

**SOILS AND
AGRICULTURAL USE & QUALITY
OF LAND OFF GRIFFITHS ROAD
GWERSYLLT**

Report 1073/2

16th April, 2015

Land
Research
ASSOCIATES

**SOILS AND AGRICULTURAL USE AND QUALITY
OF LAND OFF GRIFFITHS ROAD, GWERSYLLT**

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Report 1073/2

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SUMMARY

A survey has been undertaken of 2.1 ha of land off Griffiths Road, Gwersyllt in Clwyd.

The agricultural land comprises a single field, under grass grazed by horses at the time of survey. The soils are fine loams with impeded subsoil drainage, giving subgrade 3a quality agricultural land due to soil wetness limitation.

Placing the loss of this land in context, evidence suggests the land is of lower agricultural quality than the average for the area and that lower quality land is unlikely to be available for development. The fact the land is separated on all sides from other agricultural land and not in current agricultural use suggests the effect of the loss of this land on agricultural land resources would be minimal.

The fine loamy topsoil would form a high quality resource for landscaping use if the site is developed.

1.0 Introduction

- 1.1 This report provides information on the soils and agricultural quality and use of 2.1 ha of land off Griffiths Road, Gwersyllt in Clwyd. The report is based on a soil and agricultural desk study and a survey of the land in February 2015.

SITE ENVIRONMENT

- 1.2 The site comprises a single field. The land is bordered to the south by Griffiths Road, to the east by Mold Road, to the west by Summerhill Road and to the north by residential development. The site is gently sloping at an average elevation of approximately 100 m AOD.

AGRICULTURAL USE

- 1.3 At the time of survey the land was under grass grazed by horses.

PUBLISHED INFORMATION

- 1.4 1:50,000 BGS geological information shows solid geology as interbedded sedimentary rocks of the Pennine Coal Measure, overlain by drift deposits; these consist of glacial till in the east and glacio-fluvial sands and gravels in the west.
- 1.5 A soil map of the area, published at 1:25,000 scale¹ shows fine loams or fine loams over clays with impeded subsoil drainage formed in reddish glacial till, of the Salop, Clifton and Salwick soil series.
- 1.6 Provisional Agricultural Land Classification (ALC) mapping carried out in the 1970s shows the site as grade 2. No more detailed survey of the site has been published.

¹ Lea, J.W. and Thompson, T.R.E., 1978. *Soils in Clwyd I (Wrexham North)*. Soil Survey of England and Wales Record No. 48, Harpenden.

2.0 Soils

- 2.1 The National Planning Practice Guidance states that the planning system should protect and enhance valued soils and prevent the adverse effects of unacceptable levels of pollution. This is because soil is an essential finite resource that provides important ecosystem services, for example as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution.
- 2.2 A detailed soil resource and agricultural quality survey was carried out in February 2015. It was based on observations at intersects of a 50 m grid, giving a sampling density of 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.
- 2.3 Soils were found to dominantly consist of medium clay loam or sandy clay loam topsoil. The upper subsoil is of similar texture and is mainly permeable to over 50 cm depth. The lower subsoil is heavier-textured and slowly permeable.
- 2.4 An example profile is described below from observation 6 (Map 1).
- | | |
|-----------|--|
| 0-27 cm | Dark greyish brown (10YR 4/2) medium clay loam; very slightly stony (medium angular hard stones of mixed lithology); moderately developed medium sub-angular blocky structure; friable; clear smooth boundary to: |
| 27-61 cm | Greyish brown (10YR 5/2) medium clay loam with common distinct fine reddish brown (5YR 4/4) mottles; stoneless; weakly developed medium to coarse sub-angular blocky structure; friable; porous; gradual smooth boundary to: |
| 61-120 cm | Light brownish grey (10YR 6/2) heavy clay loam with many distinct medium strong brown (7.5YR 5/6) mottles; moderately stony (small rounded hard pebbles); weakly developed very coarse angular blocky to prismatic structure; very firm. |
- 2.5 These soils are imperfectly-draining (mainly Soil Wetness Class III or II) and have a high capacity to absorb excess rainfall during the growing season and a moderate capacity during winter.

3.0 Agricultural Quality

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 Agricultural Land Classification (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 Classification². The relevant site data for an elevation of 100m is given below.

- Average annual rainfall: 841 mm
- January-June accumulated temperature >0°C 1363 day°
- Field capacity period 192 days
(when the soils are fully replete with water) mid Oct-early May
- Summer moisture deficits for: wheat: 89 mm
potatoes: 75 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 agricultural land classification issued in 1988 by the Ministry of Agriculture, Fisheries and Food³. Climate does not present a limitation to agriculture in this locality.

