

**AGRICULTURAL QUALITY  
OF LAND OFF BRYN MORFA  
BODELWYDDAN**

Report 1608/1

7<sup>th</sup> October, 2019

**AGRICULTURAL QUALITY  
OF LAND OFF BRYN MORFA, BODELWYDDAN**

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Report 1553/1  
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7<sup>th</sup> October, 2019

## **SUMMARY**

A soil and agricultural land quality survey has been undertaken of 0.86 ha of land off Bryn Morfa, Bodelwyddan.

The land has fine loamy over clayey soils with wetness limitations giving land of subgrades 3a and 3b agricultural quality.

## 1.0 Introduction

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- 1.1 This report provides information on the soils and agricultural quality of 0.86 ha of land off Bryn Morfa, Bodelwyddan. The report is based on a survey of the land in September 2019.

### **SITE ENVIRONMENT**

- 1.2 The site investigated comprises a small field/paddock, bordered to the south and west by residential development, to the east by allotment gardens and to the north by adjoining grassland.
- 1.3 The land is level, at an elevation of approximately 10 m AOD.

### **AGRICULTURAL USE**

- 1.4 At the time of survey, the land at the site was under rough grass and scrub.

### **PUBLISHED INFORMATION**

- 1.5 1:50,000 scale BGS information records the geology of the land as Warwickshire Group (interbedded mudstone, siltstone and sandstone), overlain by Devensian glacial till.
- 1.6 A reconnaissance detail soil map of the area (published at 1:250,000 scale) shows the land as Salop Association, comprising mainly fine loamy and fine loamy over clayey soils formed in reddish glacial till<sup>1</sup>.
- 1.7 The Welsh Government predictive Agricultural Land Classification map shows the land as subgrade 3a quality. No detailed survey has been published.

<sup>1</sup>Rudeforth C.C. *et al.*, (1984). *Soils and their use in Wales*, Soil Survey of England and Wales. Bulletin No. 11, Harpenden.

## 2.0 Soils

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- 2.1 A detailed agricultural quality survey was carried out in September 2019. It was based on observations at intersects of a 50 m grid, giving a sampling density of approximately four observations per hectare. During the survey, soils were examined by a combination of pits and augerings to a maximum depth of 1.2 m. A log of the sampling points and a map (Map 1) showing their location is in an appendix to this report.
- 2.2 Soils at the site were found to be fine loams over reddish clay, with impeded subsoil drainage. Topsoils are medium clay loams or sandy clay loams. The subsoils are poorly structured and show evidence of seasonal waterlogging (greyish and ochreous mottled *gley* colouration) to shallow depth (Soil Wetness Class IV). Upper subsoil was found to be permeable in the south (Soil Wetness Class III).
- 2.3 An example profile is described below from a pit at observation 2 (Map 1).
- |           |   |
|-----------|---|
| 0 -29 cm  | Very dark greyish brown (10YR 3/2) medium clay loam; slightly stony (small soft sandstone); well developed medium and fine sub-angular blocky structure; friable; smooth gradual boundary to:   |
| 29-62 cm  | Reddish brown (5YR 4/4) heavy clay loam with common distinct fine yellowish red (5YR 5/8) and fine and medium pink (5YR 7/6) mottles; slightly stony; moderately developed coarse prismatic structure; very firm; smooth diffuse boundary to: |
| 62-120 cm | Dark reddish brown (2.5YR 3/4) clay with common faint red (2.5YR 4/8) mottles; very slightly stony; structureless (massive); very firm and dense.   |

## 3.0 Agricultural land quality

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3.1 To assist in assessing land quality, the Ministry of Agriculture, Fisheries and Food (MAFF) developed a method for classifying agricultural land by grade according to the extent to which physical or chemical characteristics impose long-term limitations on agricultural use for food production. The MAFF ALC system classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The system was devised and introduced in the 1960s and revised in 1988.

3.2 The agricultural climate is an important factor in assessing the agricultural quality of land and has been calculated using the Climatological Data for Agricultural Land Classification<sup>2</sup>. The relevant site data for an average elevation of 10 m is given below.

