

**A DESK REVIEW OF SOILS AND AGRICULTURAL QUALITY
OF LAND OFF FORD ROAD, ARUNDEL**

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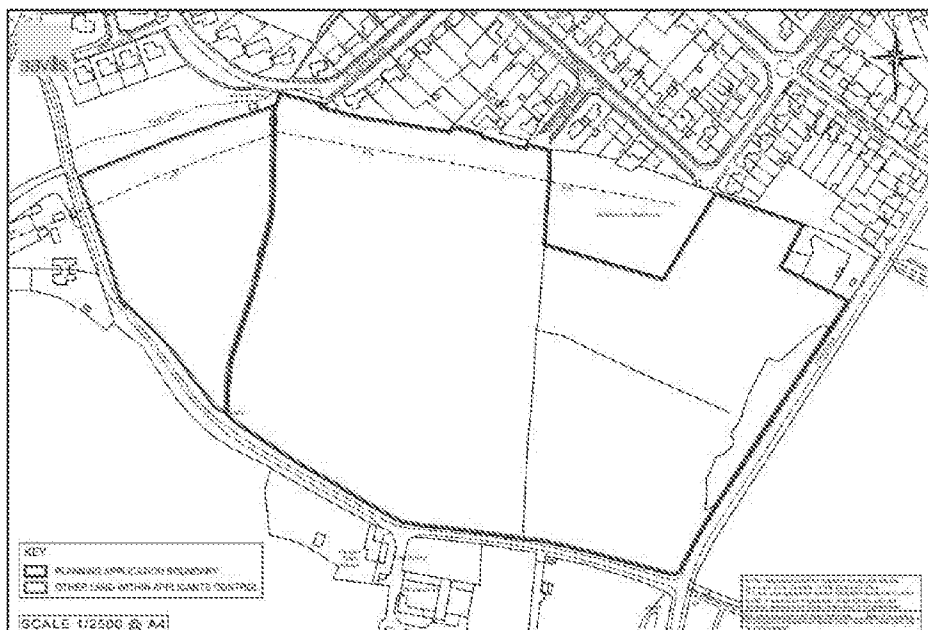
Report 1808/1
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1.0 Introduction

- 1.1 This review provides provisional information on the soil and agricultural quality of approximately 10 ha of land off Ford Road, Arundel (see site plan below).

Image 1: Site boundary (red line)



- 1.2 The land comprises three fields, bordered to the east by Ford Road, to the north by residential properties and by allotment gardens, to the south by Priory Lane and to the west by adjoining grassland.
- 1.3 The site is situated on the gentle south-east facing slopes of the Arun Valley, with the easternmost land forming the western edge of the (tidal) Arun floodplain. Average elevation is approximately 15 m AOD.
- 1.4 1:50,000 scale BGS information records the solid geology of the land as Tertiary clays, silts and sands of the London Clay Formation and Lambeth Group. Head deposits are recorded to overlie the solid geology on midslopes in central areas of the site.
- 1.5 The National Soil Map (published at 1:250,000 scale) shows the land as Wickham 4 Association: most commonly fine loamy over clayey soils formed in thin drift (Head) over clay, with similar soils with clay to the surface formed where drift is absent. These soils generally have significant drainage

restrictions caused by slow permeability of the underlying clay¹.

- 1.6 A detailed soil survey of the area (published at 1:25,000 scale) shows the land as Titchfield Complex, comprising imperfect and poorly drained clayey soils with variable upper layers (a complex mixture of Titchfield series and Wickham series) , formed in thin drift over Eocene clay².

¹ Jarvis M.G. *et al.*, (1984). *Soils and their use in South East England*, Soil Survey of England and Wales. Bulletin No. 15, Harpenden.

² Hodgson, J.M., 1967 *Soils of the West Sussex Coastal Plain*: Soil Survey Bulletin No 3, Harpenden.

2.0 Agricultural land quality

- 2.1 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 Classification³. The relevant data for the Site is given below.

Ford Road, Arundel (15 m)

- Average annual rainfall: 779 mm
- January-June accumulated temperature >0°C 1529 day°
- Field capacity period 161 days
(when the soils are fully replete with water) early Nov-mid Apr
- Summer moisture deficits for: wheat: 117 mm
potatoes: 113 mm

- 2.2 There are no climatic limitations to agricultural land quality at this locality.

SITE LIMITATIONS

Topography and gradient

- 2.3 The land is gently sloping (less than 7 degrees) and there are no other obvious topographic constraints to land quality.

