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LAND NEAR ASTLEHAM COTTAGE, LALEHAM, SURREY.

AGRICULTURAL LAND CLASSIFICATION.

MAFF Ministry of Agriculture Fisheries and Food

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1. BACKGROUND

1.1 The site lies to the south of the Queen Mary Reservoir near Laleham in Surrey. It is bounded to the north by a track leading to Astleham Cottage, to the south and west by the River Ash, and to the east by a drain. The site was visited on 31st May 1990 in connection with proposals for the extraction of sand and gravel.

1.2 The site was inspected using 100 cm and 120 cm Dutch soil augers with samples being taken at approximately 100 m intervals across the site. In addition, one soil pit was examined.

1.3 The site was previously surveyed during 1982 in connection with the North-West Surrey Minerals Plan, (Ref: 4007/015/82). The purpose of the current survey was to review the grading on the site in light of the recent revision of the agricultural land classification system, (Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land, MAFF, 1988).

Land-use

1.4 At the time of inspection the site was under permanent pasture.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

2.1 The site lies at approximately 14-15 m A.O.D., falling very gently towards the River Ash at the south and west. Gradient is not a significant limitation in terms of land quality in this locality.

Climate

2.2 The average annual rainfall for this area is approximately 657 mm, (Met Office, 1989), this being relatively low in national terms. The median accumulated temperature above 0°C between January and June, a measure of the relative warmth of a locality is expected to be 1501 day degrees, (Met Office, 1989). The site has approximately 134 field capacity days which provides a measure of the effect of climate on the soil water regime. Crop adjusted moisture deficits are 119 mm for wheat and 115 mm for potatoes.
The site is unlikely to be especially frost-prone or exposed.

2.3 Climatic factors per se place no limitation on agricultural land quality, but do affect interactive limitations between soil and climate, namely soil wetness and droughtiness.

Geology and Soils

2.4 British Geological Survey, Sheet 269, Windsor, (1981), shows the site to be underlain mainly by Quaternary Flood Plain Gravel, with a narrow band of alluvium occurring towards the south and west in association with the River Ash.

2.5 Soil Survey of England and Wales, Sheet 6, Soils of South-East England, (1983), shows the site as typical argillic brown earths of the Hucklesbrook association. These are described aswell drained, coarse loamy soils which overlie gravel at moderate depth (SSEW, 1983).

2.6 Detailed field examination of the soils indicates that there are two broad soil groups present on the site.

2.7 Firstly, and most extensively, are those soils, which have developed over the Quarternary Flood Plain Gravel deposits. They typically comprise slightly stony, (c. 2-5% v/v of medium angular flints), fine sandy silt loam topsoils, overlying sandy silt loam

in the upper subsoil, and passing to medium or heavy clay loam, sandy clay loam or sandy loam in the lower subsoil below about 45-50 cm depth. They typically rest over gravel at variable depth below about 80 cm, although commonly profiles became impenetrable above this depth due to the presence of flints throughout the profile.
Although occasional profiles are mottled and gleyed at depths between about 30 cm and 70 cm, they are not thought to be slowly permeable and are thus assigned to wetness class I or II.

2.8 The second group of soils are very localised, being found in association with the alluvial deposits adjacent to the River Ash. They typically comprise slightly stony (c. 2-5% medium angular flints v/v), medium silty clay loam topsoils, which are thought to overlie similar or heavier textures in the subsoil. Due to the stony and dry nature of the soil at the time of inspection, it was not possible to obtain a full profile description for this soil group. However, information obtained on an adjacent site to the west of the River Ash, indicates that the profiles comprise slightly stony (c. 2-5% v/v of medium angular flints), medium silty clay loam topsoils overlying stony, (ie, 8-10% v/v of medium angular flints), heavy silty clay loam or medium clay in the subsoil, which becomes impenetrable over gravel at about 70 cm. These soils are poorly drained with mottling and gleying occurring immediately below the topsoil from about 20 cm depth in association with slowly permeable clay horizons. Profiles are thus appropriately assigned to wetness class IV.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 Inspection of the site in view of the revised guidelines and criteria for grading the quality of agricultural land, (MAFF, 1988), indicates that the distribution of grades is similar to that identified in the 1982 survey.

3.2 The ALC grading of the survey area is primarily determined by interactions between climate and soil factors, namely wetness and droughtiness. ALC grades 2 and 3b have been identified.

3.3 Appendix 1 gives a generalised description of the grades and sub-grades, identified in this survey.

3.4 Grade 2

Land of this quality occurs across the majority of the site in association with the underlying Flood Plain Gravel deposits. Profiles are typically slightly stony throughout, (ie, containing c. 2-5% medium angular flints v/v), and comprise fine sandy silt loam topsoils overlying sandy silt loam in the upper subsoil, passing to similar textures or medium or heavy clay loam, sandy clay loam or sandy loam at variable depth. They commonly become impenetrable, (to soil auger), over gravel in a sandy matrix at depths greater than 80 cm.

Profiles are usually mottled and gleyed at variable depths between about 30 cm and 70 cm as a result of a fluctuating ground water-table. They are generally well drained and are thus assigned to wetness class I or II. Profiles are, however, limited to a minor extent by slight droughtiness resulting from stoniness and moderately shallow depth over gravel.

3.5 Grade 3b

Land of this quality occurs in two situations on the site. Firstly, in association with the alluvial deposits adjacent to the River Ash where profiles typically comprise slightly stony, (c. 2-5% medium angular flints v/v), medium silty clay loam topsoils which are thought to overlie similar textures, heavy silty clay loam or medium clay in the subsoil and which become impenetrable over gravel in a sandy matrix at variable depths greater than about 70 cm.

Profiles are typically mottled, gleyed and slowly permeable from about 20 cm depth and thus fall into wetness class IV. They are limited in agricultural terms by drainage imperfections.

The second situation in which land of this quality occurs is in association with disturbed ground near the eastern boundary of

the site. Here profiles are stony, (estimated 5-10% medium angular flints v/v throughout), and impenetrable to soil auger at very shallow depth.

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SOURCES OF REFERENCE

BRITISH GEOLOGICAL SURVEY, (1981), Sheet 269, Windsor.

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

METEOROLOGICAL OFFICE, (1989), Climatological datasets for agricultural land classification.

SOIL SURVEY OF ENGLAND AND WALES, (1983), Sheet 6, Soils of South-east England,

SOIL SURVEY OF ENGLAND AND WALES, (1984). Bulletin 15 - Soils and their use in South-east England.

APPENDIX 1

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.

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.