- Average annual rainfall: 680 mm
- January-June accumulated temperature >0°C 1461 day°
- Field capacity period 164 days  
(when the soils are fully replete with water) early Nov-mid Apr
- Summer moisture deficits for: wheat: 108 mm  
potatoes: 100 mm

3.3 The survey described in the previous section was used in conjunction with the agro-climatic data above to classify the site using the revised guidelines for ALC issued in 1988 by MAFF<sup>3</sup>. There are no climatic limitations at this locality.

### **SURVEY RESULTS**

3.4 The agricultural quality of the land is determined by wetness. Land of grade 3 has been identified.

#### **Subgrade 3a**

3.5 This subgrade includes land with imperfect drainage (Soil Wetness Class III). Under the local climate these soils are too wet to cultivate in winter and early spring, although late spring as well as autumn-sowings are usually possible.

#### **Subgrade 3b**

3.6 This subgrade includes land with poor drainage (Soil Wetness Class IV). Under the local climate the combination of moderately high topsoil clay content and

<sup>2</sup>Meteorological Office, (1989). *Climatological Data for Agricultural Land Classification*.

<sup>3</sup>MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

impeded subsoil drainage restricts machinery land access in spring; arable cropping is mainly limited to autumn-sown cereal-based rotations.

**Non Agricultural**

3.7 This land includes a residential property and garden and areas of woodland and scrub.

**Grade areas**

3.8 The boundary of the land grade is shown on Map 2 and the area occupied shown below.

**Table 1: Areas occupied by the land grade**

<i>Grade/subgrade</i>	<i>Area (ha)</i>	<i>% of the land</i>
<b>Subgrade 3a</b>	0.22	26
<b>Subgrade 3b</b>	0.41	47
<b>Non Agricultural</b>	0.23	27
<b>Total</b>	0.86	100

**APPENDIX**

**MAPS AND DETAILS OF OBSERVATIONS**



**Land at Bodelwyddan: ALC and soil resources survey – Details of observations at each sampling point**

Obs No	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
1	0-30	MCL	<5	30-42	HCL(r)	xxx	42-90+	C(r)	xxx	0	IV	3b	W
2	0-29	MCL	<5	<u>29</u> -62	HCL(r)	xxx	62-120	C(r)	xxx	0	IV	3b	W
3	0-27	MCL/SCL	<5	27-50	MCL	xxx	50-86 86-100+	HCL(r) C(r)	xxx	0	III	3a	W

**Key to table**

*Mottle intensity:*

- o unmottled
- x few to common rusty root mottles (topsoils) or a few ochreous mottles (subsoils)
- xx common to many ochreous mottles and/or dull structure faces
- xxx common to many greyish or pale mottles (gleyed horizon)
- xxxx dominantly grey, often with some ochreous mottles (gleyed horizon)

a depth underlined (e.g. 50) indicates the top of a slowly permeable layer  
(a wavy underline indicates the top of a layer borderline to slowly permeable)

