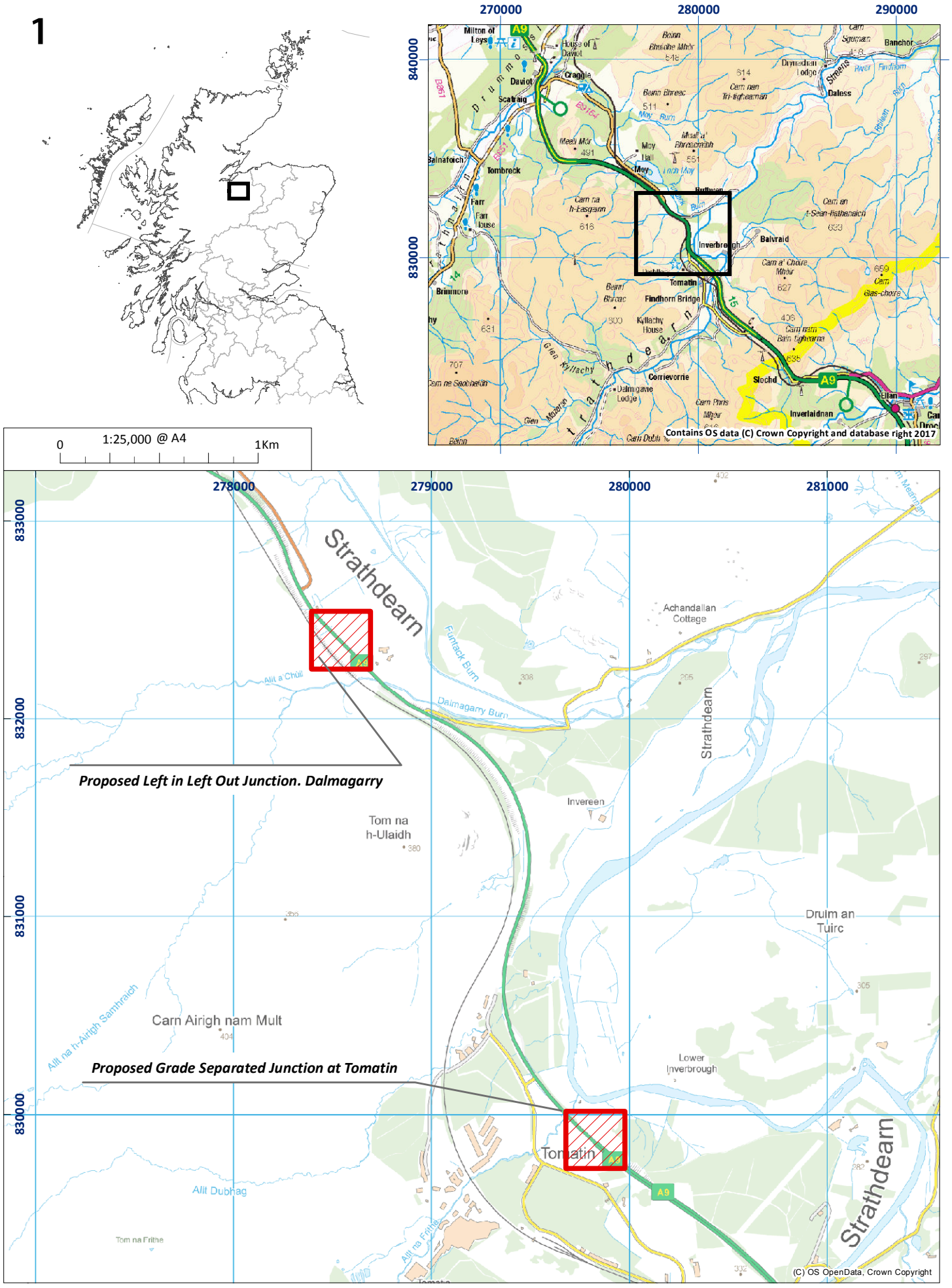
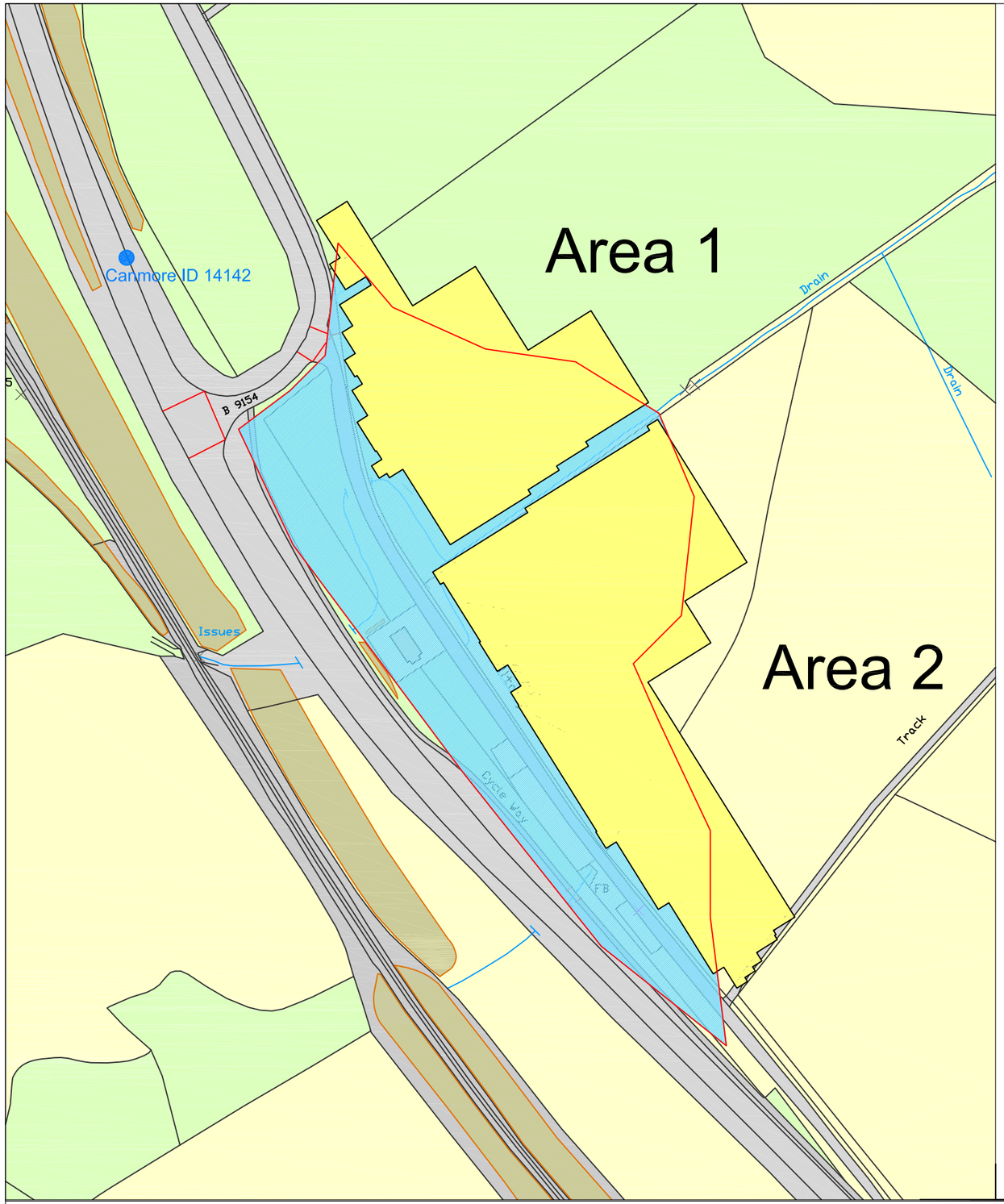
