

**SOILS AND
AGRICULTURAL QUALITY
OF LAND OFF
ST MARY'S ROAD, HAYLING ISLAND**

Report 1251/1

23rd February, 2017

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OF LAND OFF ST MARY'S ROAD, HAYLING ISLAND**

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Report 1251/1
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SUMMARY

This report provides information on the soils and agricultural quality of 11.9 ha of land off St Mary's Road, Hayling Island, Hampshire.

The land comprises two arable fields. The soils are medium silty clay loam topsoils over slowly permeable subsoil. Agricultural land quality is limited to grade 2 or subgrade 3a by soil wetness.

Were the site to be developed, the topsoils represent a high quality resource for re-use in landscaping.

1.0 Introduction

- 1.1 This report provides information on the soils and agricultural quality of 11.9 ha of land off St Mary's Road, Hayling Island, Hampshire. The report is based on a survey of the land in January 2017.

SITE ENVIRONMENT

- 1.2 The land investigated comprises two fields, bordered to the south and east by residential properties adjoining St Mary's Road and to the north and west by adjoining agricultural land. The land is level at an approximate elevation of 7 m AOD.

AGRICULTURAL USE

- 1.3 The land was under cereal cropping at the time of survey. The land is not currently registered under an agri-environmental stewardship scheme.

PUBLISHED INFORMATION

- 1.4 1:50,000 scale BGS information records the land to be underlain by river terrace deposits over London Clay.
- 1.5 The National Soil Map (published at 1:250,000 scale) shows the land as Park Gate Soil Association, comprising mainly silty soils formed in wind-blown drift with slightly impeded drainage¹.
- 1.6 Provisional ALC mapping from the 1970's shows the site as grade 2 agricultural land quality. Part of the site was surveyed in greater detail by MAFF in 1992, showing a mixture of grade 2 and subgrade 3a.

¹Jarvis, M.G. *et al.*, 1984. *Soils and their use in South East England*. Soil Survey of England and Wales Bulletin No. 15, 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 January 2017. It was based on observations at intersects of a 100 m grid, giving a sampling density of one observation 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 The site has medium silty clay loam topsoil and upper subsoil, overlying slowly permeable heavy clay loam or silty clay loam lower subsoil. The depth to the slowly permeable layer varies, which affects the depth of seasonal waterlogging (as evidenced by grey mottled colours). Generally, the slowly permeable layer is at shallower depth in the south of the site. An area in the south-east (see sample point 7, Map 1) appears to have been disturbed resulting in reduced subsoil permeability.
- 2.4 An example profile with shallow depth to slowly permeable subsoil is described below from a pit at observation 9 (Map 1).
- | | |
|-----------|---|
| 0-26 cm | Dark greyish brown (10YR 4/2) medium silty clay loam; stoneless; moderately developed medium sub-angular blocky structure; friable; non-calcareous; smooth gradual boundary to: |
| 26-49 cm | Brown (10YR 5/3) medium silty clay loam with greyish brown (10YR 5/2) ped faces and rare fine faint brownish yellow (10YR 5/6) mottles; stoneless; moderately developed coarse sub-angular blocky structure; friable; non-calcareous; smooth diffuse boundary to: |
| 49-120 cm | Light brownish yellow (10YR 6/4) heavy silty clay loam with many fine and medium yellowish red (5YR 6/8) mottles; stoneless; weakly developed very coarse angular blocky structure; very firm; non-calcareous. |
- 2.5 These soils are imperfectly-draining (Soil Wetness Class III) and have a low to moderate capacity to absorb excess winter rainfall.
- 2.6 An example profile with greater depth to slowly permeable subsoil is described below from a pit at observation 4 (Map 1).

0-28 cm	Dark greyish brown (10YR 4/2) medium silty clay loam; stoneless; moderately developed medium sub-angular blocky structure; friable; non-calcareous; smooth gradual boundary to:
28-60 cm	Brown (7.5YR 5/3) medium silty clay loam with paler brown (7.5YR 5/2) ped faces and few fine faint strong brown (7.5YR 5/6) mottles; stoneless; moderately developed coarse sub-angular blocky structure; firm to friable; non-calcareous; smooth diffuse boundary to:
60-120 cm	Light brown 7.5YR 6/4) heavy clay loam with common fine distinct strong brown (7.5YR 5/8) and faint pale grey (7.5YR 6/2) mottles; very slightly stony (small angular flints); weakly developed very coarse sub-angular blocky structure; firm; non-calcareous.