*Texture:*

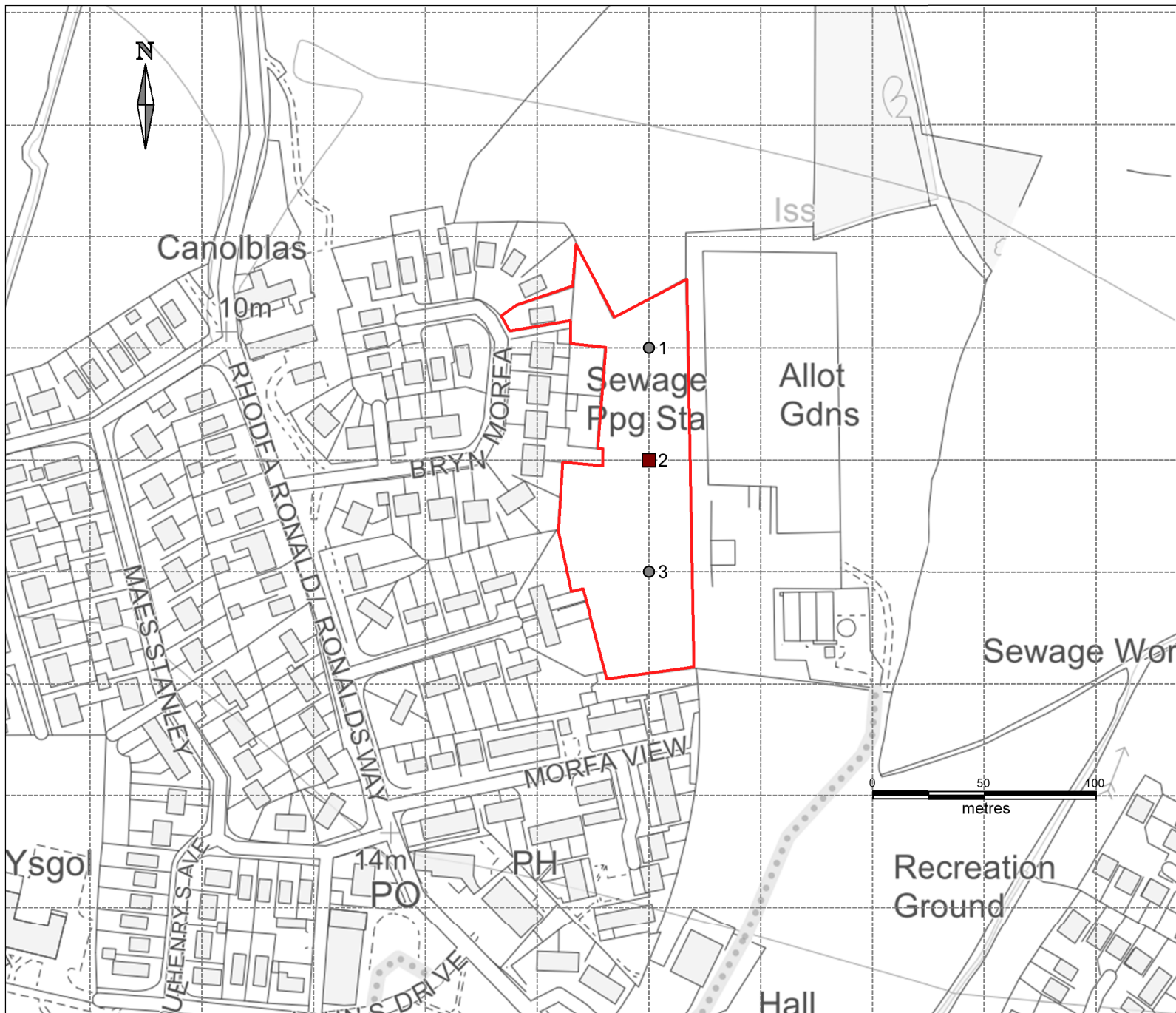
- C - clay
- ZC - silty clay
- SC - sandy clay
- CL - clay loam (H-heavy, M-medium)
- ZCL - silty clay loam (H-heavy, M-medium)
- SCL - sandy clay loam
- SZL - sandy silt loam (F-fine, M-medium, C-coarse)
- SL - sandy loam (F-fine, M-medium, C-coarse)
- LS - loamy sand (F-fine, M-medium, C-coarse)
- S - sand (F-fine, M-medium, C-coarse)
- P - peat (H-humified, SF-semi-fibrous, F-fibrous)
- LP - loamy peat; PL - peaty loam
- R - bedrock

*Limitations:*

- W - wetness/workability
- D - droughtiness
- De - depth
- St - stoniness
- Sl - slope
- F - flooding
- T - topography/microrelief

*Texture suffixes & prefixes:*

- ca – calcareous: x-extremely, v-very, sl-slightly
- (ca) marginally calcareous
- mn - ferrimanganiferous concentrations
- gn – greenish, yb – yellowish brown, rb – reddish brown
- r – reddish; (v)st – (very) stony; sdst–sandstone;lst - limestone
- dist - disturbed soil layer; mdst - mudstone



**KEY**

- Observation point
- Soil description pit
- Survey area

Client:

**Maxi Developments NW Ltd**

Site:

**Bryn Morfa  
Bodelwyddan**

Map title:

**Map 1  
Observations**

**Land  
Research**  
ASSOCIATES

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Lockington Hall  
Lockington  
Derby DE74 2RH  
01509 670570

Scale: 1:2,500

Date: 07/10/2019



**KEY**

- Subgrade 3a
- Subgrade 3b
- Non Agricultural
- Survey area

Client:

**Maxi Developments NW Ltd**

Site:

**Bryn Morfa  
Bodelwyddan**

Map title:

**Map 2  
Agricultural Land  
Classification**

**Land  
Research**  
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Land Research Associates  
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01509 670570

Scale: 1:2,500

Date: 07/10/2019