SURVEY RESULTS

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

Subgrade 3a

3.5 This subgrade accounts for all of the agricultural land at the site. The impeded subsoil drainage means these soils will stand wet at moderately shallow depth for long periods from mid to late autumn to mid spring and given the

² *Climatological Data for Agricultural Land Classification*. Meteorological Office, 1989

³ *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*. MAFF, 1988.

moderately high clay content of the topsoil, this limits flexibility of operations. High yields of autumn sown cereals are likely, but spring sowings are likely to result in moderate average yields.

- 3.6 A degree of variation was observed in the degree of wetness limitation (see details of observations in an appendix to this report). This variation is accepted as a function of the mapping scale and the land is graded according to the average degree of limitation.

Grade areas

- 3.7 The boundaries between the different grades of land are shown on Map 2 and the areas occupied by each are shown below.

Table 1. Areas occupied by the different land grades

<i>Grade/subgrade</i>	<i>Area (ha)</i>	<i>% of the agricultural land</i>
Subgrade 3a	2.1	100
Total	2.1	100

4.0 Soil resources and their use

- 4.3. An objective of the Defra Soil Strategy was to ensure that the construction industry and planning authorities take sufficient account of the need to protect soil resources, and ensure soils are able to fulfil as many as possible of their functions. An Environment Agency strategy *Soil a Precious Resource: Our strategy for protecting, managing and restoring soil* (Environment Agency, 2007) has complementary aims.

Topsoil

- 4.4. The topsoils are approximately 250-300 mm in thickness. Were the site to be developed, the topsoils represent a high quality resource for use in landscaping.

Subsoil

- 4.5. The upper subsoils of the site are naturally permeable, but are susceptible to smearing and sealing during construction activities which could result in restricted rooting depth, increased droughtiness and risk of localised flooding. If compacted during construction they should be loosened before any topsoil is spread on them.

Soil Handling

- 4.6. Areas not being built over (e.g. environmental buffers and landscape areas) should not be trafficked by construction vehicles as this will render the soils impermeable, preventing percolation of rainfall beyond the base of the topsoil, which will quickly become saturated.
- 4.7. Stripped topsoil should be stored in separate resource bunds no more than 3 m high, and kept grassed and free from construction traffic until required for re-use. The *Construction Code of Practice for Sustainable Use of Soils on Construction Sites* (Defra 2009) provides guidance on good practice in soil handling.

5.0 Impacts of the loss of the land on agriculture

- 5.1. Paragraph 4.10.1 of Planning Policy Wales (2014) sets out the requirement for planning authorities to apply “considerable weight” to the potential loss of best and most versatile agricultural land to development. However, it also states that where there is an overriding need for development, and brownfield or lower quality sites are not available (or constrained by other environmental considerations), development of best and most versatile land should be directed towards land of the lowest grade (i.e. subgrade 3a).
- 5.2. The site is very small in an agricultural context (2.1 ha) which is well below the threshold of what could be considered a viable stand-alone smallholding. It is separated from neighbouring agricultural land on all sides by roads and development. The land is used for grazing horses and does not appear to have been used for arable cropping within at least the last decade. Its loss therefore, would not have any effect on the continued use of neighbouring land as best and most versatile, or on the stock of land used as best and most versatile arable/horticultural land in the area. There do not appear to be any landscape, wildlife, historic or archaeological designations which would make this site unsuitable for development.
- 5.3. The land around Gwersyllt and the wider Wrexham area is recorded by provisional ALC mapping to be mainly of grade 2 quality, being mostly formed on glacial sand and gravel deposits which results in well-draining soils and high quality agricultural land. The soils at the site are formed in glacial till, which presents greater limitations to agriculture. Glacial till is recorded (by the British Geological Survey) to cover relatively small areas around Wrexham and could be expected to form the lower quality land in these lowland areas (excluding that along river corridors at flood risk). The evidence therefore suggests both that much of the land in the locality will be of higher agricultural quality and that land of lower quality is unlikely to be available.

