STATEMENT OF PHYSICAL CHARACTERISTICS

LAND AT STONECASTLE FARM

WHETSTED KENT

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1 BACKGROUND

1 1 Land on this 14 1ha site was inspected on the 11 April 1991 in connection with proposals to extract sand and gravel 14 auger borings were made with a 1 2m dutch soil auger at approximately 100m intervals across the site Additional soil data was collected from two soil inspection pits

1 2 At the time of survey the land was divided into two enclosures both in cereal production

2 PHYSICAL FACTORS AFFECTING LAND QUALITY

2 1 Climate

Interpolation of climatic variables to obtain a site estimate from surrounding grid point data (Met Office 1989) gives the following climatic information

Grid reference	TQ 659466
Altitude	14m A O D
Accumulated Temperature	1497 day degrees >0 C
Average Annual Rainfall	684mm
Field Capacity Days	141 days
Moisture Deficit-wheat	122mm
-potatoes	119mm

2 2 The relatively warm and dry climate at this location places no limitation on agricultural land quality per se However interactions between soil and climatic factors, namely wetness and droughtiness are important factors influencing land quality

2 3 Relief

The site lies at an altitude of approximately 14m A O D on very gently sloping land within the River Medway valley The highest land on the site occurs towards the northwest with gentle falls away from this to the south and east Gradient places no limitation on agricultural land quality

2 4 Geology and Soils

The published geological survey map covering the site (Sheet 287 Sevenoaks I G S, 1971) indicates the land to comprise flooplain alluvium Detailed inspection of the site, however suggests that soils are probably derived from stoneless drift possibly partly derived from adjoining brickearth deposits A semi-detailed soil map of the site is published (Soil Survey Record No 99, Sheet TQ64 SSEW, 1986) This maps the majority of the site as the Hook series mapping unit described as 'deep permeable stoneless slightly mottled silty soils, occasionally calcareous below 40cm common similar stony or fine loamy soils in places (SSEW, 1986) The Conway series mapping unit is also shown as a narrow strip along the south eastern boundary of the site This mapping unit is described as containing Deep stoneless prominently mottled greyish fine silty soils (SSEW, 1986)

2 5 Field inspection of soils on this site suggests that they may be derived from a combination of drift materials including river terrace material and brickearth Topsoils are typically medium sandy silt loams overlying similar textured or slightly heavier upper subsoils which usually become sandier passing to sandy clay loams medium sandy loams and loamy medium sands at depth At occasional locations a gravelly substratum was encountered at depth

2 6 The presence of ochreous mottles and gley features together with the absence of well defined slowly permeable horizons over most of the site indicates that the soils are affected by fluctuating

groundwater to varying degrees At some locations narrow slowly permeable layers may occur in the sandy clay loam horizons but these are not well defined Wetness Class is mainly I and II, with occasional borings of wetness Class III where slowly permeable layers occur

2 7 These soils have a moderately good available water capacity but the relatively coarse nature of the subsoils coupled with the relatively high crop adjusted moisture deficits at this locality make most of these soils slightly drought-prone

3 AGRICULTURAL LAND CLASSIFICATION

3 1 The breakdown of grades in terms of area and extent is as follows

	Ha	%
Grade 2	14 1	100

Grade 2

3 2 The whole of the site is included in this grade The major limitation to agricultural use is one of slight wetness and/or droughtiness Although wetness class varies from I to III the light loamy sandy silt loam topsoil enables these soils to remain in a workable condition over a range of moisture contents aided by the relatively dry climatic regime

4 SOIL RESOURCES

4 1 Soils on the site are sufficiently uniform in nature to comprise a single topsoil mapping unit of dark brown to dark greyish brown (10YR 4/3-4/2) medium sandy silt loam with a mean depth of 28 4 cm (range 27-30 cm)

4 2 Subsoils are more variable in texture ranging from medium clay loam and sandy clay loams to loamy sands and sands This variation occurs vertically rather than laterally A single mapping unit is therefore identified although a separation could be made on the basis of wetness class with the slightly lower lying land to the east of the site having a higher groundwater table than to the west

