

**YCCART 2015 / Y 5
North Somerset HER 2016/022
Gradiometry & Resistivity Surveys at Banwell**

**YATTON, CONGRESBURY, CLAVERHAM AND CLEEVE ARCHAEOLOGICAL
RESEARCH TEAM (YCCART)**

General Editor: Vince Russett



A tricky moment for the RM 15 team

Page	Contents
3	Abstract Acknowledgements Introduction
4	Site location Land use and geology
5	Historical & archaeological context
6	Survey objectives Methodology
7	Results
12	Recommendations References
13	Appendix – Site Records

Abstract

The Banwell Society of Archaeology requested that YCCCART undertake surveys on three fields at Banwell in order to determine the extent of the Roman graveyard & settlement. A gradiometer survey revealed a possible area of domestic activity.

Acknowledgements

A Heritage Lottery Grant enabled the purchase, by YCCCART, of a Bartington 601 gradiometer and Geoscan RM15 resistivity meter without which this survey could not have been undertaken.

This survey would also not have been carried out without the willing permission of the landowner, Mrs Susan Worth and the help and assistance of the Banwell Society of Archaeology.

The authors are grateful for the hard work by the members of YCCCART in performing the survey and Vince Russett for editing the report.

Introduction

YCCCART is one of a number of Community Archaeology teams across North Somerset.

The objective of the Community Archaeology in North Somerset (CANS) project is to undertake archaeological fieldwork to enable a better understanding and management of the heritage of the area while recording the activities and locations of the research carried out.

Site Location



Fig 1: Site locations are indicated by the red arrow.

The site locations indicated by the red arrows in Fig 1 above show two fields. The top arrow indicates the field where the gradiometry survey was undertaken and lower arrow where the resistivity surveys were completed.

Since this photo the field on the left has been subdivided by a fence placed around the pipeline excavation area. Hence the survey is described below as over three fields.

The field is privately owned.

Land use and geology

The fields are used for grazing.

Geology is the Murcia Mudstone group – Mudstone and Halite stone

Historical & archaeological context

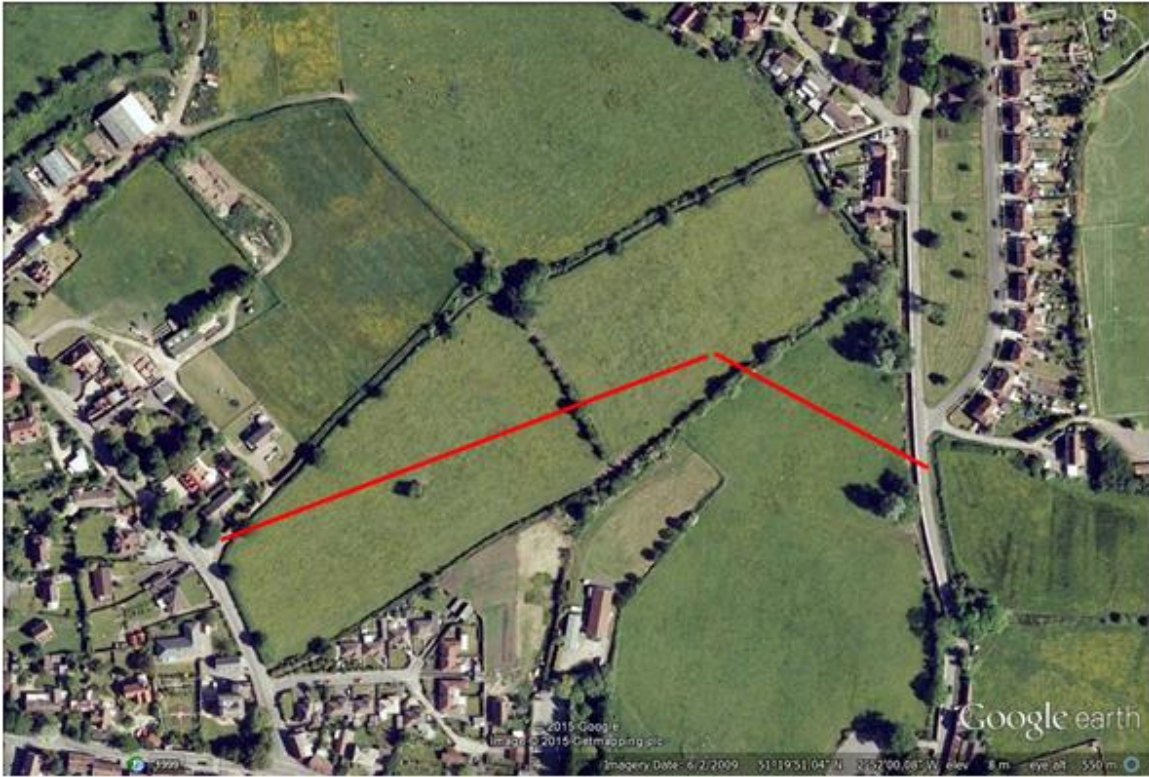


Fig 2. Map showing new pipeline across fields as red lines. The top red line crosses the fields surveyed by YCCART.

In 2012 Bristol Water PLC, during the construction of a water main from Banwell to Hutton and the former Weston super Mare airfield, employed Border Archaeology to carry out excavations.

This revealed

- 1) A Roman cemetery, strangely positioned in a curving, water-filled ditch. The human remains themselves appear to date from the second phase of use – three 'inhumation burials' comprising remains of complete individuals. All three inhumations were orientated north-south, with the head to the north, suggesting a pre-Christian burial practice.
- 2) Some 9,000 pieces of pottery as well as jewellery.

Border Archaeology have yet to publish their report but further information can be found in the Banwell Society of Archaeology Journal Search No 25.

Survey objectives

The survey was undertaken in order to continue to investigate the extent of the Roman graveyard /settlement.

Methodology

The gradiometer survey of the field of the right in Fig 1 above was undertaken during February 2015 by teams from YCCCART, using a Bartington 601 gradiometer, with settings as per the site record in the Appendix.

The resistivity surveys of the two fields, on the left in Fig 1, above were undertaken during February and March 2015 using a Geoscan RM 15 resistance meter, with settings as per the site record in Appendix.

The completed surveys were downloaded to a TerraSurveyor program.