APPENDIX

MAPS AND DETAILS OF OBSERVATIONS

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

Obs No	Topsoil			Upper subsoil			Lower subsoil			Slope (°)	Wetness Class	Agricultural quality	
	Depth (cm)	Texture	Stones (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling			Grade	Main limitation
1	0-32	SCL	<5	32-72	SCL	xxx	72-100+	HCL(r)	xxx	3	III	3a	W
2	0-23	MSL	<5	23-51	MSL	xxx	51-73 <u>73-100+</u>	SCL(r) SC(r)	xxx xxx	2	IV/III	3b/3a	W
3	0-36	MCL	<5	36-100+	vstCSL	xxx				2	I	2	W
4	0-32	MCL	<5	32-100+	SCL	xx				1	II	3a	W
5	0-24	SCL	<5	24-50	SCL(r)	xxx	50-82 <u>82-110+</u>	HCL(r) SC(r)	xxx	2	IV/III	3b/3a	W
6	0-27	MCL	<5	27-61	MCL	xxx	61-120	HCL	xxx	1	III	3a	W
7	0-22	SCL	<5	22-37	SCL	xxx	37-72 <u>72-100+</u>	SC(r) C(l)	xxx xxx	4	IV	3b	W
8	0-31	MCL	<5	31-72	MCL	xx	<u>72-110+</u>	SCL	xxx	3	II	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 (slightly gleyed horizon)
- xxx greyish colours and common to many ochreous mottles (gleyed horizon)
- xxxx dominantly grey, often with some ochreous mottles (gleyed horizon)

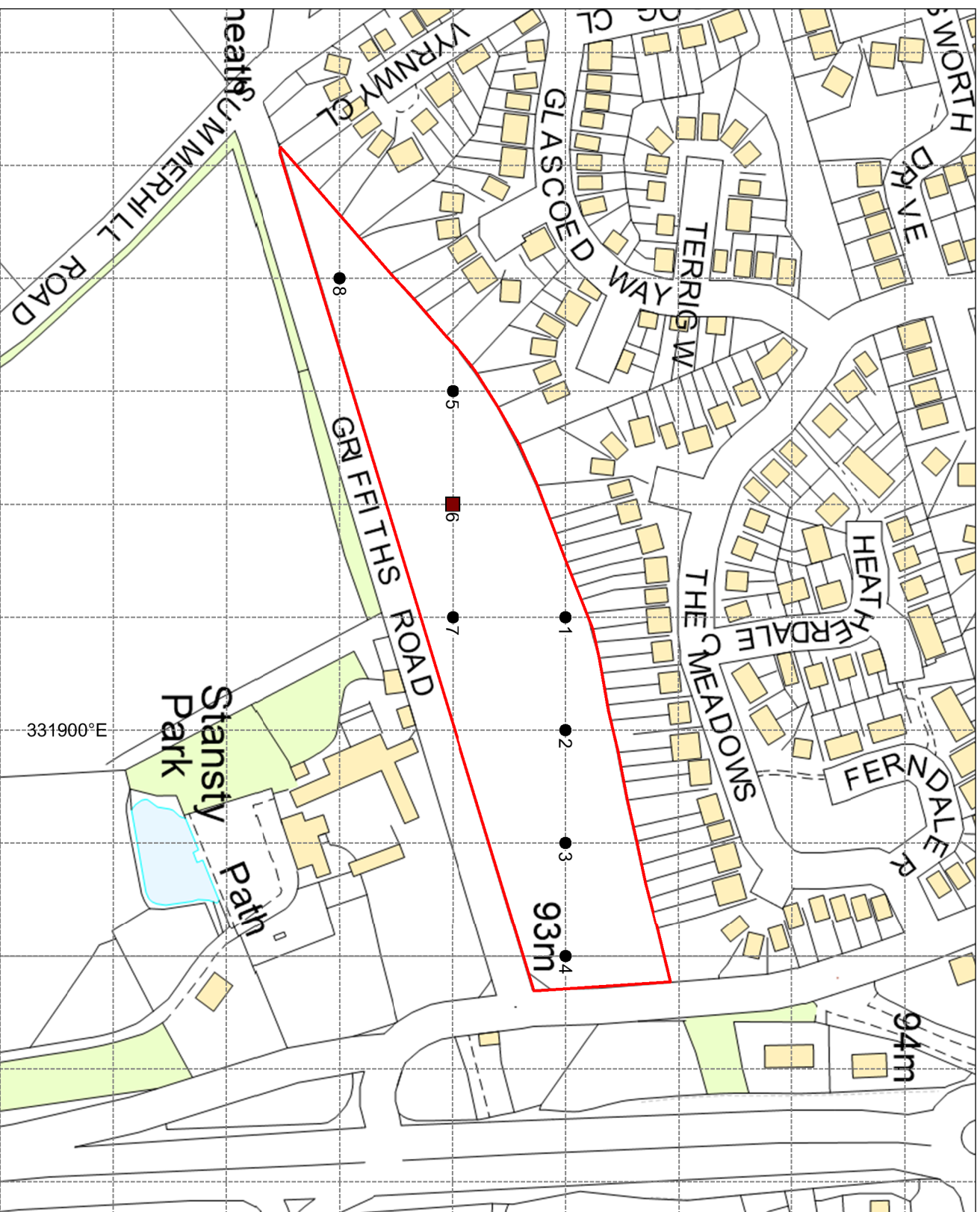
a depth underlined (e.g. 50) indicates the top of a slowly permeable layer
(a wavy underline indicates the top of a layer borderline to slowly permeable)

