

## **GEOPHYSICAL SURVEYS OF LAND AT WORDEN PARK, LEYLAND**

*on behalf of*

**SCOTT WILSON LTD**



NGR SD 5373 2084

OASIS ID: northpen3-41348

Martin Railton BA (Hons), MA AIFA  
North Pennines Archaeology Ltd  
Nenthead Mines Heritage Centre  
Nenthead  
Alston  
Cumbria CA9 3PD  
Tel: (01434) 382045  
Fax: (01434) 382294  
Mobile: 07979617882  
Email: m.railton@nparchaeology.co.uk



North Pennines Archaeology Ltd is a wholly owned company of North Pennines Heritage Trust

Company Registration No. 4847034

VAT Registration No. 817 2284 31

## CONTENTS

### Page

List of Figures.....	ii
Non-Technical Summary.....	iii
<b>1 INTRODUCTION (<i>FIGURE 1</i>) .....</b>	<b>1</b>
<b>2 METHODOLOGY.....</b>	<b>2</b>
2.1 Standards.....	2
2.2 Technique Selection.....	2
2.3 Field Methods .....	2
2.4 Data Processing.....	2
2.5 Interpretation.....	3
2.6 Presentation.....	3
2.7 Project Archive .....	3
<b>3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....</b>	<b>4</b>
3.1 Historical Background .....	4
3.2 Previous Archaeological Works.....	5
<b>4 SURVEY RESULTS (<i>FIGURES 2-4</i>) .....</b>	<b>6</b>
4.1 Introduction (Figure 2).....	6
4.2 Area A (Figures 3&4) .....	6
4.3 Area B (Figures 3&4).....	6
<b>5 CONCLUSIONS .....</b>	<b>7</b>
<b>6 ACKNOWLEDGEMENTS.....</b>	<b>8</b>
<b>7 BIBLIOGRAPHY .....</b>	<b>8</b>
<b>APPENDIX I – ILLUSTRATIONS.....</b>	<b>9</b>
<b>APPENDIX II – TRACE PLOTS.....</b>	<b>10</b>

## LIST OF FIGURES

Figure 1: Location of the geophysical survey areas .....	Appendix I
Figure 2: Geophysical surveys .....	Appendix I
Figure 3: Geophysical interpretation.....	Appendix I
Figure 4: Archaeological interpretation .....	Appendix I

## SUMMARY

In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland, centred on Ordnance Survey grid reference NZ 3879 1396. The surveys were designed to target the site of the former Worden Hall (Area A), and a *parterre* garden to the south (Area B).

Worden Park is Grade II listed on the English Heritage Register of Parks and Gardens. Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family between 1717 and 1946. During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. Worden hall was extensively damaged by fire in April 1941, and was demolished in the 1960's.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies in the study area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the surveys may be used to inform the creation of a ground plan to mark the site of the former Worden Hall, as part of a development plan for Worden Park.

Earth resistance surveys were conducted over two areas within Worden Park. The external walls of the former hall were detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, were indicated by the geophysical survey. The remains of a smaller building were also detected on the north side of Area A, which corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850). No certain formal garden features, or other archaeological remains, have been detected in Area B.

## **1 INTRODUCTION (*Figure 1*)**

- 1.1 In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland. The work was conducted in accordance with a Specification for Geophysical Survey, produced by Scott Wilson Ltd (Scott Wilson 2008), and the relevant English Heritage and IFA guidelines.
- 1.2 Worden Park is located c.2km west of Leyland, and comprises approximately 62ha of public parkland, associated with the site of the former Worden Hall. The park is bounded by Shaw Brook to the south, Worden Lane to the east, and Parkgate Drive to the north (Figure 1). Worden Hall was located on the south side of the park, centred on Ordnance Survey grid reference SD 5373 2084.
- 1.3 Worden Park is South Ribble's largest park, and is Grade II listed on the English Heritage Register of Parks and Gardens. A conservation and development plan for the park is being implemented by South Ribble Borough Council. This will include the restoration of aspects of the historic park, and possibly the creation of a ground plan to mark the site of the former Worden Hall.
- 1.5 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site of Worden Hall, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to provide information on the layout of the former Worden Hall and gardens.
- 1.6 The geophysical surveys were conducted by Kevin Mounsey and Martin Railton on 21<sup>st</sup> April 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton between 22<sup>nd</sup> April and 25<sup>th</sup> April 2008.

## **2 METHODOLOGY**

### *2.1 Standards*

- 2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 1995), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

### *2.2 Technique Selection*

- 2.2.1 Earth resistance survey was selected as the most appropriate technique, given the expected presence of cut archaeological features and stone structures at depths of no more than *c.* 1m.
- 2.2.2 This technique involved the use of a Resistance Meter with twin probes set 0.5m apart. When a small electric current is injected into the ground it encounters sub-surface resistance, which is measured. This resistance relates to the ability of the soil to retain moisture and can correspond to the location of cut archaeological features or buried stone walls etc.

### *2.3 Field Methods*

- 2.3.1 The study area was located in the gardens of Worden Park on two areas of lawn, subdivided by a yew hedge, and paths. Two areas were surveyed (Areas A & B) to target the site of the former Worden Hall and associated gardens to the south. A 20m grid was established in each area, and tied-in to known mapped Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.
- 2.3.2 Measurements of earth resistance were determined using a Geoscan RM15 Resistance Meter and MPX15 Multiplexor, with two parallel pairs of probes set 0.5m apart. It was expected that significant archaeological features at a depth of up to *c.* 1m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 20m grid units. A sample interval of 0.5m was used, with a traverse interval of 1m, providing 800 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

### *2.4 Data Processing*

- 2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Areas of anomalously high resistance are displayed as dark grey, and areas of anomalously low resistance are displayed as light grey. Palette bars show the relationship between the grey shades and earth resistance values in ohms for each area.
- 2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random extreme readings in the resistance data

*Clip:* to clip data to specified maximum and minimum values, in order to limit extreme readings in the resistance data

*Interpolate:* to double the number of values in the traverse direction to match the sample interval

## 2.5 *Interpretation*

### 2.5.1 Two types of geophysical anomaly were detected in the earth resistance data:

*high resistance:* regions of anomalously high resistance, which may be associated with the presence of stone-built features, geological features or sub-surface voids.

*low resistance:* regions of anomalously low resistance, which may be associated with cut features which contain a higher moisture content than the surrounding material, such as pits or ditches

## 2.6 *Presentation*

2.6.1 The grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey plans. Colour-coded geophysical interpretation diagrams are provided, showing the locations and extent of areas of anomalously high and low resistance.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 Trace plots of the unprocessed geophysical data are included in Appendix II.

## 2.7 *Project Archive*

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

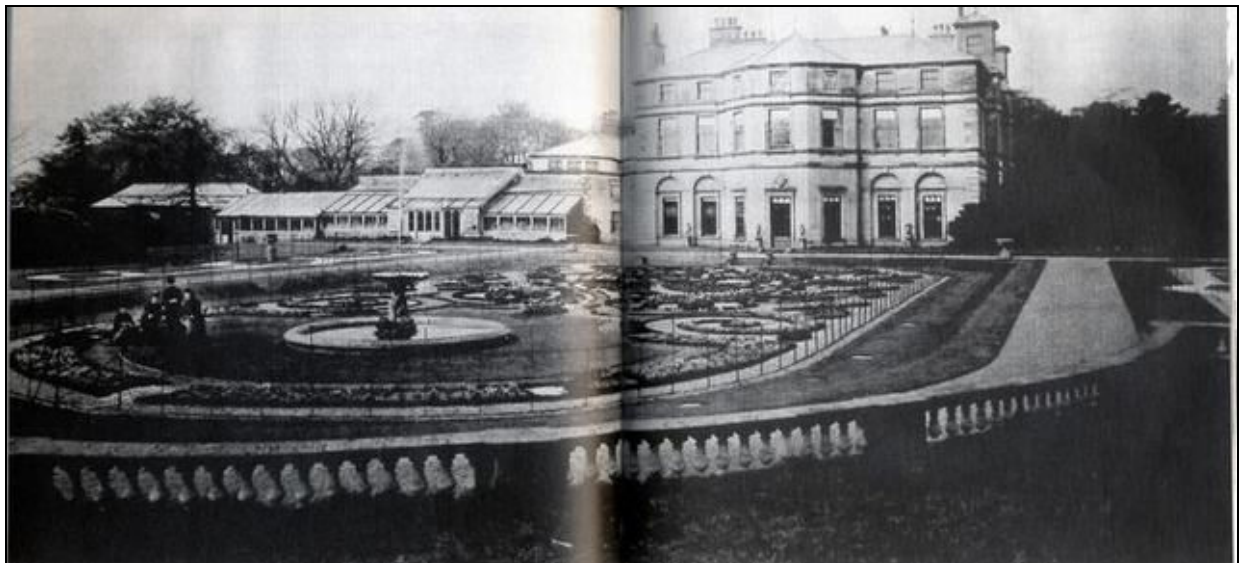
2.7.2 One copy of the survey report will be deposited with the County Historic Environment, where viewing will be available on request.

2.7.3 The project is also registered with the **Online Access to the Index of archaeological investigationS (OASIS)**. The OASIS reference for this project is **northpen3-41348**.

### 3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 3.1 *Historical Background*

- 3.1.1 Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family from 1717 ([www.british-history.ac.uk](http://www.british-history.ac.uk)). The original family home was at Worden (Old) Hall, but the estate transferred to Shaw Hall, when the Ffaringtons of Worden (Old) Hall died without descendents.
- 3.1.2 During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. William Ffarington also added a new wing to the hall in the 18<sup>th</sup> century, and created a number of new features in the park.
- 3.1.3 The 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850) shows the Shaw Hall to the south with further ranges of buildings to the north, surrounded by parkland. The hall was largely rebuilt by Anthony Salvin after 1842 for James Nowell Farington ([www.british-history.ac.uk](http://www.british-history.ac.uk)), and comprised a square main hall, with a main entrance and turning circle at the east side (Plate 2).
- 3.1.4 During the 19<sup>th</sup> century the grounds were landscaped by Salvin's brother-in-law William Andrew Nesfield. This included the creation of a maze and *parterre* garden. James Nowell Farington also changed the name of Shaw Hall to Worden Hall at this time (Plate 1).
- 3.1.5 Worden hall was extensively damaged by fire in April 1941. Following the death of the last squire in 1946, the fixtures and fittings were sold off. Leyland Urban District Council brought Worden Park and opened it to the public on June 18th 1951 ([www.houghton59.fsnet.co.uk](http://www.houghton59.fsnet.co.uk)).
- 3.1.6 The main hall was eventually demolished in the early 1960's, the only surviving part of the original hall being the Derby Wing, which is also believed to be one of the oldest parts of the building.



**Plate 1:** The south elevation of the former Worden Hall, showing *parterre* garden with working fountain





**Plate 2:** The east elevation and entrance of the former Worden Hall

### 3.2 *Previous Archaeological Works*

3.2.1 No known previous archaeological investigations have taken place in Worden Park.



**Plate 3:** Area A, the site of the former Worden Hall (looking south)



**Plate 4:** Area B, part of the *parterre* garden with redundant fountain, looking north towards the site of the former Worden Hall

## **4 SURVEY RESULTS (Figures 2-4)**

### *4.1 Introduction (Figure 2)*

- 4.1.1 The locations of the individual geophysical survey areas were designed by Scott Wilson Ltd, to target the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 4.1.2 Area A comprised an area of lawn, to the east of the existing hall buildings, bounded by a mature yew hedge to the south, and a car park to the north, with shrubs and gardens to the west (Plate 3). Area B was located within the *parterre* garden, and comprised an area of lawn, bounded by banks and gravel paths, with the remain of a fountain at the south end (Plate 4).

### *4.2 Area A (Figures 3&4)*

- 4.2.1 The survey of Area A was hindered by the presence of mature shrubs, including dense rhododendrons on the east side of this area. A number of trees were also located in Area A, the roots of which had an influence on the results of the survey. A discrete area of anomalously high resistance, with a corresponding area of anomalously low resistance was detected on the southern corner of this area, and was due to the presence of tree roots. A low resistance linear feature was detected on the northern edge of Area A, and was due to the presence of the adjacent car park.
- 4.2.2 Irregular areas of anomalously high resistance were detected along the southwest and northwest sides of Area A, which may indicate the presence of sub-surface deposits of stone rubble or wall foundations. On the south side of Area A, a 50m by 37m rectangular area of high resistance was detected, which corresponded to the location of the former Worden Hall. Variations in resistance within this area could be indicative of internal divisions or floors within the main hall. This area was bounded on the southeast and northeast sides by two low resistance linear features, interpreted as the foundation cuts of exterior walls.
- 4.2.3 A 17m-long 16m-wide rectangular area of high resistance was detected on the north side of Area A, which may indicate the location of a smaller building. An area of anomalously high resistance was detected on the southeast side of this area, which may indicate the presence of a deposit of stone rubble or a wall foundation.

### *4.3 Area B (Figures 3&4)*

- 4.3.1 Area B was a sunken lawn, bounded by steep banks, which produced areas of anomalously high resistance along the southern edge of this area. The remains of a fountain at the south end of Area B had to be excluded from the survey. A metal drain cover on the southeast side of the fountain produced a high resistance response, and corresponding areas of low resistance.
- 4.3.2 Irregular areas of anomalously high resistance and low resistance were detected over the majority of Area B. Whilst these anomalies may be indicative of ground disturbance through gardening activity, no formal garden features were detected in this area.

## 5 CONCLUSIONS

- 5.1 Earth resistance surveys, covering 0.2ha of land in total, have been conducted over two areas in Worden Park, targeting the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 5.2 The external walls of the former hall have been detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, have been indicated by the geophysical survey. The remains of a smaller building have been also detected on the north side of Area A. This corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850).
- 5.3 No certain formal garden features, or other archaeological remains have been detected in Area B. As this survey was located within a sunken area, it is possible that the variations detected by the geophysical survey in Area B are geological in nature.
- 5.4 The results of the survey have helped to locate the exterior hall walls, and will inform the creation of a ground plan to mark the site of the former Worden Hall. However, it is possible that additional geophysical survey could provide further information, and help clarify the internal layout of the former hall. This could take the form of further high resolution earth resistance survey, or survey using ground penetrating radar.

## **6 ACKNOWLEDGEMENTS**

North Pennines Archaeology is grateful to Laura Broughton of Scott Wilson Ltd, for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of Scott Wilson Ltd.

## **7 BIBLIOGRAPHY**

Archaeology Data Service, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Arts and Humanities Data Service

English Heritage, 1995 *Geophysical survey in field evaluation*, Research and Professional Services Guideline No.1, London

Institute of Field Archaeologists, 2002 *The use of geophysical techniques in archaeological evaluations*, Paper No.6, IFA, Birmingham

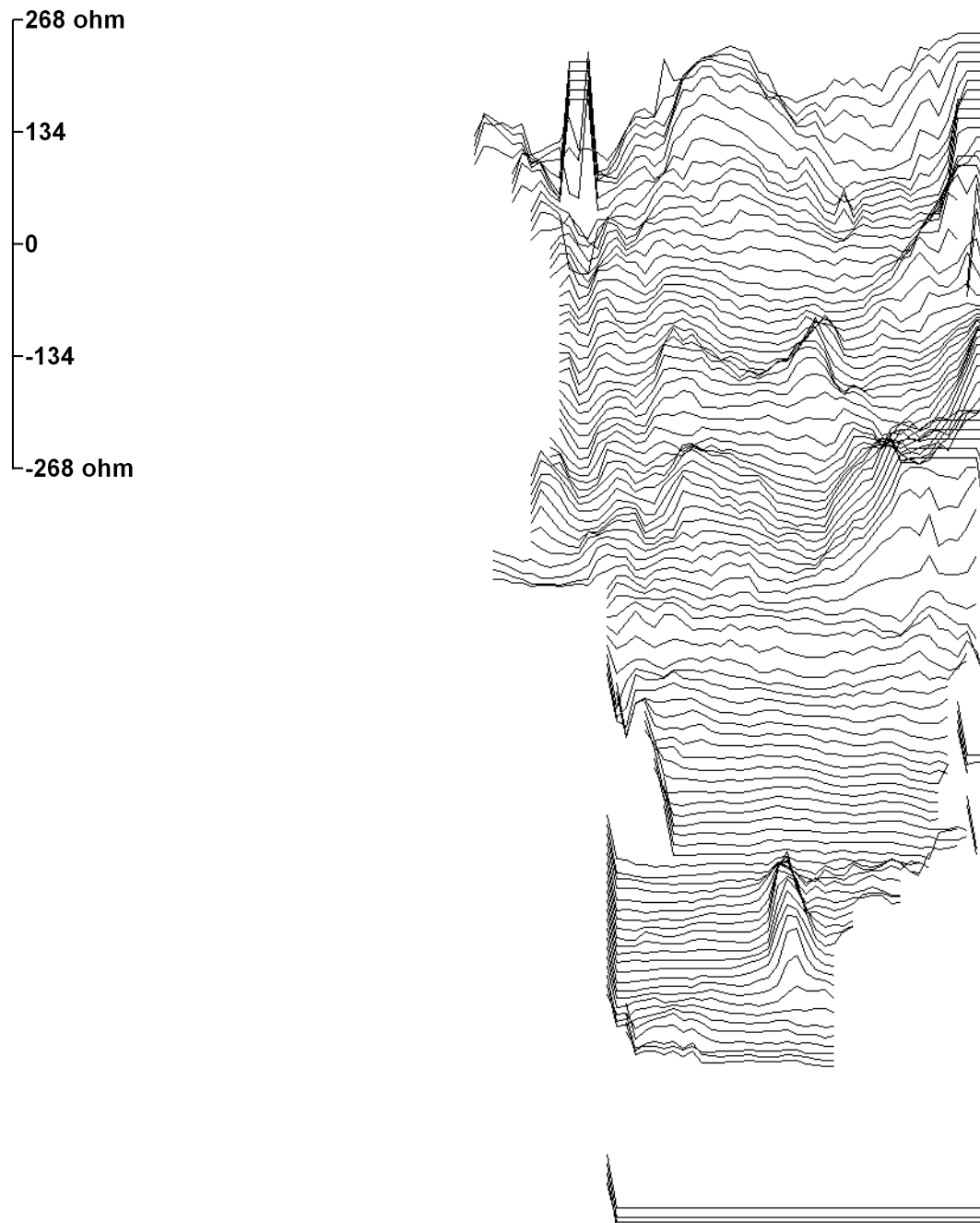
Scott Wilson, 2008 *Worden Park, Leyland: Specification for Geophysical Survey*, unpublished specification, for South Ribble Borough Council

## **APPENDIX I – ILLUSTRATIONS**

## APPENDIX II – TRACE PLOTS

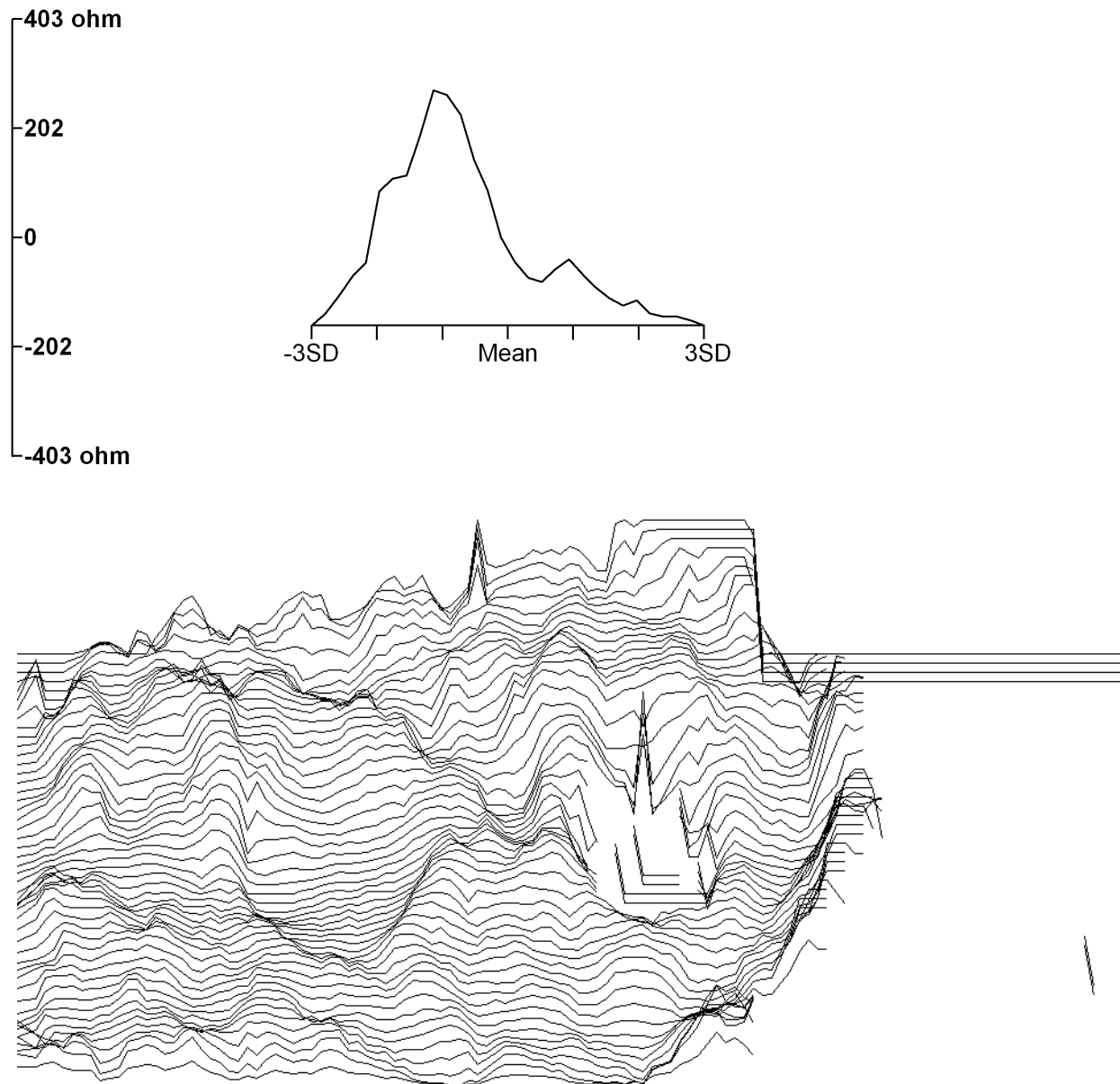
### Worden Park

#### Area 1



## Worden Park

### Area 2



## **GEOPHYSICAL SURVEYS OF LAND AT WORDEN PARK, LEYLAND**

*on behalf of*

**SCOTT WILSON LTD**



NGR SD 5373 2084

OASIS ID: northpen3-41348

Martin Railton BA (Hons), MA AIFA  
North Pennines Archaeology Ltd  
Nenthead Mines Heritage Centre  
Nenthead  
Alston  
Cumbria CA9 3PD  
Tel: (01434) 382045  
Fax: (01434) 382294  
Mobile: 07979617882  
Email: m.railton@nparchaeology.co.uk



North Pennines Archaeology Ltd is a wholly owned company of North Pennines Heritage Trust

Company Registration No. 4847034

VAT Registration No. 817 2284 31



## CONTENTS

### Page

List of Figures.....	ii
Non-Technical Summary.....	iii
<b>1 INTRODUCTION (<i>FIGURE 1</i>) .....</b>	<b>1</b>
<b>2 METHODOLOGY.....</b>	<b>2</b>
2.1 Standards.....	2
2.2 Technique Selection.....	2
2.3 Field Methods .....	2
2.4 Data Processing.....	2
2.5 Interpretation.....	3
2.6 Presentation.....	3
2.7 Project Archive .....	3
<b>3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....</b>	<b>4</b>
3.1 Historical Background .....	4
3.2 Previous Archaeological Works.....	5
<b>4 SURVEY RESULTS (<i>FIGURES 2-4</i>) .....</b>	<b>6</b>
4.1 Introduction (Figure 2).....	6
4.2 Area A (Figures 3&4) .....	6
4.3 Area B (Figures 3&4).....	6
<b>5 CONCLUSIONS .....</b>	<b>7</b>
<b>6 ACKNOWLEDGEMENTS.....</b>	<b>8</b>
<b>7 BIBLIOGRAPHY .....</b>	<b>8</b>
<b>APPENDIX I – ILLUSTRATIONS.....</b>	<b>9</b>
<b>APPENDIX II – TRACE PLOTS.....</b>	<b>10</b>

## LIST OF FIGURES

Figure 1: Location of the geophysical survey areas .....	Appendix I
Figure 2: Geophysical surveys .....	Appendix I
Figure 3: Geophysical interpretation.....	Appendix I
Figure 4: Archaeological interpretation .....	Appendix I

## SUMMARY

In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland, centred on Ordnance Survey grid reference NZ 3879 1396. The surveys were designed to target the site of the former Worden Hall (Area A), and a *parterre* garden to the south (Area B).

Worden Park is Grade II listed on the English Heritage Register of Parks and Gardens. Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family between 1717 and 1946. During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. Worden hall was extensively damaged by fire in April 1941, and was demolished in the 1960's.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies in the study area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the surveys may be used to inform the creation of a ground plan to mark the site of the former Worden Hall, as part of a development plan for Worden Park.

Earth resistance surveys were conducted over two areas within Worden Park. The external walls of the former hall were detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, were indicated by the geophysical survey. The remains of a smaller building were also detected on the north side of Area A, which corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850). No certain formal garden features, or other archaeological remains, have been detected in Area B.

## **1 INTRODUCTION (*Figure 1*)**

- 1.1 In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland. The work was conducted in accordance with a Specification for Geophysical Survey, produced by Scott Wilson Ltd (Scott Wilson 2008), and the relevant English Heritage and IFA guidelines.
- 1.2 Worden Park is located c.2km west of Leyland, and comprises approximately 62ha of public parkland, associated with the site of the former Worden Hall. The park is bounded by Shaw Brook to the south, Worden Lane to the east, and Parkgate Drive to the north (Figure 1). Worden Hall was located on the south side of the park, centred on Ordnance Survey grid reference SD 5373 2084.
- 1.3 Worden Park is South Ribble's largest park, and is Grade II listed on the English Heritage Register of Parks and Gardens. A conservation and development plan for the park is being implemented by South Ribble Borough Council. This will include the restoration of aspects of the historic park, and possibly the creation of a ground plan to mark the site of the former Worden Hall.
- 1.5 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site of Worden Hall, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to provide information on the layout of the former Worden Hall and gardens.
- 1.6 The geophysical surveys were conducted by Kevin Mounsey and Martin Railton on 21<sup>st</sup> April 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton between 22<sup>nd</sup> April and 25<sup>th</sup> April 2008.

## 2 METHODOLOGY

### 2.1 Standards

- 2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 1995), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

### 2.2 Technique Selection

- 2.2.1 Earth resistance survey was selected as the most appropriate technique, given the expected presence of cut archaeological features and stone structures at depths of no more than *c.* 1m.
- 2.2.2 This technique involved the use of a Resistance Meter with twin probes set 0.5m apart. When a small electric current is injected into the ground it encounters sub-surface resistance, which is measured. This resistance relates to the ability of the soil to retain moisture and can correspond to the location of cut archaeological features or buried stone walls etc.