TerraSurveyor composites were adjusted using the following filters:

1. Gradiometer
 - Colour: Red Blue Green 2
 - Colour: Black Green White
 - Band weight equaliser
 - Grad shade
 - Despiked
 - Destriped
 - Clip SD2
 - Periphery

2. Resistivity
 - Band weight equaliser
 - Grad shade
 - Clip SD 2.00
 - High Level Pass (uniform) Mean
 - Despike
 - Periphery

The report was written in Microsoft Word 2013.

Photographs were taken by members of YCCCART, and remain the copyright of YCCCART.

Results

Gradiometry

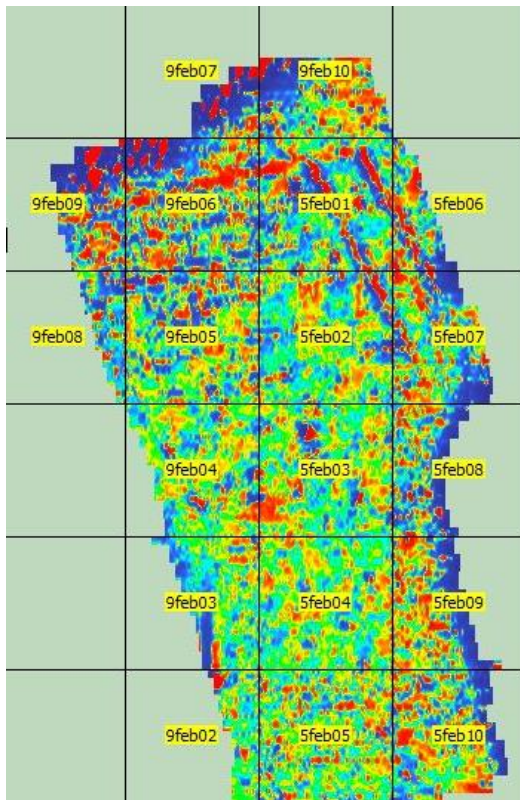
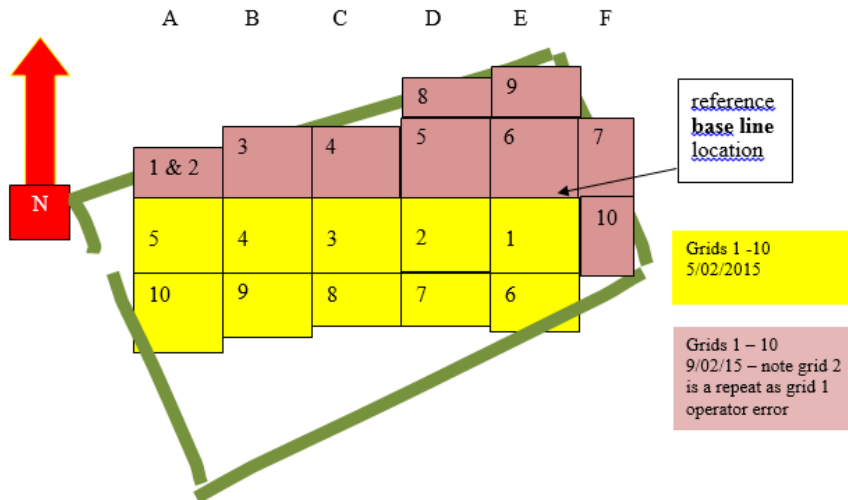


Fig 3: Grid layout (above) and TerraSurveyor (below)

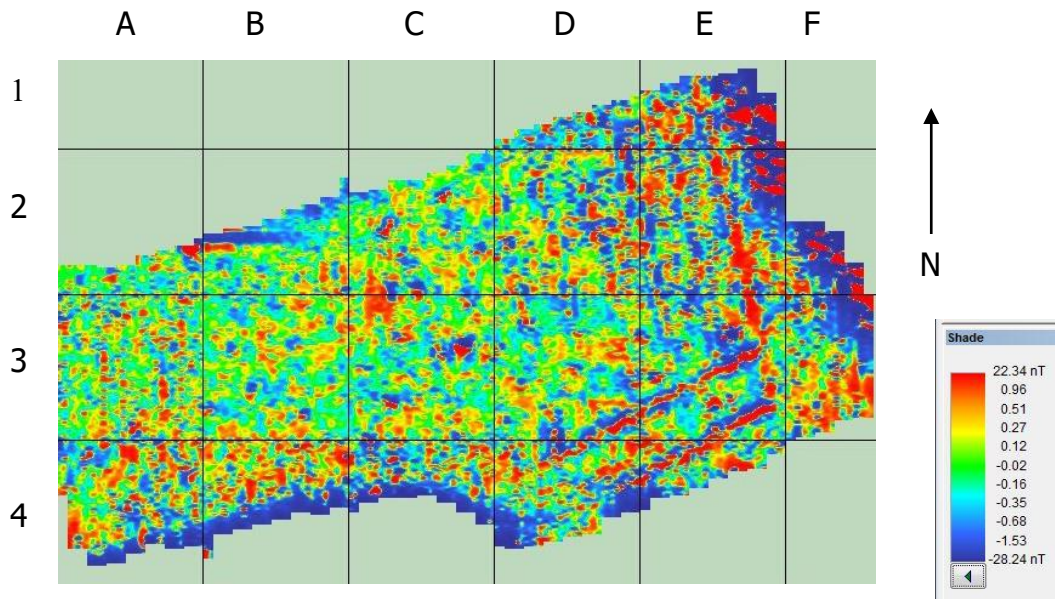


Fig 4. Terra Surveyor colour shade image. High readings are red.

The results shown in Fig 3 above show the following:

Two parallel lines commencing in grid 4D and continuing into grid 3E and a red line which joins the top parallel line in grid 3E above and continues north west into grid 1E. These appear to relate to grypes shown on a 1946 air photograph.

Grid 2D and 2E also show of number of red (high anomalies) indicating possible domestic activity.