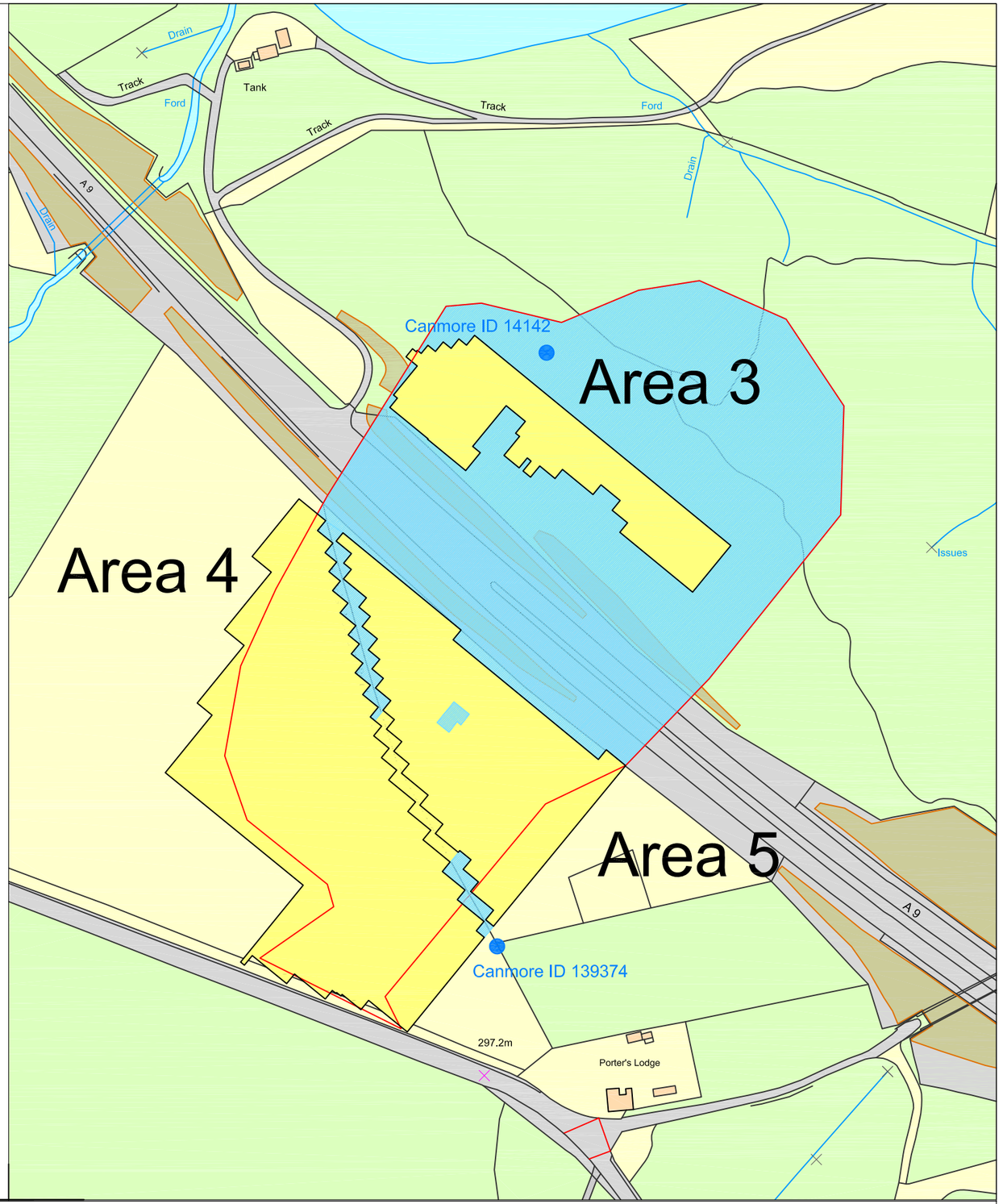