### 2.3 Field Methods

- 2.3.1 The study area was located in the gardens of Worden Park on two areas of lawn, subdivided by a yew hedge, and paths. Two areas were surveyed (Areas A & B) to target the site of the former Worden Hall and associated gardens to the south. A 20m grid was established in each area, and tied-in to known mapped Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.
- 2.3.2 Measurements of earth resistance were determined using a Geoscan RM15 Resistance Meter and MPX15 Multiplexor, with two parallel pairs of probes set 0.5m apart. It was expected that significant archaeological features at a depth of up to *c.* 1m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 20m grid units. A sample interval of 0.5m was used, with a traverse interval of 1m, providing 800 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

### 2.4 Data Processing

- 2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Areas of anomalously high resistance are displayed as dark grey, and areas of anomalously low resistance are displayed as light grey. Palette bars show the relationship between the grey shades and earth resistance values in ohms for each area.
- 2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random extreme readings in the resistance data

*Clip:* to clip data to specified maximum and minimum values, in order to limit extreme readings in the resistance data

*Interpolate:* to double the number of values in the traverse direction to match the sample interval

## 2.5 *Interpretation*

### 2.5.1 Two types of geophysical anomaly were detected in the earth resistance data:

*high resistance:* regions of anomalously high resistance, which may be associated with the presence of stone-built features, geological features or sub-surface voids.

*low resistance:* regions of anomalously low resistance, which may be associated with cut features which contain a higher moisture content than the surrounding material, such as pits or ditches

## 2.6 *Presentation*

2.6.1 The grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey plans. Colour-coded geophysical interpretation diagrams are provided, showing the locations and extent of areas of anomalously high and low resistance.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 Trace plots of the unprocessed geophysical data are included in Appendix II.

## 2.7 *Project Archive*

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

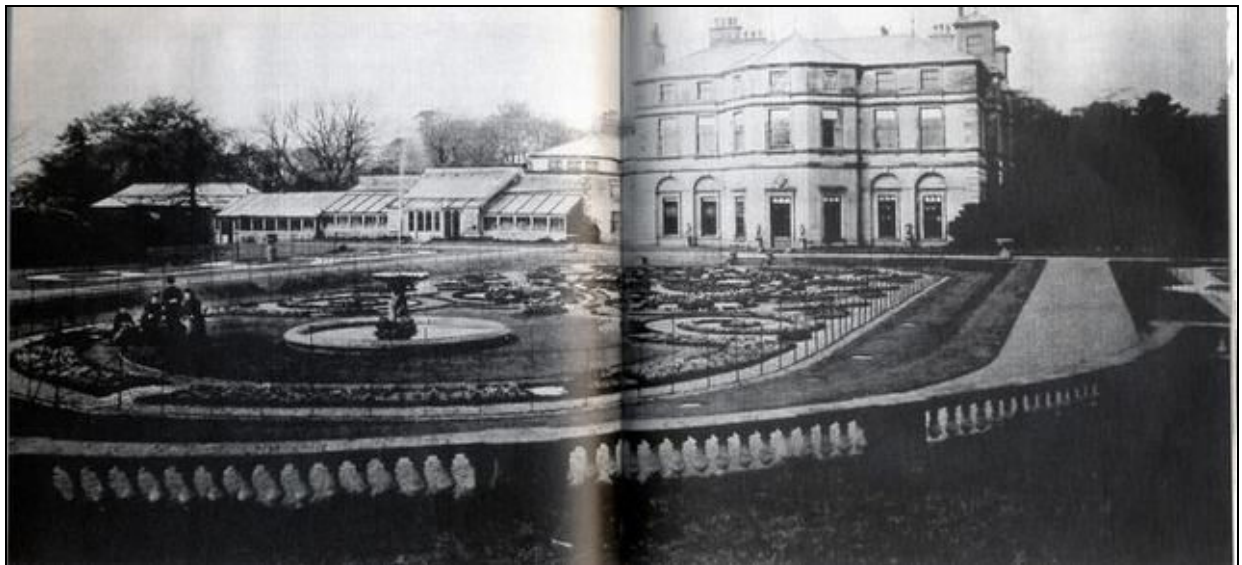
2.7.2 One copy of the survey report will be deposited with the County Historic Environment, where viewing will be available on request.

2.7.3 The project is also registered with the **Online Access to the Index of archaeological investigationS (OASIS)**. The OASIS reference for this project is **northpen3-41348**.

### 3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 3.1 *Historical Background*

- 3.1.1 Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family from 1717 ([www.british-history.ac.uk](http://www.british-history.ac.uk)). The original family home was at Worden (Old) Hall, but the estate transferred to Shaw Hall, when the Ffaringtons of Worden (Old) Hall died without descendents.
- 3.1.2 During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. William Ffarington also added a new wing to the hall in the 18<sup>th</sup> century, and created a number of new features in the park.
- 3.1.3 The 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850) shows the Shaw Hall to the south with further ranges of buildings to the north, surrounded by parkland. The hall was largely rebuilt by Anthony Salvin after 1842 for James Nowell Farington ([www.british-history.ac.uk](http://www.british-history.ac.uk)), and comprised a square main hall, with a main entrance and turning circle at the east side (Plate 2).
- 3.1.4 During the 19<sup>th</sup> century the grounds were landscaped by Salvin's brother-in-law William Andrew Nesfield. This included the creation of a maze and *parterre* garden. James Nowell Farington also changed the name of Shaw Hall to Worden Hall at this time (Plate 1).
- 3.1.5 Worden hall was extensively damaged by fire in April 1941. Following the death of the last squire in 1946, the fixtures and fittings were sold off. Leyland Urban District Council brought Worden Park and opened it to the public on June 18th 1951 ([www.houghton59.fsnet.co.uk](http://www.houghton59.fsnet.co.uk)).
- 3.1.6 The main hall was eventually demolished in the early 1960's, the only surviving part of the original hall being the Derby Wing, which is also believed to be one of the oldest parts of the building.



**Plate 1:** The south elevation of the former Worden Hall, showing *parterre* garden with working fountain



**Plate 2:** The east elevation and entrance of the former Worden Hall

### 3.2 *Previous Archaeological Works*

3.2.1 No known previous archaeological investigations have taken place in Worden Park.



**Plate 3:** Area A, the site of the former Worden Hall (looking south)



**Plate 4:** Area B, part of the *parterre* garden with redundant fountain, looking north towards the site of the former Worden Hall



## **4 SURVEY RESULTS (Figures 2-4)**

### *4.1 Introduction (Figure 2)*

- 4.1.1 The locations of the individual geophysical survey areas were designed by Scott Wilson Ltd, to target the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 4.1.2 Area A comprised an area of lawn, to the east of the existing hall buildings, bounded by a mature yew hedge to the south, and a car park to the north, with shrubs and gardens to the west (Plate 3). Area B was located within the *parterre* garden, and comprised an area of lawn, bounded by banks and gravel paths, with the remain of a fountain at the south end (Plate 4).

### *4.2 Area A (Figures 3&4)*

- 4.2.1 The survey of Area A was hindered by the presence of mature shrubs, including dense rhododendrons on the east side of this area. A number of trees were also located in Area A, the roots of which had an influence on the results of the survey. A discrete area of anomalously high resistance, with a corresponding area of anomalously low resistance was detected on the southern corner of this area, and was due to the presence of tree roots. A low resistance linear feature was detected on the northern edge of Area A, and was due to the presence of the adjacent car park.
- 4.2.2 Irregular areas of anomalously high resistance were detected along the southwest and northwest sides of Area A, which may indicate the presence of sub-surface deposits of stone rubble or wall foundations. On the south side of Area A, a 50m by 37m rectangular area of high resistance was detected, which corresponded to the location of the former Worden Hall. Variations in resistance within this area could be indicative of internal divisions or floors within the main hall. This area was bounded on the southeast and northeast sides by two low resistance linear features, interpreted as the foundation cuts of exterior walls.
- 4.2.3 A 17m-long 16m-wide rectangular area of high resistance was detected on the north side of Area A, which may indicate the location of a smaller building. An area of anomalously high resistance was detected on the southeast side of this area, which may indicate the presence of a deposit of stone rubble or a wall foundation.

### *4.3 Area B (Figures 3&4)*

- 4.3.1 Area B was a sunken lawn, bounded by steep banks, which produced areas of anomalously high resistance along the southern edge of this area. The remains of a fountain at the south end of Area B had to be excluded from the survey. A metal drain cover on the southeast side of the fountain produced a high resistance response, and corresponding areas of low resistance.
- 4.3.2 Irregular areas of anomalously high resistance and low resistance were detected over the majority of Area B. Whilst these anomalies may be indicative of ground disturbance through gardening activity, no formal garden features were detected in this area.

## 5 CONCLUSIONS

- 5.1 Earth resistance surveys, covering 0.2ha of land in total, have been conducted over two areas in Worden Park, targeting the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 5.2 The external walls of the former hall have been detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, have been indicated by the geophysical survey. The remains of a smaller building have been also detected on the north side of Area A. This corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850).
- 5.3 No certain formal garden features, or other archaeological remains have been detected in Area B. As this survey was located within a sunken area, it is possible that the variations detected by the geophysical survey in Area B are geological in nature.
- 5.4 The results of the survey have helped to locate the exterior hall walls, and will inform the creation of a ground plan to mark the site of the former Worden Hall. However, it is possible that additional geophysical survey could provide further information, and help clarify the internal layout of the former hall. This could take the form of further high resolution earth resistance survey, or survey using ground penetrating radar.

## **6 ACKNOWLEDGEMENTS**

North Pennines Archaeology is grateful to Laura Broughton of Scott Wilson Ltd, for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of Scott Wilson Ltd.

## **7 BIBLIOGRAPHY**

Archaeology Data Service, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Arts and Humanities Data Service

English Heritage, 1995 *Geophysical survey in field evaluation*, Research and Professional Services Guideline No.1, London

Institute of Field Archaeologists, 2002 *The use of geophysical techniques in archaeological evaluations*, Paper No.6, IFA, Birmingham

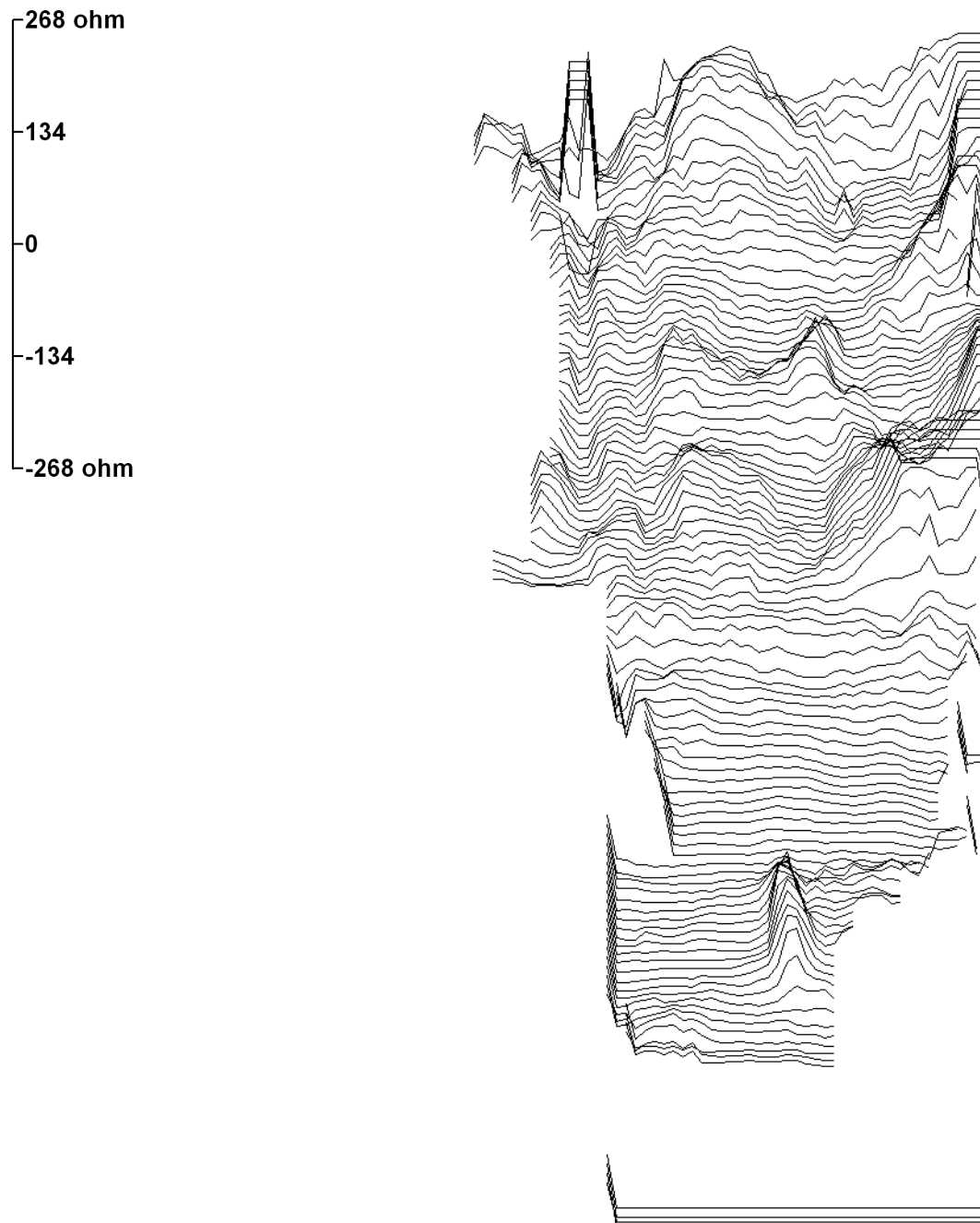
Scott Wilson, 2008 *Worden Park, Leyland: Specification for Geophysical Survey*, unpublished specification, for South Ribble Borough Council

## **APPENDIX I – ILLUSTRATIONS**

## APPENDIX II – TRACE PLOTS

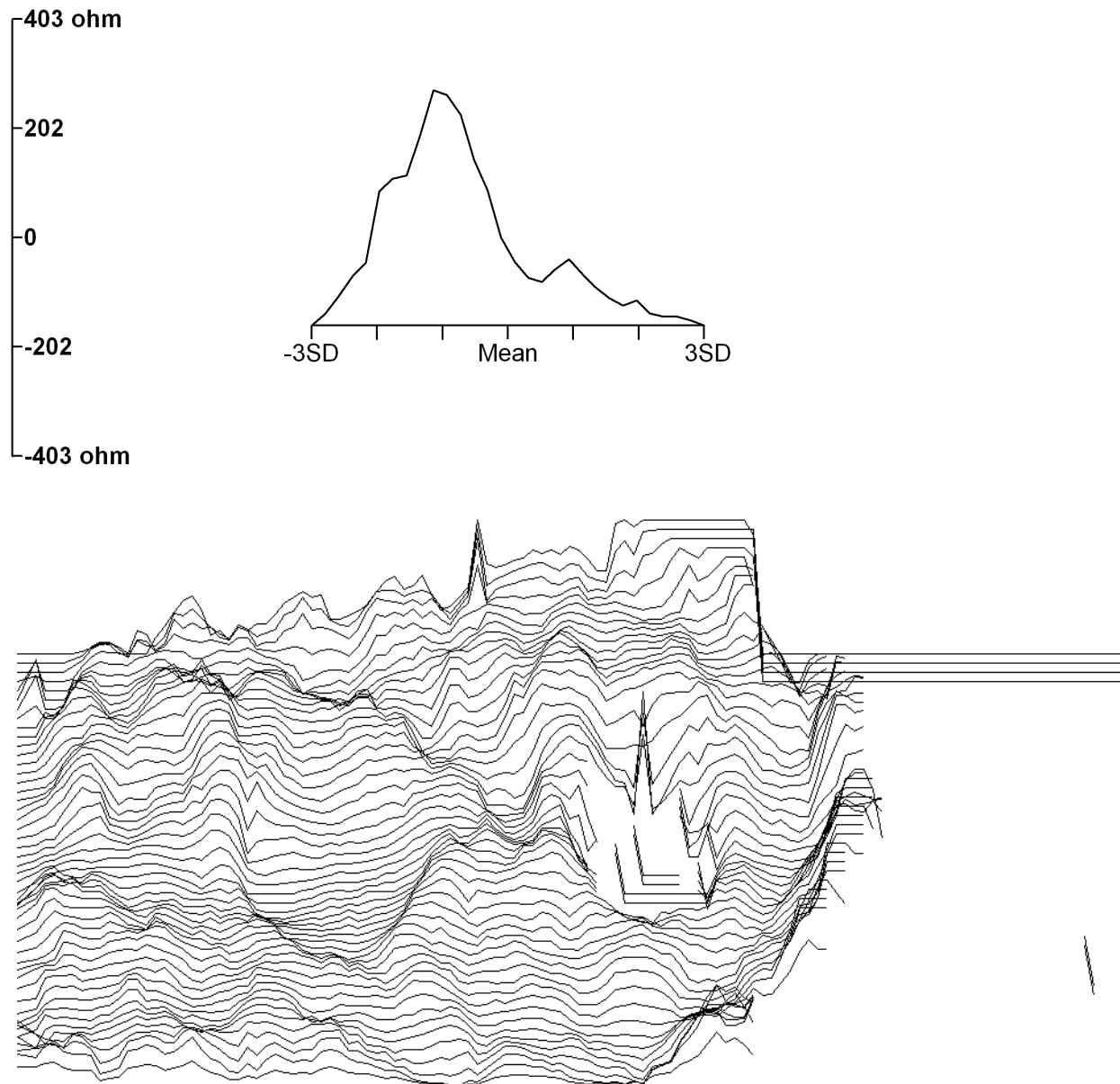
### Worden Park

#### Area 1



## Worden Park

### Area 2



## **GEOPHYSICAL SURVEYS OF LAND AT WORDEN PARK, LEYLAND**

*on behalf of*

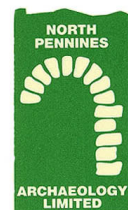
**SCOTT WILSON LTD**



NGR SD 5373 2084

OASIS ID: northpen3-41348

Martin Railton BA (Hons), MA AIFA  
North Pennines Archaeology Ltd  
Nenthead Mines Heritage Centre  
Nenthead  
Alston  
Cumbria CA9 3PD  
Tel: (01434) 382045  
Fax: (01434) 382294  
Mobile: 07979617882  
Email: m.railton@nparchaeology.co.uk



North Pennines Archaeology Ltd is a wholly owned company of North Pennines Heritage Trust

## CONTENTS

### Page

List of Figures.....	ii
Non-Technical Summary.....	iii
<b>1 INTRODUCTION (<i>FIGURE 1</i>) .....</b>	<b>1</b>
<b>2 METHODOLOGY.....</b>	<b>2</b>
2.1 Standards.....	2
2.2 Technique Selection.....	2
2.3 Field Methods .....	2
2.4 Data Processing.....	2
2.5 Interpretation.....	3
2.6 Presentation.....	3
2.7 Project Archive .....	3
<b>3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....</b>	<b>4</b>
3.1 Historical Background .....	4
3.2 Previous Archaeological Works.....	5
<b>4 SURVEY RESULTS (<i>FIGURES 2-4</i>) .....</b>	<b>6</b>
4.1 Introduction (Figure 2).....	6
4.2 Area A (Figures 3&4) .....	6
4.3 Area B (Figures 3&4).....	6
<b>5 CONCLUSIONS .....</b>	<b>7</b>
<b>6 ACKNOWLEDGEMENTS.....</b>	<b>8</b>
<b>7 BIBLIOGRAPHY .....</b>	<b>8</b>
<b>APPENDIX I – ILLUSTRATIONS.....</b>	<b>9</b>
<b>APPENDIX II – TRACE PLOTS.....</b>	<b>10</b>



## LIST OF FIGURES

Figure 1: Location of the geophysical survey areas .....	Appendix I
Figure 2: Geophysical surveys .....	Appendix I
Figure 3: Geophysical interpretation.....	Appendix I
Figure 4: Archaeological interpretation .....	Appendix I

## SUMMARY

In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland, centred on Ordnance Survey grid reference NZ 3879 1396. The surveys were designed to target the site of the former Worden Hall (Area A), and a *parterre* garden to the south (Area B).

Worden Park is Grade II listed on the English Heritage Register of Parks and Gardens. Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family between 1717 and 1946. During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. Worden hall was extensively damaged by fire in April 1941, and was demolished in the 1960's.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies in the study area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the surveys may be used to inform the creation of a ground plan to mark the site of the former Worden Hall, as part of a development plan for Worden Park.

Earth resistance surveys were conducted over two areas within Worden Park. The external walls of the former hall were detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, were indicated by the geophysical survey. The remains of a smaller building were also detected on the north side of Area A, which corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850). No certain formal garden features, or other archaeological remains, have been detected in Area B.

## **1 INTRODUCTION (*Figure 1*)**

- 1.1 In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland. The work was conducted in accordance with a Specification for Geophysical Survey, produced by Scott Wilson Ltd (Scott Wilson 2008), and the relevant English Heritage and IFA guidelines.
- 1.2 Worden Park is located c.2km west of Leyland, and comprises approximately 62ha of public parkland, associated with the site of the former Worden Hall. The park is bounded by Shaw Brook to the south, Worden Lane to the east, and Parkgate Drive to the north (Figure 1). Worden Hall was located on the south side of the park, centred on Ordnance Survey grid reference SD 5373 2084.
- 1.3 Worden Park is South Ribble's largest park, and is Grade II listed on the English Heritage Register of Parks and Gardens. A conservation and development plan for the park is being implemented by South Ribble Borough Council. This will include the restoration of aspects of the historic park, and possibly the creation of a ground plan to mark the site of the former Worden Hall.
- 1.5 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site of Worden Hall, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to provide information on the layout of the former Worden Hall and gardens.
- 1.6 The geophysical surveys were conducted by Kevin Mounsey and Martin Railton on 21<sup>st</sup> April 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton between 22<sup>nd</sup> April and 25<sup>th</sup> April 2008.

## 2 METHODOLOGY

### 2.1 Standards

- 2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 1995), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

### 2.2 Technique Selection

- 2.2.1 Earth resistance survey was selected as the most appropriate technique, given the expected presence of cut archaeological features and stone structures at depths of no more than *c.* 1m.
- 2.2.2 This technique involved the use of a Resistance Meter with twin probes set 0.5m apart. When a small electric current is injected into the ground it encounters sub-surface resistance, which is measured. This resistance relates to the ability of the soil to retain moisture and can correspond to the location of cut archaeological features or buried stone walls etc.

### 2.3 Field Methods

- 2.3.1 The study area was located in the gardens of Worden Park on two areas of lawn, subdivided by a yew hedge, and paths. Two areas were surveyed (Areas A & B) to target the site of the former Worden Hall and associated gardens to the south. A 20m grid was established in each area, and tied-in to known mapped Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.
- 2.3.2 Measurements of earth resistance were determined using a Geoscan RM15 Resistance Meter and MPX15 Multiplexor, with two parallel pairs of probes set 0.5m apart. It was expected that significant archaeological features at a depth of up to *c.* 1m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 20m grid units. A sample interval of 0.5m was used, with a traverse interval of 1m, providing 800 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

### 2.4 Data Processing

- 2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Areas of anomalously high resistance are displayed as dark grey, and areas of anomalously low resistance are displayed as light grey. Palette bars show the relationship between the grey shades and earth resistance values in ohms for each area.
- 2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random extreme readings in the resistance data

*Clip:* to clip data to specified maximum and minimum values, in order to limit extreme readings in the resistance data

*Interpolate:* to double the number of values in the traverse direction to match the sample interval

## 2.5 *Interpretation*

### 2.5.1 Two types of geophysical anomaly were detected in the earth resistance data:

*high resistance:* regions of anomalously high resistance, which may be associated with the presence of stone-built features, geological features or sub-surface voids.

*low resistance:* regions of anomalously low resistance, which may be associated with cut features which contain a higher moisture content than the surrounding material, such as pits or ditches

## 2.6 *Presentation*

2.6.1 The grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey plans. Colour-coded geophysical interpretation diagrams are provided, showing the locations and extent of areas of anomalously high and low resistance.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 Trace plots of the unprocessed geophysical data are included in Appendix II.

## 2.7 *Project Archive*

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

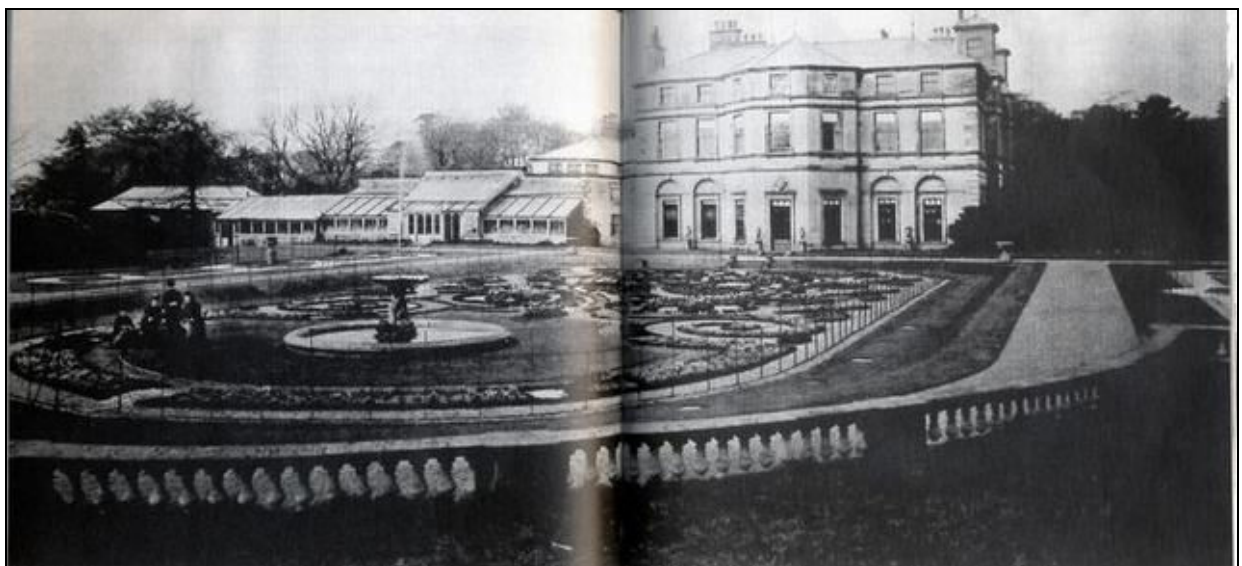
2.7.2 One copy of the survey report will be deposited with the County Historic Environment, where viewing will be available on request.

2.7.3 The project is also registered with the **Online Access to the Index of archaeological investigationS (OASIS)**. The OASIS reference for this project is **northpen3-41348**.

### 3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 3.1 *Historical Background*

- 3.1.1 Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family from 1717 ([www.british-history.ac.uk](http://www.british-history.ac.uk)). The original family home was at Worden (Old) Hall, but the estate transferred to Shaw Hall, when the Ffaringtons of Worden (Old) Hall died without descendents.
- 3.1.2 During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. William Ffarington also added a new wing to the hall in the 18<sup>th</sup> century, and created a number of new features in the park.
- 3.1.3 The 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850) shows the Shaw Hall to the south with further ranges of buildings to the north, surrounded by parkland. The hall was largely rebuilt by Anthony Salvin after 1842 for James Nowell Farington ([www.british-history.ac.uk](http://www.british-history.ac.uk)), and comprised a square main hall, with a main entrance and turning circle at the east side (Plate 2).
- 3.1.4 During the 19<sup>th</sup> century the grounds were landscaped by Salvin's brother-in-law William Andrew Nesfield. This included the creation of a maze and *parterre* garden. James Nowell Farington also changed the name of Shaw Hall to Worden Hall at this time (Plate 1).
- 3.1.5 Worden hall was extensively damaged by fire in April 1941. Following the death of the last squire in 1946, the fixtures and fittings were sold off. Leyland Urban District Council brought Worden Park and opened it to the public on June 18th 1951 ([www.houghton59.fsnet.co.uk](http://www.houghton59.fsnet.co.uk)).
- 3.1.6 The main hall was eventually demolished in the early 1960's, the only surviving part of the original hall being the Derby Wing, which is also believed to be one of the oldest parts of the building.