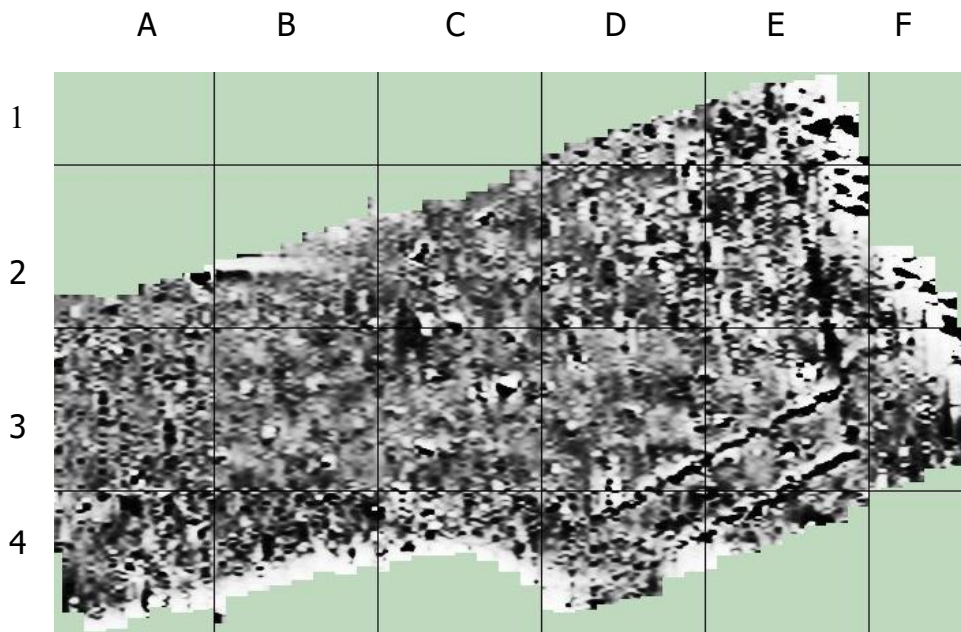


Fig 5. Terra Surveyor black and white shade image. High readings are black.

The black and white result, at Fig 4 above, shows in addition to the previously noted anomalies, an unusual feature on the right hand side of grid 3C.

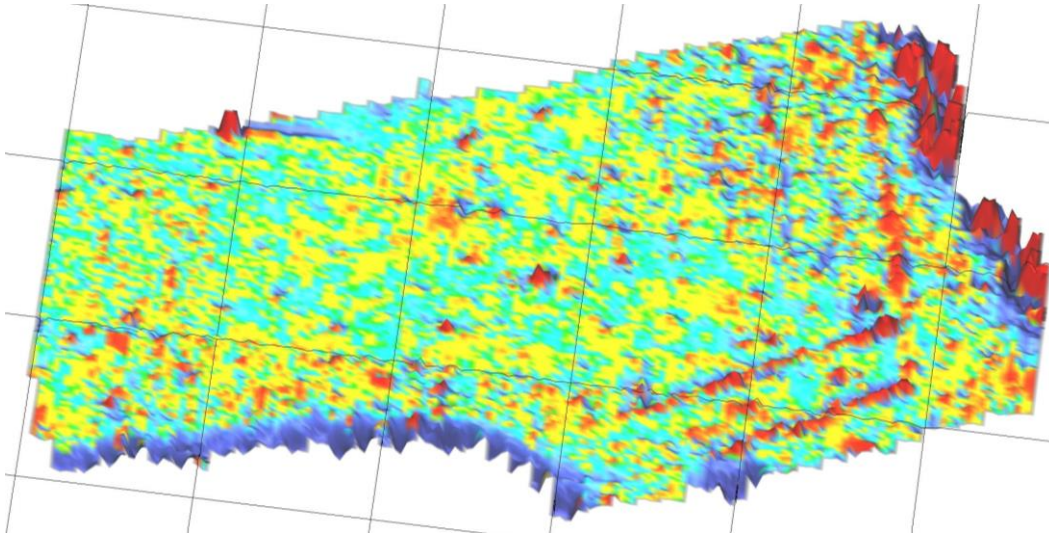


Fig 6: TerraSurveyor axonometric view

The 3d image in Fig 5 above again shows the features previously mentioned.

Resistivity

Field 1

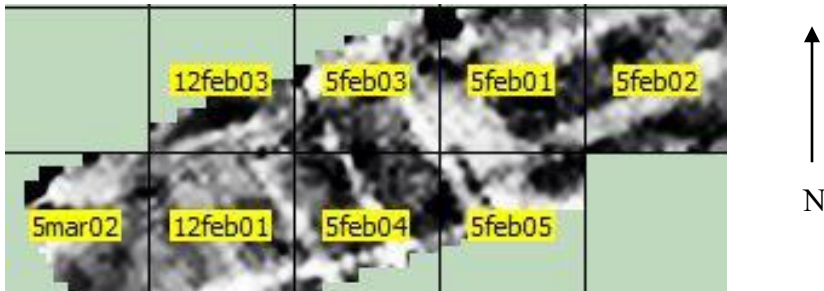
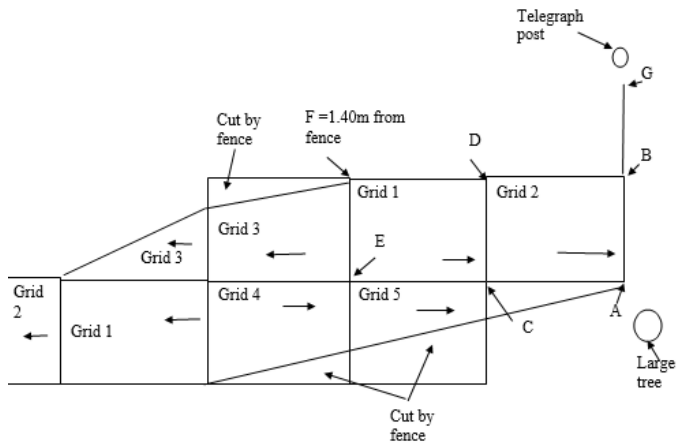
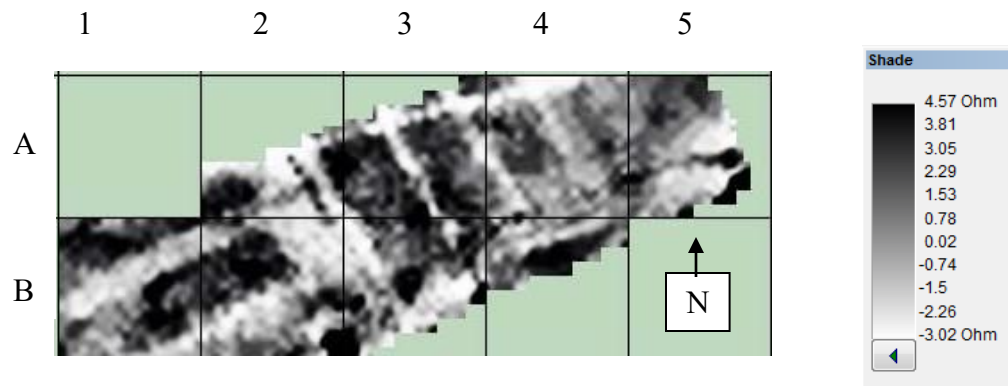