2.7 These soils are moderately freely-draining (Soil Wetness Class II) and have a moderate capacity to absorb excess winter rainfall.

3.0 Agricultural land 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 average elevation of 7 m is given below.
- Average annual rainfall: 704 mm
 - January-June accumulated temperature >0°C 1379 day°
 - Field capacity period 153 days
(when the soils are fully replete with water) mid Nov–mid Apr
 - Summer moisture deficits for: wheat: 100 mm
potatoes: 90 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. There are no climatic limitations at this locality.

SURVEY RESULTS

- 3.4 The agricultural quality of the land is determined by soil wetness. Land of grade 2 and 3 quality has been identified.

Grade 2

- 3.5 This land occurs in north and central parts of the site where soils are more freely-draining (see paragraphs 2.6 to 2.7). It has slight wetness limitations under the local climate resulting from the combination of moderately high clay

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

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

content and slight drainage impedance. This is likely to restrict winter field operations but a wide range of autumn and spring sown crops can be grown.

Subgrade 3a

- 3.6 This land occurs in the south, where the imperfectly-draining soils (see Paragraphs 2.4 to 2.5) result in greater wetness limitations than the rest of the site. Land access is likely to be limited for winter field operations and wetness in early spring is likely to reduce flexibility of spring cropping.

Non Agricultural

- 3.7 This land comprises an area of scrub in the centre of the site (the former site of farm buildings), a second area of scrub in the north-east comprising the access track from St Marys Road, and a mature hedgerow in the south-west.

Grade areas

- 3.8 Map 2, included in an appendix to this report, outlines the land grade of the site.

Table 1. Areas occupied by the different land grades

<i>Grade/subgrade</i>	<i>Area (ha)</i>	<i>% of the land</i>
Grade 2	7.2	61
Sub-grade 3a	4.3	36
Non Agricultural	0.4	3
Total	11.9	100

4.0 Soil resources and their use

- 4.1. As part of the Government's 'Safeguarding our Soils' Strategy, Defra published a code of practice on the sustainable use of soils on construction sites, which can be helpful in design of developments and setting planning conditions. An Environment Agency strategy Soil a Precious Resource: Our strategy for protecting, managing and restoring soil (Environment Agency, 2007) has complementary aims.

Topsoil

- 4.2. If the site were to be developed, the topsoils are medium textured (loamy), of low stone content, hold high reserves of moisture and are naturally fertile. They would represent a high quality resource for reuse in gardens and landscaping.

Subsoil

- 4.3. The subsoils are susceptible to compaction during construction activities which could result in restricted rooting depth, increased droughtiness and risk of localised flooding. If compacted during construction subsoils should be loosened before any topsoil is spread on them.

Soil Handling

- 4.4. 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.
- 4.5. 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.

APPENDIX
MAPS AND DETAILS OF OBSERVATIONS

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

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
1	0-29	MZCL	<5	29-61	MZCL	x	61-75 <u>75-100+</u>	HZCL HZCL	xx xxx	0	II	2	D
2	0-31	MZCL	<5	31-55	MZCL/HZCL	x	<u>55-90+</u>	HZCL	xx	0	II	2	D
3	0-23	MZCL	<5	23-40	MZCL	xx	40-90+	HCL	xxx	0	III	3a	W
4	0-28	MZCL	<5	28-60	MZCL	xx	60-120	HCL	xxx	0	II	2	D
5	0-30	MZCL	<5	30-56	MZCL	xx	<u>56-90+</u>	HCL	xxx	0	II	2	D
6	0-25	MZCL	<5	25-63	MZCL	x	<u>63-90+</u>	HZCL	xx	0	II/III	2/3a	W
7	0-45	MZCL(dist)	<5	<u>45-80+</u>	HCL	xxx			xxx	0	III	3a	W
8	0-24	MZCL	<5	24-46	MZCL	xx	46-90+	HCL	xxx	0	III	3a	W
9	0-26	MZCL	<5	26-49	MZCL	x	<u>49-120</u>	HCL	xxx	0	III	3a	W
10	0-29	MZCL	<5	29-45	MZCL	xx	<u>45-90+</u>	HCL	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:

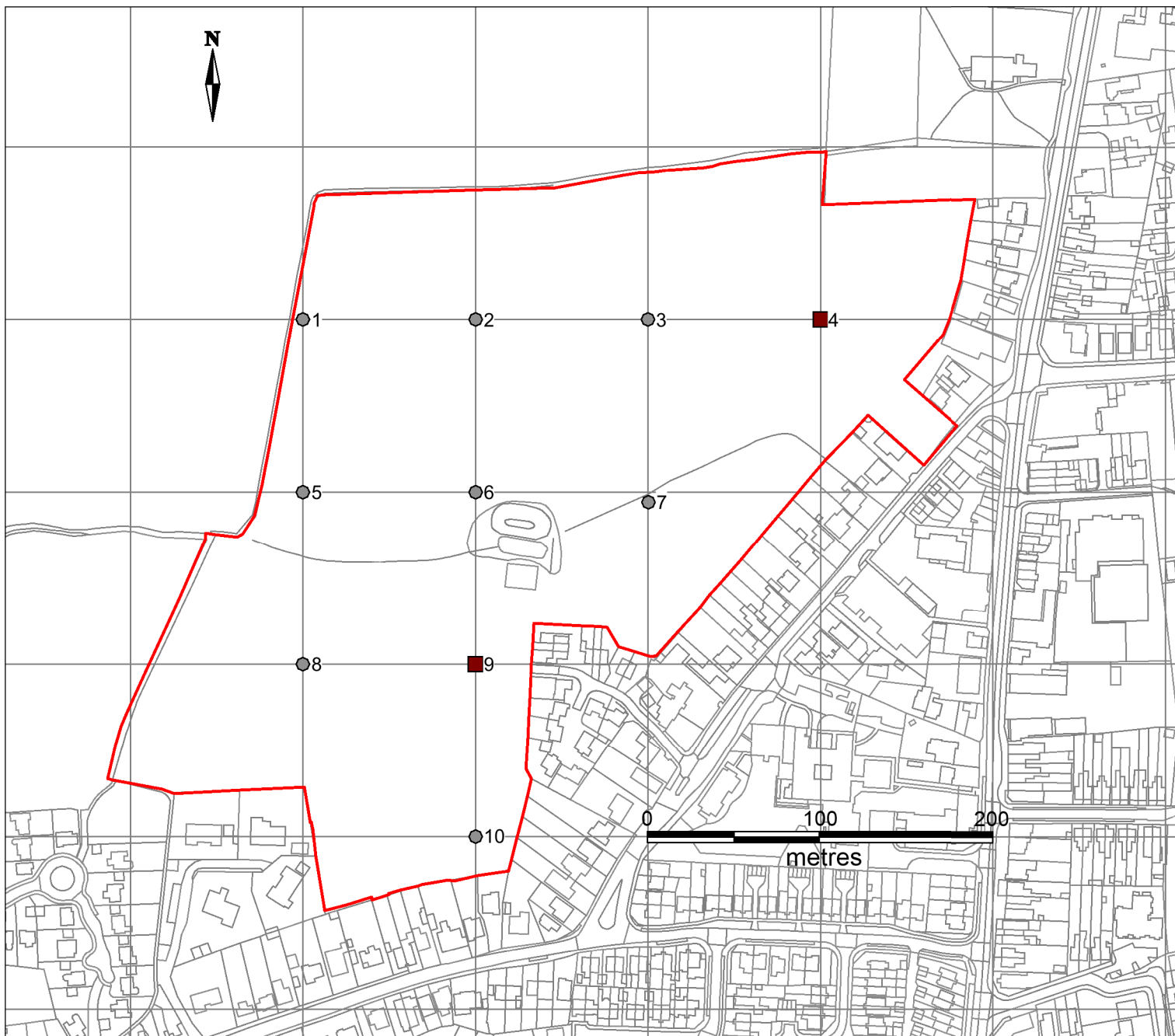
- C - clay
- ZC - silty clay
- SC - sandy clay
- CL - clay loam (H-heavy, M-medium)
- ZCL - silty clay loam (H-heavy, M-medium)
- SCL - sandy clay loam
- SZL - sandy silt loam (F-fine, M-medium, C-coarse)
- SL - sandy loam (F-fine, M-medium, C-coarse)
- LS - loamy sand (F-fine, M-medium, C-coarse)
- 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

- Auger observation
- Soil/land grade description point
- Survey area

Client:



Site:

Hayling Island

Map title:

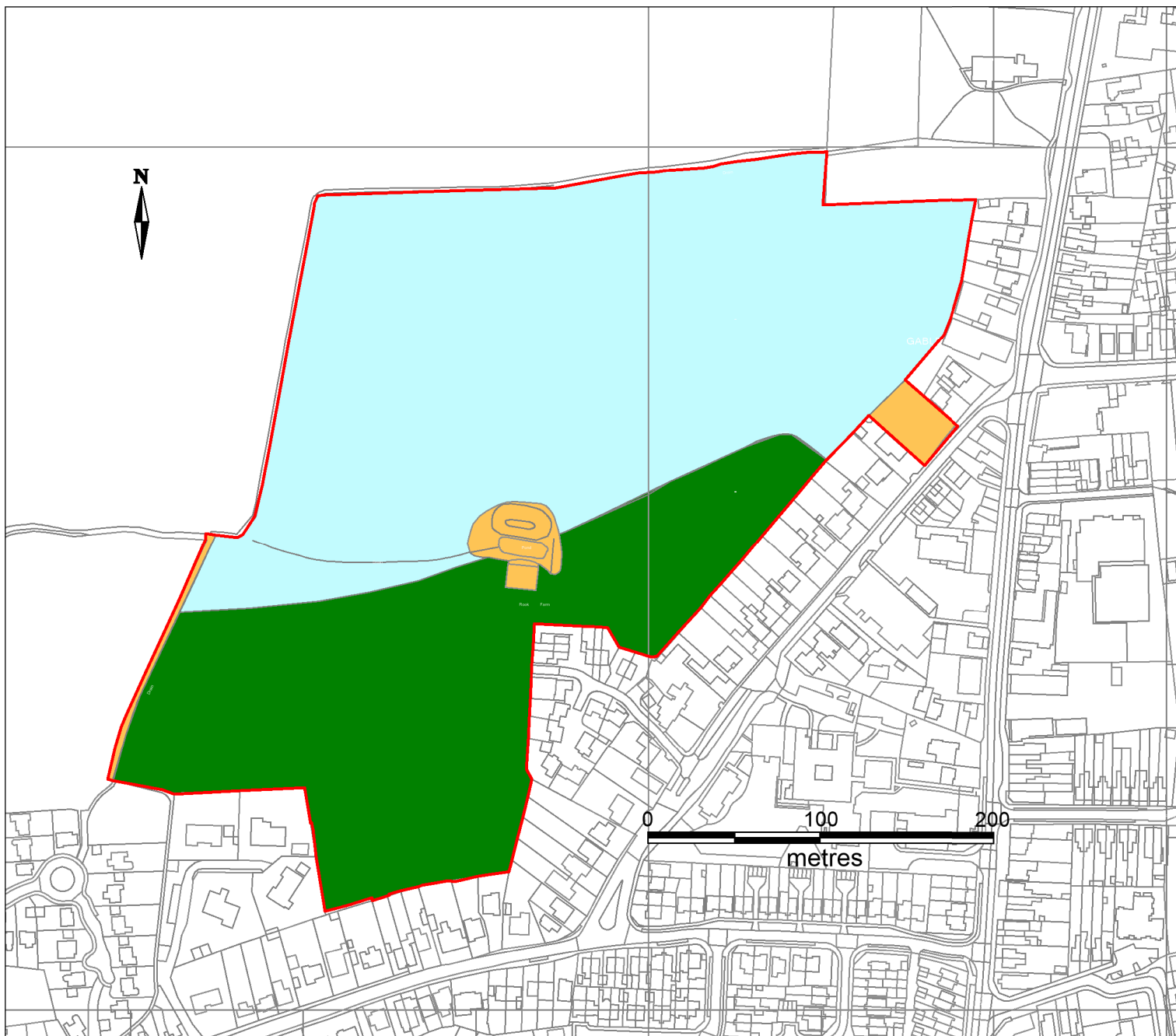
**Map 1
Survey observations**

**Land
Research
ASSOCIATES**

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Scale: 1:4,000

Date: 23/02/2017



KEY

- Grade 2
- Subgrade 3a
- Non Agricultural
- Survey area

Client:



Site:

Hayling Island

Map title:

**Map 2
Agricultural Land
Classification**

**Land
Research
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Scale: 1:4,000

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