Figure 1: Location of the survey areas

01/51695



Location of Survey Areas - Dalmagarry



Location of Survey Areas - Tomatin

Figure 2

N

Survey Area Boundary
Area Surveyed
Area not Surveyed
Canmore Heritage Asset

0 80m
1:2000 at A3

AOC Archaeology Group

Canmore ID 14142

Area 3

Area 4

Area 5

Canmore ID 139374

297.2m

Scale
2nT
-1nT

Unprocessed gradiometer survey results - Tomatin

Figure
3

Survey Area Boundary

Canmore Heritage Asset

N

0 40m

1:1000 at A3

AOC Archaeology Group

Canmore ID 14142

Area 3

Area 4

Area 5

Canmore ID 139374

297.2m

Scale
2nT
-1nT

Processed gradiometer survey results - Tomatin

Figure
4

Survey Area Boundary

Canmore Heritage Asset

N

0 40m

1:1000 at A3

AOC Archaeology Group

Canmore ID 14142

Area 3

Area 4

Area 5

Canmore ID 139374

297.2m

Scale 2nT -1nT

Scale 94.64 ohm -100.09 ohm

Processed earth resistance survey results overlaying gradiometer survey results - Greyscale plot - Tomatin

Figure 5

Survey Area Boundary

Canmore Heritage Asset

N

0 40m

1:1000 at A3

AOC Archaeology Group

Canmore ID 14142

Area 3

A9

A10

A12

Area 4

A3

A11

A2

A5

A11

A4

A1

A6

Area 5

A7

A3

A8

Canmore ID 139374

297.2m

Porter's Lodge

Interpretation of gradiometer survey results - Tomatin

Figure 6

- Survey Area Boundary
- Canmore Heritage Asset
- Discrete Linear Trend (Archaeology?)
- Discrete - Possible Archaeology
- Magnetic Disturbance (Modern)
- Pit
- Geology / Natural
- Ferrous / Iron Spikes

