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AGRICULTURAL LAND CLASSIFICATION

CROWMARSH GIFFORD OXON

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LAND AT BENSON LANE CROWMARSH GIFFORD OXFORDSHIRE

1 APPLICATION SITE

1 1 BACKGROUND

1 1 1 Land on this 4 1 ha site was inspected on 19 and 20 September 1989 in connection with residential development proposals Auger borings were made over the area supplemented with additional information from 2 soil pits

1 1 2 At the time of survey the land which forms part of a larger enclosure was in winter cereal production

1 2 PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

1 2 1 The land lies at an altitude of around 50 m A O D on very gently sloping land forming part of a terrace within the River Thames Valley The land has only very gentle and minor surface undulations and consequently gradient is not a limitation in terms of the agricultural land quality of the site

Climate

1 2 2 Site estimates of climate data from interpolation of grid point values (Met Office 1989) indicate an average annual rainfall of 602 mm which is low by national standards An accumulated temperature of 1461 day degrees and a 131 day field capacity day period is anticipated Moisture deficit values of 117 mm and 110 mm are obtained for wheat and potatoes respectively

1 2 3 Climatic factors per se place no limitation on the agricultural land quality of the site but they do have an important influence on the interactive limitations between climate and soil namely wetness and droughtiness

Geology and Soils

1 2 4 A geological map of the Wallingford area at 1 25 000 is included in Mineral Assessment Report 64 (Sheet SU 68) (I G S 1981) This indicates that the site lies within an area of 1st level river terrace deposits which rest over Lower Chalk The terrace deposits are described as well-sorted well stratified and cross bedded sands with pebbles of flints Juarssic limestone and minor amounts of ironstone chalk quartz and quartzite (I G S 1981)

1 2 5 The soils associated with this deposit on the site comprise very slightly stony calcareous medium to heavy clay loam or sandy clay loam topsoils overlying a similar textured or slightly heavier heavy clay loam subsoil which may be slightly stony Below 50 cm this may pass into a highly calcareous sandy loam or sandy clay loam with an

increasing flint gravel content They typically become impenetrable within 70 100 cm as sandy flint gravels are encountered Faint ochreous mottling may be evident but full gley morphology is confined to a small number of profiles at depths of 50-70 cm plus These soils are not slowly permeable and therefore appropriately allocated to wetness class I since they have no significant wetness limitation The main agricultural limitation of this land is drought risk

1 3 AGRICULTURAL LAND CLASSIFICATION

1 3 1 The whole site is mapped as grade 2 on the accompanying plan

Grade 2

1 3 2 Land of this quality comprises very good quality agricultural land and a wide range of agricultural and horticultural crops can usually be grown As outlined in paragraph 2 5 the soils are permeable and freely draining and although groundwater may occur at depth in the profile this does not constitute a significant wetness effect The main limitation causing this land to be included in grade 2 if one of droughtiness This is due to a combination of low rainfall relatively coarse lower subsoil textured slight stone content (around 5% or less total volume 0-50 cm but increasing below) and a basal deposit of calcareous sandy gravel from depths of 70-100+ The likely agronomic effect is to depress and cause some variability in crop yields

2 LAND ADJOINING APPLICATION SITE LYING WITHIN A423 CROWMARSH BY-PASS

2 1 BACKGROUND

2 1 1 An additional 19 94 ha of land was inspected on 19 and 20 September 1989 in parallel with the planning application site described previously A further 22 auger borings were made on a 100 m grid sampling basis This additional area comprised the whole of one enclosure and the remaining part of the field containing the application site At the time of survey both were in arable use (winter cereals/plough)

2 2 PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief and Climate

2 2 1 The data and observations contained in paragraphs 1 2 1 and 1 2 2 are also applicable to this more extensive area

Geology and Soils

2 2 2 The geological map referred to in paragraph 1 2 4 9 (I G S 1981) indicates that the whole of this additional survey area comprises first level river terrace deposits overlying Lower Chalk However detailed field survey indicates that soft highly calcareous grey marly deposits believed to be Lower Chalk are exposed in a limited area in the extreme south eastern corner of the site adjoining the by-pass

2 2 3 The majority of soils associated with the additional survey area are very similar in type to those described previously in paragraph 1 2 5 However there is a tendency for soils to be shallower over the calcareous sandy gravelly parent material towards the centre and northern sections of the area This increases the drought-risk in these locations In addition the soils associated with the Lower Chalk deposits noted in paragraph 2 2 2 comprise almost stone-free highly calcareous heavy clay loam topsoils over a highly calcareous and uniform grey mostly heavy clay loam upper subsoil which passes to pale grey soft silt loam or medium silty clay loam (cheesey) chalk marl Although well drained these soils are limited by relatively heavy topsoil textures and consequently workability constraints

2 3 AGRICULTURAL LAND CLASSIFICATION

2 3 1 A breakdown of the area and relative extent of the grades mapped for this additional area are given below together with totals for the whole of the survey area within the A423 by-pass including the application area

ADDITIONAL SURVEY AREA			WHOLE SURVEY AREA (incl Application Site)		
Grade	Ha	%	Grade	Ha	%
2	11 01	55	2	15 11	63
3a	8 93	45	3a	8 93	37
Total	19 94		Total	24 04	

2 3 2 The descriptions and explanation below relate to the additional survey area only

Grade 2

2 3 3 The majority of land mapped as the grade 2 is very similar to that described in paragraph 1 3 2 and is limited by drought-risk A small area of land associated with the Lower Chalk deposits described previously is also included in grade 2 These soils are freely draining (wetness class I) and have adequate supplies of available moisture but are limited by their heavy clay loam topsoils which give rise to potential workability constraints

Grade 3

Subgrade 3a

2 3 4 Land of this quality is mapped towards the northern part of the site and as a tongue extending southwards The associated soils are those derived from river terrace deposits and are described in paragraph 2 2 3 This land is distinguished from that included in grade 2 by the occurrence of the calcareous sandy gravelly parent material higher in the soil profile (ie from depths of about

50-70 cm) This results in an increased likelihood of drought when compared with the adjoining land

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Sources of Reference

INSTITUTE OF GEOLOGICAL SERVICES (1981) Mineral Assessment Report 64 - Sheet SU 68 (Wallingford and Goring Oxfordshire)

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

METEOROLOGICAL OFFICE (1989) Agroclimatic Datasets for Agricultural Land Classification

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

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