**Plate 1:** The south elevation of the former Worden Hall, showing *parterre* garden with working fountain



**Plate 2:** The east elevation and entrance of the former Worden Hall

### 3.2 *Previous Archaeological Works*

3.2.1 No known previous archaeological investigations have taken place in Worden Park.



**Plate 3:** Area A, the site of the former Worden Hall (looking south)



**Plate 4:** Area B, part of the *parterre* garden with redundant fountain, looking north towards the site of the former Worden Hall

## **4 SURVEY RESULTS (Figures 2-4)**

### *4.1 Introduction (Figure 2)*

- 4.1.1 The locations of the individual geophysical survey areas were designed by Scott Wilson Ltd, to target the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 4.1.2 Area A comprised an area of lawn, to the east of the existing hall buildings, bounded by a mature yew hedge to the south, and a car park to the north, with shrubs and gardens to the west (Plate 3). Area B was located within the *parterre* garden, and comprised an area of lawn, bounded by banks and gravel paths, with the remain of a fountain at the south end (Plate 4).

### *4.2 Area A (Figures 3&4)*

- 4.2.1 The survey of Area A was hindered by the presence of mature shrubs, including dense rhododendrons on the east side of this area. A number of trees were also located in Area A, the roots of which had an influence on the results of the survey. A discrete area of anomalously high resistance, with a corresponding area of anomalously low resistance was detected on the southern corner of this area, and was due to the presence of tree roots. A low resistance linear feature was detected on the northern edge of Area A, and was due to the presence of the adjacent car park.
- 4.2.2 Irregular areas of anomalously high resistance were detected along the southwest and northwest sides of Area A, which may indicate the presence of sub-surface deposits of stone rubble or wall foundations. On the south side of Area A, a 50m by 37m rectangular area of high resistance was detected, which corresponded to the location of the former Worden Hall. Variations in resistance within this area could be indicative of internal divisions or floors within the main hall. This area was bounded on the southeast and northeast sides by two low resistance linear features, interpreted as the foundation cuts of exterior walls.
- 4.2.3 A 17m-long 16m-wide rectangular area of high resistance was detected on the north side of Area A, which may indicate the location of a smaller building. An area of anomalously high resistance was detected on the southeast side of this area, which may indicate the presence of a deposit of stone rubble or a wall foundation.

### *4.3 Area B (Figures 3&4)*

- 4.3.1 Area B was a sunken lawn, bounded by steep banks, which produced areas of anomalously high resistance along the southern edge of this area. The remains of a fountain at the south end of Area B had to be excluded from the survey. A metal drain cover on the southeast side of the fountain produced a high resistance response, and corresponding areas of low resistance.
- 4.3.2 Irregular areas of anomalously high resistance and low resistance were detected over the majority of Area B. Whilst these anomalies may be indicative of ground disturbance through gardening activity, no formal garden features were detected in this area.



## 5 CONCLUSIONS

- 5.1 Earth resistance surveys, covering 0.2ha of land in total, have been conducted over two areas in Worden Park, targeting the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 5.2 The external walls of the former hall have been detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, have been indicated by the geophysical survey. The remains of a smaller building have been also detected on the north side of Area A. This corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850).
- 5.3 No certain formal garden features, or other archaeological remains have been detected in Area B. As this survey was located within a sunken area, it is possible that the variations detected by the geophysical survey in Area B are geological in nature.
- 5.4 The results of the survey have helped to locate the exterior hall walls, and will inform the creation of a ground plan to mark the site of the former Worden Hall. However, it is possible that additional geophysical survey could provide further information, and help clarify the internal layout of the former hall. This could take the form of further high resolution earth resistance survey, or survey using ground penetrating radar.

## **6 ACKNOWLEDGEMENTS**

North Pennines Archaeology is grateful to Laura Broughton of Scott Wilson Ltd, for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of Scott Wilson Ltd.

## **7 BIBLIOGRAPHY**

Archaeology Data Service, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Arts and Humanities Data Service

English Heritage, 1995 *Geophysical survey in field evaluation*, Research and Professional Services Guideline No.1, London

Institute of Field Archaeologists, 2002 *The use of geophysical techniques in archaeological evaluations*, Paper No.6, IFA, Birmingham

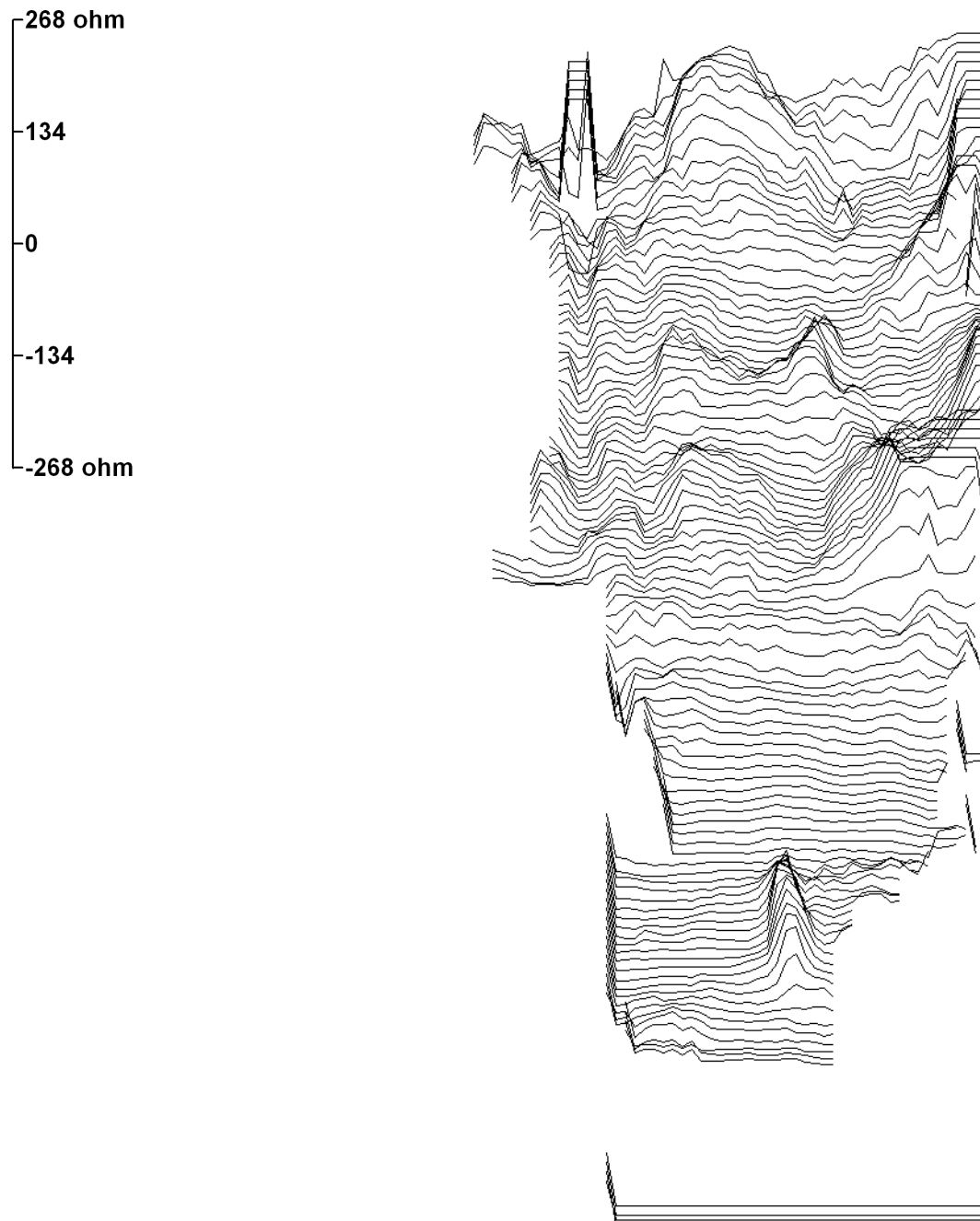
Scott Wilson, 2008 *Worden Park, Leyland: Specification for Geophysical Survey*, unpublished specification, for South Ribble Borough Council

## **APPENDIX I – ILLUSTRATIONS**

## APPENDIX II – TRACE PLOTS

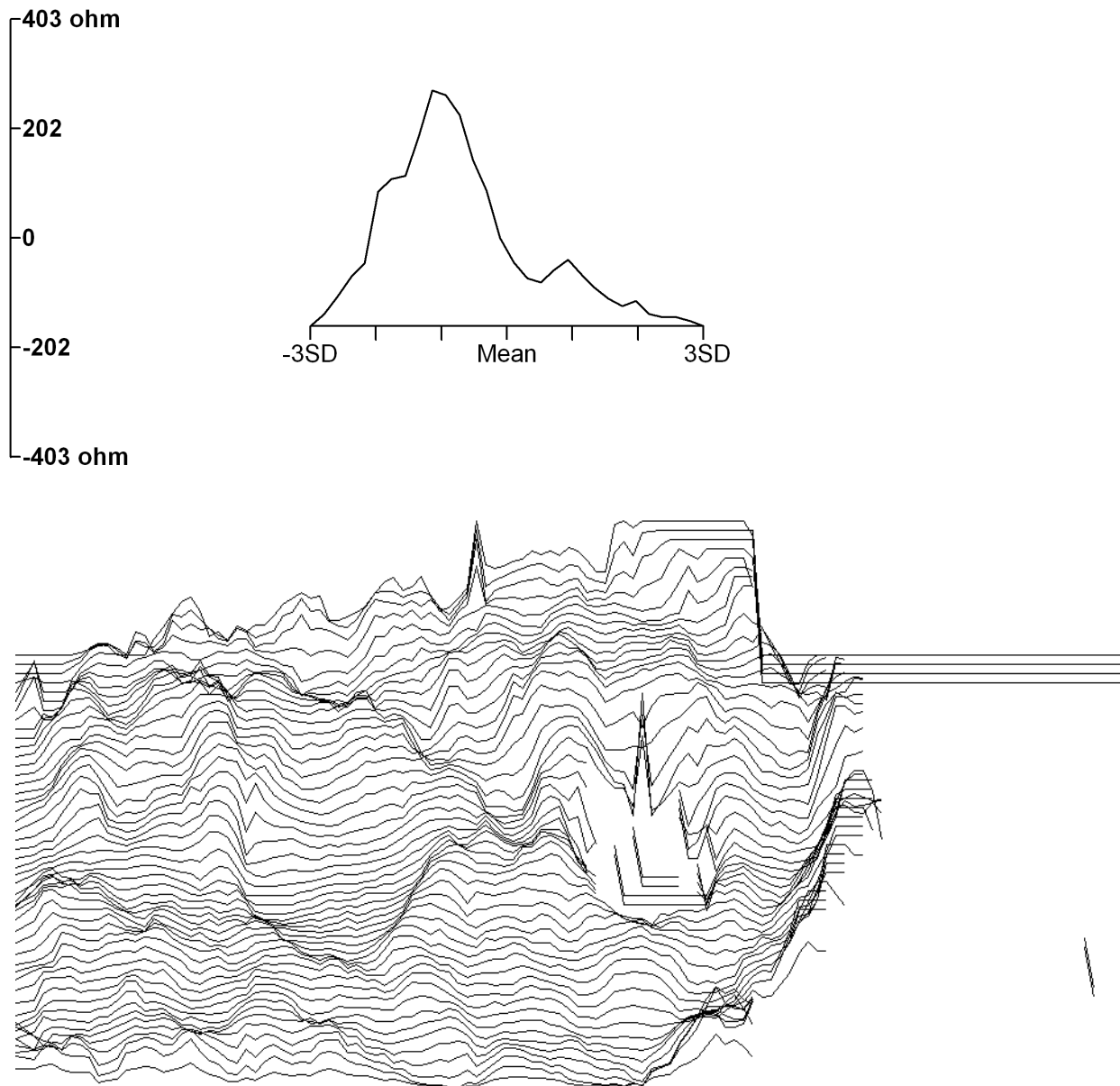
### Worden Park

#### Area 1



## Worden Park

### Area 2



## **GEOPHYSICAL SURVEYS OF LAND AT WORDEN PARK, LEYLAND**

*on behalf of*

**SCOTT WILSON LTD**



NGR SD 5373 2084

OASIS ID: northpen3-41348

Martin Railton BA (Hons), MA AIFA  
North Pennines Archaeology Ltd  
Nenthead Mines Heritage Centre  
Nenthead  
Alston  
Cumbria CA9 3PD  
Tel: (01434) 382045  
Fax: (01434) 382294  
Mobile: 07979617882  
Email: m.railton@nparchaeology.co.uk



North Pennines Archaeology Ltd is a wholly owned company of North Pennines Heritage Trust

Company Registration No. 4847034

VAT Registration No. 817 2284 31

## CONTENTS

### Page

List of Figures.....	ii
Non-Technical Summary.....	iii
<b>1 INTRODUCTION (<i>FIGURE 1</i>) .....</b>	<b>1</b>
<b>2 METHODOLOGY.....</b>	<b>2</b>
2.1 Standards.....	2
2.2 Technique Selection.....	2
2.3 Field Methods .....	2
2.4 Data Processing.....	2
2.5 Interpretation.....	3
2.6 Presentation.....	3
2.7 Project Archive .....	3
<b>3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....</b>	<b>4</b>
3.1 Historical Background .....	4
3.2 Previous Archaeological Works.....	5
<b>4 SURVEY RESULTS (<i>FIGURES 2-4</i>) .....</b>	<b>6</b>
4.1 Introduction (Figure 2).....	6
4.2 Area A (Figures 3&4) .....	6
4.3 Area B (Figures 3&4).....	6
<b>5 CONCLUSIONS .....</b>	<b>7</b>
<b>6 ACKNOWLEDGEMENTS.....</b>	<b>8</b>
<b>7 BIBLIOGRAPHY .....</b>	<b>8</b>
<b>APPENDIX I – ILLUSTRATIONS.....</b>	<b>9</b>
<b>APPENDIX II – TRACE PLOTS.....</b>	<b>10</b>

## LIST OF FIGURES

Figure 1: Location of the geophysical survey areas .....	Appendix I
Figure 2: Geophysical surveys .....	Appendix I
Figure 3: Geophysical interpretation.....	Appendix I
Figure 4: Archaeological interpretation .....	Appendix I



## SUMMARY

In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland, centred on Ordnance Survey grid reference NZ 3879 1396. The surveys were designed to target the site of the former Worden Hall (Area A), and a *parterre* garden to the south (Area B).

Worden Park is Grade II listed on the English Heritage Register of Parks and Gardens. Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family between 1717 and 1946. During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. Worden hall was extensively damaged by fire in April 1941, and was demolished in the 1960's.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies in the study area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the surveys may be used to inform the creation of a ground plan to mark the site of the former Worden Hall, as part of a development plan for Worden Park.

Earth resistance surveys were conducted over two areas within Worden Park. The external walls of the former hall were detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, were indicated by the geophysical survey. The remains of a smaller building were also detected on the north side of Area A, which corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850). No certain formal garden features, or other archaeological remains, have been detected in Area B.

## **1 INTRODUCTION (*Figure 1*)**

- 1.1 In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland. The work was conducted in accordance with a Specification for Geophysical Survey, produced by Scott Wilson Ltd (Scott Wilson 2008), and the relevant English Heritage and IFA guidelines.
- 1.2 Worden Park is located c.2km west of Leyland, and comprises approximately 62ha of public parkland, associated with the site of the former Worden Hall. The park is bounded by Shaw Brook to the south, Worden Lane to the east, and Parkgate Drive to the north (Figure 1). Worden Hall was located on the south side of the park, centred on Ordnance Survey grid reference SD 5373 2084.
- 1.3 Worden Park is South Ribble's largest park, and is Grade II listed on the English Heritage Register of Parks and Gardens. A conservation and development plan for the park is being implemented by South Ribble Borough Council. This will include the restoration of aspects of the historic park, and possibly the creation of a ground plan to mark the site of the former Worden Hall.
- 1.5 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site of Worden Hall, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to provide information on the layout of the former Worden Hall and gardens.
- 1.6 The geophysical surveys were conducted by Kevin Mounsey and Martin Railton on 21<sup>st</sup> April 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton between 22<sup>nd</sup> April and 25<sup>th</sup> April 2008.

## 2 METHODOLOGY

### 2.1 *Standards*

- 2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 1995), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

### 2.2 *Technique Selection*

- 2.2.1 Earth resistance survey was selected as the most appropriate technique, given the expected presence of cut archaeological features and stone structures at depths of no more than *c.* 1m.
- 2.2.2 This technique involved the use of a Resistance Meter with twin probes set 0.5m apart. When a small electric current is injected into the ground it encounters sub-surface resistance, which is measured. This resistance relates to the ability of the soil to retain moisture and can correspond to the location of cut archaeological features or buried stone walls etc.

### 2.3 *Field Methods*

- 2.3.1 The study area was located in the gardens of Worden Park on two areas of lawn, subdivided by a yew hedge, and paths. Two areas were surveyed (Areas A & B) to target the site of the former Worden Hall and associated gardens to the south. A 20m grid was established in each area, and tied-in to known mapped Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.
- 2.3.2 Measurements of earth resistance were determined using a Geoscan RM15 Resistance Meter and MPX15 Multiplexor, with two parallel pairs of probes set 0.5m apart. It was expected that significant archaeological features at a depth of up to *c.* 1m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 20m grid units. A sample interval of 0.5m was used, with a traverse interval of 1m, providing 800 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

### 2.4 *Data Processing*

- 2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Areas of anomalously high resistance are displayed as dark grey, and areas of anomalously low resistance are displayed as light grey. Palette bars show the relationship between the grey shades and earth resistance values in ohms for each area.
- 2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random extreme readings in the resistance data

*Clip:* to clip data to specified maximum and minimum values, in order to limit extreme readings in the resistance data

*Interpolate:* to double the number of values in the traverse direction to match the sample interval

## 2.5 *Interpretation*

### 2.5.1 Two types of geophysical anomaly were detected in the earth resistance data:

*high resistance:* regions of anomalously high resistance, which may be associated with the presence of stone-built features, geological features or sub-surface voids.

*low resistance:* regions of anomalously low resistance, which may be associated with cut features which contain a higher moisture content than the surrounding material, such as pits or ditches

## 2.6 *Presentation*

2.6.1 The grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey plans. Colour-coded geophysical interpretation diagrams are provided, showing the locations and extent of areas of anomalously high and low resistance.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 Trace plots of the unprocessed geophysical data are included in Appendix II.

## 2.7 *Project Archive*

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

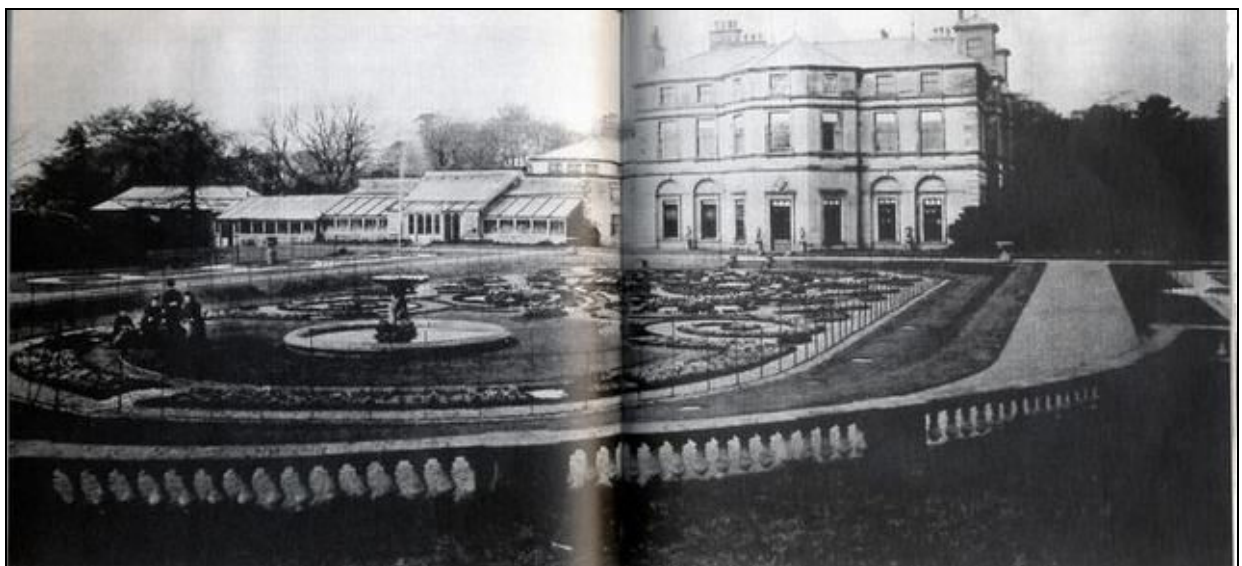
2.7.2 One copy of the survey report will be deposited with the County Historic Environment, where viewing will be available on request.

2.7.3 The project is also registered with the **Online Access to the Index of archaeological investigationS (OASIS)**. The OASIS reference for this project is **northpen3-41348**.

### 3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 3.1 *Historical Background*

- 3.1.1 Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family from 1717 ([www.british-history.ac.uk](http://www.british-history.ac.uk)). The original family home was at Worden (Old) Hall, but the estate transferred to Shaw Hall, when the Ffaringtons of Worden (Old) Hall died without descendents.
- 3.1.2 During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. William Ffarington also added a new wing to the hall in the 18<sup>th</sup> century, and created a number of new features in the park.
- 3.1.3 The 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850) shows the Shaw Hall to the south with further ranges of buildings to the north, surrounded by parkland. The hall was largely rebuilt by Anthony Salvin after 1842 for James Nowell Farington ([www.british-history.ac.uk](http://www.british-history.ac.uk)), and comprised a square main hall, with a main entrance and turning circle at the east side (Plate 2).
- 3.1.4 During the 19<sup>th</sup> century the grounds were landscaped by Salvin's brother-in-law William Andrew Nesfield. This included the creation of a maze and *parterre* garden. James Nowell Farington also changed the name of Shaw Hall to Worden Hall at this time (Plate 1).
- 3.1.5 Worden hall was extensively damaged by fire in April 1941. Following the death of the last squire in 1946, the fixtures and fittings were sold off. Leyland Urban District Council brought Worden Park and opened it to the public on June 18th 1951 ([www.houghton59.fsnet.co.uk](http://www.houghton59.fsnet.co.uk)).
- 3.1.6 The main hall was eventually demolished in the early 1960's, the only surviving part of the original hall being the Derby Wing, which is also believed to be one of the oldest parts of the building.



**Plate 1:** The south elevation of the former Worden Hall, showing *parterre* garden with working fountain



**Plate 2:** The east elevation and entrance of the former Worden Hall

### 3.2 *Previous Archaeological Works*

3.2.1 No known previous archaeological investigations have taken place in Worden Park.



**Plate 3:** Area A, the site of the former Worden Hall (looking south)



**Plate 4:** Area B, part of the *parterre* garden with redundant fountain, looking north towards the site of the former Worden Hall

## **4 SURVEY RESULTS (Figures 2-4)**

### *4.1 Introduction (Figure 2)*

- 4.1.1 The locations of the individual geophysical survey areas were designed by Scott Wilson Ltd, to target the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 4.1.2 Area A comprised an area of lawn, to the east of the existing hall buildings, bounded by a mature yew hedge to the south, and a car park to the north, with shrubs and gardens to the west (Plate 3). Area B was located within the *parterre* garden, and comprised an area of lawn, bounded by banks and gravel paths, with the remain of a fountain at the south end (Plate 4).

### *4.2 Area A (Figures 3&4)*

- 4.2.1 The survey of Area A was hindered by the presence of mature shrubs, including dense rhododendrons on the east side of this area. A number of trees were also located in Area A, the roots of which had an influence on the results of the survey. A discrete area of anomalously high resistance, with a corresponding area of anomalously low resistance was detected on the southern corner of this area, and was due to the presence of tree roots. A low resistance linear feature was detected on the northern edge of Area A, and was due to the presence of the adjacent car park.
- 4.2.2 Irregular areas of anomalously high resistance were detected along the southwest and northwest sides of Area A, which may indicate the presence of sub-surface deposits of stone rubble or wall foundations. On the south side of Area A, a 50m by 37m rectangular area of high resistance was detected, which corresponded to the location of the former Worden Hall. Variations in resistance within this area could be indicative of internal divisions or floors within the main hall. This area was bounded on the southeast and northeast sides by two low resistance linear features, interpreted as the foundation cuts of exterior walls.
- 4.2.3 A 17m-long 16m-wide rectangular area of high resistance was detected on the north side of Area A, which may indicate the location of a smaller building. An area of anomalously high resistance was detected on the southeast side of this area, which may indicate the presence of a deposit of stone rubble or a wall foundation.

### *4.3 Area B (Figures 3&4)*

- 4.3.1 Area B was a sunken lawn, bounded by steep banks, which produced areas of anomalously high resistance along the southern edge of this area. The remains of a fountain at the south end of Area B had to be excluded from the survey. A metal drain cover on the southeast side of the fountain produced a high resistance response, and corresponding areas of low resistance.
- 4.3.2 Irregular areas of anomalously high resistance and low resistance were detected over the majority of Area B. Whilst these anomalies may be indicative of ground disturbance through gardening activity, no formal garden features were detected in this area.

## 5 CONCLUSIONS

- 5.1 Earth resistance surveys, covering 0.2ha of land in total, have been conducted over two areas in Worden Park, targeting the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 5.2 The external walls of the former hall have been detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, have been indicated by the geophysical survey. The remains of a smaller building have been also detected on the north side of Area A. This corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850).
- 5.3 No certain formal garden features, or other archaeological remains have been detected in Area B. As this survey was located within a sunken area, it is possible that the variations detected by the geophysical survey in Area B are geological in nature.
- 5.4 The results of the survey have helped to locate the exterior hall walls, and will inform the creation of a ground plan to mark the site of the former Worden Hall. However, it is possible that additional geophysical survey could provide further information, and help clarify the internal layout of the former hall. This could take the form of further high resolution earth resistance survey, or survey using ground penetrating radar.



## **6 ACKNOWLEDGEMENTS**

North Pennines Archaeology is grateful to Laura Broughton of Scott Wilson Ltd, for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of Scott Wilson Ltd.