N

0 40m

1:1000 at A3

AOC Archaeology Group

Area 4

General Wade's Military Road (co

Are

Canmore ID 139374

297.2m

Porter's

Scale

94.64 ohm

-100.09 ohm

Area 4

R7

R5

R10

R4

R2

R12

R6

R3

R11

R1

R8

R9

Are

Canmore ID 139374

297.2m

Porter's

Processed earth resistance survey results - Greyscale plot - Tomatin

Interpretation of earth resistance survey results - Tomatin

Figure 7

N

Survey Area Boundary

Canmore Heritage Asset

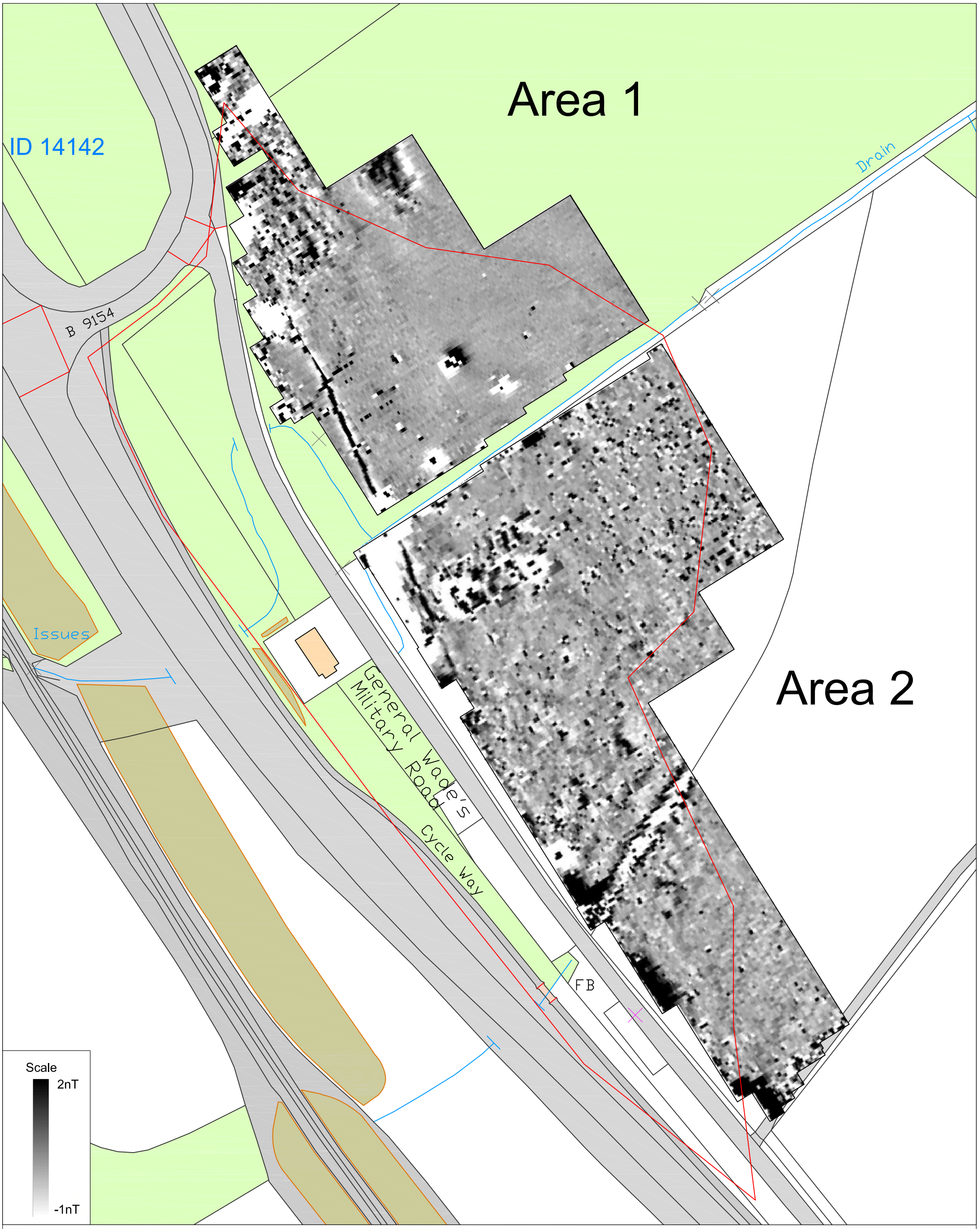
Area of High Resistance

Area of Low Resistance

0 40m

1:1000 at A3

AOC Archaeology Group



Unprocessed gradiometer survey results - Greyscale plot - Dalmagarry

Figure 8

Survey Area Boundary

Canmore Heritage Asset

N

0 40m

1:1000 at A3

AOC Archaeology Group

Area 1

ID 14142

Drain

B 9154

Issues

General Wade's Military Road

cycle way

FB

Area 2

Scale
2nT
-1nT

Processed gradiometer survey results - Greyscale plot - Dalmagarry

Figure 9

Survey Area Boundary

Canmore Heritage Asset

N

0 40m

1:1000 at A3

AOC Archaeology Group

Area 1

ID 14142

Drain

B 9154

Issues

General Wade's Military Road

cycle way

Area 2

FB

Scale 2nT -1nT

Scale 94.64 ohm -100.09 ohm

Processed earth resistance survey results overlaying gradiometer survey results - Greyscale plot - Dalmagarry

Figure 10

Survey Area Boundary

Canmore Heritage Asset

N

0 40m

1:1000 at A3

AOC Archaeology Group

Area 1

Area 2

ID 14142

A25

A19

A26

A13

A14

A22

A16

A15

A17

A20

A24

A18

A23

A21

B 9154

Drain

Issues

General Wade's Military Road

Cycle Way

FB

Interpretation of gradiometer survey results - Dalmagarry

Figure 11

- Survey Area Boundary
- Canmore Heritage Asset
- Discrete Linear Trend (Archaeology?)
- Discrete Disturbance (Archaeology?)
- Possible Archaeology
- Disturbance - Possible Archaeology
- Magnetic Disturbance (Modern)
- Pit
- Linear Trend (Modern)
- Linear Trend (Agricultural)
- Geology / Natural
- Ferrous / Iron Spikes

N

0 40m

1:1000 at A3

AOC Archaeology Group

Area 2

General Wade's Military Road

Cycle Way

Scale

94.64 ohm

-100.09 ohm

Processed earth resistance survey results - Greyscale plot - Dalmagarry

Area 2

R18

R13

R14

R15

R16

R17

General Wade's Military Road

Cycle Way

Interpretation of earth resistance survey results - Dalmagarry

Figure 12

N

Survey Area Boundary

Canmore Heritage Asset

Area of Very High Resistance

Area of High Resistance

Area of Low Resistance

0 40m

1:1000 at A3

AOC Archaeology Group

Plate 1. Area 1 looking north at the rocky outcrop

Plate 2. Area 2 looking south towards proposed housing platform / monument

Plate 3. Area 2 looking north west towards Area 1

Plate 4. Area 3 looking north east showing the difficult terrain

Plate 5. Area 3 looking north east showing the bunker and aircraft post

Plate 6. Area 4 looking west

Plate 7. Area 4 looking north towards Area 5 across drystone wall / Wade's Military Road