4 3 Where examined subsoil structures comprised mainly friable, weakly developed coarse sub-angular blocky peds with porous upper profiles (to c 50 cm) containing more than 0 5% biopores >0 5 mm Subsoils were well explored by roots to 100-120 cm

4 4 With the exception of one sampling location all profiles extended to at least 120 cm Useful soil forming materials may occur below this depth

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SOURCES OF REFERENCE

INSTITUTE OF GEOLOGICAL SCIENCES (1971) Sheet 287 (Sevenoaks)

MAFF (1988) Agricultural Land Classification in England and Wales Revised guidelines and criteria for grading the quality of agricultural land

METEOROLOGICAL OFFICE (1989) Climatological Data for Agricultural Land Classification

SOIL SURVEY OF ENGLAND AND WALES (1986) 1 25 000 Survey Sheet No TQ 64 (Paddock Wood), Soil Survey Record No 99

APPENDIX I

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur typical cropping range and the expected level and consistency of yield In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one third of the agricultural land in England and Wales About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4 Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates The remainder is very poor quality land in Grade 5 which mostly occurs in the uplands

Descriptions are also given of other land categories which may be used on ALC maps

Grade 1 – excellent quality agricultural land

Land with no or very minor limitations to agricultural use A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit soft fruit salad crops and winter harvested vegetables Yields are high and less variable than on land of lower quality

Grade 2 – very good quality agricultural land

Land with minor limitations which affect crop yield cultivations or harvesting A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops The level of yield is generally high but may be lower or more variable than Grade 1

Grade 3 – good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops timing and type of cultivation harvesting or the level of yield Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2

Subgrade 3a – good quality agricultural land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops especially cereals or moderate yields of a wide range of crops including cereals grass oilseed rape potatoes sugar beet and the less demanding horticultural crops

Subgrade 3b – moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year

Grade 4 – poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable In moist climates yields of grass may be moderate to high but there may be difficulties in utilisation The grade also includes very droughty arable land

Grade 5 – very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing except for occasional pioneer forage crops

Descriptions of other land categories used on ALC maps

Urban

Built up or hard uses with relatively little potential for a return to agriculture including housing industry commerce education transport religious buildings cemeteries Also hard surfaced sports facilities permanent caravan sites and vacant land all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants

Non agricultural

Soft uses where most of the land could be returned relatively easily to agriculture including golf courses private parkland public open spaces sports fields allotments and soft surfaced areas on airports/airfields Also active mineral workings and refuse tips where restoration conditions to soft after uses may apply

Woodland

Includes commercial and non commercial woodland A distinction may be made as necessary between farm and non farm woodland

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses Temporary structures (eg polythene tunnels erected for lambing) may be ignored

Open water

Includes lakes ponds and rivers as map scale permits

Land not surveyed

Agricultural land which has not been surveyed

Where the land use includes more than one of the above land cover types eg buildings in large grounds and where map scale permits the cover types may be shown separately Otherwise the most extensive cover type will usually be shown

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile Six revised soil wetness classes (Hodgson in preparation) are identified and are defined in Table 11

Table 11 Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years[2]
II	The soil profile is wet within 70 cm depth for 31 90 days in most years *or* if there is no slowly permeable layer within 80 cm depth it is wet within 70 cm for more than 90 days but not wet within 40 cm depth for more than 30 days in most years
III	The soil profile is wet within 70 cm depth for 91 180 days in most years *or* if there is no slowly permeable layer within 80 cm depth it is wet within 70 cm for more than 180 days but only wet within 40 cm depth for between 31 and 90 days in most years
IV	The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years *or* if there is no slowly permeable layer within 80 cm depth it is wet within 40 cm depth for 91 210 days in most years
V	The soil profile is wet within 40 cm depth for 211 335 days in most years
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years

[1] The number of days specified is not necessarily a continuous period

[2] In most years is defined as more than 10 out of 20 years

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics site and climatic factors Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field The method adopted here is common to ADAS and the SSLRC