## **7 BIBLIOGRAPHY**

Archaeology Data Service, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Arts and Humanities Data Service

English Heritage, 1995 *Geophysical survey in field evaluation*, Research and Professional Services Guideline No.1, London

Institute of Field Archaeologists, 2002 *The use of geophysical techniques in archaeological evaluations*, Paper No.6, IFA, Birmingham

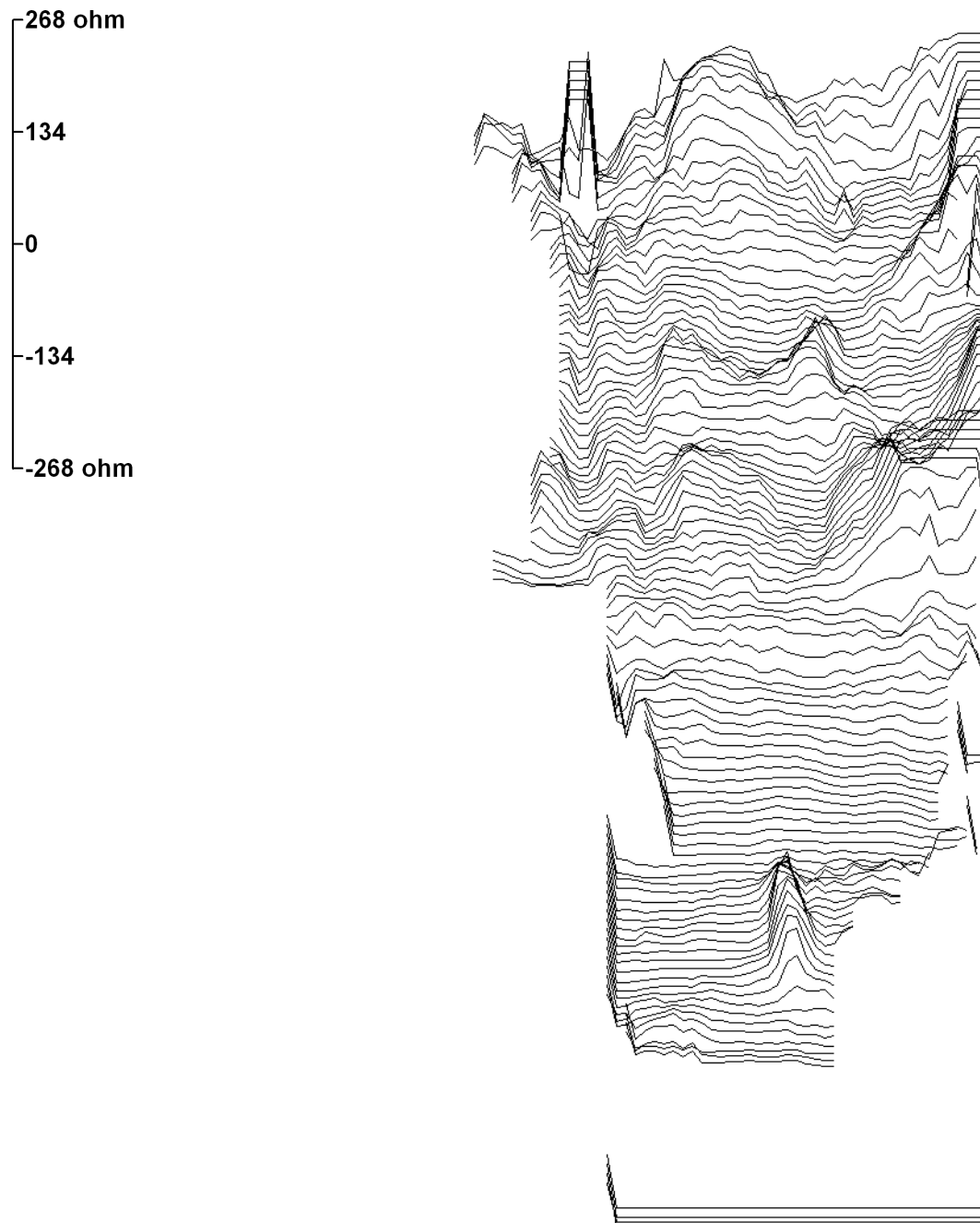
Scott Wilson, 2008 *Worden Park, Leyland: Specification for Geophysical Survey*, unpublished specification, for South Ribble Borough Council

## **APPENDIX I – ILLUSTRATIONS**

## APPENDIX II – TRACE PLOTS

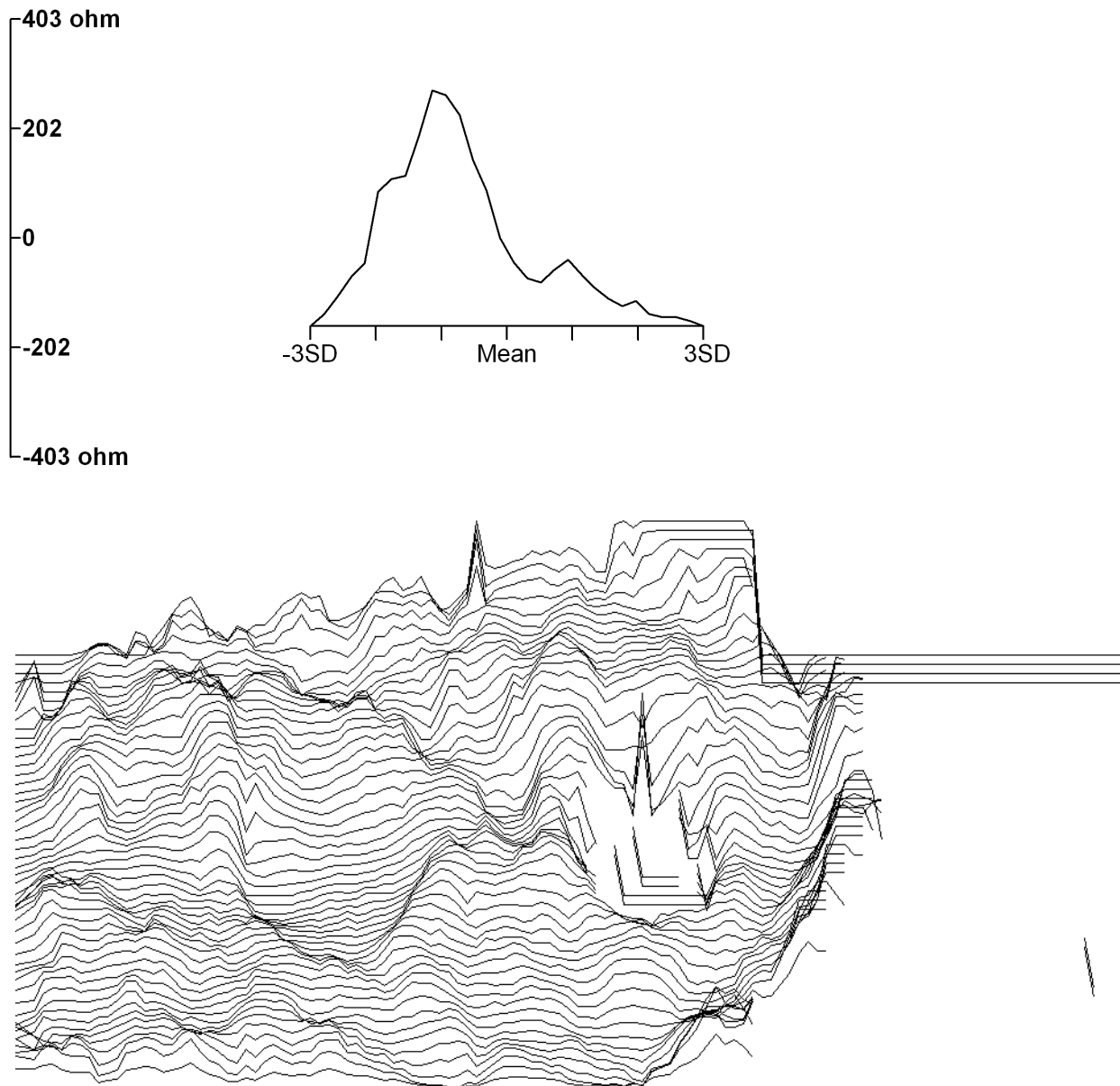
### Worden Park

#### Area 1



## Worden Park

### Area 2



## **GEOPHYSICAL SURVEYS OF LAND AT WORDEN PARK, LEYLAND**

*on behalf of*

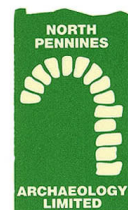
**SCOTT WILSON LTD**



NGR SD 5373 2084

OASIS ID: northpen3-41348

Martin Railton BA (Hons), MA AIFA  
North Pennines Archaeology Ltd  
Nenthead Mines Heritage Centre  
Nenthead  
Alston  
Cumbria CA9 3PD  
Tel: (01434) 382045  
Fax: (01434) 382294  
Mobile: 07979617882  
Email: m.railton@nparchaeology.co.uk



North Pennines Archaeology Ltd is a wholly owned company of North Pennines Heritage Trust

Company Registration No. 4847034

VAT Registration No. 817 2284 31

## CONTENTS

### Page

List of Figures.....	ii
Non-Technical Summary.....	iii
<b>1 INTRODUCTION (FIGURE 1) .....</b>	<b>1</b>
<b>2 METHODOLOGY.....</b>	<b>2</b>
2.1 Standards.....	2
2.2 Technique Selection.....	2
2.3 Field Methods .....	2
2.4 Data Processing.....	2
2.5 Interpretation.....	3
2.6 Presentation.....	3
2.7 Project Archive .....	3
<b>3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....</b>	<b>4</b>
3.1 Historical Background .....	4
3.2 Previous Archaeological Works.....	5
<b>4 SURVEY RESULTS (FIGURES 2-4) .....</b>	<b>6</b>
4.1 Introduction (Figure 2).....	6
4.2 Area A (Figures 3&4) .....	6
4.3 Area B (Figures 3&4).....	6
<b>5 CONCLUSIONS .....</b>	<b>7</b>
<b>6 ACKNOWLEDGEMENTS.....</b>	<b>8</b>
<b>7 BIBLIOGRAPHY .....</b>	<b>8</b>
<b>APPENDIX I – ILLUSTRATIONS.....</b>	<b>9</b>
<b>APPENDIX II – TRACE PLOTS.....</b>	<b>10</b>

## LIST OF FIGURES

Figure 1: Location of the geophysical survey areas .....	Appendix I
Figure 2: Geophysical surveys .....	Appendix I
Figure 3: Geophysical interpretation.....	Appendix I
Figure 4: Archaeological interpretation .....	Appendix I

## SUMMARY

In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland, centred on Ordnance Survey grid reference NZ 3879 1396. The surveys were designed to target the site of the former Worden Hall (Area A), and a *parterre* garden to the south (Area B).

Worden Park is Grade II listed on the English Heritage Register of Parks and Gardens. Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family between 1717 and 1946. During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. Worden hall was extensively damaged by fire in April 1941, and was demolished in the 1960's.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies in the study area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the surveys may be used to inform the creation of a ground plan to mark the site of the former Worden Hall, as part of a development plan for Worden Park.

Earth resistance surveys were conducted over two areas within Worden Park. The external walls of the former hall were detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, were indicated by the geophysical survey. The remains of a smaller building were also detected on the north side of Area A, which corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850). No certain formal garden features, or other archaeological remains, have been detected in Area B.



## **1 INTRODUCTION (*Figure 1*)**

- 1.1 In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland. The work was conducted in accordance with a Specification for Geophysical Survey, produced by Scott Wilson Ltd (Scott Wilson 2008), and the relevant English Heritage and IFA guidelines.
- 1.2 Worden Park is located c.2km west of Leyland, and comprises approximately 62ha of public parkland, associated with the site of the former Worden Hall. The park is bounded by Shaw Brook to the south, Worden Lane to the east, and Parkgate Drive to the north (Figure 1). Worden Hall was located on the south side of the park, centred on Ordnance Survey grid reference SD 5373 2084.
- 1.3 Worden Park is South Ribble's largest park, and is Grade II listed on the English Heritage Register of Parks and Gardens. A conservation and development plan for the park is being implemented by South Ribble Borough Council. This will include the restoration of aspects of the historic park, and possibly the creation of a ground plan to mark the site of the former Worden Hall.
- 1.5 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site of Worden Hall, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to provide information on the layout of the former Worden Hall and gardens.
- 1.6 The geophysical surveys were conducted by Kevin Mounsey and Martin Railton on 21<sup>st</sup> April 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton between 22<sup>nd</sup> April and 25<sup>th</sup> April 2008.

## **2 METHODOLOGY**

### *2.1 Standards*

- 2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 1995), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

### *2.2 Technique Selection*

- 2.2.1 Earth resistance survey was selected as the most appropriate technique, given the expected presence of cut archaeological features and stone structures at depths of no more than *c.* 1m.
- 2.2.2 This technique involved the use of a Resistance Meter with twin probes set 0.5m apart. When a small electric current is injected into the ground it encounters sub-surface resistance, which is measured. This resistance relates to the ability of the soil to retain moisture and can correspond to the location of cut archaeological features or buried stone walls etc.

### *2.3 Field Methods*

- 2.3.1 The study area was located in the gardens of Worden Park on two areas of lawn, subdivided by a yew hedge, and paths. Two areas were surveyed (Areas A & B) to target the site of the former Worden Hall and associated gardens to the south. A 20m grid was established in each area, and tied-in to known mapped Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.
- 2.3.2 Measurements of earth resistance were determined using a Geoscan RM15 Resistance Meter and MPX15 Multiplexor, with two parallel pairs of probes set 0.5m apart. It was expected that significant archaeological features at a depth of up to *c.* 1m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 20m grid units. A sample interval of 0.5m was used, with a traverse interval of 1m, providing 800 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

### *2.4 Data Processing*

- 2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Areas of anomalously high resistance are displayed as dark grey, and areas of anomalously low resistance are displayed as light grey. Palette bars show the relationship between the grey shades and earth resistance values in ohms for each area.
- 2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random extreme readings in the resistance data

*Clip:* to clip data to specified maximum and minimum values, in order to limit extreme readings in the resistance data

*Interpolate:* to double the number of values in the traverse direction to match the sample interval

## 2.5 *Interpretation*

### 2.5.1 Two types of geophysical anomaly were detected in the earth resistance data:

*high resistance:* regions of anomalously high resistance, which may be associated with the presence of stone-built features, geological features or sub-surface voids.

*low resistance:* regions of anomalously low resistance, which may be associated with cut features which contain a higher moisture content than the surrounding material, such as pits or ditches

## 2.6 *Presentation*

2.6.1 The grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey plans. Colour-coded geophysical interpretation diagrams are provided, showing the locations and extent of areas of anomalously high and low resistance.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 Trace plots of the unprocessed geophysical data are included in Appendix II.

## 2.7 *Project Archive*

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

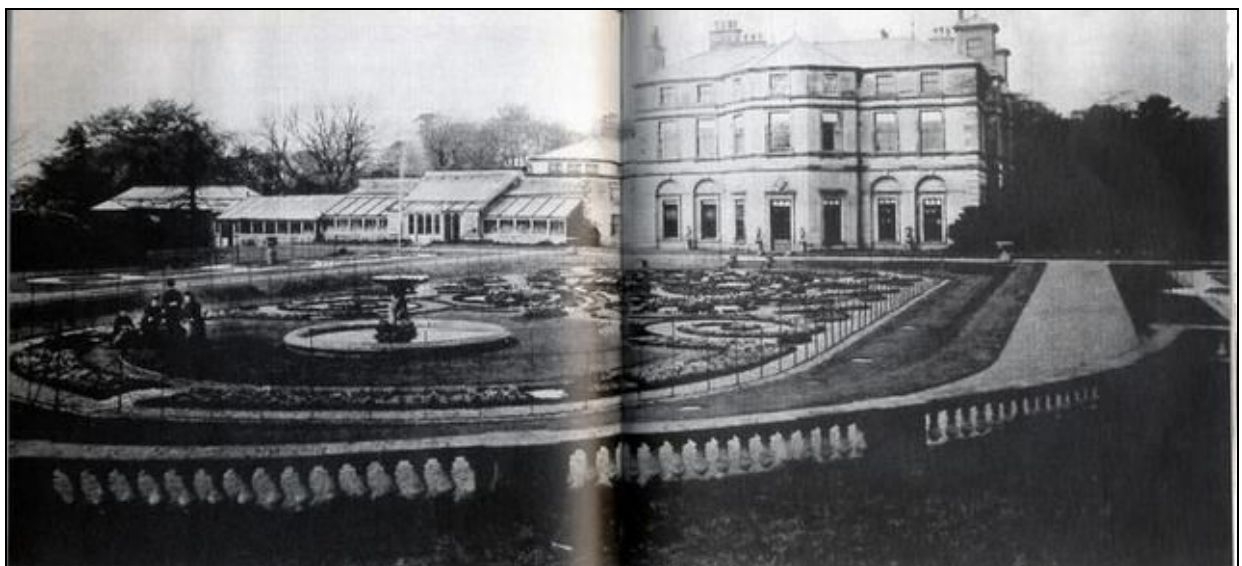
2.7.2 One copy of the survey report will be deposited with the County Historic Environment, where viewing will be available on request.

2.7.3 The project is also registered with the **Online Access to the Index of archaeological investigationS (OASIS)**. The OASIS reference for this project is **northpen3-41348**.

### 3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 3.1 *Historical Background*

- 3.1.1 Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family from 1717 ([www.british-history.ac.uk](http://www.british-history.ac.uk)). The original family home was at Worden (Old) Hall, but the estate transferred to Shaw Hall, when the Ffaringtons of Worden (Old) Hall died without descendents.
- 3.1.2 During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. William Ffarington also added a new wing to the hall in the 18<sup>th</sup> century, and created a number of new features in the park.
- 3.1.3 The 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850) shows the Shaw Hall to the south with further ranges of buildings to the north, surrounded by parkland. The hall was largely rebuilt by Anthony Salvin after 1842 for James Nowell Farington ([www.british-history.ac.uk](http://www.british-history.ac.uk)), and comprised a square main hall, with a main entrance and turning circle at the east side (Plate 2).
- 3.1.4 During the 19<sup>th</sup> century the grounds were landscaped by Salvin's brother-in-law William Andrew Nesfield. This included the creation of a maze and *parterre* garden. James Nowell Farington also changed the name of Shaw Hall to Worden Hall at this time (Plate 1).
- 3.1.5 Worden hall was extensively damaged by fire in April 1941. Following the death of the last squire in 1946, the fixtures and fittings were sold off. Leyland Urban District Council brought Worden Park and opened it to the public on June 18th 1951 ([www.houghton59.fsnet.co.uk](http://www.houghton59.fsnet.co.uk)).
- 3.1.6 The main hall was eventually demolished in the early 1960's, the only surviving part of the original hall being the Derby Wing, which is also believed to be one of the oldest parts of the building.



**Plate 1:** The south elevation of the former Worden Hall, showing *parterre* garden with working fountain



**Plate 2:** The east elevation and entrance of the former Worden Hall

### 3.2 *Previous Archaeological Works*

3.2.1 No known previous archaeological investigations have taken place in Worden Park.



**Plate 3:** Area A, the site of the former Worden Hall (looking south)



**Plate 4:** Area B, part of the *parterre* garden with redundant fountain, looking north towards the site of the former Worden Hall

## **4 SURVEY RESULTS (Figures 2-4)**

### *4.1 Introduction (Figure 2)*

- 4.1.1 The locations of the individual geophysical survey areas were designed by Scott Wilson Ltd, to target the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 4.1.2 Area A comprised an area of lawn, to the east of the existing hall buildings, bounded by a mature yew hedge to the south, and a car park to the north, with shrubs and gardens to the west (Plate 3). Area B was located within the *parterre* garden, and comprised an area of lawn, bounded by banks and gravel paths, with the remain of a fountain at the south end (Plate 4).

### *4.2 Area A (Figures 3&4)*

- 4.2.1 The survey of Area A was hindered by the presence of mature shrubs, including dense rhododendrons on the east side of this area. A number of trees were also located in Area A, the roots of which had an influence on the results of the survey. A discrete area of anomalously high resistance, with a corresponding area of anomalously low resistance was detected on the southern corner of this area, and was due to the presence of tree roots. A low resistance linear feature was detected on the northern edge of Area A, and was due to the presence of the adjacent car park.
- 4.2.2 Irregular areas of anomalously high resistance were detected along the southwest and northwest sides of Area A, which may indicate the presence of sub-surface deposits of stone rubble or wall foundations. On the south side of Area A, a 50m by 37m rectangular area of high resistance was detected, which corresponded to the location of the former Worden Hall. Variations in resistance within this area could be indicative of internal divisions or floors within the main hall. This area was bounded on the southeast and northeast sides by two low resistance linear features, interpreted as the foundation cuts of exterior walls.
- 4.2.3 A 17m-long 16m-wide rectangular area of high resistance was detected on the north side of Area A, which may indicate the location of a smaller building. An area of anomalously high resistance was detected on the southeast side of this area, which may indicate the presence of a deposit of stone rubble or a wall foundation.

### *4.3 Area B (Figures 3&4)*

- 4.3.1 Area B was a sunken lawn, bounded by steep banks, which produced areas of anomalously high resistance along the southern edge of this area. The remains of a fountain at the south end of Area B had to be excluded from the survey. A metal drain cover on the southeast side of the fountain produced a high resistance response, and corresponding areas of low resistance.
- 4.3.2 Irregular areas of anomalously high resistance and low resistance were detected over the majority of Area B. Whilst these anomalies may be indicative of ground disturbance through gardening activity, no formal garden features were detected in this area.

## 5 CONCLUSIONS

- 5.1 Earth resistance surveys, covering 0.2ha of land in total, have been conducted over two areas in Worden Park, targeting the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 5.2 The external walls of the former hall have been detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, have been indicated by the geophysical survey. The remains of a smaller building have been also detected on the north side of Area A. This corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850).
- 5.3 No certain formal garden features, or other archaeological remains have been detected in Area B. As this survey was located within a sunken area, it is possible that the variations detected by the geophysical survey in Area B are geological in nature.
- 5.4 The results of the survey have helped to locate the exterior hall walls, and will inform the creation of a ground plan to mark the site of the former Worden Hall. However, it is possible that additional geophysical survey could provide further information, and help clarify the internal layout of the former hall. This could take the form of further high resolution earth resistance survey, or survey using ground penetrating radar.

## **6 ACKNOWLEDGEMENTS**

North Pennines Archaeology is grateful to Laura Broughton of Scott Wilson Ltd, for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of Scott Wilson Ltd.

## **7 BIBLIOGRAPHY**

Archaeology Data Service, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Arts and Humanities Data Service

English Heritage, 1995 *Geophysical survey in field evaluation*, Research and Professional Services Guideline No.1, London

Institute of Field Archaeologists, 2002 *The use of geophysical techniques in archaeological evaluations*, Paper No.6, IFA, Birmingham

Scott Wilson, 2008 *Worden Park, Leyland: Specification for Geophysical Survey*, unpublished specification, for South Ribble Borough Council

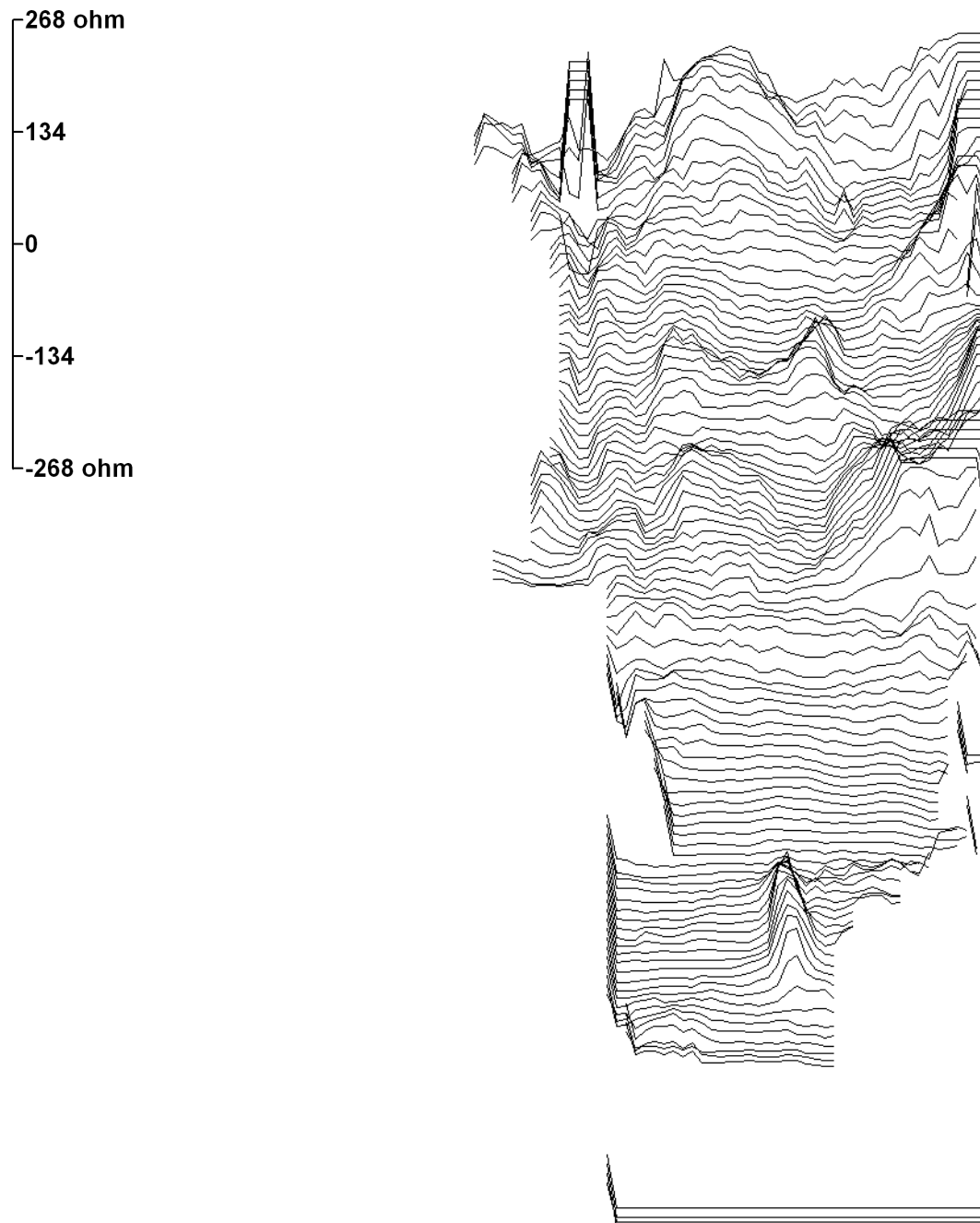


## **APPENDIX I – ILLUSTRATIONS**

## APPENDIX II – TRACE PLOTS

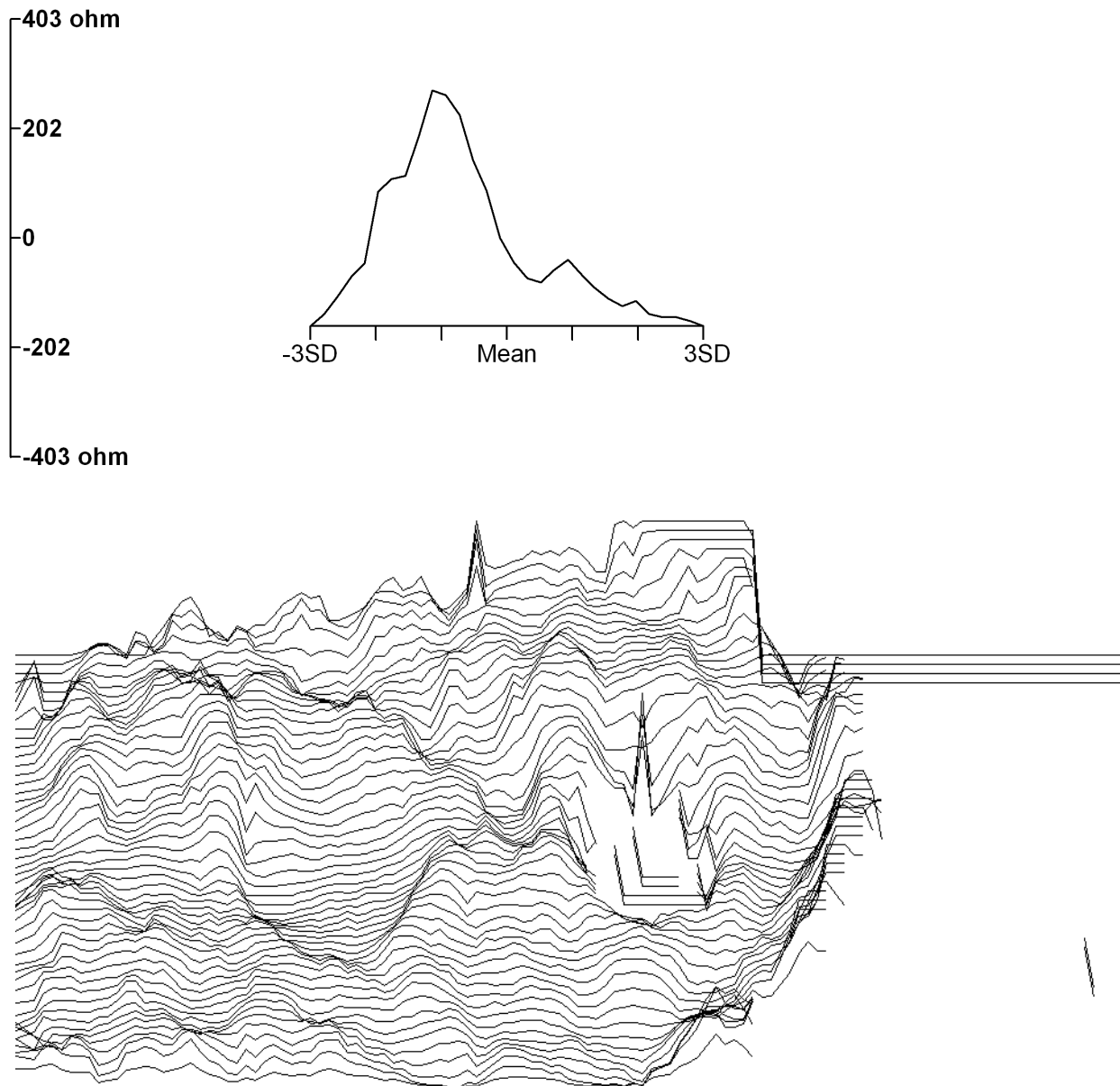
### Worden Park

#### Area 1



## Worden Park

### Area 2



## **GEOPHYSICAL SURVEYS OF LAND AT WORDEN PARK, LEYLAND**

*on behalf of*

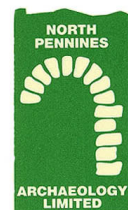
**SCOTT WILSON LTD**



NGR SD 5373 2084

OASIS ID: northpen3-41348

Martin Railton BA (Hons), MA AIFA  
North Pennines Archaeology Ltd  
Nenthead Mines Heritage Centre  
Nenthead  
Alston  
Cumbria CA9 3PD  
Tel: (01434) 382045  
Fax: (01434) 382294  
Mobile: 07979617882  
Email: m.railton@nparchaeology.co.uk



North Pennines Archaeology Ltd is a wholly owned company of North Pennines Heritage Trust

## CONTENTS

### Page

List of Figures.....	ii
Non-Technical Summary.....	iii
<b>1 INTRODUCTION (<i>FIGURE 1</i>) .....</b>	<b>1</b>
<b>2 METHODOLOGY.....</b>	<b>2</b>
2.1 Standards.....	2
2.2 Technique Selection.....	2
2.3 Field Methods .....	2
2.4 Data Processing.....	2
2.5 Interpretation.....	3
2.6 Presentation.....	3
2.7 Project Archive .....	3
<b>3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....</b>	<b>4</b>
3.1 Historical Background .....	4
3.2 Previous Archaeological Works.....	5
<b>4 SURVEY RESULTS (<i>FIGURES 2-4</i>) .....</b>	<b>6</b>
4.1 Introduction (Figure 2).....	6
4.2 Area A (Figures 3&4) .....	6
4.3 Area B (Figures 3&4).....	6
<b>5 CONCLUSIONS .....</b>	<b>7</b>
<b>6 ACKNOWLEDGEMENTS.....</b>	<b>8</b>
<b>7 BIBLIOGRAPHY .....</b>	<b>8</b>
<b>APPENDIX I – ILLUSTRATIONS.....</b>	<b>9</b>
<b>APPENDIX II – TRACE PLOTS.....</b>	<b>10</b>

## LIST OF FIGURES

Figure 1: Location of the geophysical survey areas .....	Appendix I
Figure 2: Geophysical surveys .....	Appendix I
Figure 3: Geophysical interpretation.....	Appendix I
Figure 4: Archaeological interpretation .....	Appendix I

## SUMMARY

In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland, centred on Ordnance Survey grid reference NZ 3879 1396. The surveys were designed to target the site of the former Worden Hall (Area A), and a *parterre* garden to the south (Area B).