Fig 7: Grid layout (above) and TerraSurveyor (below)



Processes: 5

- 1 Base Layer
- 2 Clip at 2.00 SD
- 3 High pass Uniform (mean) filter: Window: 21 x 21
- 4 Despike Threshold: 1 Window size: 3x3
- 5 Periphery Match ALL grids in the survey.

Fig 8: Terra Surveyor shade image. High readings are black.

The results, in Fig above 8, showed

- 1) what seemed initially to be a potential rectangular structure / building on the right hand side of grid 1B and the left hand side of grid 2B. Also a possible structure in grids 2B (top right hand side) and on the left hand side of grid 3A. However, a trench evaluation by AC archaeology Ltd, reported in February 2016, revealed no archaeological features in this area.
- 2) an anomaly in the form of a black (high resistance) line commencing top right in grid 3B and continuing north eastwards into grid 5A and another black line at right angles to this line in grid 3B. These probably relate to service pipes / drains
- 3) another possible service or drainage pipe in the form of a black line near the centre top of grid 2A and continuing south west into grid 3B.

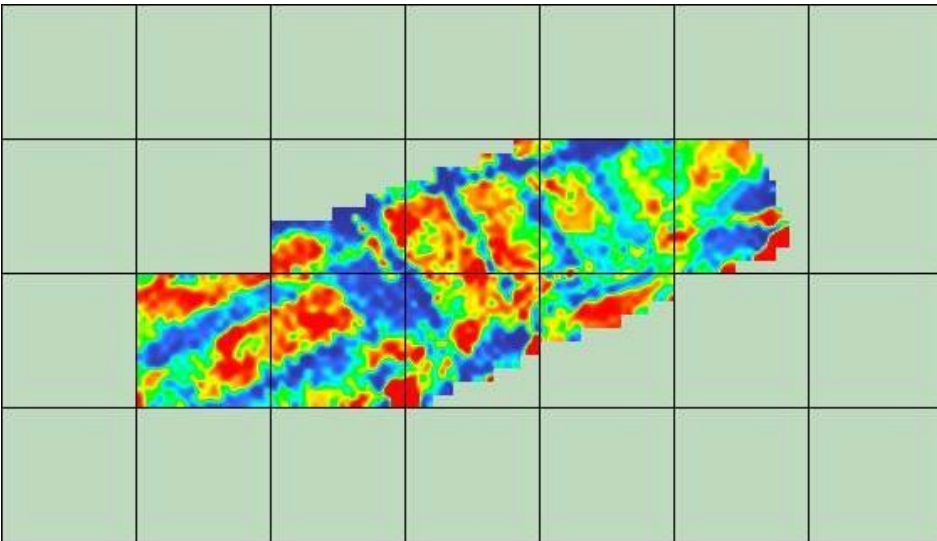
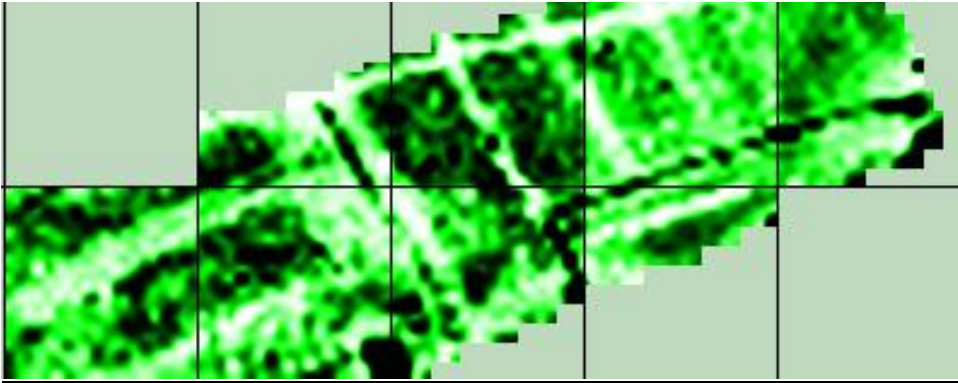


Fig 9: TerraSureyor shade view colour images. High readings are black (top image) and red (lower image).

The coloured results at Fig 9 above show the anomalies even clearer.