Plate 8. Area 5 looking north across undulating terrain and boggy area

Appendix 1: Survey Information

Field	Description
Surveyor	AOC Archaeology
Client	Atkins/Mouchel Joint Venture (AMJV)
Site	A9 Dualling – Northern Section: Tomatin to Moy
County	Cairngorms, Highlands
NGR	North: NH 78399 32743 South: NH 79796 29657
Solid geology	Dalmagarry bedrock geology: consisting of Dava Subgroup made up of Psammite and Gneissose metamorphic rocks. Dalmagarry superficial deposits: Glaciofluvial Ice Contact Deposits composed of gravel, sand and silt, Peat, Alluvium made up of clay, silt, sand and gravel as well as Alluvial Fan Deposits made up of gravel, sand, silt and clay. Tomatin bedrock geology: comprising Findhorn Pluton, Phase 2 made up of Granodiorite, Biotite igneous rocks. Tomatin superficial deposits: comprise Glaciofluvial sheet deposits made up of gravel, sand and silt, as well as Devensian till made up of Diamicton, Peat, and in places River Terrace Deposits (undifferentiated) composed of gravel, sand, silt and clay. (BGS 2017)
Soil composition	The soils at Dalmagarry are overlain by peaty gleyed podzols, and at Tomatin they are overlain by humus-iron podzols (Scotland's Soils 2017).
Historical documentation/ mapping on site	None
Known archaeology on site	Yes
Scheduled Ancient Monument	No
Land use/ field condition	Pasture, moorland scrub, woodland
Duration	20/2/17 - 24/2/17
Weather	Sun/overcast, snow, rain
Survey type	Gradiometer Survey
Instrumentation	Trimble GXOR system / Bartington Grad 601-2 / Geoscan RM15 resistance meter with MPX15 multiplexer
Area covered	Approx 7.2 ha (77 full and partial 30m grids)
Data collection staffing	James Lawton, Kimberley Teale, Alistair Galt
Download software	Grad601 PC Software v313, Geoplot v3.0, Geoplot v4.0
Processing software	Geoplot v3.0, Geoplot v4.0
Visualisation software	AutoCAD LT 2009
Report title	A9 Dualling – Northern Section: Tomatin to Moy
Project number	51695
Report Author	Kimberley Teale
Report approved by	Graeme Cavers

Appendix 2: Archaeological Prospection Techniques, Instrumentation and Software Utilised

Gradiometer survey

Gradiometer surveys measure small changes in the earth's magnetic field. Archaeological materials and activity can be detected by identifying changes to the magnetic values caused by the presence of weakly magnetised iron oxides in the soil (Aspinall *et al.*, 2008, 23; Sharma, 1997, 105). Human inhabitation often causes alterations to the magnetic properties of the ground (Aspinall et al, 2008, 21). There are two physical transformations that produce a significant contrast between the magnetic properties of archaeological features and the surrounding soil: the enhancement of magnetic susceptibility and thermoremnant magnetization (Aspinall *et al.*, 2008, 21; Heron and Gaffney 1987, 72).

Ditches and pits can be easily detected through gradiometer survey as the top soil is generally suggested to have a greater magnetisation than the subsoil caused by human habitation. Also areas of burning or materials which have been subjected to heat commonly have high magnetic signatures, examples include: hearths, kilns, fired clay and mudbricks (Clark 1996, 65; Lowe and Fogel 2010, 24). It should be noted that negative anomalies can also be useful for characterising archaeological features. If the buried remains are composed of a material with a lower magnetisation compared with the surrounding soil, the surrounding soil will consequently have a greater magnetisation resulting in the feature displaying a negative signature. For example stone materials of a structural nature that are composed of sedimentary rocks are considered non-magnetic and so will appear a negative features within the data set.

Ferrous objects- i.e. iron and its alloys- are strongly magnetic and are typically detected as high-value peaks in gradiometer survey data, though it is not usually possible to determine whether these relate to archaeological or modern objects.

Although gradiometer surveys have been successfully carried out in all areas of the United Kingdom, the effectiveness of the technique is lessened in areas with complex geology, particularly where igneous and metamorphic bedrock is present. All magnetic geophysical surveys must therefore take the effects of background geological and geomorphological conditions into account.

Gradiometer survey instrumentation

AOC Archaeology's gradiometer surveys are carried out using Bartington Grad601-2 magnetic gradiometers. The Grad601-2 is a high-stability fluxgate magnetic gradient sensor, which uses a 1m sensor separation. The detection resolution is from 0.03 nT/m to 0.1nT/m, depending on the sensor parameters selected, making the Grad601-2 an ideal instrument for prospective survey of large areas as well as detailed surveys of known archaeology. The instrument stores the data collected on an on-board data-logger, which is then downloaded as a series of survey grids for processing.

Gradiometer survey software

Following the survey, gradiometer data was downloaded from the instrument using Grad601 PC Software v313. Survey grids were then assembled into composites and enhanced using a range of processing techniques are applied to the data using Geoscan's Geoplot v3.0 (see Appendix 3 for a summary of the processes used in Geoplot and Appendix 4 for a list of processes used to create final data plots).