Worden Park is Grade II listed on the English Heritage Register of Parks and Gardens. Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family between 1717 and 1946. During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. Worden hall was extensively damaged by fire in April 1941, and was demolished in the 1960's.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies in the study area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the surveys may be used to inform the creation of a ground plan to mark the site of the former Worden Hall, as part of a development plan for Worden Park.

Earth resistance surveys were conducted over two areas within Worden Park. The external walls of the former hall were detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, were indicated by the geophysical survey. The remains of a smaller building were also detected on the north side of Area A, which corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850). No certain formal garden features, or other archaeological remains, have been detected in Area B.

## **1 INTRODUCTION (*Figure 1*)**

- 1.1 In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland. The work was conducted in accordance with a Specification for Geophysical Survey, produced by Scott Wilson Ltd (Scott Wilson 2008), and the relevant English Heritage and IFA guidelines.
- 1.2 Worden Park is located c.2km west of Leyland, and comprises approximately 62ha of public parkland, associated with the site of the former Worden Hall. The park is bounded by Shaw Brook to the south, Worden Lane to the east, and Parkgate Drive to the north (Figure 1). Worden Hall was located on the south side of the park, centred on Ordnance Survey grid reference SD 5373 2084.
- 1.3 Worden Park is South Ribble's largest park, and is Grade II listed on the English Heritage Register of Parks and Gardens. A conservation and development plan for the park is being implemented by South Ribble Borough Council. This will include the restoration of aspects of the historic park, and possibly the creation of a ground plan to mark the site of the former Worden Hall.
- 1.5 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site of Worden Hall, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to provide information on the layout of the former Worden Hall and gardens.
- 1.6 The geophysical surveys were conducted by Kevin Mounsey and Martin Railton on 21<sup>st</sup> April 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton between 22<sup>nd</sup> April and 25<sup>th</sup> April 2008.



## 2 METHODOLOGY

### 2.1 Standards

- 2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 1995), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

### 2.2 Technique Selection

- 2.2.1 Earth resistance survey was selected as the most appropriate technique, given the expected presence of cut archaeological features and stone structures at depths of no more than *c.* 1m.
- 2.2.2 This technique involved the use of a Resistance Meter with twin probes set 0.5m apart. When a small electric current is injected into the ground it encounters sub-surface resistance, which is measured. This resistance relates to the ability of the soil to retain moisture and can correspond to the location of cut archaeological features or buried stone walls etc.

### 2.3 Field Methods

- 2.3.1 The study area was located in the gardens of Worden Park on two areas of lawn, subdivided by a yew hedge, and paths. Two areas were surveyed (Areas A & B) to target the site of the former Worden Hall and associated gardens to the south. A 20m grid was established in each area, and tied-in to known mapped Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.
- 2.3.2 Measurements of earth resistance were determined using a Geoscan RM15 Resistance Meter and MPX15 Multiplexor, with two parallel pairs of probes set 0.5m apart. It was expected that significant archaeological features at a depth of up to *c.* 1m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 20m grid units. A sample interval of 0.5m was used, with a traverse interval of 1m, providing 800 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

### 2.4 Data Processing

- 2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Areas of anomalously high resistance are displayed as dark grey, and areas of anomalously low resistance are displayed as light grey. Palette bars show the relationship between the grey shades and earth resistance values in ohms for each area.
- 2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random extreme readings in the resistance data

*Clip:* to clip data to specified maximum and minimum values, in order to limit extreme readings in the resistance data

*Interpolate:* to double the number of values in the traverse direction to match the sample interval

## 2.5 *Interpretation*

### 2.5.1 Two types of geophysical anomaly were detected in the earth resistance data:

*high resistance:* regions of anomalously high resistance, which may be associated with the presence of stone-built features, geological features or sub-surface voids.

*low resistance:* regions of anomalously low resistance, which may be associated with cut features which contain a higher moisture content than the surrounding material, such as pits or ditches

## 2.6 *Presentation*

2.6.1 The grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey plans. Colour-coded geophysical interpretation diagrams are provided, showing the locations and extent of areas of anomalously high and low resistance.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 Trace plots of the unprocessed geophysical data are included in Appendix II.

## 2.7 *Project Archive*

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

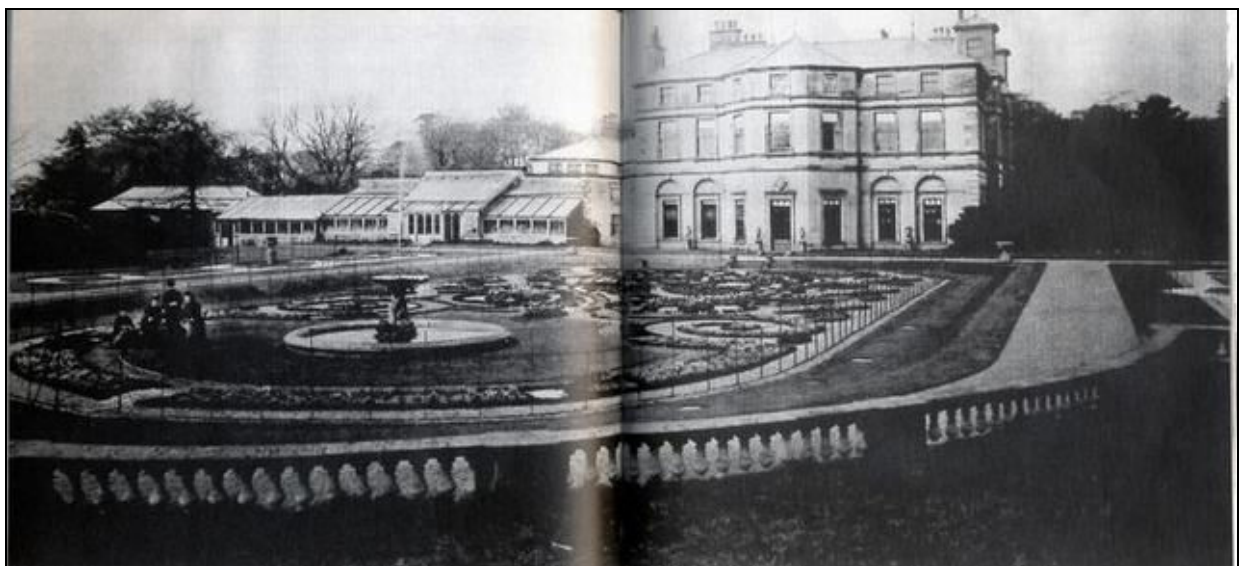
2.7.2 One copy of the survey report will be deposited with the County Historic Environment, where viewing will be available on request.

2.7.3 The project is also registered with the **Online Access to the Index of archaeological investigationS (OASIS)**. The OASIS reference for this project is **northpen3-41348**.

### 3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 3.1 *Historical Background*

- 3.1.1 Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family from 1717 ([www.british-history.ac.uk](http://www.british-history.ac.uk)). The original family home was at Worden (Old) Hall, but the estate transferred to Shaw Hall, when the Ffaringtons of Worden (Old) Hall died without descendents.
- 3.1.2 During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. William Ffarington also added a new wing to the hall in the 18<sup>th</sup> century, and created a number of new features in the park.
- 3.1.3 The 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850) shows the Shaw Hall to the south with further ranges of buildings to the north, surrounded by parkland. The hall was largely rebuilt by Anthony Salvin after 1842 for James Nowell Farington ([www.british-history.ac.uk](http://www.british-history.ac.uk)), and comprised a square main hall, with a main entrance and turning circle at the east side (Plate 2).
- 3.1.4 During the 19<sup>th</sup> century the grounds were landscaped by Salvin's brother-in-law William Andrew Nesfield. This included the creation of a maze and *parterre* garden. James Nowell Farington also changed the name of Shaw Hall to Worden Hall at this time (Plate 1).
- 3.1.5 Worden hall was extensively damaged by fire in April 1941. Following the death of the last squire in 1946, the fixtures and fittings were sold off. Leyland Urban District Council brought Worden Park and opened it to the public on June 18th 1951 ([www.houghton59.fsnet.co.uk](http://www.houghton59.fsnet.co.uk)).
- 3.1.6 The main hall was eventually demolished in the early 1960's, the only surviving part of the original hall being the Derby Wing, which is also believed to be one of the oldest parts of the building.



**Plate 1:** The south elevation of the former Worden Hall, showing *parterre* garden with working fountain



**Plate 2:** The east elevation and entrance of the former Worden Hall

### 3.2 *Previous Archaeological Works*

3.2.1 No known previous archaeological investigations have taken place in Worden Park.



**Plate 3:** Area A, the site of the former Worden Hall (looking south)



**Plate 4:** Area B, part of the *parterre* garden with redundant fountain, looking north towards the site of the former Worden Hall

## **4 SURVEY RESULTS (Figures 2-4)**

### *4.1 Introduction (Figure 2)*

- 4.1.1 The locations of the individual geophysical survey areas were designed by Scott Wilson Ltd, to target the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 4.1.2 Area A comprised an area of lawn, to the east of the existing hall buildings, bounded by a mature yew hedge to the south, and a car park to the north, with shrubs and gardens to the west (Plate 3). Area B was located within the *parterre* garden, and comprised an area of lawn, bounded by banks and gravel paths, with the remain of a fountain at the south end (Plate 4).

### *4.2 Area A (Figures 3&4)*

- 4.2.1 The survey of Area A was hindered by the presence of mature shrubs, including dense rhododendrons on the east side of this area. A number of trees were also located in Area A, the roots of which had an influence on the results of the survey. A discrete area of anomalously high resistance, with a corresponding area of anomalously low resistance was detected on the southern corner of this area, and was due to the presence of tree roots. A low resistance linear feature was detected on the northern edge of Area A, and was due to the presence of the adjacent car park.
- 4.2.2 Irregular areas of anomalously high resistance were detected along the southwest and northwest sides of Area A, which may indicate the presence of sub-surface deposits of stone rubble or wall foundations. On the south side of Area A, a 50m by 37m rectangular area of high resistance was detected, which corresponded to the location of the former Worden Hall. Variations in resistance within this area could be indicative of internal divisions or floors within the main hall. This area was bounded on the southeast and northeast sides by two low resistance linear features, interpreted as the foundation cuts of exterior walls.
- 4.2.3 A 17m-long 16m-wide rectangular area of high resistance was detected on the north side of Area A, which may indicate the location of a smaller building. An area of anomalously high resistance was detected on the southeast side of this area, which may indicate the presence of a deposit of stone rubble or a wall foundation.

### *4.3 Area B (Figures 3&4)*

- 4.3.1 Area B was a sunken lawn, bounded by steep banks, which produced areas of anomalously high resistance along the southern edge of this area. The remains of a fountain at the south end of Area B had to be excluded from the survey. A metal drain cover on the southeast side of the fountain produced a high resistance response, and corresponding areas of low resistance.
- 4.3.2 Irregular areas of anomalously high resistance and low resistance were detected over the majority of Area B. Whilst these anomalies may be indicative of ground disturbance through gardening activity, no formal garden features were detected in this area.

## 5 CONCLUSIONS

- 5.1 Earth resistance surveys, covering 0.2ha of land in total, have been conducted over two areas in Worden Park, targeting the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 5.2 The external walls of the former hall have been detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, have been indicated by the geophysical survey. The remains of a smaller building have been also detected on the north side of Area A. This corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850).
- 5.3 No certain formal garden features, or other archaeological remains have been detected in Area B. As this survey was located within a sunken area, it is possible that the variations detected by the geophysical survey in Area B are geological in nature.
- 5.4 The results of the survey have helped to locate the exterior hall walls, and will inform the creation of a ground plan to mark the site of the former Worden Hall. However, it is possible that additional geophysical survey could provide further information, and help clarify the internal layout of the former hall. This could take the form of further high resolution earth resistance survey, or survey using ground penetrating radar.

## **6 ACKNOWLEDGEMENTS**

North Pennines Archaeology is grateful to Laura Broughton of Scott Wilson Ltd, for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of Scott Wilson Ltd.

## **7 BIBLIOGRAPHY**

Archaeology Data Service, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Arts and Humanities Data Service

English Heritage, 1995 *Geophysical survey in field evaluation*, Research and Professional Services Guideline No.1, London

Institute of Field Archaeologists, 2002 *The use of geophysical techniques in archaeological evaluations*, Paper No.6, IFA, Birmingham

Scott Wilson, 2008 *Worden Park, Leyland: Specification for Geophysical Survey*, unpublished specification, for South Ribble Borough Council

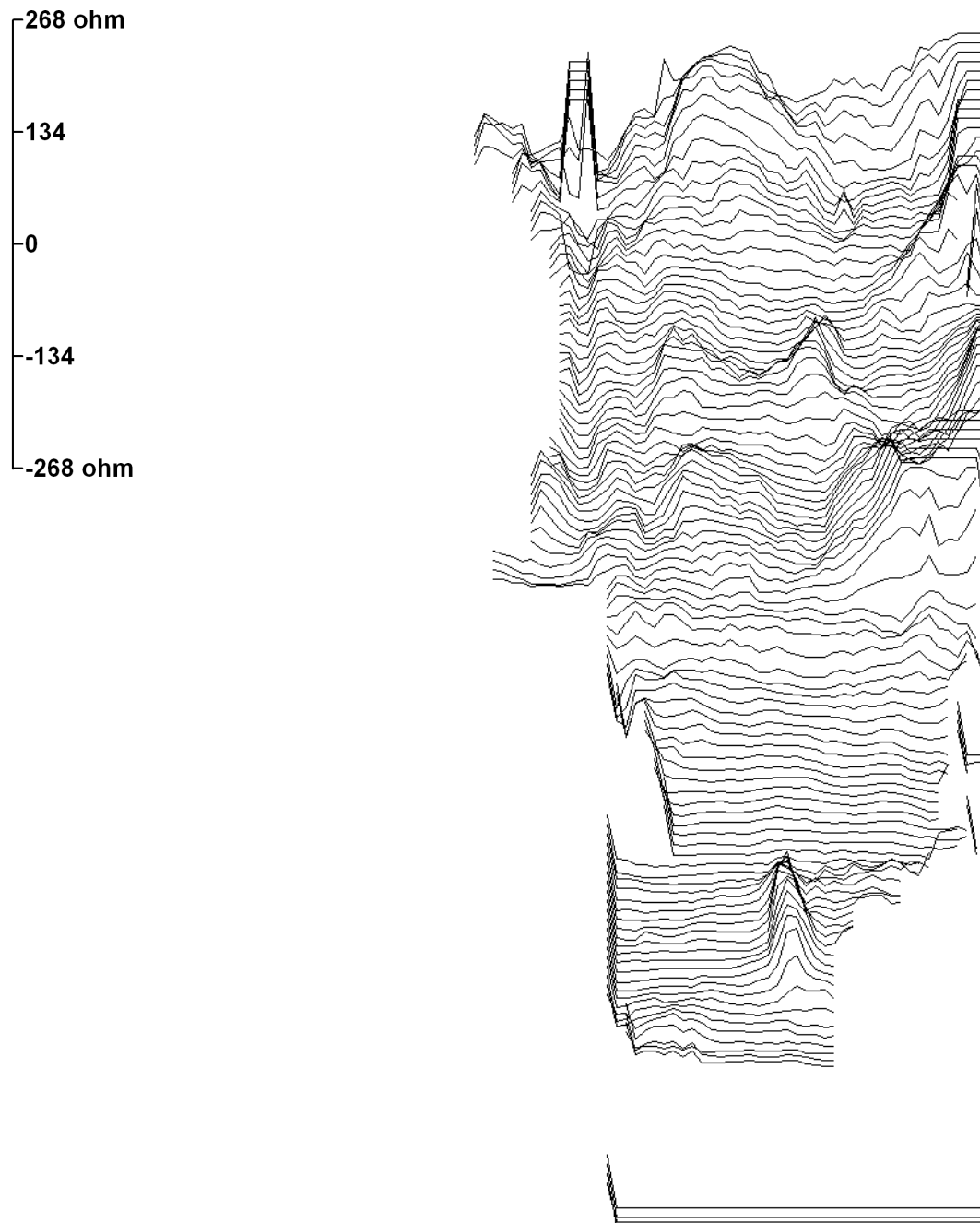
## **APPENDIX I – ILLUSTRATIONS**



## APPENDIX II – TRACE PLOTS

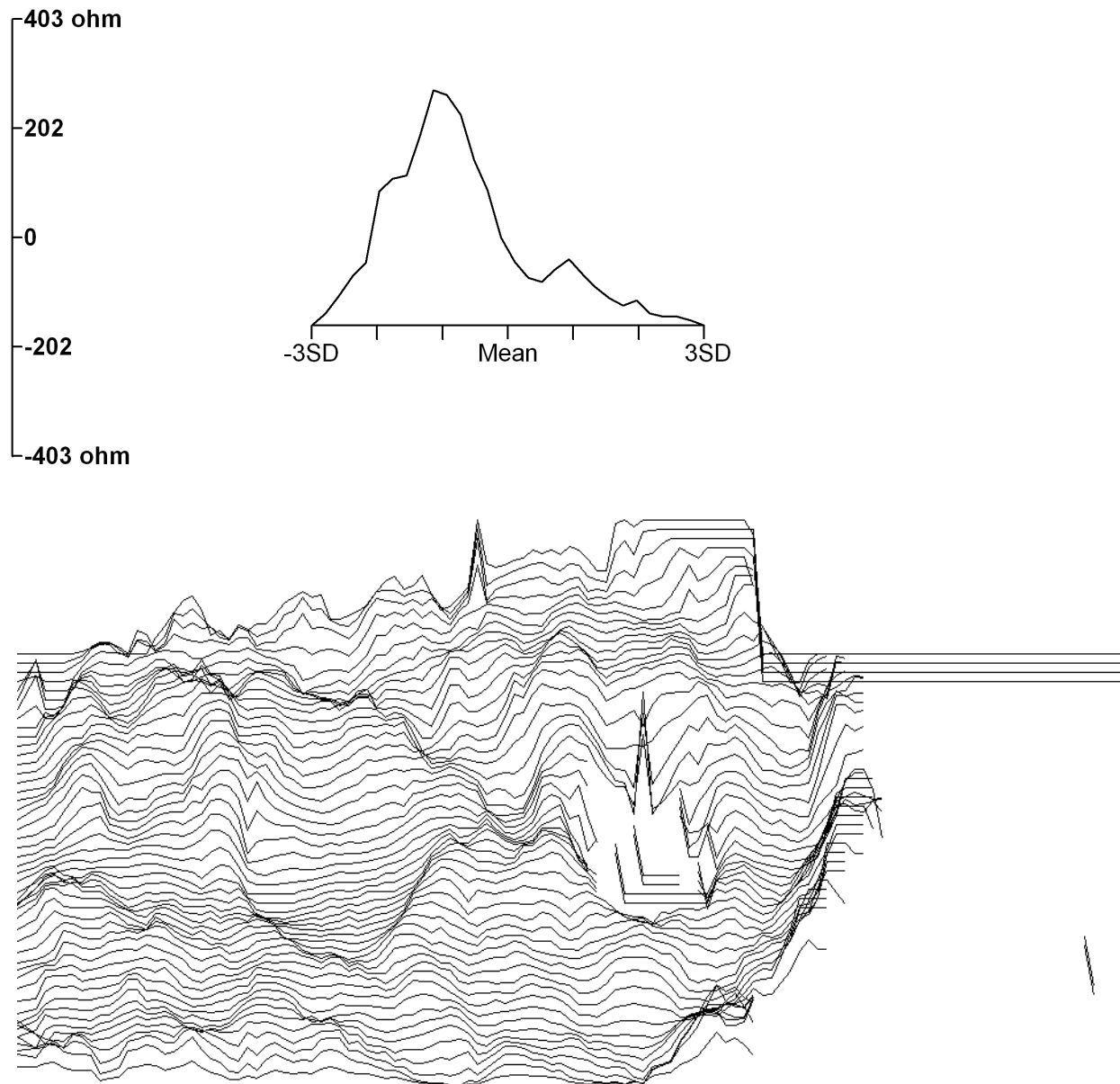
### Worden Park

#### Area 1



## Worden Park

### Area 2



## **GEOPHYSICAL SURVEYS OF LAND AT WORDEN PARK, LEYLAND**

*on behalf of*

**SCOTT WILSON LTD**



NGR SD 5373 2084

OASIS ID: northpen3-41348

Martin Railton BA (Hons), MA AIFA  
North Pennines Archaeology Ltd  
Nenthead Mines Heritage Centre  
Nenthead  
Alston  
Cumbria CA9 3PD  
Tel: (01434) 382045  
Fax: (01434) 382294  
Mobile: 07979617882  
Email: m.railton@nparchaeology.co.uk



North Pennines Archaeology Ltd is a wholly owned company of North Pennines Heritage Trust

## CONTENTS

### Page

List of Figures.....	ii
Non-Technical Summary.....	iii
<b>1 INTRODUCTION (<i>FIGURE 1</i>) .....</b>	<b>1</b>
<b>2 METHODOLOGY.....</b>	<b>2</b>
2.1 Standards.....	2
2.2 Technique Selection.....	2
2.3 Field Methods .....	2
2.4 Data Processing.....	2
2.5 Interpretation.....	3
2.6 Presentation.....	3
2.7 Project Archive .....	3
<b>3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....</b>	<b>4</b>
3.1 Historical Background .....	4
3.2 Previous Archaeological Works.....	5
<b>4 SURVEY RESULTS (<i>FIGURES 2-4</i>) .....</b>	<b>6</b>
4.1 Introduction (Figure 2).....	6
4.2 Area A (Figures 3&4) .....	6
4.3 Area B (Figures 3&4).....	6
<b>5 CONCLUSIONS .....</b>	<b>7</b>
<b>6 ACKNOWLEDGEMENTS.....</b>	<b>8</b>
<b>7 BIBLIOGRAPHY .....</b>	<b>8</b>
<b>APPENDIX I – ILLUSTRATIONS.....</b>	<b>9</b>
<b>APPENDIX II – TRACE PLOTS.....</b>	<b>10</b>

## LIST OF FIGURES

Figure 1: Location of the geophysical survey areas .....	Appendix I
Figure 2: Geophysical surveys .....	Appendix I
Figure 3: Geophysical interpretation.....	Appendix I
Figure 4: Archaeological interpretation .....	Appendix I

## SUMMARY

In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland, centred on Ordnance Survey grid reference NZ 3879 1396. The surveys were designed to target the site of the former Worden Hall (Area A), and a *parterre* garden to the south (Area B).

Worden Park is Grade II listed on the English Heritage Register of Parks and Gardens. Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family between 1717 and 1946. During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. Worden hall was extensively damaged by fire in April 1941, and was demolished in the 1960's.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies in the study area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the surveys may be used to inform the creation of a ground plan to mark the site of the former Worden Hall, as part of a development plan for Worden Park.

Earth resistance surveys were conducted over two areas within Worden Park. The external walls of the former hall were detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, were indicated by the geophysical survey. The remains of a smaller building were also detected on the north side of Area A, which corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850). No certain formal garden features, or other archaeological remains, have been detected in Area B.

## **1 INTRODUCTION (*Figure 1*)**

- 1.1 In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland. The work was conducted in accordance with a Specification for Geophysical Survey, produced by Scott Wilson Ltd (Scott Wilson 2008), and the relevant English Heritage and IFA guidelines.
- 1.2 Worden Park is located *c.*2km west of Leyland, and comprises approximately 62ha of public parkland, associated with the site of the former Worden Hall. The park is bounded by Shaw Brook to the south, Worden Lane to the east, and Parkgate Drive to the north (Figure 1). Worden Hall was located on the south side of the park, centred on Ordnance Survey grid reference SD 5373 2084.
- 1.3 Worden Park is South Ribble's largest park, and is Grade II listed on the English Heritage Register of Parks and Gardens. A conservation and development plan for the park is being implemented by South Ribble Borough Council. This will include the restoration of aspects of the historic park, and possibly the creation of a ground plan to mark the site of the former Worden Hall.
- 1.5 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site of Worden Hall, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to provide information on the layout of the former Worden Hall and gardens.
- 1.6 The geophysical surveys were conducted by Kevin Mounsey and Martin Railton on 21<sup>st</sup> April 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton between 22<sup>nd</sup> April and 25<sup>th</sup> April 2008.