Field 2

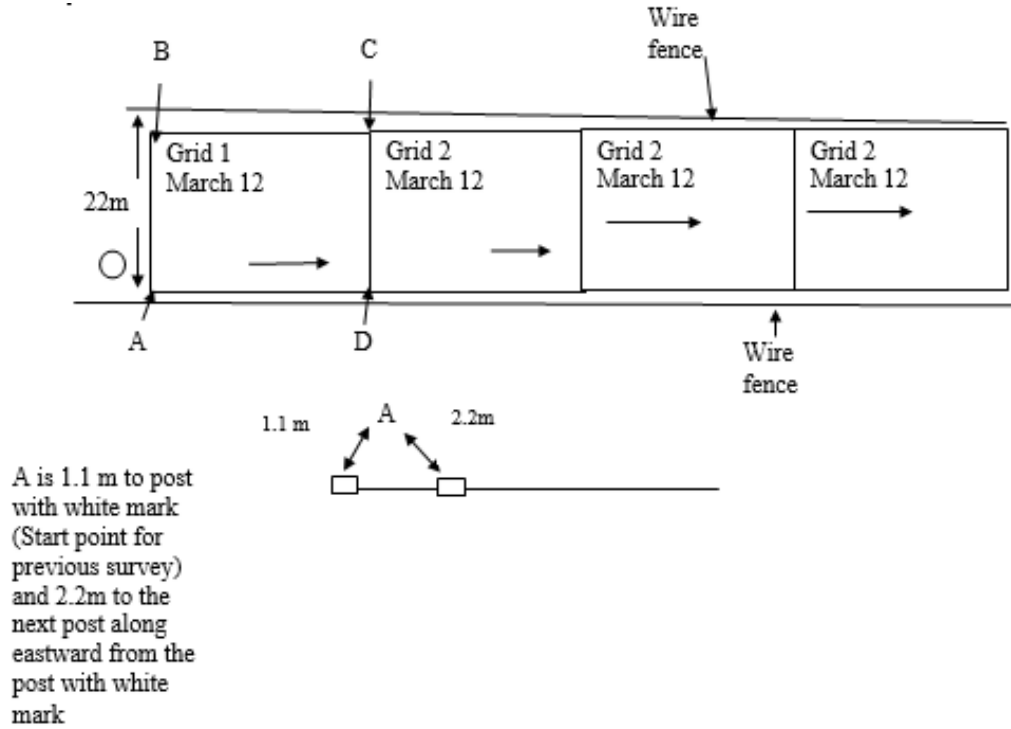


Fig 10: Grid layout (above) and TerraSurveyor grids (below)

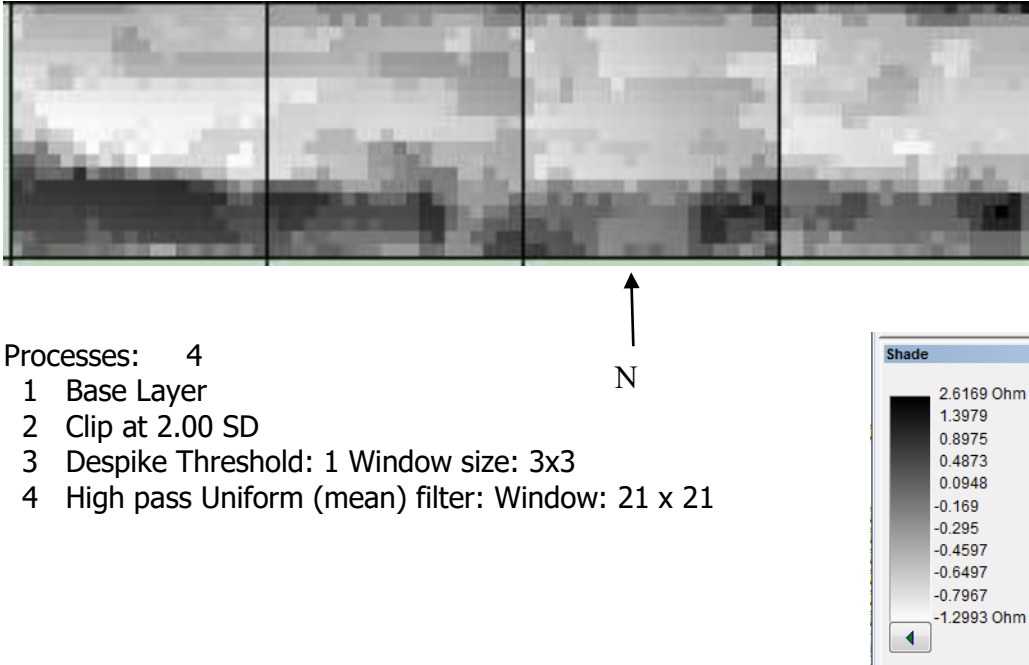


Fig 11: TerraSurveyor shade image. High readings are black

The results in Fig 11 above show no archaeological features.

Combined

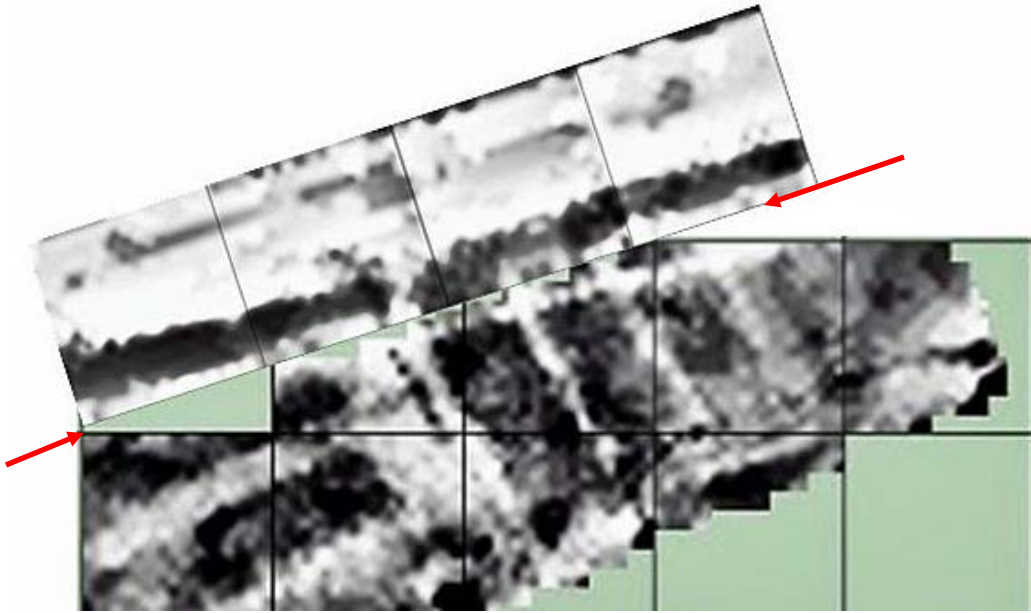


Fig 12. TerraSurveyor shade image. High readings are black. Fields 1 & 2 combined

Red arrows indicate the live of the wire fence separating the surveys. The area to the north of the red arrows contained the skeletons found by Border Archaeology.

Finds

During the resistivity survey pottery shards as follows were picked up

Pre Roman

1	Iron Age
1	Cheddar E – Pre Conquest

Roman

No of shards	Description
4	Unknown fabric
1	Black Burnished Ware (Poole)
1	Severn Valley Ware
1	Oxford Ware (Mortarium)
8	Congresbury Ware

Medieval

No of shards	Description
1	From cooking pot
1	?
1	Ham Green

Recommendations

Without the full archaeological report from Border Archaeology the interpretation of the results can only be tentative and are to be reviewed once the final archaeological report is published. However, a resistivity survey over the area revealed by the gradiometer. indicating possible domestic activity. may be worthwhile.