Resistance survey

Earth resistance surveys measure small changes in the earth's ability to allow a small induced current between two probes. Archaeological materials and activity can be detected by identifying changes in the current caused by the presence of the amount of moisture in the ground (Kearey and Brooks 1996, 173; Gaffney and Gater, 2003, 26; Scollar et al., 2009, 307). Human inhabitation often causes alterations to the ability of the ground to absorb moisture thereby aiding or hindering the electrical current (Kearey and Brooks 1996, 174). There are two physical transformations that produce a significant contrast between the resistant properties of archaeological features and the surrounding soil: a high resistance from less conductive material, or a low resistance by more conductive ground (Kearey and Brooks 1996, 176; Gaffney and Gater 2010, 28).

Ditches and pits can be easily detected through resistance survey as these sub soil features generally allow an induced current to pass easily, a result of human activity, when compared to the surrounding undisturbed material. Likewise, the structural remains or foundations of a former building will inhibit the ability of the current to pass through the ground in comparison to the surrounding earth. (Gaffney and Gater 2010, 55; Kearey and Brooks 1996, 175).

Although resistivity surveys have been successfully carried out in all areas of the United Kingdom, the effectiveness of the technique is lessened in areas with complex geology, particularly where igneous and metamorphic bedrock is present as this suggests thin topsoil and therefore no contrast in results. Also worth noting is the saturation of the ground. If the surrounding area of a site is waterlogged, or in contrast too dry, the clear contrast needed to discover archaeological anomalies is lost. All earth resistance geophysical surveys must therefore take the effects of background geological, weather and geomorphological conditions into account.

Resistance survey instrumentation

AOC Archaeology's resistance surveys are carried out using Geoscan Research RM15. The RM15 is an instrument which allows the recording of data after a current has been introduced into the ground. It is traditionally used 0.5m probe separation, along 1m wide traverses and takes reading every 1m. However this can be altered as required, and a greater separation of the probes, means that a greater depth of readings can be obtained. It is an ideal instrument for prospective survey of small areas in the search for structural archaeology. The instrument stores the data collected on an on-board data-logger, which is then downloaded as a series of survey grids for processing. The MPX15 attachment gives more options for probe separations and configurations, allowing for faster data collection and/or limited depth investigations.

Resistance survey software

Following the survey, resistance data was downloaded from the instrument using Geoscan's Geoplot v3.0and v4.0. Survey grids were then assembled into composites and enhanced using a range of processing techniques are applied to the data using Geoscan's Geoplot v3.0 (see Appendix 4 for a summary of the processes used in Geoplot and Appendix 5 for a list of processes used to create final data plots).

Appendix 3: Summary of Processes used in Geoplot

Process	Effect
Clip	Replaces data values outside a specified range, in order to display important data with relative values stretched across the display range.
De-spike	Removes exceptionally high values represented in the data that can obscure the visibility of archaeological features. In resistivity survey, these can be caused by poor contact of the mobile probes with the ground; in gradiometer survey, these can be caused by highly magnetic items such as buried ferrous objects.
De-stagger	Counteracts the striping effect caused by misalignment of data when collected on a zig-zag traverse pattern.
Edge Match	Counteracts edge effects in grid composites by subtracting the difference between mean values in the two lines either side of the grid edge.
High pass filter	Removes low-frequency, large scale detail in order to remove background trends in the data, such as variations in geology.
Interpolate	Increases the resolution of a survey by interpolating new values between surveyed data points
Low Pass filter	Uses a Gaussian filter to remove high-frequency, small scale detail, typically for smoothing or generalising data.
Periodic Filter	Used to either remove or reduce amplitudes of constant and reoccurring features that distort other potential patterns. An example of which is plough lines.
Wallis filter	Applies a locally adaptive contrast enhancement filter.
Zero Mean Grid	Resets the mean value of each grid to zero, in order to counteract edge discontinuities in composite assemblies.
Zero Mean Traverse	Resets the mean value of each traverse to zero, in order to address the effect of striping in the data and counteract edge effects.

Appendix 4: Survey Processing Steps

Process	Extent
Gradiometer Survey	
Zero Mean Traverse	All LMS =on, threshold -5 to 5
Despike	X=1 Y=1 Thr = 3 Repl = Mean
Clip	Min =-5 Max = 5
Destagger	All grids dir Shift = 2 Line Pattern 34-78 Dual-DS
Low Pass filter	X=1 Y=1 Wt=G
Interpolate	Y, Expand – Expand –SinX/X x2
Raw Palette Scale	Grey55 Min= -1nT Max= 2nT
Palette Scale	Grey55 Min= -1nT Max= 2nT
Resistance Survey	
Despike	X=1 Y=1 Thr = 3 Repl = Mean
High Pass filter	HPF x=10 y=10 wt =u
Interpolate	X, Expand – sin x/x, x2, Y, Expand – sin x/x, x2
Palette Scale	Grey55 Min= -100.09 ohm Max= 94.64 ohm