Flooding

- 2.4 The Arun downstream of Arundel is protected by flood embankments and is therefore unlikely to affect land on the floodplain with any regularity which would affect agricultural quality. However, the floodplain land to the east of the site (east of Ford Road) is subject to numerous drainage ditches feeding the Arun, and it appears likely these will overtop and inundate this land frequently when the Arun is subject to high flows. Given the Site is elevated above the floodplain, it is judged that flood risk is not a likely limitation for the vast majority of the Site. A narrow strip of land in the east of the Site adjoining Ford Road appears to be subject to shallow groundwater (as evidenced by rush pasture) and this land is likely to be unsuitable for cultivation due to prolonged waterlogging and shallow flooding.

³Meteorological Office, (1989). *Climatological Data for Agricultural Land Classification*.

ESTIMATION OF LAND QUALITY

2.5 This assessment considers the following properties:

- Published soils and geology
- Climatic data for the site (which interact with soil properties to affect soil wetness and droughtiness constraints in the ALC system issued in 1988 by MAFF⁴).
- Relevant detailed ALC surveys in the area
- Historical aerial imagery

2.6 Wickham soil series⁵ and the associated Denchworth and Windsor series mapped at the site are imperfectly to poorly-draining under the local climate (Soil Wetness Class III to IV) due to surface water perching above dense, poorly-structured subsoil. This, in combination with the likely high clay content of the topsoil (greater than 27%), means that arable cropping is mainly limited to autumn-sown cereal rotations, because the soil is usually too wet to cultivate in spring.

2.7 A number of detailed Agricultural Land Classification surveys were undertaken in the area around Arundel by surveyors from the Ministry of Agriculture, Fisheries and Food (MAFF). Many of these surveys were conducted over similar geology and are recorded as similar soil types as the Site. They therefore provide relevant evidence in estimating the land grade of the Site. These results are summarised in Table 1 below.

⁴MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

⁵The former Titchworth soil series is included as a variation of Wickham soil series in the current soil classification system in use in England and Wales.

Table 1: relevant MAFF detailed ALC surveys

Site location	Natural England report ref.	Published geology	ALC grade
2 km west of Arundel	R073/93	London Clay and Alluvium over London Clay	Subgrade 3b with some grade 4
Land east of Fontwell	R071/97	Head over Lambeth Group	Subgrade 3b
Land south of Fontwell	R04202/027/90	Head over Lambeth Group	Mainly subgrade 3b, some subgrade 3a
Land north of Angmering	R4202\057\98	Head over London Clay and London Clay	Subgrades 3a and 3b
Land north of Angmering	4202\067\94	Head over London Clay and London Clay	Subgrades 3a and 3b
Land north of Angmering	4202\072\94	Head over London Clay and London Clay	Subgrade 3b
Land east of Angmering	4202\071\94	Head over London Clay and London Clay	Subgrades 3a and 3b with some grade 2

2.8 Historical aerial imagery shows the field in the west to be mainly in arable use over recent decades. The lower-lying fields in the east have been in permanent grass for at least twenty years.

2.9 Some consistent patchiness in colouration of the western field is visible on aerial images from different years, which may suggest variation in soil type (see Image 2 below). Some marshy areas in the easternmost field adjoining Ford Road is also evident, indicating it to be affected by waterlogging and possibly shallow water tables.

Image 2: Google Earth image dated 2012

3.0 Conclusions

LAND QUALITY

- 3.1 Other studies in the area have indicated that this type of land (over similar geology) is most commonly of subgrade 3b agricultural quality, with some subgrade 3a in lighter patches and grade 4 where land is wettest.
- 3.2 The Site is most likely to be dominantly of subgrade 3b agricultural quality, possibly with some patches of subgrade 3a on mid-slopes in the centre of the site, and grade 4 on the eastern margins. Wetness is likely to be the principal limitation to agriculture.

SOIL RESOURCES

Topsoils

- 3.3 The topsoil resources are most likely to be heavy and of moderate to low quality for reuse in landscaping and gardens, due to difficulties in handling caused when wet. Patches of lighter topsoil may occur in the western field which are of higher quality for reuse.

Subsoils

- 3.4 The subsoils are likely to be heavy, poorly-structured and of low reuse potential. Better structured upper subsoils with higher potential may occur in patches in the western field.
- 3.5 The nature and quantity of available resources should be checked with a site survey to inform a Soil Management Plan.