References

Banwell Society of Archaeology, 2014

Search Issue 25
Journal of the Banwell
Society of Archaeology

AC archaeology Ltd

Document No: ACW879/2/0
February 2016

Date: April 2016

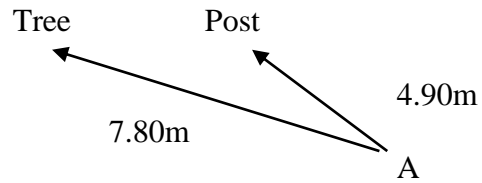
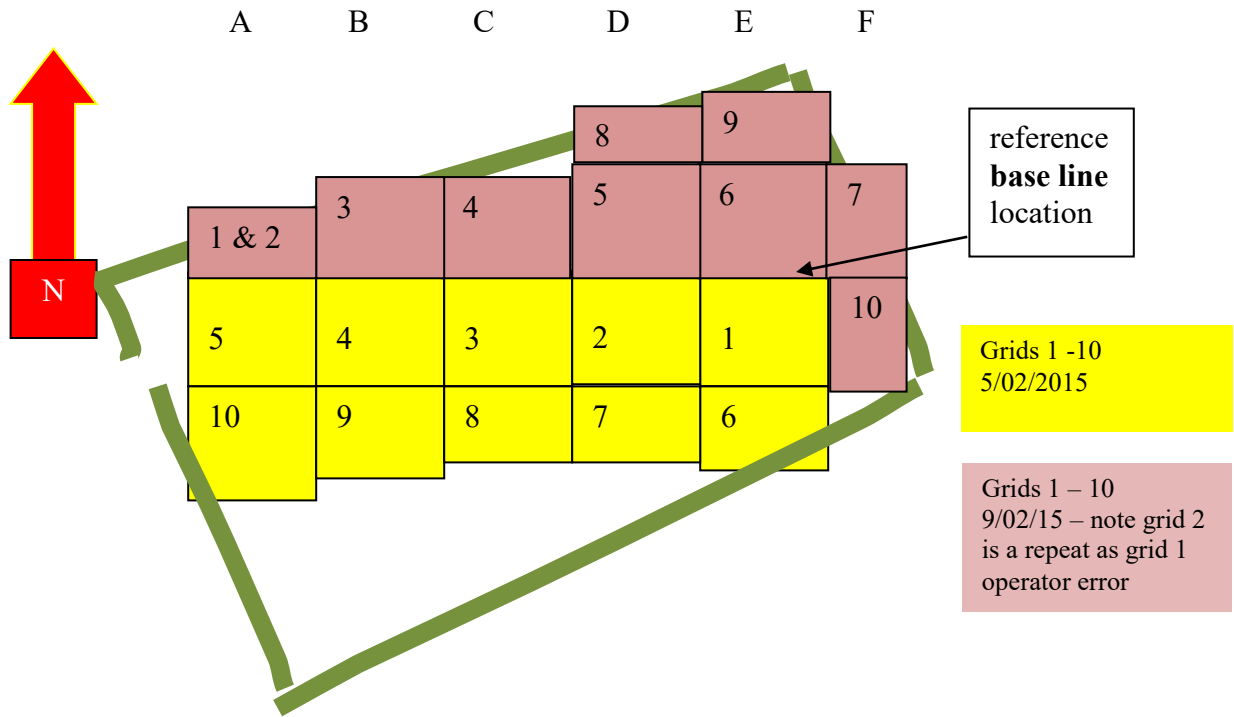
Authors: Chris Short

Appendix

YCCART Site Survey Project –Banwell burial site		
Survey date	9 February 2015	
Report date	9 February 2015	
Type /Instrument	Grad 601	
	Pace : 1.5 Lines/m : 1 Range:100nT Volume: High Sensors:2	Grid size: 30m x30m Pattern : Zig Zag Samples/m:4 Audio: On Threshold:10nT Reject:50 Hz
Location	Wolvershill Road	
Ref	none	
Site name	Banwell burial	
Landowner		
Tenant		
HER ref		
Site type	Open land	
Description	Grass land	
Period		
Geology		
Land use	Grazing	
Survey team and conditions		
02/02/2015	Team	Peter English, Arthur Langley, Ian Morton and Members of Banwell Archaeological Society
	Weather	Overcast and cold, ground frost but thawing
05/02/2015	Team	Peter Wright, Janet Dickson, Arthur Langley, Ian Morton, Ferdie and Members of Banwell Archaeological Society
	Weather	Overcast, cold, dry
09/02/2015	Team	Peter Wright, Arthur Langley, Ian Morton, Dave L, Ferdie and a member of Banwell Archaeological Society
	Weather	Cold and misty to start, clearing to bright sunshine later. Ground frosted.

Survey area		notes		readings		
		size	walk direction	max	min	mean
Date	Grid number					
2/02/2015		Setting out base line and 10 grids. Fault with 601 so no survey started. Base line GPS completed				
5/02/2015	1	30 x 30m	S	+54.3	-100	-1.0
	2	30 x 30m	S	+15.1	-12.5	-0.8
	3	30 x 30m	S	+12.0	-8.1	-0.8
	4	30 x 30m	S	+3.5	-5.4	-0.9
	5	30 x 30m	S	+7.9	-8.4	-1.7
	6	30 x 30m Mirror & return	S	+21.9	-48.8	-2.0
	7	30 x 30m Mirror & return	S	+8.3	-41.2	-3.4
	8	30 x 30m Mirror & return	S	+43.8	-46.9	-4.0
	9	30 x 30m Mirror & return	S	+13.7	-24.7	-3.8
	10	30 x 30m Mirror & return	S	+17.8	-20.5	-3.0
9/02/2015	1	Partial grid Mirror & return	Ignore as operator error			
	2	Partial grid Mirror & return	N	+99.4	-100.0	+0.2
	3	Partial grid Mirror & return	N	+3.4	-3.7	-0.3
	4	Partial grid Mirror & return	N	+67.6	-12.0	-0.1
	Elect pole at 69m	30 x 30m	N	+14.3	-6.7	-0.5
	6	30 x 30m	N	+100.0	-100.0	-2.5
	7	Partial grid Mirror & return	N	+100.0	-100.0	Not recorded
	8	Partial grid Mirror & return	N	+9.7	-6.5	-1.8
	9	Partial grid Mirror & return	N	+100.0	-100.0	-6.9
	10	Partial grid Mirror & return	N	+46.2	-37.7	-3.3