## **2 METHODOLOGY**

### *2.1 Standards*

- 2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 1995), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

### *2.2 Technique Selection*

- 2.2.1 Earth resistance survey was selected as the most appropriate technique, given the expected presence of cut archaeological features and stone structures at depths of no more than *c.* 1m.
- 2.2.2 This technique involved the use of a Resistance Meter with twin probes set 0.5m apart. When a small electric current is injected into the ground it encounters sub-surface resistance, which is measured. This resistance relates to the ability of the soil to retain moisture and can correspond to the location of cut archaeological features or buried stone walls etc.

### *2.3 Field Methods*

- 2.3.1 The study area was located in the gardens of Worden Park on two areas of lawn, subdivided by a yew hedge, and paths. Two areas were surveyed (Areas A & B) to target the site of the former Worden Hall and associated gardens to the south. A 20m grid was established in each area, and tied-in to known mapped Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.
- 2.3.2 Measurements of earth resistance were determined using a Geoscan RM15 Resistance Meter and MPX15 Multiplexor, with two parallel pairs of probes set 0.5m apart. It was expected that significant archaeological features at a depth of up to *c.* 1m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 20m grid units. A sample interval of 0.5m was used, with a traverse interval of 1m, providing 800 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

### *2.4 Data Processing*

- 2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Areas of anomalously high resistance are displayed as dark grey, and areas of anomalously low resistance are displayed as light grey. Palette bars show the relationship between the grey shades and earth resistance values in ohms for each area.
- 2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random extreme readings in the resistance data

*Clip:* to clip data to specified maximum and minimum values, in order to limit extreme readings in the resistance data

*Interpolate:* to double the number of values in the traverse direction to match the sample interval



## 2.5 *Interpretation*

### 2.5.1 Two types of geophysical anomaly were detected in the earth resistance data:

*high resistance:* regions of anomalously high resistance, which may be associated with the presence of stone-built features, geological features or sub-surface voids.

*low resistance:* regions of anomalously low resistance, which may be associated with cut features which contain a higher moisture content than the surrounding material, such as pits or ditches

## 2.6 *Presentation*

2.6.1 The grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey plans. Colour-coded geophysical interpretation diagrams are provided, showing the locations and extent of areas of anomalously high and low resistance.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 Trace plots of the unprocessed geophysical data are included in Appendix II.

## 2.7 *Project Archive*

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

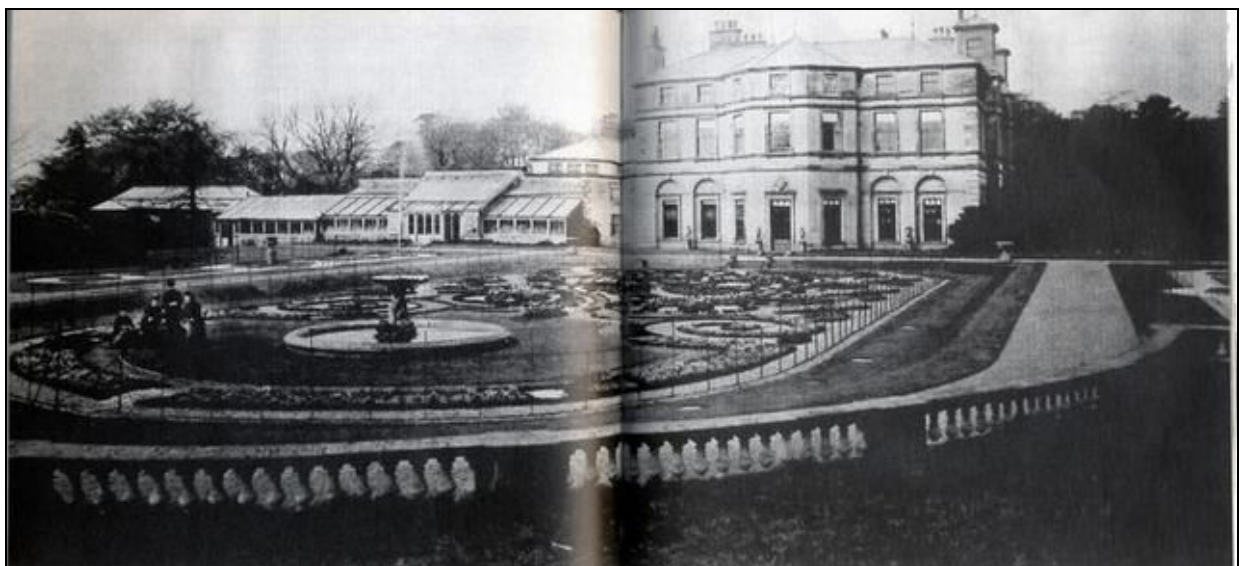
2.7.2 One copy of the survey report will be deposited with the County Historic Environment, where viewing will be available on request.

2.7.3 The project is also registered with the **Online Access to the Index of archaeological investigations (OASIS)**. The OASIS reference for this project is **northpen3-41348**.

### 3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 3.1 *Historical Background*

- 3.1.1 Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family from 1717 ([www.british-history.ac.uk](http://www.british-history.ac.uk)). The original family home was at Worden (Old) Hall, but the estate transferred to Shaw Hall, when the Ffaringtons of Worden (Old) Hall died without descendents.
- 3.1.2 During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. William Ffarington also added a new wing to the hall in the 18<sup>th</sup> century, and created a number of new features in the park.
- 3.1.3 The 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850) shows the Shaw Hall to the south with further ranges of buildings to the north, surrounded by parkland. The hall was largely rebuilt by Anthony Salvin after 1842 for James Nowell Farington ([www.british-history.ac.uk](http://www.british-history.ac.uk)), and comprised a square main hall, with a main entrance and turning circle at the east side (Plate 2).
- 3.1.4 During the 19<sup>th</sup> century the grounds were landscaped by Salvin's brother-in-law William Andrew Nesfield. This included the creation of a maze and *parterre* garden. James Nowell Farington also changed the name of Shaw Hall to Worden Hall at this time (Plate 1).
- 3.1.5 Worden hall was extensively damaged by fire in April 1941. Following the death of the last squire in 1946, the fixtures and fittings were sold off. Leyland Urban District Council brought Worden Park and opened it to the public on June 18th 1951 ([www.houghton59.fsnet.co.uk](http://www.houghton59.fsnet.co.uk)).
- 3.1.6 The main hall was eventually demolished in the early 1960's, the only surviving part of the original hall being the Derby Wing, which is also believed to be one of the oldest parts of the building.



**Plate 1:** The south elevation of the former Worden Hall, showing *parterre* garden with working fountain



**Plate 2:** The east elevation and entrance of the former Worden Hall

### 3.2 *Previous Archaeological Works*

3.2.1 No known previous archaeological investigations have taken place in Worden Park.



**Plate 3:** Area A, the site of the former Worden Hall (looking south)



**Plate 4:** Area B, part of the *parterre* garden with redundant fountain, looking north towards the site of the former Worden Hall

## **4 SURVEY RESULTS (Figures 2-4)**

### **4.1 Introduction (Figure 2)**

- 4.1.1 The locations of the individual geophysical survey areas were designed by Scott Wilson Ltd, to target the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 4.1.2 Area A comprised an area of lawn, to the east of the existing hall buildings, bounded by a mature yew hedge to the south, and a car park to the north, with shrubs and gardens to the west (Plate 3). Area B was located within the *parterre* garden, and comprised an area of lawn, bounded by banks and gravel paths, with the remain of a fountain at the south end (Plate 4).

### **4.2 Area A (Figures 3&4)**

- 4.2.1 The survey of Area A was hindered by the presence of mature shrubs, including dense rhododendrons on the east side of this area. A number of trees were also located in Area A, the roots of which had an influence on the results of the survey. A discrete area of anomalously high resistance, with a corresponding area of anomalously low resistance was detected on the southern corner of this area, and was due to the presence of tree roots. A low resistance linear feature was detected on the northern edge of Area A, and was due to the presence of the adjacent car park.
- 4.2.2 Irregular areas of anomalously high resistance were detected along the southwest and northwest sides of Area A, which may indicate the presence of sub-surface deposits of stone rubble or wall foundations. On the south side of Area A, a 50m by 37m rectangular area of high resistance was detected, which corresponded to the location of the former Worden Hall. Variations in resistance within this area could be indicative of internal divisions or floors within the main hall. This area was bounded on the southeast and northeast sides by two low resistance linear features, interpreted as the foundation cuts of exterior walls.
- 4.2.3 A 17m-long 16m-wide rectangular area of high resistance was detected on the north side of Area A, which may indicate the location of a smaller building. An area of anomalously high resistance was detected on the southeast side of this area, which may indicate the presence of a deposit of stone rubble or a wall foundation.

### **4.3 Area B (Figures 3&4)**

- 4.3.1 Area B was a sunken lawn, bounded by steep banks, which produced areas of anomalously high resistance along the southern edge of this area. The remains of a fountain at the south end of Area B had to be excluded from the survey. A metal drain cover on the southeast side of the fountain produced a high resistance response, and corresponding areas of low resistance.
- 4.3.2 Irregular areas of anomalously high resistance and low resistance were detected over the majority of Area B. Whilst these anomalies may be indicative of ground disturbance through gardening activity, no formal garden features were detected in this area.

## 5 CONCLUSIONS

- 5.1 Earth resistance surveys, covering 0.2ha of land in total, have been conducted over two areas in Worden Park, targeting the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 5.2 The external walls of the former hall have been detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, have been indicated by the geophysical survey. The remains of a smaller building have been also detected on the north side of Area A. This corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850).
- 5.3 No certain formal garden features, or other archaeological remains have been detected in Area B. As this survey was located within a sunken area, it is possible that the variations detected by the geophysical survey in Area B are geological in nature.
- 5.4 The results of the survey have helped to locate the exterior hall walls, and will inform the creation of a ground plan to mark the site of the former Worden Hall. However, it is possible that additional geophysical survey could provide further information, and help clarify the internal layout of the former hall. This could take the form of further high resolution earth resistance survey, or survey using ground penetrating radar.

## **6 ACKNOWLEDGEMENTS**

North Pennines Archaeology is grateful to Laura Broughton of Scott Wilson Ltd, for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of Scott Wilson Ltd.

## **7 BIBLIOGRAPHY**

Archaeology Data Service, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Arts and Humanities Data Service

English Heritage, 1995 *Geophysical survey in field evaluation*, Research and Professional Services Guideline No.1, London

Institute of Field Archaeologists, 2002 *The use of geophysical techniques in archaeological evaluations*, Paper No.6, IFA, Birmingham

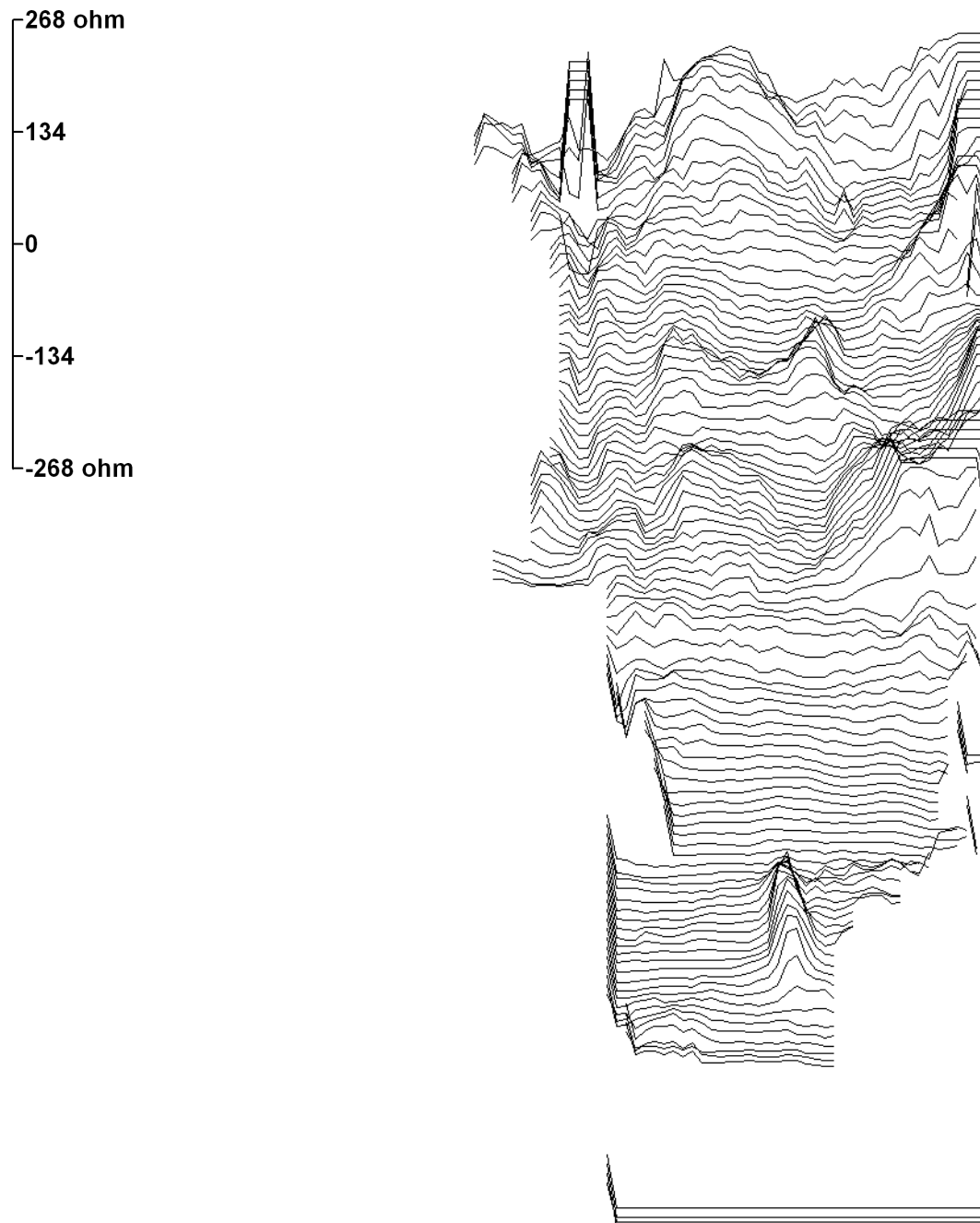
Scott Wilson, 2008 *Worden Park, Leyland: Specification for Geophysical Survey*, unpublished specification, for South Ribble Borough Council

## **APPENDIX I – ILLUSTRATIONS**

## APPENDIX II – TRACE PLOTS

### Worden Park

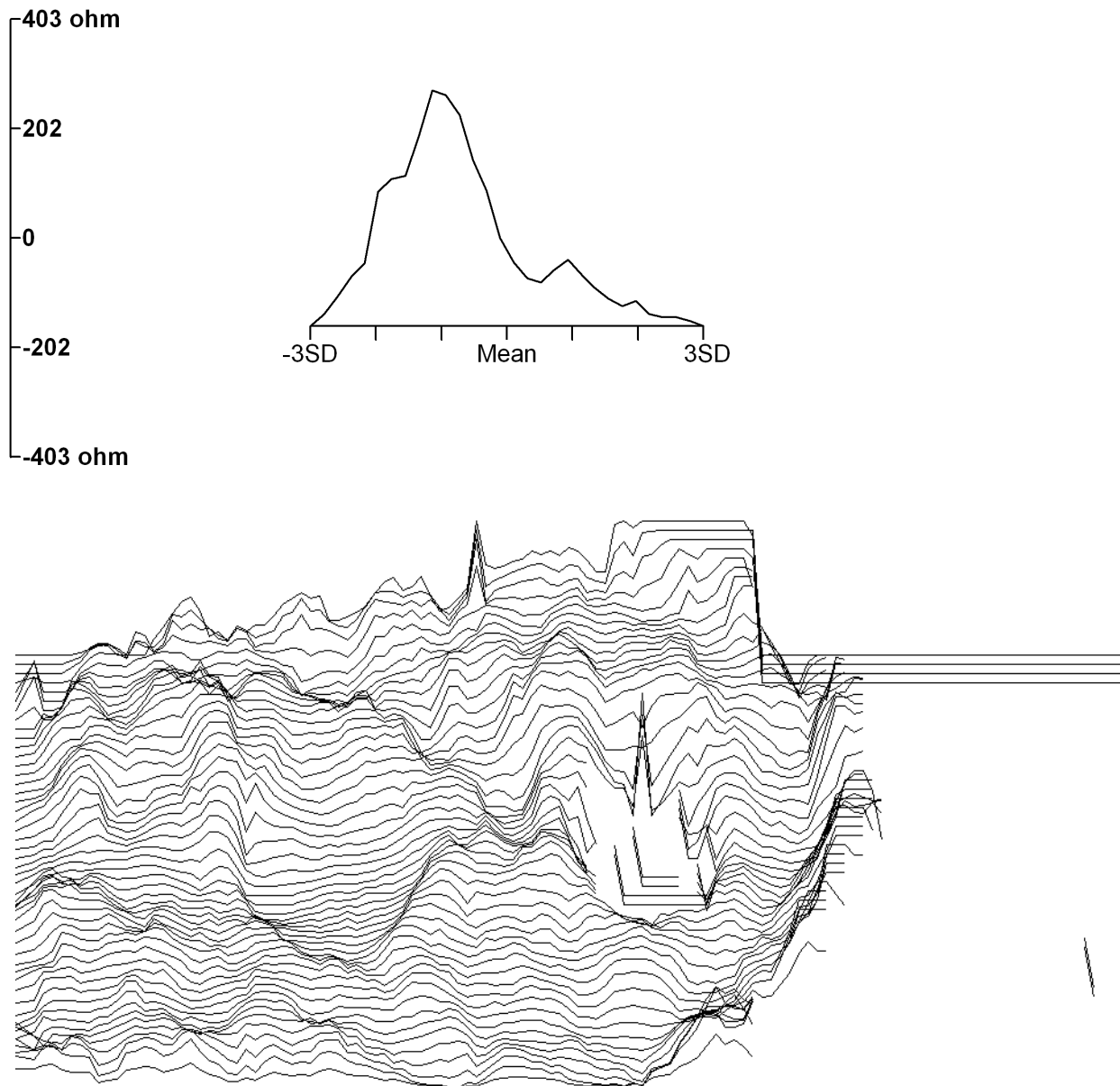
#### Area 1





## Worden Park

### Area 2



## **GEOPHYSICAL SURVEYS OF LAND AT WORDEN PARK, LEYLAND**

*on behalf of*

**SCOTT WILSON LTD**



NGR SD 5373 2084

OASIS ID: northpen3-41348

Martin Railton BA (Hons), MA AIFA  
North Pennines Archaeology Ltd  
Nenthead Mines Heritage Centre  
Nenthead  
Alston  
Cumbria CA9 3PD  
Tel: (01434) 382045  
Fax: (01434) 382294  
Mobile: 07979617882  
Email: m.railton@nparchaeology.co.uk



North Pennines Archaeology Ltd is a wholly owned company of North Pennines Heritage Trust

Company Registration No. 4847034

VAT Registration No. 817 2284 31

## CONTENTS

### Page

List of Figures.....	ii
Non-Technical Summary.....	iii
<b>1 INTRODUCTION (<i>FIGURE 1</i>) .....</b>	<b>1</b>
<b>2 METHODOLOGY.....</b>	<b>2</b>
2.1 Standards.....	2
2.2 Technique Selection.....	2
2.3 Field Methods .....	2
2.4 Data Processing.....	2
2.5 Interpretation.....	3
2.6 Presentation.....	3
2.7 Project Archive .....	3
<b>3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....</b>	<b>4</b>
3.1 Historical Background .....	4
3.2 Previous Archaeological Works.....	5
<b>4 SURVEY RESULTS (<i>FIGURES 2-4</i>) .....</b>	<b>6</b>
4.1 Introduction (Figure 2).....	6
4.2 Area A (Figures 3&4) .....	6
4.3 Area B (Figures 3&4).....	6
<b>5 CONCLUSIONS .....</b>	<b>7</b>
<b>6 ACKNOWLEDGEMENTS.....</b>	<b>8</b>
<b>7 BIBLIOGRAPHY .....</b>	<b>8</b>
<b>APPENDIX I – ILLUSTRATIONS.....</b>	<b>9</b>
<b>APPENDIX II – TRACE PLOTS.....</b>	<b>10</b>

## LIST OF FIGURES

Figure 1: Location of the geophysical survey areas .....	Appendix I
Figure 2: Geophysical surveys .....	Appendix I
Figure 3: Geophysical interpretation.....	Appendix I
Figure 4: Archaeological interpretation .....	Appendix I

## SUMMARY

In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland, centred on Ordnance Survey grid reference NZ 3879 1396. The surveys were designed to target the site of the former Worden Hall (Area A), and a *parterre* garden to the south (Area B).

Worden Park is Grade II listed on the English Heritage Register of Parks and Gardens. Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family between 1717 and 1946. During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. Worden hall was extensively damaged by fire in April 1941, and was demolished in the 1960's.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies in the study area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the surveys may be used to inform the creation of a ground plan to mark the site of the former Worden Hall, as part of a development plan for Worden Park.

Earth resistance surveys were conducted over two areas within Worden Park. The external walls of the former hall were detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, were indicated by the geophysical survey. The remains of a smaller building were also detected on the north side of Area A, which corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850). No certain formal garden features, or other archaeological remains, have been detected in Area B.

## **1 INTRODUCTION (*Figure 1*)**

- 1.1 In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland. The work was conducted in accordance with a Specification for Geophysical Survey, produced by Scott Wilson Ltd (Scott Wilson 2008), and the relevant English Heritage and IFA guidelines.
- 1.2 Worden Park is located c.2km west of Leyland, and comprises approximately 62ha of public parkland, associated with the site of the former Worden Hall. The park is bounded by Shaw Brook to the south, Worden Lane to the east, and Parkgate Drive to the north (Figure 1). Worden Hall was located on the south side of the park, centred on Ordnance Survey grid reference SD 5373 2084.
- 1.3 Worden Park is South Ribble's largest park, and is Grade II listed on the English Heritage Register of Parks and Gardens. A conservation and development plan for the park is being implemented by South Ribble Borough Council. This will include the restoration of aspects of the historic park, and possibly the creation of a ground plan to mark the site of the former Worden Hall.
- 1.5 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site of Worden Hall, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to provide information on the layout of the former Worden Hall and gardens.
- 1.6 The geophysical surveys were conducted by Kevin Mounsey and Martin Railton on 21<sup>st</sup> April 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton between 22<sup>nd</sup> April and 25<sup>th</sup> April 2008.

## **2 METHODOLOGY**

### *2.1 Standards*

- 2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 1995), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

### *2.2 Technique Selection*

- 2.2.1 Earth resistance survey was selected as the most appropriate technique, given the expected presence of cut archaeological features and stone structures at depths of no more than *c.* 1m.
- 2.2.2 This technique involved the use of a Resistance Meter with twin probes set 0.5m apart. When a small electric current is injected into the ground it encounters sub-surface resistance, which is measured. This resistance relates to the ability of the soil to retain moisture and can correspond to the location of cut archaeological features or buried stone walls etc.

### *2.3 Field Methods*

- 2.3.1 The study area was located in the gardens of Worden Park on two areas of lawn, subdivided by a yew hedge, and paths. Two areas were surveyed (Areas A & B) to target the site of the former Worden Hall and associated gardens to the south. A 20m grid was established in each area, and tied-in to known mapped Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.
- 2.3.2 Measurements of earth resistance were determined using a Geoscan RM15 Resistance Meter and MPX15 Multiplexor, with two parallel pairs of probes set 0.5m apart. It was expected that significant archaeological features at a depth of up to *c.* 1m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 20m grid units. A sample interval of 0.5m was used, with a traverse interval of 1m, providing 800 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

### *2.4 Data Processing*

- 2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Areas of anomalously high resistance are displayed as dark grey, and areas of anomalously low resistance are displayed as light grey. Palette bars show the relationship between the grey shades and earth resistance values in ohms for each area.
- 2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random extreme readings in the resistance data

*Clip:* to clip data to specified maximum and minimum values, in order to limit extreme readings in the resistance data

*Interpolate:* to double the number of values in the traverse direction to match the sample interval

## 2.5 *Interpretation*

### 2.5.1 Two types of geophysical anomaly were detected in the earth resistance data:

*high resistance:* regions of anomalously high resistance, which may be associated with the presence of stone-built features, geological features or sub-surface voids.

*low resistance:* regions of anomalously low resistance, which may be associated with cut features which contain a higher moisture content than the surrounding material, such as pits or ditches

## 2.6 *Presentation*

2.6.1 The grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey plans. Colour-coded geophysical interpretation diagrams are provided, showing the locations and extent of areas of anomalously high and low resistance.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 Trace plots of the unprocessed geophysical data are included in Appendix II.

## 2.7 *Project Archive*

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

2.7.2 One copy of the survey report will be deposited with the County Historic Environment, where viewing will be available on request.

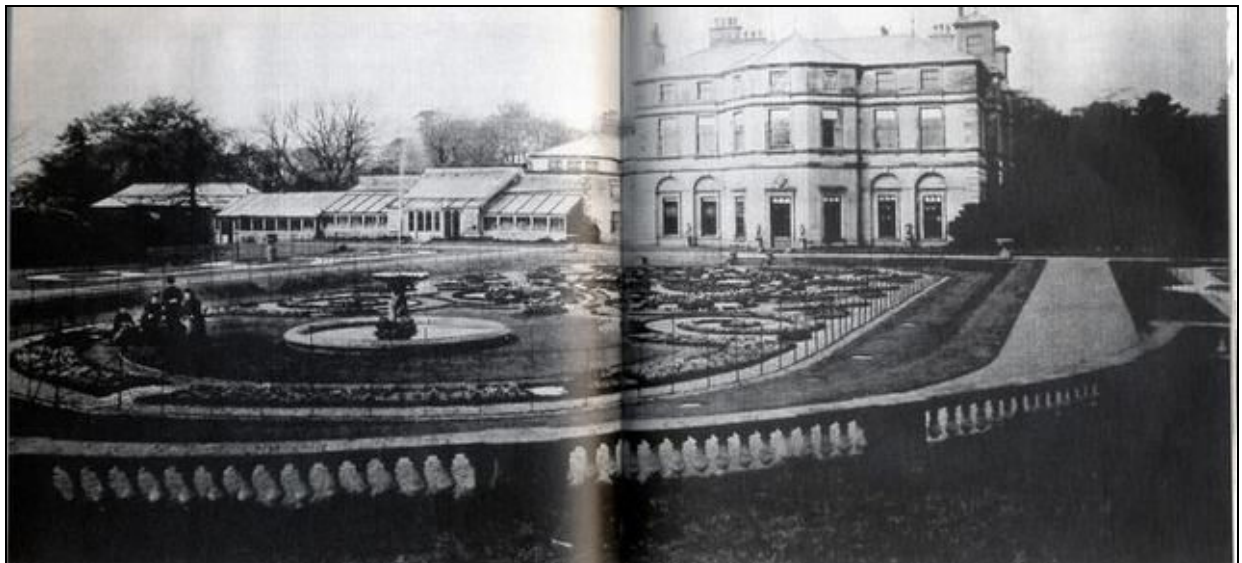
2.7.3 The project is also registered with the **Online Access to the Index of archaeological investigationS (OASIS)**. The OASIS reference for this project is **northpen3-41348**.