Appendix 5: Technical Terminology

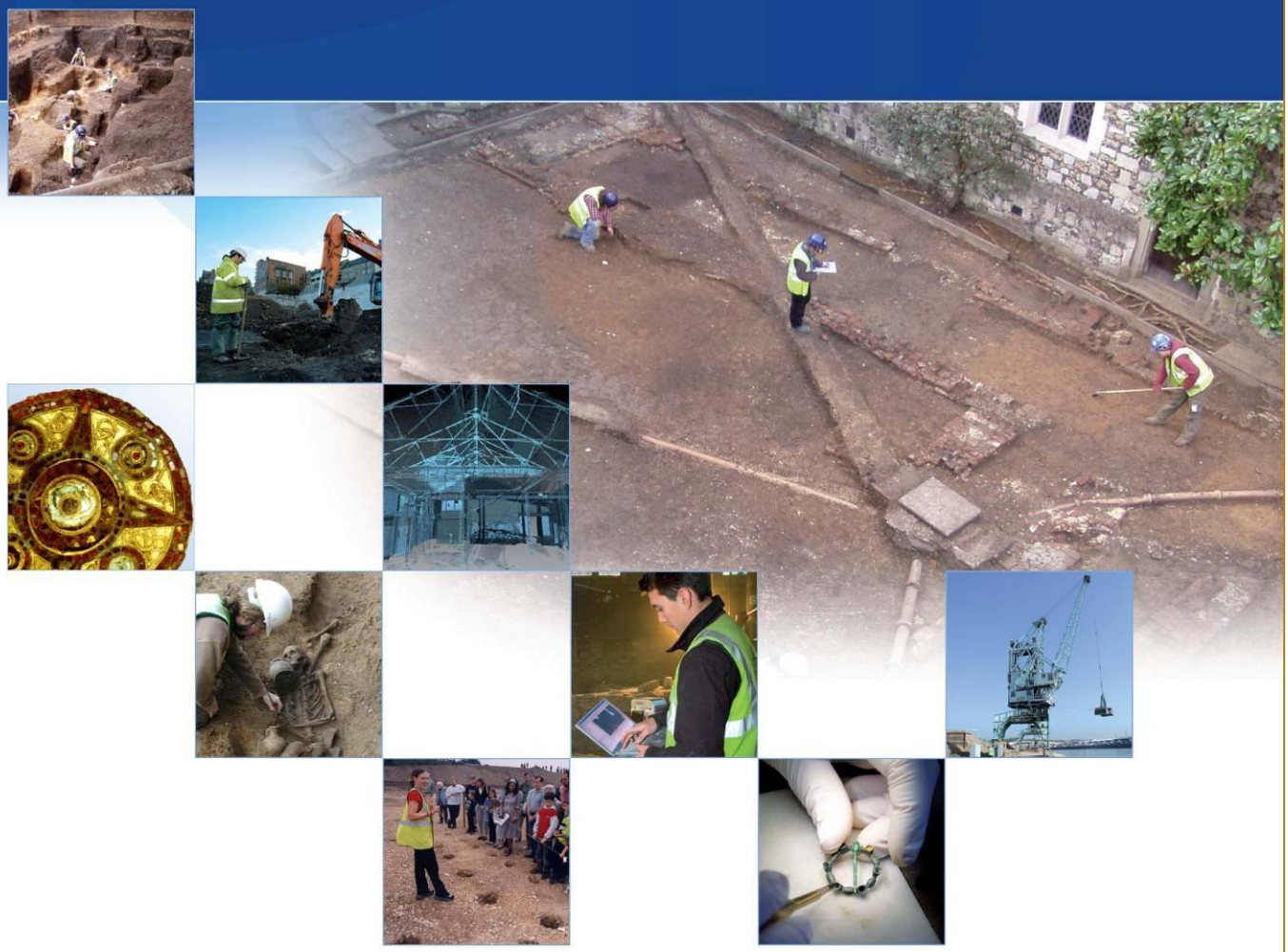
Type of Anomaly	Description
Archaeology (Isolated Linear trends)	
Linear trend (field boundary)	Isolated long linear anomalies that are likely to relate to field boundaries. Signal may appear inconsistent but patterning and positioning, especially when compared with historic mapping suggests such anomalies belong to former field division systems
Linear trend (field boundary?)	Anomalies of a long linear form, but lack the necessary patterning, signal strength or positioning to be positively identified as field boundaries.
Archaeology	
Linear trend (fortification)	Linear anomalies that are composed of a patterning and positioning that is likely to relate to structural remains such as town fortifications. These anomalies can be composed of either an increase or decrease in magnetic values, relating to in-filled ditches or buried walls.
Linear trend (road)	A regular linear trend that is identified through the absence of buried remains, especially through areas containing a variety of rectilinear anomalies that appear to have structural associations.
Linear trend (archaeology)	These can either be isolated linear anomalies or rectilinear in form and often suggest the presence of structural remains. Anomalies are either characterised by an increase or decrease in signal compared to background values depending on the properties of the feature being recorded.
Disturbed area (archaeology)	These are characterised by a general increase or decrease in the magnetic background over a localised area but do not appear as having a linear form. These anomalies do not have the high dipolar response which are manifested in an 'iron spike' anomaly, and can be the result of in-filled pits and post-holes, or kilns.
Pit	Isolated circular anomalies composed of an increase in magnetic values with a patterning that is suggestive of buried remains such as the infill of a pit
Discrete	
Linear trend (archaeology?)	Anomalies of a linear form either composed of an increased or decreased signal compared to background values. It is possible these anomalies belong to structural remains, but poor patterning or response values makes interpretation difficult.
Disturbed area (archaeological?)	Anomalies with an increase or decrease in values compared with background reading over a localised area. Poor patterning or weak signal changes creates difficulty in defining the nature of the archaeology and so interpretation is fairly tentative. On certain geologies these anomalies could be caused by in-filled natural features, and it would be necessary to undertake intrusive archaeological investigation to establish their form and character.
Possible archaeology (Unclear to origins of the remains)	Anomalies composed of a weak change in signal values compared to background reading or are composed of incomplete patterning. Consequently, interpretation is tentative and it is unclear to whether anomalies belong to an archaeological nature.
(Archaeology?)	Like with above, but located in an area previously excavated

