

AGRICULTURAL LAND CLASSIFICATION

BRIGGATE RIVER, WHITTLESEY, CAMBRIDGESHIRE

1.0 INTRODUCTION

1.1 Land on this 14 hectare site was inspected on the 22nd October 1990. A total of thirteen soil inspections were made on a 100 metre grid supplemented by information from two soil profile pits. At the time of survey the majority of the land was in arable use (typical crops including cereals, potatoes, sugar beet and beans). The small field south of the pumping station to the east of the site was lying vacant.

2.0 PHYSICAL FACTORS AFFECTING AGRICULTURAL LAND QUALITY

Relief

2.1 The site occupies very gently undulating land between 1.5 m and 2.5 m AOD. The land in arable use to the west of the site is underdrained, and groundwater levels controlled by pumping. The small area of vacant land to the east is currently undrained, and at the time of survey showed evidence of wetness in a localised area surrounding the Lock Keepers cottage.

Climate

2.2 Site specific climate data has been interpolated from data contained in the 5K agroclimatic set produced by the Meteorological Office (Met Office 1989). This shows average annual rainfall to be 568 mm which is low by national standards. Field capacity days at 97 are also low. The accumulated temperature 1453°C. This parameter measures the cumulative build up of warmth available for crop growth and influences the development of soil moisture deficits (SMD). Soil moisture deficits of 121 mm and 117 mm are recorded for wheat and potatoes respectively.

Geology & Soils

2.3 The geology of this area is mapped on the 1:50,000 solid and drift edition geology map sheet number 158. This shows the entire site to comprise Nordelph Peat, but comments that in many areas this has now wasted. (Geol. Surv, 1984)

2.4 No detailed published soil map exists for this area, however the generalised 1:250,000 scale soils map (SSEW,) shows the site to comprise Downholland 1 soil association. Field survey observations broadly support the above descriptions and identify two main soil types.

2.5 On the very slightly raised ground to the north and north west of the site soils typically comprise of organic clay textures overlying clay below 40/50 cm. Soils of this type have a relatively well developed coarse pore network within the underlying subsoil, are typically non acidic and are assessed as wetness class II.

SMD: represents the balance between rainfall and potential evapo-transpiration. For ALC purposes the soil moisture deficits developing under a winter wheat and maincrop potato crop are considered. These reference crops have been selected because they are widely grown and in terms of their susceptibility to drought are representative of a wide range of crops.

- 2.6 Over the remaining lowerlying parts of the site, soils have enhanced levels of soil organic matter. Profiles in these areas comprise peaty loam textures which may contain or overlie horizons of organic silty clay loam at depth. In areas of transitional soil types profiles may overlie clay below depths of 50 cm.
- 2.7 On the drained land to the west of the pumping station the majority of the peaty soils (see paragraph 2.6) were strongly acidic below depths of 45/50 cm (laboratory analyses indicate values of 3.09 within the subsoil). Soil pit observations in these areas indicated that roots were able to penetrate a short distance into these acid horizons but quickly petered out below depths of approximately 55cm. Drainage status within these areas was assessed as wetness class I and II.
- 2.8 On the undrained vacant land to the east of the site soils are currently non-acidic (PH levels of 7.0 were recorded in the field). It should be noted however that these soils have the potential to become acidic following the installation of under drainage*. The drainage status of these soils is assessed mainly as wetness class III, although a small area of wetness class IV soils may occur in the immediate vicinity of the Lock Keepers Cottage, to the north of the site.

3.0 AGRICULTURAL LAND CLASSIFICATION

The site is graded 2, with small areas of non agricultural and urban land flanking the river along the northern edge. A breakdown of land quality in hectares and percentage terms is provided below.

ALC	Hectares	Percentage
2	13.1	92.3
Non Ag	1.0	7.0
Urban	<u>0.1</u>	<u>0.7</u>
Total	<u>14.2</u>	<u>100.0</u>

- 3.1 The majority of the land is limited by minor summer droughtiness imperfections, and in areas of undrained, or heavier clayey soil variants (see paras 2.8 and 2.5) by minor winter wetness and workability constraints.
- 3.2 Within the area of drained peaty soils, the droughtiness constraint derives the presence of a strongly acid horizon below depths of 45/50 cm in the soil profile. This impairs root penetration and means that crops are unable to utilise reserves of water held at depth within the soil profile and are consequently susceptible to drought. Since acid conditions below approximately 45 cm are not easily corrected by normal management operations this effectively constitutes a long term and overriding limitation to land quality.

* Underdrainage causes oxidation of the iron pyrites which occurs naturally in marine sediments. This reaction causes the release of sulphuric acid as a by product. Where soils are undrained the iron pyrites remains unoxidised and profiles are usually neutral.

- 3.3 Within areas of slightly heavier soil types (para 2.5) the droughtiness constraint derives from the presence of less water retentive clay textures at depth within the profile. This also contributes to slightly reduced subsoil permeability and imposes an additional minor winter wetness and workability constraint within these areas.
- 3.4 The undrained land to the east of the site is limited by wetness and workability constraints which derive from the presence of fluctuating groundwater levels. This will effectively reduce the period over which the land can be satisfactorily grazed or cultivated.

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Sources of Reference

Meteorological Office (1989). Climate data extracted from the published agricultural climatic dataset.

Geological Survey (1984), 1:50,000 Scale Solid and drift edition geology map, sheet number 155, Peterborough.

Soil Survey of England and Wales (1984). 1:250,000 scale. Soil map of Eastern England Sheet 4.