### 3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 3.1 *Historical Background*

- 3.1.1 Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family from 1717 ([www.british-history.ac.uk](http://www.british-history.ac.uk)). The original family home was at Worden (Old) Hall, but the estate transferred to Shaw Hall, when the Ffaringtons of Worden (Old) Hall died without descendents.
- 3.1.2 During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. William Ffarington also added a new wing to the hall in the 18<sup>th</sup> century, and created a number of new features in the park.
- 3.1.3 The 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850) shows the Shaw Hall to the south with further ranges of buildings to the north, surrounded by parkland. The hall was largely rebuilt by Anthony Salvin after 1842 for James Nowell Farington ([www.british-history.ac.uk](http://www.british-history.ac.uk)), and comprised a square main hall, with a main entrance and turning circle at the east side (Plate 2).
- 3.1.4 During the 19<sup>th</sup> century the grounds were landscaped by Salvin's brother-in-law William Andrew Nesfield. This included the creation of a maze and *parterre* garden. James Nowell Farington also changed the name of Shaw Hall to Worden Hall at this time (Plate 1).
- 3.1.5 Worden hall was extensively damaged by fire in April 1941. Following the death of the last squire in 1946, the fixtures and fittings were sold off. Leyland Urban District Council brought Worden Park and opened it to the public on June 18th 1951 ([www.houghton59.fsnet.co.uk](http://www.houghton59.fsnet.co.uk)).
- 3.1.6 The main hall was eventually demolished in the early 1960's, the only surviving part of the original hall being the Derby Wing, which is also believed to be one of the oldest parts of the building.



**Plate 1:** The south elevation of the former Worden Hall, showing *parterre* garden with working fountain



**Plate 2:** The east elevation and entrance of the former Worden Hall

### 3.2 *Previous Archaeological Works*

3.2.1 No known previous archaeological investigations have taken place in Worden Park.



**Plate 3:** Area A, the site of the former Worden Hall (looking south)



**Plate 4:** Area B, part of the *parterre* garden with redundant fountain, looking north towards the site of the former Worden Hall

## 4 SURVEY RESULTS (*Figures 2-4*)

### 4.1 *Introduction (Figure 2)*

- 4.1.1 The locations of the individual geophysical survey areas were designed by Scott Wilson Ltd, to target the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 4.1.2 Area A comprised an area of lawn, to the east of the existing hall buildings, bounded by a mature yew hedge to the south, and a car park to the north, with shrubs and gardens to the west (Plate 3). Area B was located within the *parterre* garden, and comprised an area of lawn, bounded by banks and gravel paths, with the remain of a fountain at the south end (Plate 4).

### 4.2 *Area A (Figures 3&4)*

- 4.2.1 The survey of Area A was hindered by the presence of mature shrubs, including dense rhododendrons on the east side of this area. A number of trees were also located in Area A, the roots of which had an influence on the results of the survey. A discrete area of anomalously high resistance, with a corresponding area of anomalously low resistance was detected on the southern corner of this area, and was due to the presence of tree roots. A low resistance linear feature was detected on the northern edge of Area A, and was due to the presence of the adjacent car park.
- 4.2.2 Irregular areas of anomalously high resistance were detected along the southwest and northwest sides of Area A, which may indicate the presence of sub-surface deposits of stone rubble or wall foundations. On the south side of Area A, a 50m by 37m rectangular area of high resistance was detected, which corresponded to the location of the former Worden Hall. Variations in resistance within this area could be indicative of internal divisions or floors within the main hall. This area was bounded on the southeast and northeast sides by two low resistance linear features, interpreted as the foundation cuts of exterior walls.
- 4.2.3 A 17m-long 16m-wide rectangular area of high resistance was detected on the north side of Area A, which may indicate the location of a smaller building. An area of anomalously high resistance was detected on the southeast side of this area, which may indicate the presence of a deposit of stone rubble or a wall foundation.

### 4.3 *Area B (Figures 3&4)*

- 4.3.1 Area B was a sunken lawn, bounded by steep banks, which produced areas of anomalously high resistance along the southern edge of this area. The remains of a fountain at the south end of Area B had to be excluded from the survey. A metal drain cover on the southeast side of the fountain produced a high resistance response, and corresponding areas of low resistance.
- 4.3.2 Irregular areas of anomalously high resistance and low resistance were detected over the majority of Area B. Whilst these anomalies may be indicative of ground disturbance through gardening activity, no formal garden features were detected in this area.

## 5 CONCLUSIONS

- 5.1 Earth resistance surveys, covering 0.2ha of land in total, have been conducted over two areas in Worden Park, targeting the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 5.2 The external walls of the former hall have been detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, have been indicated by the geophysical survey. The remains of a smaller building have been also detected on the north side of Area A. This corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850).
- 5.3 No certain formal garden features, or other archaeological remains have been detected in Area B. As this survey was located within a sunken area, it is possible that the variations detected by the geophysical survey in Area B are geological in nature.
- 5.4 The results of the survey have helped to locate the exterior hall walls, and will inform the creation of a ground plan to mark the site of the former Worden Hall. However, it is possible that additional geophysical survey could provide further information, and help clarify the internal layout of the former hall. This could take the form of further high resolution earth resistance survey, or survey using ground penetrating radar.

## **6 ACKNOWLEDGEMENTS**

North Pennines Archaeology is grateful to Laura Broughton of Scott Wilson Ltd, for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of Scott Wilson Ltd.

## **7 BIBLIOGRAPHY**

Archaeology Data Service, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Arts and Humanities Data Service

English Heritage, 1995 *Geophysical survey in field evaluation*, Research and Professional Services Guideline No.1, London

Institute of Field Archaeologists, 2002 *The use of geophysical techniques in archaeological evaluations*, Paper No.6, IFA, Birmingham

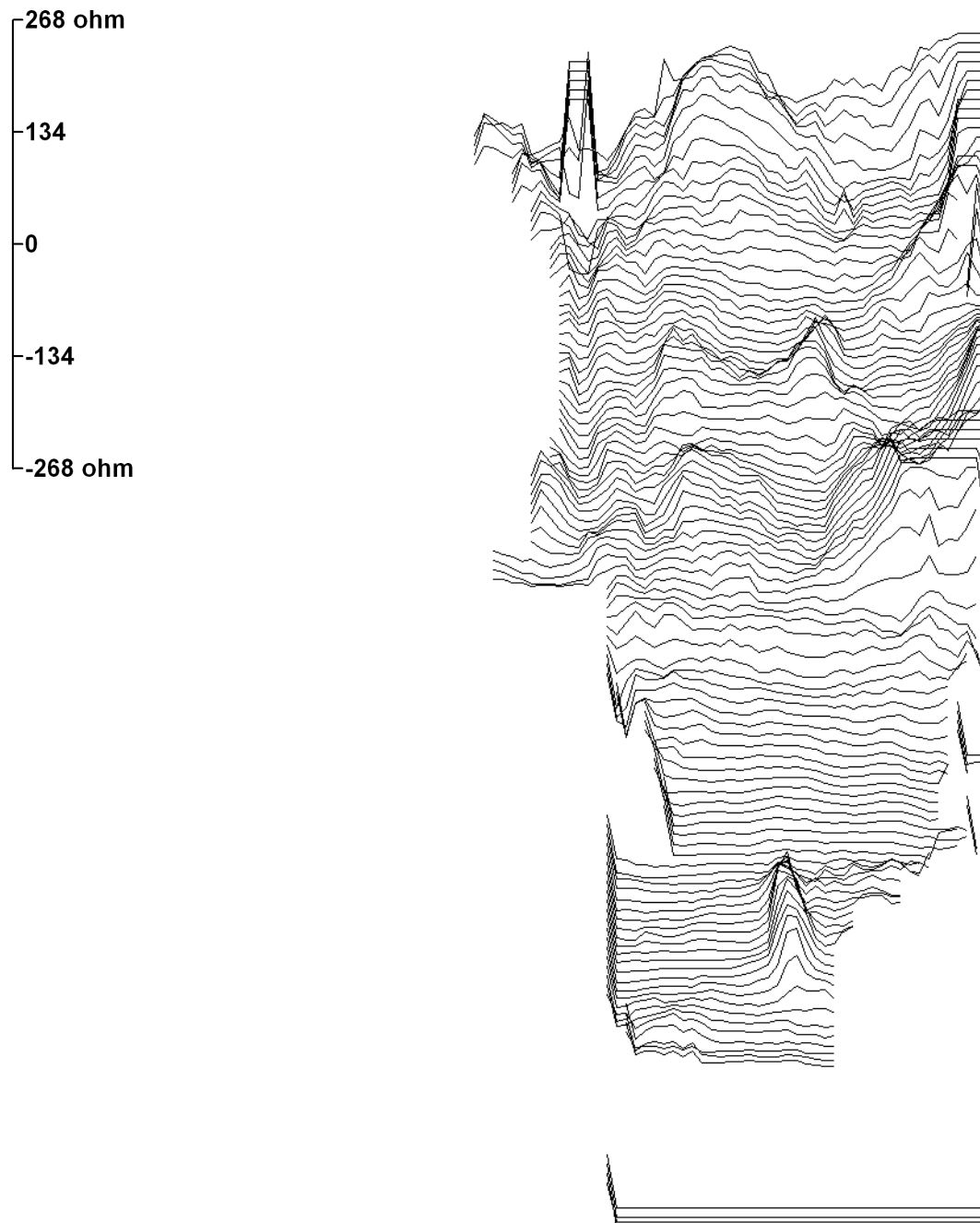
Scott Wilson, 2008 *Worden Park, Leyland: Specification for Geophysical Survey*, unpublished specification, for South Ribble Borough Council

## **APPENDIX I – ILLUSTRATIONS**

## APPENDIX II – TRACE PLOTS

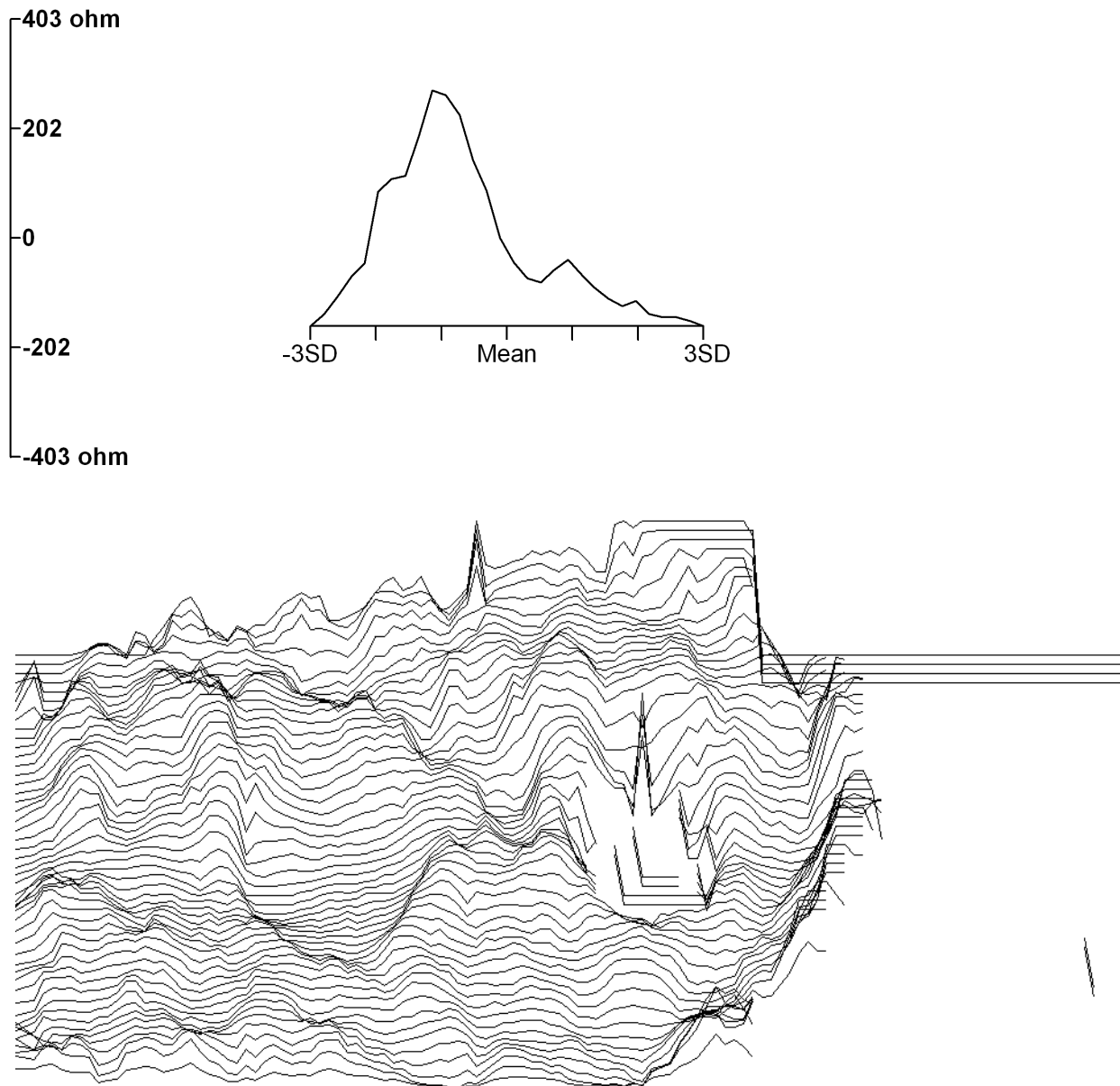
### Worden Park

#### Area 1



## Worden Park

### Area 2





## **GEOPHYSICAL SURVEYS OF LAND AT WORDEN PARK, LEYLAND**

*on behalf of*

**SCOTT WILSON LTD**



NGR SD 5373 2084

OASIS ID: northpen3-41348

Martin Railton BA (Hons), MA AIFA  
North Pennines Archaeology Ltd  
Nenthead Mines Heritage Centre  
Nenthead  
Alston  
Cumbria CA9 3PD  
Tel: (01434) 382045  
Fax: (01434) 382294  
Mobile: 07979617882  
Email: m.railton@nparchaeology.co.uk



North Pennines Archaeology Ltd is a wholly owned company of North Pennines Heritage Trust

Company Registration No. 4847034

VAT Registration No. 817 2284 31

## CONTENTS

### Page

List of Figures.....	ii
Non-Technical Summary.....	iii
<b>1 INTRODUCTION (<i>FIGURE 1</i>) .....</b>	<b>1</b>
<b>2 METHODOLOGY.....</b>	<b>2</b>
2.1 Standards.....	2
2.2 Technique Selection.....	2
2.3 Field Methods .....	2
2.4 Data Processing.....	2
2.5 Interpretation.....	3
2.6 Presentation.....	3
2.7 Project Archive .....	3
<b>3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....</b>	<b>4</b>
3.1 Historical Background .....	4
3.2 Previous Archaeological Works.....	5
<b>4 SURVEY RESULTS (<i>FIGURES 2-4</i>) .....</b>	<b>6</b>
4.1 Introduction (Figure 2).....	6
4.2 Area A (Figures 3&4) .....	6
4.3 Area B (Figures 3&4).....	6
<b>5 CONCLUSIONS .....</b>	<b>7</b>
<b>6 ACKNOWLEDGEMENTS.....</b>	<b>8</b>
<b>7 BIBLIOGRAPHY .....</b>	<b>8</b>
<b>APPENDIX I – ILLUSTRATIONS.....</b>	<b>9</b>
<b>APPENDIX II – TRACE PLOTS.....</b>	<b>10</b>

## LIST OF FIGURES

Figure 1: Location of the geophysical survey areas .....	Appendix I
Figure 2: Geophysical surveys .....	Appendix I
Figure 3: Geophysical interpretation.....	Appendix I
Figure 4: Archaeological interpretation .....	Appendix I

## SUMMARY

In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland, centred on Ordnance Survey grid reference NZ 3879 1396. The surveys were designed to target the site of the former Worden Hall (Area A), and a *parterre* garden to the south (Area B).

Worden Park is Grade II listed on the English Heritage Register of Parks and Gardens. Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family between 1717 and 1946. During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. Worden hall was extensively damaged by fire in April 1941, and was demolished in the 1960's.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies in the study area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the surveys may be used to inform the creation of a ground plan to mark the site of the former Worden Hall, as part of a development plan for Worden Park.

Earth resistance surveys were conducted over two areas within Worden Park. The external walls of the former hall were detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, were indicated by the geophysical survey. The remains of a smaller building were also detected on the north side of Area A, which corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850). No certain formal garden features, or other archaeological remains, have been detected in Area B.

## **1 INTRODUCTION (*Figure 1*)**

- 1.1 In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland. The work was conducted in accordance with a Specification for Geophysical Survey, produced by Scott Wilson Ltd (Scott Wilson 2008), and the relevant English Heritage and IFA guidelines.
- 1.2 Worden Park is located c.2km west of Leyland, and comprises approximately 62ha of public parkland, associated with the site of the former Worden Hall. The park is bounded by Shaw Brook to the south, Worden Lane to the east, and Parkgate Drive to the north (Figure 1). Worden Hall was located on the south side of the park, centred on Ordnance Survey grid reference SD 5373 2084.
- 1.3 Worden Park is South Ribble's largest park, and is Grade II listed on the English Heritage Register of Parks and Gardens. A conservation and development plan for the park is being implemented by South Ribble Borough Council. This will include the restoration of aspects of the historic park, and possibly the creation of a ground plan to mark the site of the former Worden Hall.
- 1.5 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site of Worden Hall, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to provide information on the layout of the former Worden Hall and gardens.
- 1.6 The geophysical surveys were conducted by Kevin Mounsey and Martin Railton on 21<sup>st</sup> April 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton between 22<sup>nd</sup> April and 25<sup>th</sup> April 2008.

## 2 METHODOLOGY

### 2.1 Standards

- 2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 1995), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

### 2.2 Technique Selection

- 2.2.1 Earth resistance survey was selected as the most appropriate technique, given the expected presence of cut archaeological features and stone structures at depths of no more than *c.* 1m.
- 2.2.2 This technique involved the use of a Resistance Meter with twin probes set 0.5m apart. When a small electric current is injected into the ground it encounters sub-surface resistance, which is measured. This resistance relates to the ability of the soil to retain moisture and can correspond to the location of cut archaeological features or buried stone walls etc.

### 2.3 Field Methods

- 2.3.1 The study area was located in the gardens of Worden Park on two areas of lawn, subdivided by a yew hedge, and paths. Two areas were surveyed (Areas A & B) to target the site of the former Worden Hall and associated gardens to the south. A 20m grid was established in each area, and tied-in to known mapped Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.
- 2.3.2 Measurements of earth resistance were determined using a Geoscan RM15 Resistance Meter and MPX15 Multiplexor, with two parallel pairs of probes set 0.5m apart. It was expected that significant archaeological features at a depth of up to *c.* 1m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 20m grid units. A sample interval of 0.5m was used, with a traverse interval of 1m, providing 800 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

### 2.4 Data Processing

- 2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Areas of anomalously high resistance are displayed as dark grey, and areas of anomalously low resistance are displayed as light grey. Palette bars show the relationship between the grey shades and earth resistance values in ohms for each area.
- 2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random extreme readings in the resistance data

*Clip:* to clip data to specified maximum and minimum values, in order to limit extreme readings in the resistance data

*Interpolate:* to double the number of values in the traverse direction to match the sample interval

## 2.5 *Interpretation*

### 2.5.1 Two types of geophysical anomaly were detected in the earth resistance data:

*high resistance:* regions of anomalously high resistance, which may be associated with the presence of stone-built features, geological features or sub-surface voids.

*low resistance:* regions of anomalously low resistance, which may be associated with cut features which contain a higher moisture content than the surrounding material, such as pits or ditches

## 2.6 *Presentation*

2.6.1 The grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey plans. Colour-coded geophysical interpretation diagrams are provided, showing the locations and extent of areas of anomalously high and low resistance.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 Trace plots of the unprocessed geophysical data are included in Appendix II.

## 2.7 *Project Archive*

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

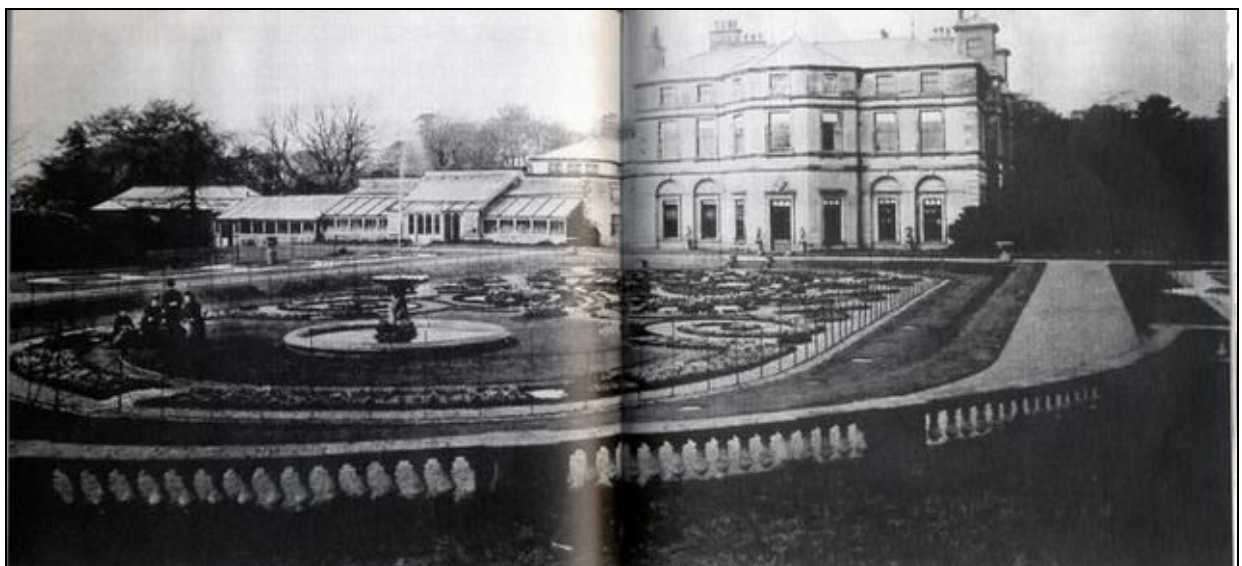
2.7.2 One copy of the survey report will be deposited with the County Historic Environment, where viewing will be available on request.

2.7.3 The project is also registered with the **Online Access to the Index of archaeological investigationS (OASIS)**. The OASIS reference for this project is **northpen3-41348**.

### 3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 3.1 *Historical Background*

- 3.1.1 Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family from 1717 ([www.british-history.ac.uk](http://www.british-history.ac.uk)). The original family home was at Worden (Old) Hall, but the estate transferred to Shaw Hall, when the Ffaringtons of Worden (Old) Hall died without descendents.
- 3.1.2 During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. William Ffarington also added a new wing to the hall in the 18<sup>th</sup> century, and created a number of new features in the park.
- 3.1.3 The 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850) shows the Shaw Hall to the south with further ranges of buildings to the north, surrounded by parkland. The hall was largely rebuilt by Anthony Salvin after 1842 for James Nowell Farington ([www.british-history.ac.uk](http://www.british-history.ac.uk)), and comprised a square main hall, with a main entrance and turning circle at the east side (Plate 2).
- 3.1.4 During the 19<sup>th</sup> century the grounds were landscaped by Salvin's brother-in-law William Andrew Nesfield. This included the creation of a maze and *parterre* garden. James Nowell Farington also changed the name of Shaw Hall to Worden Hall at this time (Plate 1).
- 3.1.5 Worden hall was extensively damaged by fire in April 1941. Following the death of the last squire in 1946, the fixtures and fittings were sold off. Leyland Urban District Council brought Worden Park and opened it to the public on June 18th 1951 ([www.houghton59.fsnet.co.uk](http://www.houghton59.fsnet.co.uk)).
- 3.1.6 The main hall was eventually demolished in the early 1960's, the only surviving part of the original hall being the Derby Wing, which is also believed to be one of the oldest parts of the building.



**Plate 1:** The south elevation of the former Worden Hall, showing *parterre* garden with working fountain





**Plate 2:** The east elevation and entrance of the former Worden Hall

### 3.2 *Previous Archaeological Works*

3.2.1 No known previous archaeological investigations have taken place in Worden Park.



**Plate 3:** Area A, the site of the former Worden Hall (looking south)



**Plate 4:** Area B, part of the *parterre* garden with redundant fountain, looking north towards the site of the former Worden Hall

## **4 SURVEY RESULTS (Figures 2-4)**

### *4.1 Introduction (Figure 2)*

- 4.1.1 The locations of the individual geophysical survey areas were designed by Scott Wilson Ltd, to target the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 4.1.2 Area A comprised an area of lawn, to the east of the existing hall buildings, bounded by a mature yew hedge to the south, and a car park to the north, with shrubs and gardens to the west (Plate 3). Area B was located within the *parterre* garden, and comprised an area of lawn, bounded by banks and gravel paths, with the remain of a fountain at the south end (Plate 4).

### *4.2 Area A (Figures 3&4)*

- 4.2.1 The survey of Area A was hindered by the presence of mature shrubs, including dense rhododendrons on the east side of this area. A number of trees were also located in Area A, the roots of which had an influence on the results of the survey. A discrete area of anomalously high resistance, with a corresponding area of anomalously low resistance was detected on the southern corner of this area, and was due to the presence of tree roots. A low resistance linear feature was detected on the northern edge of Area A, and was due to the presence of the adjacent car park.
- 4.2.2 Irregular areas of anomalously high resistance were detected along the southwest and northwest sides of Area A, which may indicate the presence of sub-surface deposits of stone rubble or wall foundations. On the south side of Area A, a 50m by 37m rectangular area of high resistance was detected, which corresponded to the location of the former Worden Hall. Variations in resistance within this area could be indicative of internal divisions or floors within the main hall. This area was bounded on the southeast and northeast sides by two low resistance linear features, interpreted as the foundation cuts of exterior walls.
- 4.2.3 A 17m-long 16m-wide rectangular area of high resistance was detected on the north side of Area A, which may indicate the location of a smaller building. An area of anomalously high resistance was detected on the southeast side of this area, which may indicate the presence of a deposit of stone rubble or a wall foundation.

### *4.3 Area B (Figures 3&4)*

- 4.3.1 Area B was a sunken lawn, bounded by steep banks, which produced areas of anomalously high resistance along the southern edge of this area. The remains of a fountain at the south end of Area B had to be excluded from the survey. A metal drain cover on the southeast side of the fountain produced a high resistance response, and corresponding areas of low resistance.
- 4.3.2 Irregular areas of anomalously high resistance and low resistance were detected over the majority of Area B. Whilst these anomalies may be indicative of ground disturbance through gardening activity, no formal garden features were detected in this area.

## 5 CONCLUSIONS

- 5.1 Earth resistance surveys, covering 0.2ha of land in total, have been conducted over two areas in Worden Park, targeting the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 5.2 The external walls of the former hall have been detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, have been indicated by the geophysical survey. The remains of a smaller building have been also detected on the north side of Area A. This corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850).
- 5.3 No certain formal garden features, or other archaeological remains have been detected in Area B. As this survey was located within a sunken area, it is possible that the variations detected by the geophysical survey in Area B are geological in nature.
- 5.4 The results of the survey have helped to locate the exterior hall walls, and will inform the creation of a ground plan to mark the site of the former Worden Hall. However, it is possible that additional geophysical survey could provide further information, and help clarify the internal layout of the former hall. This could take the form of further high resolution earth resistance survey, or survey using ground penetrating radar.

## **6 ACKNOWLEDGEMENTS**

North Pennines Archaeology is grateful to Laura Broughton of Scott Wilson Ltd, for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of Scott Wilson Ltd.