(Unclear to origins of the remains)	so is either potentially a product of excavation related activity or relates to subtle changes in the magnetic properties in the soil caused by earlier activity, which was not detected during pervious archaeological assessment works.
Area of Disturbance (archaeology?)	A large area of general disturbance which could relate to earlier human activity which has caused an increase in the magnetic properties of the soil. Generally these areas contain a variety of increased and decreased magnetic values, but lack sufficient patterning for detailed interpretation. They could indicate the presence of buried rubble relating to fallen structures, or instead denote modern material either caused by quarrying or agricultural activity.
Pit?	Isolated circular anomalies composed of an increase in magnetic values with a patterning that may be suggestive of buried remains such as the infill of a pit.
Linear trend (plough lines)	A series of regular anomalies of a linear form either composed of an increased or decreased signal compared to background values. Likely to denote the presence of ploughing and relating to archaeological agricultural activity such as ridge and furrow.
Non- Archaeology	
Linear trend (plough lines)	A series of regular anomalies of a linear form either composed of an increased or decreased signal compared to background values. Likely to denote the presence of ploughing and relating to modern agricultural activity.
Linear trend (agricultural)	Series of linear anomalies, of an indeterminate date, likely to have been caused by agricultural activity such as ploughing and land drainage
Linear trend (modern?)	Anomalies of a linear form that are likely to belong to modern features, but are composed of values, patterning or positioning which makes definite interpretation difficult
Disturbed area (modern?)	Area of disturbance that is composed of significant increases or decreases in values compared with background readings. It is highly likely that these readings are caused by modern disturbances, but interpretation is tentative.
Linear trend (modern)	Anomalies of a linear form often composed of contrasting positive and negative values. Such anomalies usually signify a feature with a high level of magnetisation and are likely to belong to modern activity such as pipe lines
Disturbed area (modern)	Area of disturbance that is likely to be caused by modern disturbances and is characterised by significant increases or decreases in values compared with background readings.
Isolated dipolar anomalies (iron spikes)	Response normally caused by ferrous materials on the surface or within the top soil of the site, which cause a ‘spike’ representing a rapid variation in the magnetic response. These are generally not assessed to be archaeological when surveying on rural sites, and generally represent modern material often re-deposited during manuring.
Geology	Area of disturbance that is composed of irregular significant increase or decreases in values compared with background readings and are likely to indicate natural variations in soil composition or geology

Appendix 6: Individual Characterisation of Identified Anomalies

Anomaly Identifier (A9 Dualling, Tomatin to Moy)	Type of Archaeology
Gradiometer survey	
Tomatin	
A1	Discrete linear trend (archaeology?)
A2	Discrete linear trends (archaeology?)
A3	Discrete linear trends (archaeology?)
A4	Linear trend – possible archaeology
A5	Linear trend – possible archaeology
A6	Linear and curvilinear trends – possible archaeology
A7	Pits
A8	Magnetic disturbance
A9	Magnetic disturbance - bunker
A10	Magnetic disturbance
A11	Geology
A12	Geology
Dalmagarry	
A13	Discrete parallel linear trends (archaeology?)
A14	Discrete linear trend (archaeology?)
A15	Discrete magnetic disturbance (archaeology?)
A16	Discrete magnetic disturbance (archaeology?)
A17	Linear trend – possible archaeology
A18	Linear and curvilinear trends – possible archaeology
A19	Magnetic disturbance – possible archaeology
A20	Pits
A21	Linear trends - agricultural
A22	Linear trend – modern?
A23	Magnetic disturbance – stream
A24	Magnetic disturbance - modern
A25	Magnetic disturbance - modern

Earth resistance survey	
Tomatin	
R1	High Resistance
R2	High Resistance
R3	High Resistance
R4	High Resistance
R5	High Resistance
R6	High Resistance
R7	Low Resistance
R8	High Resistance
R9	Low Resistance
R10	Low Resistance
R11	Low Resistance
R12	Low Resistance
Dalmagarry	
R13	High Resistance – structure?
R14	High Resistance
R15	High Resistance
R16	High Resistance
R17	High Resistance
R18	Low Resistance



AOC Archaeology Group, The Raylor Centre, James Street, York, YO10 3DW
tel: 01904 413 404 | **e-mail: york@aocarchaeology.com**