Annex 1
Setting out details



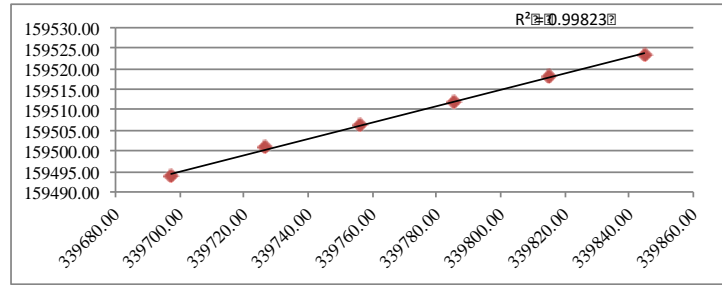
Position A on grid baseline –
4.90m to post
7.80m to tree

Quiet spot -
17.20m to A
20.80m to B

Note – Grid 3, overhead power line running diagonally across grid with pole 69m from A on baseline – powerlines cross bottom of grid 2 at 100m mark (see previous Goggle image with superimposed grid)

Grid Ref. All ST

	eastings	northings
A	339697.33	159493.70
B	339726.52	159500.90
C	339756.25	159506.37
D	339785.56	159512.08
E	339815.03	159517.90
F	339844.72	159523.53



quiet spot

HAZARD AND RISK ASSESSMENTS

Severity of hazard: 1= Minor injury 2= Serious injury 3= Major injury or fatality	Likelihood: 1= Unlikely 2= Likely 3= Very likely or inevitable	Population (no. of persons who could be affected): 1= 1-5 persons 2= 6-20 persons 3= 21+ persons	Risk Factor: Severity x Likelihood x Population (min 1, max 27)
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Location: Banwell burial
Assessor: Ian Morton

Activity/Equipment: 601

Date of assessment: 2 February 2015

Nature of hazard	Slips, trips, falls	Dust	Noise	Fire/Explosion	Exposure to harmful substances	Entrapment	Impact	Contact	Entanglement	Ejection	Electric shock	RSI/Eyestrain	Manual handling	Other	MAX. RISK FACTOR
Severity	1	0	0	0	0	0	0	1	0	0	0	1	1		1
Likelihood	1	1	1	1	1	1	1	1	1	1	1	1	1		
Population	1	1	1	1	1	1	1	1	1	1	1	1	1		

Control methods and timescale

Field is flat but ground has been rutted by cattle and is fairly soft. Care to be taken when walking with 601 – may need to reduce walking pace.

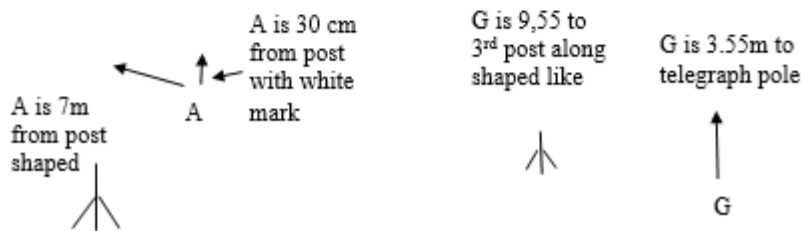
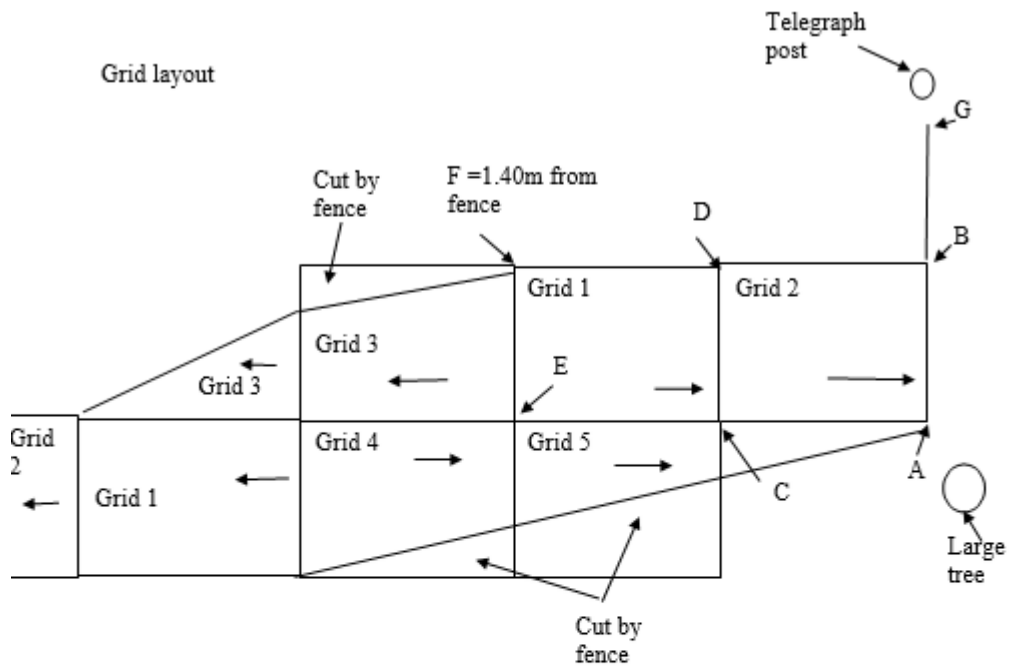
Members will wear substantial waterproof footwear to deal with the uneven and soft ground and wear long trousers protect skin from any stumbles.

NB – Car parking at entrance to these fields is not advised as the ground is very soft and muddy.