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

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
 - r - reddish; (v)st - (very) stony
 - dist - disturbed soil layer



Client:



Project:

Gwersyllt

Map title:

Map 1
Observations

KEY

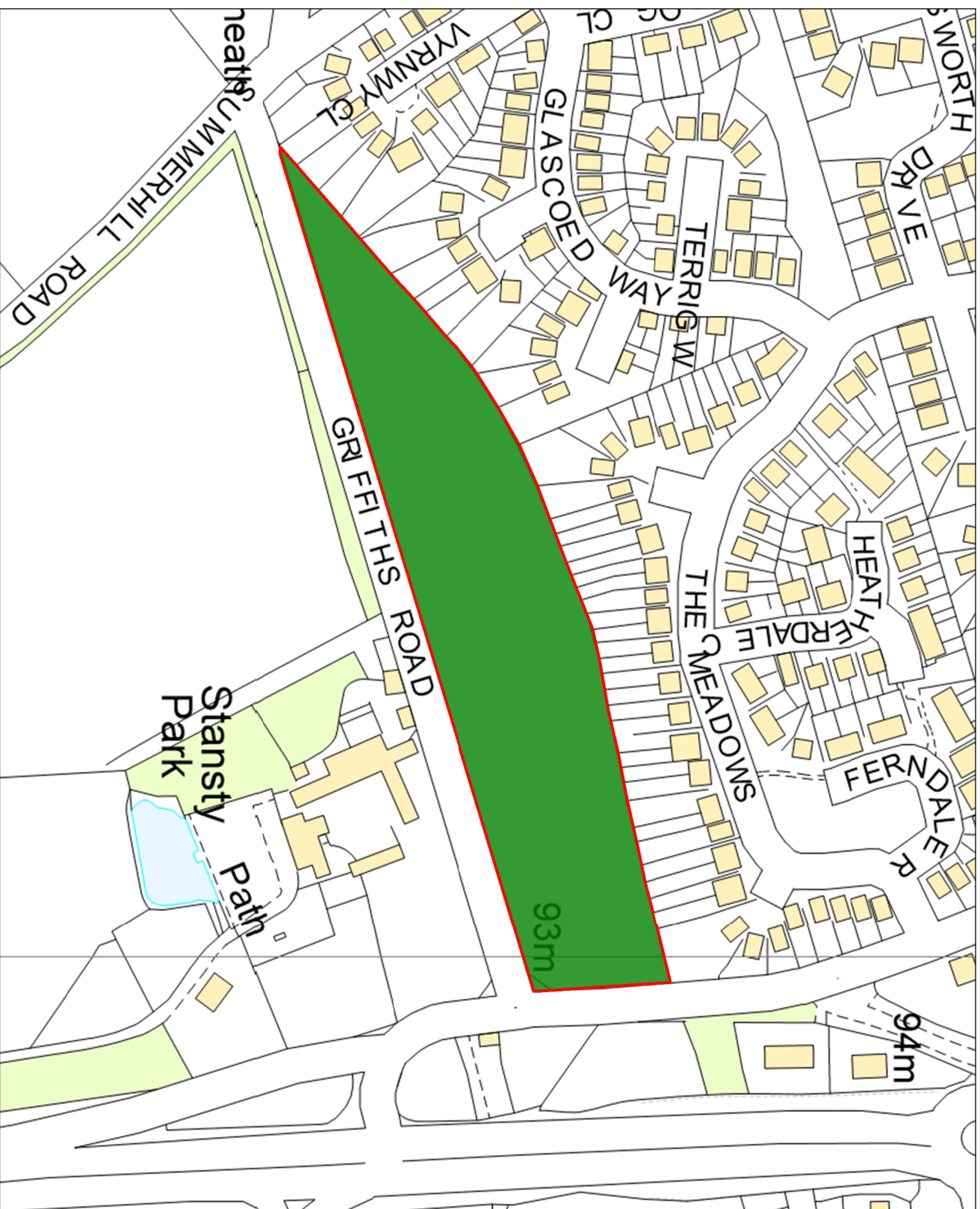
- Observation point
- Soil description pit
- Survey area

Date: 09/03/2015

Scale: 1:2,500 at A4

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Client:



Project:

Gwersyllt

Map title:

Map 2
Land Quality

KEY

 Subgrade 3a

 Survey area

Date: 09/03/2015

Scale: 1:2,500 at A4

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