## **7 BIBLIOGRAPHY**

Archaeology Data Service, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Arts and Humanities Data Service

English Heritage, 1995 *Geophysical survey in field evaluation*, Research and Professional Services Guideline No.1, London

Institute of Field Archaeologists, 2002 *The use of geophysical techniques in archaeological evaluations*, Paper No.6, IFA, Birmingham

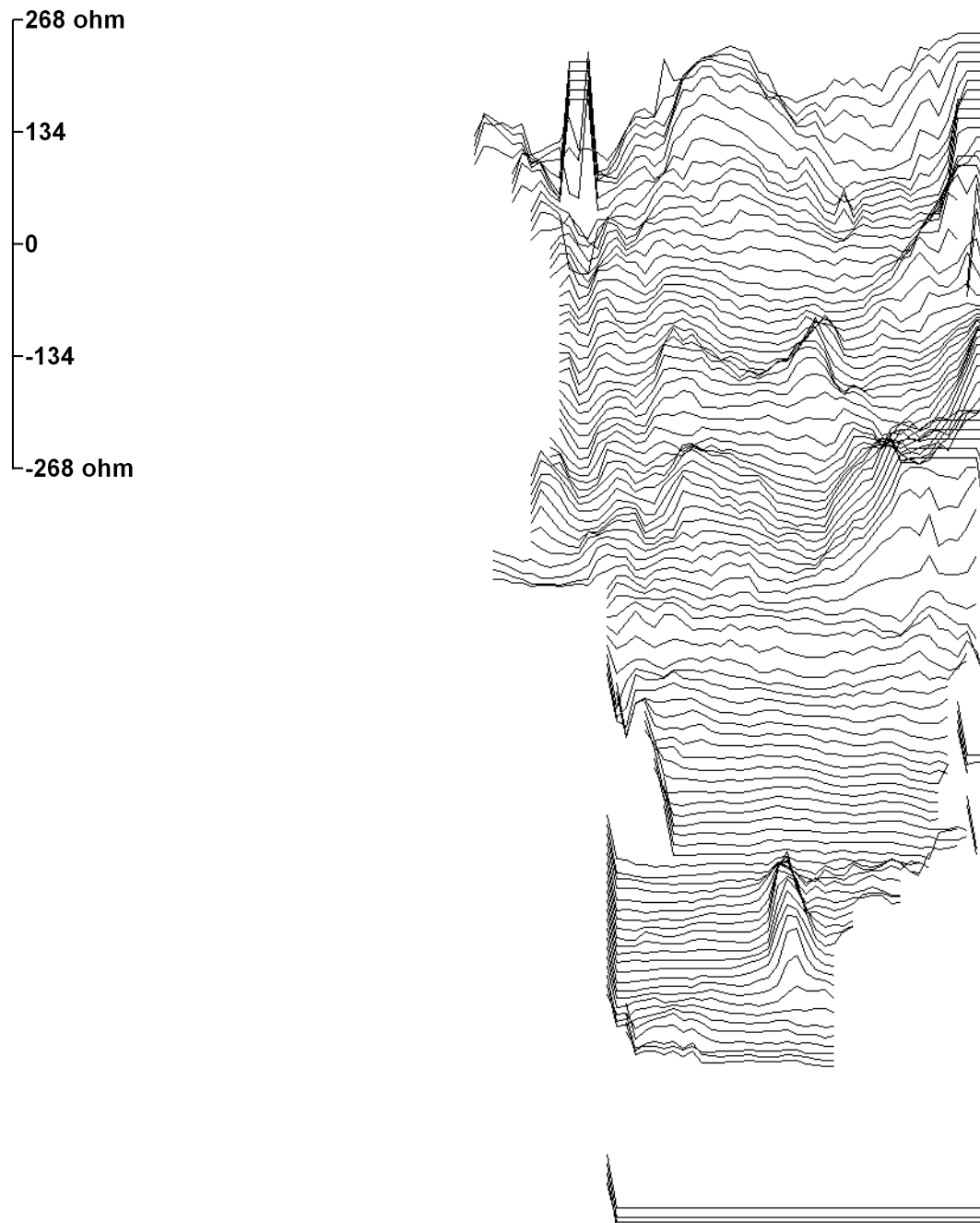
Scott Wilson, 2008 *Worden Park, Leyland: Specification for Geophysical Survey*, unpublished specification, for South Ribble Borough Council

## **APPENDIX I – ILLUSTRATIONS**

## APPENDIX II – TRACE PLOTS

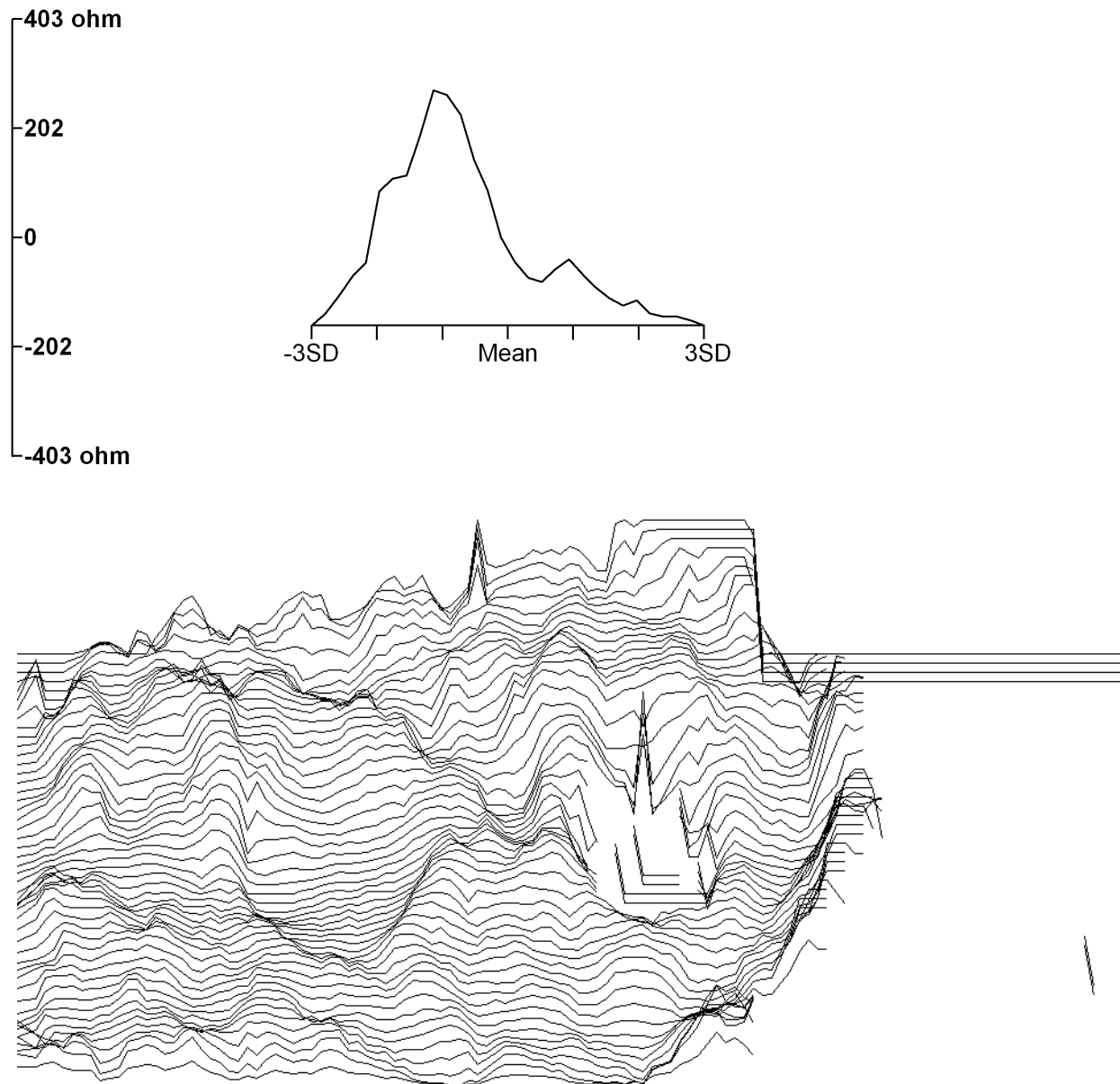
### Worden Park

#### Area 1



## Worden Park

### Area 2



## **GEOPHYSICAL SURVEYS OF LAND AT WORDEN PARK, LEYLAND**

*on behalf of*

**SCOTT WILSON LTD**



NGR SD 5373 2084

OASIS ID: northpen3-41348

Martin Railton BA (Hons), MA AIFA  
North Pennines Archaeology Ltd  
Nenthead Mines Heritage Centre  
Nenthead  
Alston  
Cumbria CA9 3PD  
Tel: (01434) 382045  
Fax: (01434) 382294  
Mobile: 07979617882  
Email: m.railton@nparchaeology.co.uk



North Pennines Archaeology Ltd is a wholly owned company of North Pennines Heritage Trust



## CONTENTS

### Page

List of Figures.....	ii
Non-Technical Summary.....	iii
<b>1 INTRODUCTION (<i>FIGURE 1</i>) .....</b>	<b>1</b>
<b>2 METHODOLOGY.....</b>	<b>2</b>
2.1 Standards.....	2
2.2 Technique Selection.....	2
2.3 Field Methods .....	2
2.4 Data Processing.....	2
2.5 Interpretation.....	3
2.6 Presentation.....	3
2.7 Project Archive .....	3
<b>3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....</b>	<b>4</b>
3.1 Historical Background .....	4
3.2 Previous Archaeological Works.....	5
<b>4 SURVEY RESULTS (<i>FIGURES 2-4</i>) .....</b>	<b>6</b>
4.1 Introduction (Figure 2).....	6
4.2 Area A (Figures 3&4) .....	6
4.3 Area B (Figures 3&4).....	6
<b>5 CONCLUSIONS .....</b>	<b>7</b>
<b>6 ACKNOWLEDGEMENTS.....</b>	<b>8</b>
<b>7 BIBLIOGRAPHY .....</b>	<b>8</b>
<b>APPENDIX I – ILLUSTRATIONS.....</b>	<b>9</b>
<b>APPENDIX II – TRACE PLOTS.....</b>	<b>10</b>

## LIST OF FIGURES

Figure 1: Location of the geophysical survey areas .....	Appendix I
Figure 2: Geophysical surveys .....	Appendix I
Figure 3: Geophysical interpretation.....	Appendix I
Figure 4: Archaeological interpretation .....	Appendix I

## SUMMARY

In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland, centred on Ordnance Survey grid reference NZ 3879 1396. The surveys were designed to target the site of the former Worden Hall (Area A), and a *parterre* garden to the south (Area B).

Worden Park is Grade II listed on the English Heritage Register of Parks and Gardens. Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family between 1717 and 1946. During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. Worden hall was extensively damaged by fire in April 1941, and was demolished in the 1960's.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies in the study area, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the surveys may be used to inform the creation of a ground plan to mark the site of the former Worden Hall, as part of a development plan for Worden Park.

Earth resistance surveys were conducted over two areas within Worden Park. The external walls of the former hall were detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, were indicated by the geophysical survey. The remains of a smaller building were also detected on the north side of Area A, which corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850). No certain formal garden features, or other archaeological remains, have been detected in Area B.

## **1 INTRODUCTION (*Figure 1*)**

- 1.1 In April 2008, North Pennines Archaeology Ltd, commissioned by Scott Wilson Ltd, undertook geophysical surveys of 0.2ha of land at Worden Park, Leyland. The work was conducted in accordance with a Specification for Geophysical Survey, produced by Scott Wilson Ltd (Scott Wilson 2008), and the relevant English Heritage and IFA guidelines.
- 1.2 Worden Park is located c.2km west of Leyland, and comprises approximately 62ha of public parkland, associated with the site of the former Worden Hall. The park is bounded by Shaw Brook to the south, Worden Lane to the east, and Parkgate Drive to the north (Figure 1). Worden Hall was located on the south side of the park, centred on Ordnance Survey grid reference SD 5373 2084.
- 1.3 Worden Park is South Ribble's largest park, and is Grade II listed on the English Heritage Register of Parks and Gardens. A conservation and development plan for the park is being implemented by South Ribble Borough Council. This will include the restoration of aspects of the historic park, and possibly the creation of a ground plan to mark the site of the former Worden Hall.
- 1.5 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of any archaeological anomalies at the site of Worden Hall, and the presence/absence of any known modern anomalies within the study area, which may affect the results. The results of the geophysical survey were to be used to provide information on the layout of the former Worden Hall and gardens.
- 1.6 The geophysical surveys were conducted by Kevin Mounsey and Martin Railton on 21<sup>st</sup> April 2008, and managed by Martin Railton, NPA Project Manager. This report was prepared and illustrated by Martin Railton between 22<sup>nd</sup> April and 25<sup>th</sup> April 2008.

## 2 METHODOLOGY

### 2.1 Standards

- 2.1.1 The geophysical survey and reporting were conducted in accordance with English Heritage guidelines (English Heritage 1995), and the recommendations of the Institute of Field Archaeologists (IFA 2002).

### 2.2 Technique Selection

- 2.2.1 Earth resistance survey was selected as the most appropriate technique, given the expected presence of cut archaeological features and stone structures at depths of no more than *c.* 1m.
- 2.2.2 This technique involved the use of a Resistance Meter with twin probes set 0.5m apart. When a small electric current is injected into the ground it encounters sub-surface resistance, which is measured. This resistance relates to the ability of the soil to retain moisture and can correspond to the location of cut archaeological features or buried stone walls etc.

### 2.3 Field Methods

- 2.3.1 The study area was located in the gardens of Worden Park on two areas of lawn, subdivided by a yew hedge, and paths. Two areas were surveyed (Areas A & B) to target the site of the former Worden Hall and associated gardens to the south. A 20m grid was established in each area, and tied-in to known mapped Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.
- 2.3.2 Measurements of earth resistance were determined using a Geoscan RM15 Resistance Meter and MPX15 Multiplexor, with two parallel pairs of probes set 0.5m apart. It was expected that significant archaeological features at a depth of up to *c.* 1m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 20m grid units. A sample interval of 0.5m was used, with a traverse interval of 1m, providing 800 sample measurements per grid unit. The data was downloaded on site into a laptop computer for processing and storage.

### 2.4 Data Processing

- 2.4.1 Geophysical survey data was processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Areas of anomalously high resistance are displayed as dark grey, and areas of anomalously low resistance are displayed as light grey. Palette bars show the relationship between the grey shades and earth resistance values in ohms for each area.
- 2.4.2 Raw data was processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random extreme readings in the resistance data

*Clip:* to clip data to specified maximum and minimum values, in order to limit extreme readings in the resistance data

*Interpolate:* to double the number of values in the traverse direction to match the sample interval

## 2.5 *Interpretation*

### 2.5.1 Two types of geophysical anomaly were detected in the earth resistance data:

*high resistance:* regions of anomalously high resistance, which may be associated with the presence of stone-built features, geological features or sub-surface voids.

*low resistance:* regions of anomalously low resistance, which may be associated with cut features which contain a higher moisture content than the surrounding material, such as pits or ditches

## 2.6 *Presentation*

2.6.1 The grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey plans. Colour-coded geophysical interpretation diagrams are provided, showing the locations and extent of areas of anomalously high and low resistance.

2.6.2 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.6.3 Trace plots of the unprocessed geophysical data are included in Appendix II.

## 2.7 *Project Archive*

2.7.1 The data archive for this project has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). The archive is currently held at the company offices at Nenthead, Cumbria.

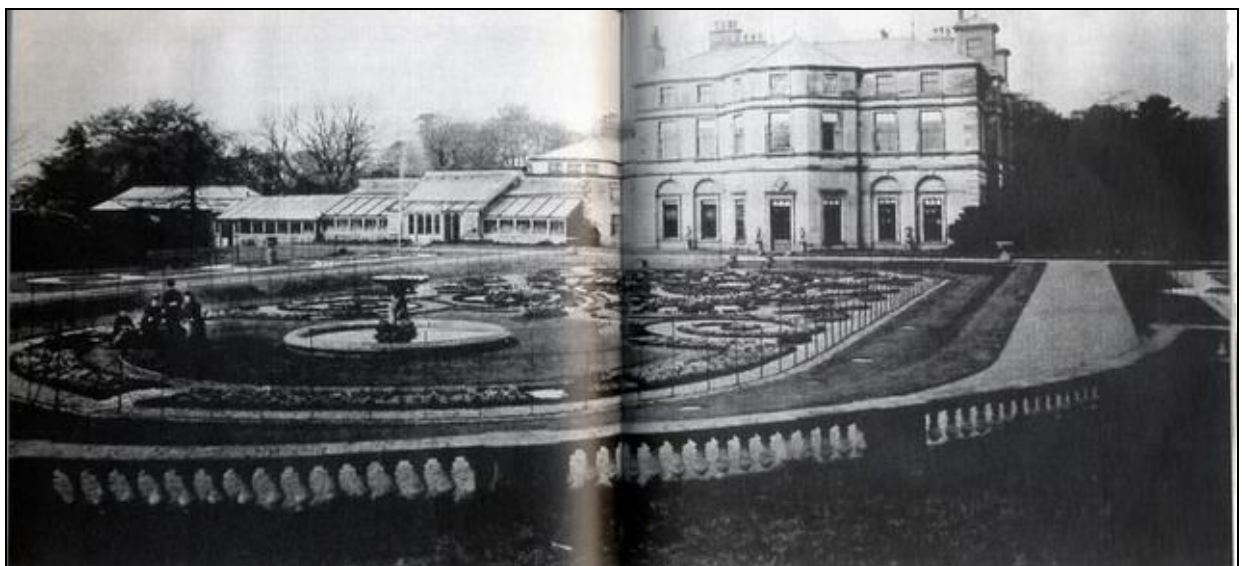
2.7.2 One copy of the survey report will be deposited with the County Historic Environment, where viewing will be available on request.

2.7.3 The project is also registered with the **Online Access to the Index of archaeological investigationS (OASIS)**. The OASIS reference for this project is **northpen3-41348**.

### 3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

#### 3.1 *Historical Background*

- 3.1.1 Worden Hall (originally known as Shaw Hall) was the principal home of the Ffarington family from 1717 ([www.british-history.ac.uk](http://www.british-history.ac.uk)). The original family home was at Worden (Old) Hall, but the estate transferred to Shaw Hall, when the Ffaringtons of Worden (Old) Hall died without descendents.
- 3.1.2 During the 18<sup>th</sup> century the grounds were extensively landscaped, and included the creation of a formal garden. William Ffarington also added a new wing to the hall in the 18<sup>th</sup> century, and created a number of new features in the park.
- 3.1.3 The 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850) shows the Shaw Hall to the south with further ranges of buildings to the north, surrounded by parkland. The hall was largely rebuilt by Anthony Salvin after 1842 for James Nowell Farington ([www.british-history.ac.uk](http://www.british-history.ac.uk)), and comprised a square main hall, with a main entrance and turning circle at the east side (Plate 2).
- 3.1.4 During the 19<sup>th</sup> century the grounds were landscaped by Salvin's brother-in-law William Andrew Nesfield. This included the creation of a maze and *parterre* garden. James Nowell Farington also changed the name of Shaw Hall to Worden Hall at this time (Plate 1).
- 3.1.5 Worden hall was extensively damaged by fire in April 1941. Following the death of the last squire in 1946, the fixtures and fittings were sold off. Leyland Urban District Council brought Worden Park and opened it to the public on June 18th 1951 ([www.houghton59.fsnet.co.uk](http://www.houghton59.fsnet.co.uk)).
- 3.1.6 The main hall was eventually demolished in the early 1960's, the only surviving part of the original hall being the Derby Wing, which is also believed to be one of the oldest parts of the building.



**Plate 1:** The south elevation of the former Worden Hall, showing *parterre* garden with working fountain



**Plate 2:** The east elevation and entrance of the former Worden Hall

### 3.2 *Previous Archaeological Works*

3.2.1 No known previous archaeological investigations have taken place in Worden Park.



**Plate 3:** Area A, the site of the former Worden Hall (looking south)



**Plate 4:** Area B, part of the *parterre* garden with redundant fountain, looking north towards the site of the former Worden Hall



## **4 SURVEY RESULTS (Figures 2-4)**

### *4.1 Introduction (Figure 2)*

- 4.1.1 The locations of the individual geophysical survey areas were designed by Scott Wilson Ltd, to target the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 4.1.2 Area A comprised an area of lawn, to the east of the existing hall buildings, bounded by a mature yew hedge to the south, and a car park to the north, with shrubs and gardens to the west (Plate 3). Area B was located within the *parterre* garden, and comprised an area of lawn, bounded by banks and gravel paths, with the remain of a fountain at the south end (Plate 4).

### *4.2 Area A (Figures 3&4)*

- 4.2.1 The survey of Area A was hindered by the presence of mature shrubs, including dense rhododendrons on the east side of this area. A number of trees were also located in Area A, the roots of which had an influence on the results of the survey. A discrete area of anomalously high resistance, with a corresponding area of anomalously low resistance was detected on the southern corner of this area, and was due to the presence of tree roots. A low resistance linear feature was detected on the northern edge of Area A, and was due to the presence of the adjacent car park.
- 4.2.2 Irregular areas of anomalously high resistance were detected along the southwest and northwest sides of Area A, which may indicate the presence of sub-surface deposits of stone rubble or wall foundations. On the south side of Area A, a 50m by 37m rectangular area of high resistance was detected, which corresponded to the location of the former Worden Hall. Variations in resistance within this area could be indicative of internal divisions or floors within the main hall. This area was bounded on the southeast and northeast sides by two low resistance linear features, interpreted as the foundation cuts of exterior walls.
- 4.2.3 A 17m-long 16m-wide rectangular area of high resistance was detected on the north side of Area A, which may indicate the location of a smaller building. An area of anomalously high resistance was detected on the southeast side of this area, which may indicate the presence of a deposit of stone rubble or a wall foundation.

### *4.3 Area B (Figures 3&4)*

- 4.3.1 Area B was a sunken lawn, bounded by steep banks, which produced areas of anomalously high resistance along the southern edge of this area. The remains of a fountain at the south end of Area B had to be excluded from the survey. A metal drain cover on the southeast side of the fountain produced a high resistance response, and corresponding areas of low resistance.
- 4.3.2 Irregular areas of anomalously high resistance and low resistance were detected over the majority of Area B. Whilst these anomalies may be indicative of ground disturbance through gardening activity, no formal garden features were detected in this area.

## 5 CONCLUSIONS

- 5.1 Earth resistance surveys, covering 0.2ha of land in total, have been conducted over two areas in Worden Park, targeting the site of the former Worden Hall (Area A), and *parterre* garden to the south (Area B).
- 5.2 The external walls of the former hall have been detected in Area A. In addition surviving sub-surface features, possibly associated with the remains of interior walls or floors, have been indicated by the geophysical survey. The remains of a smaller building have been also detected on the north side of Area A. This corresponds to the location of a range of buildings shown on the 1<sup>st</sup> Edition Ordnance Survey map (surveyed 1844-1850).
- 5.3 No certain formal garden features, or other archaeological remains have been detected in Area B. As this survey was located within a sunken area, it is possible that the variations detected by the geophysical survey in Area B are geological in nature.
- 5.4 The results of the survey have helped to locate the exterior hall walls, and will inform the creation of a ground plan to mark the site of the former Worden Hall. However, it is possible that additional geophysical survey could provide further information, and help clarify the internal layout of the former hall. This could take the form of further high resolution earth resistance survey, or survey using ground penetrating radar.

## **6 ACKNOWLEDGEMENTS**

North Pennines Archaeology is grateful to Laura Broughton of Scott Wilson Ltd, for commissioning the geophysical surveys. The digital mapping used during the survey was provided courtesy of Scott Wilson Ltd.

## **7 BIBLIOGRAPHY**

Archaeology Data Service, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Arts and Humanities Data Service

English Heritage, 1995 *Geophysical survey in field evaluation*, Research and Professional Services Guideline No.1, London

Institute of Field Archaeologists, 2002 *The use of geophysical techniques in archaeological evaluations*, Paper No.6, IFA, Birmingham

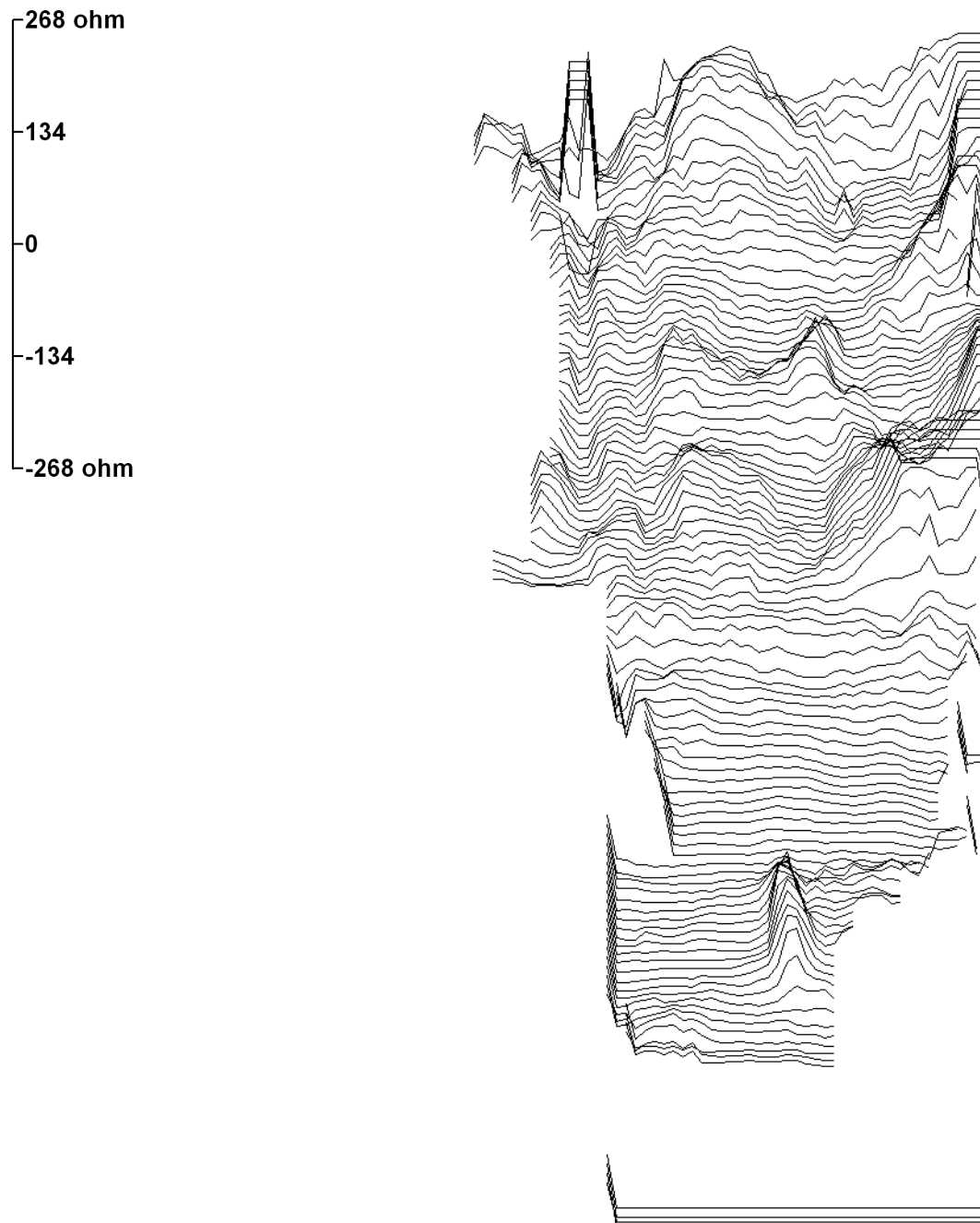
Scott Wilson, 2008 *Worden Park, Leyland: Specification for Geophysical Survey*, unpublished specification, for South Ribble Borough Council

## **APPENDIX I – ILLUSTRATIONS**

## APPENDIX II – TRACE PLOTS

### Worden Park

#### Area 1



## Worden Park

### Area 2