Resistivity Field 1

YCCART Site Survey Project -		
Survey date	5 February to 5 March 2015	
Report date	5 March 2015	
Type /Instrument	RM15	
Location	Wolvershill Road	
Site name		
Landowner	Mrs. Susan Worth	
Tenant	Mr. Keith Raymond.	
HER ref	TBC	
Site type	Grass	
Description	Large open field	
Period		
Geology		
Land use	Grazing	
Survey team and conditions		
5 February 2015	Team	David Long, Pete English, Chris Short, Geoff Pearson, Brian Wills, Tony Yarde <i>Weather: Overcast. Grass – frosty/damp.</i>
12 February 2015	Team	David Long, Pete English, Chris Short, Geoff Pearson, Brian Wills, Tony Yarde <i>Weather: Overcast /sunny. Grass – damp.</i>
5 March 2015	Team	Peter English, Tony Yarde & Chris Short

Survey area		Notes	
		Size	Walk direction
5 February	Grids 1 to 2 Grid 3 – *Truncated by hedge Grids 4 to 5. *Truncated by hedge.	20x20m 20x20m* 20x20m*	W E W
12 February	Grids 1 to 3 *2 & 3 truncated	20x20m*	E
5 March	Re- surveyed grid 2 Feb 12	20x20m*	E



GPS

A	339635.33	159380.96
B	339637.62	159361.50
C	339655.14	159383.49
D	339657.65	159362.74
E	339675.65	159383.34
F	339676.96	159363.84

Settings

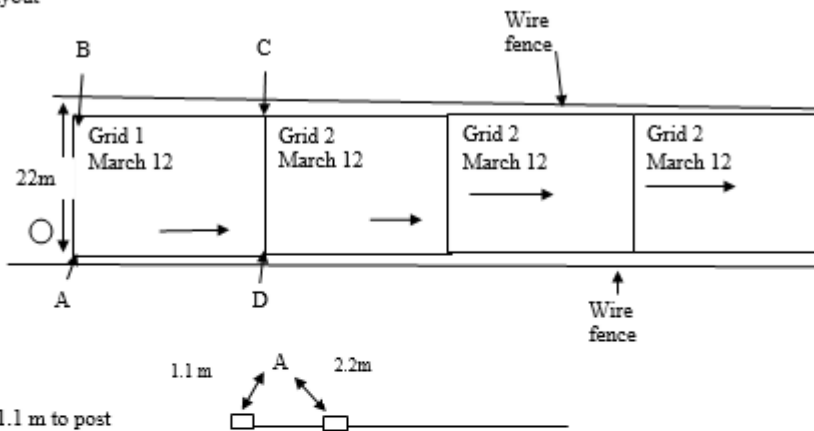
1. Map	Grid size	20m.	5 Comms.	Baud Rate	9600
	Sample Interval	1m.		Data Separator	No Space
	Traverse Interval	1m.			
	Traverse Mode	Zig-Zag			
2. Range	Gain	x 1	6. Progr	Program Number	1
	Current	1mA.		Probe Configurations	1
	Frequency	137 Hz.		Colours	Gr highlighted
3. Set-Up	Output Voltage	40V.	7. Status	Battery Voltage	10.4V.(eg)
	Auto log speed	Medium		RM15 Adv	15000, Version 2.00
	High Pass Filter	13Hz.			
	Mains Frequency	50 Hz.			
	Reset RM 15 ?	No			
4. Array	Hardware PA1				

Field 2

YCCART Site Survey Project -		
Survey date	12 to 19 March 2015	
Report date	19 March 2015	
Type /Instrument	RM15	
Location	Wolvershill Road Site 2	
Site name		
Landowner	Mrs. Susan Worth	
Tenant	Mr. Keith Raymond.	
HER ref	TBC	
Site type	Grass	
Description	Large open field	
Period		
Geology		
Land use	Grazing	
Survey team and conditions		
12 March 2015	Team	Peter English, Tony Yarde, David Long, David Walker & Chris Short. <i>Weather: Overcast. Grass/ground very wet</i>
19 March 2015		Peter English, Tony Yarde, David Long, John Haynes & Chris Short. <i>Weather: Overcast. Grass/ground very wet</i>

Survey area		Notes	
		Size	Walk direction
12 March	Grids 1 to 2	20x20m	E
19 March	Grids 1 to 2	20x20m	E

Grid layout



A is 1.1 m to post with white mark (Start point for previous survey) and 2.2m to the next post along eastward from the post with white mark

GPS

A	339635.10	159381.10
B	339627.40	159395.00
C	339654.60	159388.80
D	339644.30	159406.30

1. Map	Grid size Sample Interval Traverse Interval Traverse Mode	20m. 1m. 1m. Zig-Zag	5 Comms.	Baud Rate 9600 Data Separator No Space
2. Range	Gain Current Frequency	x 1 1mA. 137 Hz.	6. Progr	Program Number 1 Probe Configurations 1 Colours Gr highlighted
3. Set-Up	Output Voltage Auto log speed High Pass Filter Mains Frequency Reset RM 15 ?	40V. Medium 13Hz. 50 Hz. No	7. Status	Battery Voltage 10.4V.(eg) RM15 Adv 15000, Version 2.00
4. Array	Hardware PA1			

Health & Safety

HAZARD AND RISK ASSESSMENTS

Severity of hazard: 1= Minor injury 2= Serious injury 3= Major injury or fatality	Likelihood: 1= Unlikely 2= Likely 3= Very likely or inevitable	Population (no. of persons who could be affected): 1= 1-5 persons 2= 6-20 persons 3= 21+ persons	Risk Factor : Severity x Likelihood x Population (min 1, max 27)
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Location: Banwell **Activity/Equipment:** RM15 **Date of assessment:** February 2015
Assessor: Chris Short

Nature of hazard	Slips, trips, falls	Dust	Noise	Fire/Explosion	Exposure to harmful substances	Entrapment	Impact	Contact	Entanglement	Ejection	Electric shock	RSI/Eyestrain	Mammal handling	Other	MAX. RISK FACTOR
Severity	1	0	0	0	0	0	0	1	0	0	0	1	1	2	4
Likelihood	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
Population	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Control methods and timescale

Members will wear substantial footwear and long trousers which will deal with the uneven ground, wet grass and protect skin from any stumbles and protect them.
 Operator to restrict period of survey to avoid back strain
 Entrance to field is on to a very busy road. Great care needed on entry / exit