

AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF SOIL CHARACTERISTICS, LONGHAM, EAST DEREHAM, NORFOLK

1.0 BACKGROUND

- 1.1 The site covers an area of 44.5 ha, and is the subject of an application for mineral extraction.
- 1.2 ADAS Statutory Resource Planning Team undertook a detailed Agricultural Land Classification (ALC) survey of the site during October 1995. Information was collected from 34 auger borings spaced at 100 m intervals to a depth of 120 cm unless prevented by impenetrable material. Subsoil conditions were assessed from three inspection pits. Stone content of the topsoil was measured by sieving at each auger boring, and lower horizons were measured whilst digging the inspection pits.
- 1.3 At the time of the survey part of the site was being worked for mineral extraction the remainder was under post harvest stubble.
- 1.4 On the published 1:63 360 scale provisional ALC map (MAFF 1972) the whole site is shown as grade 3. This map, however, is of a reconnaissance nature and the current survey was undertaken to provide more detailed site specific information on soil and land quality.

2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

- 2.1 Climate criteria are considered when classifying land as these may have an overriding limitation in terms of the agriculture use of the land. The main parameters used in the assessment of the overall climate limitation are average

annual rainfall, as a measure of overall wetness, and accumulated temperature (day °C Jan - June) as a measure of the relative warmth of an area.

- 2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid data set produced by the Meteorological Office (Met. Office 1989). The details are given in Table 1 and show that there is no overall climatic limitation affecting this site.

Table 1 Climatic Interpolation

| | |
|---|------------|
| Grid Reference | TF 927 170 |
| Altitude (m) | 60-65 |
| Accumulated Temperature (Day °C Jan - June) | 1364 |
| Average Annual Rainfall (mm) | 703 |
| Moisture Deficit, Wheat (mm) | 104 |
| Moisture Deficit, Potatoes (mm) | 96 |
| Field Capacity (Days) | 146 |
| Overall Climatic Grade | 1 |

Altitude and Relief

- 2.3 The land gently rises from 60 m AOD in the south east corner of the site to approximately 65 m AOD in the north west part of the site. It is bounded on three sides by tracks or tarmac roads and by a hedge-lined ditch on the southern side. Gradient does not impose any limitation to the ALC grading.

Geology and Soils

- 2.4 There are no detailed geology maps for the area, but the published 1:250,000 small scale geology map (GSEW 1985) shows the site to overlie a bedrock of upper chalk. No detailed map of the drift deposits exists for this area. However the small scale, 1:250,000, soil survey map (SSEW 1983) indicates that the soils are derived from chalky till and glaciofluvial drift.

2.5 The reconnaissance soil survey map for the area (SSEW 1983) shows the whole site to comprise soils of the Burlingham 1 Association *

2.6 The present detailed survey of the site shows the presence of two soil types.

Soil type 1 typically comprises non calcareous slightly stony medium sandy loam topsoil with non calcareous slightly stony (occasionally moderately stony) medium sandy loam (occasionally loamy medium sand) upper subsoil. Lower subsoil comprises moderately stony (occasionally very stony) loamy medium sand. Within the lower horizon medium sand and sandy clay loam lenses were variably encountered.

Soil type 2 typically comprises non calcareous moderately stony medium sandy loam with non calcareous moderately stony (occasionally very stony) medium sandy loam (occasionally loamy medium sand) upper subsoil. Lower subsoil comprises very stony loamy medium sand with occasional sandy clay loam lenses

3.0 AGRICULTURE LAND CLASSIFICATION

3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the individual grades found within the site is given in Table 2. The definitions of the various ALC grades are given in Appendix 2.

* Burlingham 1 Association:- Deep coarse and fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some deep well drained coarse loamy and sandy soils.

Table 2 Distribution of Grades and Subgrades

| Grade | Area (ha) | % of site |
|------------------|-------------|-------------|
| 3a | 27.3 | 61.3 |
| 3b | 4.6 | 10.4 |
| Non Agricultural | <u>12.6</u> | <u>28.3</u> |
| | 44.5 | 100.0 |

Subgrade 3a

- 3.2 Land graded subgrade 3a occurs over the majority of the surveyed area. The combination of light soil textures and slightly stony horizons reduces the available water for crop growth. Consequently moderate droughtiness imperfections restrict the land to subgrade 3a. Due to variability across the site occasional soil profiles of grade 2 occur, but due to the scale of mapping it is not possible to delineate these areas separately.

Subgrade 3b

- 3.3 Land graded subgrade 3b occurs on the remainder of the surveyed area. The profiles are light textured with moderate stoniness in the topsoil and moderate/very stony subsoils. High stone content causes extra wear and tear to implements and tyres and causes reduced plant population in precision drilled crops. Also moderate/severe droughtiness imperfections will occur, therefore the land is restricted to subgrade 3b.
- 3.4 Irrigation is available, however the quantity of water is insufficient to raise the quality of the land which has not been down graded on stoniness.

Non Agricultural

3.5 The non-agricultural area consists of an area being worked for mineral extraction and soil bunds.

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Resource Planning Team
ADAS Cambridge

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES. 1985

Solid geology map sheet 52°N - 00° scale 1:250,000

**MAFF 1972. AGRICULTURAL LAND CLASSIFICATION map, provisional. sheet
125**

scale 1:63360

**MAFF 1988. AGRICULTURAL LAND CLASSIFICATION OF ENGLAND AND
WALES**

(Revised guidelines and criteria for grading the quality of agricultural land).

Alnwick.

**METEOROLOGICAL OFFICE 1989. Climatological data for Agricultural Land
Classification. Met Office, Bracknell.**

**SOIL SURVEY OF ENGLAND AND WALES, 1973. Soils of Norfolk Scale
1:100000**

**SOIL SURVEY OF ENGLAND AND WALES, 1983. Sheet 4 Soils of Eastern
England Scale 1:250000**

Appendix 1

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

Soil Type 1

| | | |
|---------------|-------------|--|
| Topsoil | Texture | : medium sandy loam |
| | Colour | : 10YR4/3 |
| | Stone | : 6% medium and large angular flints |
| | Roots | : many, fine and very fine, few medium |
| | Depth | : 37 cm |
| Upper Subsoil | Texture | : medium sandy loam |
| | Colour | : 10YR4/6 |
| | Stone | : 6% medium and large angular flints |
| | Structure | : weakly developed; medium and coarse sub angular blocky |
| | Consistence | : very friable |
| | Porosity | : >1% |
| | Roots | : common, fine and very fine |
| | Depth | : 72 cm |
| Lower Subsoil | Texture | : loamy medium sand |
| | Colour | : 7.5YR5/8 |
| | Stone | : 42% medium and large angular flints |
| | Structure | : too stony to assess |
| | Porosity | : >1% |
| | Roots | : few, fine and very fine |
| | Depth | : 110 cm |

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

Soil Type 2

| | | |
|---------------|-----------|--|
| Topsoil | Texture | : medium sandy loam |
| | Colour | : 10YR4/3 |
| | Stone | : 25% medium and large angular and subangular flints |
| | Roots | : many, fine and very fine |
| | Depth | : 31 cm |
| Upper Subsoil | Texture | : medium sandy loam |
| | Colour | : 10YR5/6 |
| | Stone | : 80% small, medium and large angular flints 70% at 55 cm |
| | Structure | : too stony to assess |
| | Porosity | : >1% |
| | Roots | : many, fine and very fine |
| | Depth | : 100 cm |