

Cambs 81/89

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AGRICULTURAL LAND CLASSIFICATION

LAND AT WESTHILL FARM (SITE B), BRACKLEY, NORTHAMPTONSHIRE

1. BACKGROUND

1.1 The site, an area of 23.2 ha, is the subject of an application for residential development at Westhill Farm, Brackley. MAFF surveyed this site in January 1990 to assess the agricultural land quality.

1.2 Published Agricultural Land Classification (ALC) information is available at a scale of 1:63 360 (sheet 146: Provisional: MAFF 1968). This map shows the entire site to be grade 3. These maps are inappropriate for site-specific appraisals however, as they are essentially reconnaissance in nature and do not always show small areas of individual ALC grades of less than approximately 80 ha. The current survey was undertaken to provide a more detailed ALC for the area.

1.3 A total of 32 soil inspections were made over the site and data collected was supplemented by information from 3 soil profile pits.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 Climate data for the site has been obtained by interpolating information contained in the published agricultural climatic dataset (Met Office, 1989). This indicates that, for a mid-range altitude of 145m AOD, the annual average rainfall is 680 mm (26.8"). Soils are likely to be at field capacity for approximately 153 days and soil moisture deficits are 97 mm for wheat and 87 mm for potatoes.

2.2 Climatic factors impose no limitation on ALC grade at this site.

Altitude and Relief

- 2.3 The site comprises gently sloping land between altitudes of 140m and 150m AOD, with overall falls to the south-east. Gradient and altitude do not constitute limitations to ALC grade.

Geology and Soils

- 2.4 The Institute of Geological Sciences have mapped the solid geology of the East Midlands at a scale of 1:250,000 (Sheet 52°N-02°W; 1983). This shows the presence of the Blisworth Limestone deposits (Jurassic) over the entire site. The Soil Survey of England and Wales reconnaissance scale map "Soils of Eastern England" (1:250000; 1983) shows the occurrence of two soil associations within the survey area:- the Aberford Association (*1) covering the south-western half of the site and the Ragdale Association (*2) covering the remainder. During this survey, a more detailed inspection of the soils was carried out.

Four main soil types occur over the site.

- 2.4.1 The majority of the site comprises soils derived from the Limestone geological deposits.
- 2.4.1a) In parts of the southern end of the site and running southwest of Brackley Fields soils typically comprise heavy clay loam topsoils over clay (or occasionally heavy clay loam) subsoils. At depth, directly above the fractured Limestone bedrock the subsoils become slightly stony (5-10% limestone fragments). Depth to Limestone bedrock varies from 60cm to 120cm⁺. To the south east of the survey area, topsoils comprise slightly stony medium clay loams and subsoils typically merge into stone free weathered Limestone before the fractured Limestone bedrock is encountered (65/105cm⁺).

(*1) Aberford Association: Shallow, locally brashy, well drained calcareous fine loamy soils over limestone. Some deeper calcareous soils in colluvium.

(*2) Ragdale Association: Slowly permeable seasonally waterlogged clayey and fine loamy over clayey soils. Some slowly permeable calcareous soils especially on slopes.

2.4.1b) More droughty variants of the above soil type occur where subsoils are slightly to moderately stony and overlie the fractured Limestone at shallower depths.

2.4.1c) In localised areas within the southern half of the site shallow brashy limestone derived soils occur. Topsoils typically contain 15-30% limestone fragments which are predominantly large in size. Depth to fractured Limestone bedrock ranges from 25 to 43 cm⁺.

2.4.2 Deeper soils occur in the north-west corner of the site. They typically comprise non-calcareous heavy clay loam topsoils over non- or very slightly calcareous clay subsoils to depth. Lower subsoils often contain approximately 5 to 10% limestone fragments below 55 cms⁺.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The site has been graded using the revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). Definitions of the agricultural land classification grades are set out in Appendix 1.

3.2 The table below shows a breakdown of the ALC grades for the survey area.

Agricultural Land Classification		
Grade	ha	%
2	10.0	43.0
3a	9.9	42.5
3b	3.2	14.0
Non-Agricultural	0.1	0.5
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	23.2	100.0
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4. GRADE 2

Land graded 2 occurs in two locations. Firstly in the south of the site and secondly in a broad band south-west of Brackley Fields.

4.1 Land of this quality is associated with the freely draining soils described in paragraph 2.4.1a), where fractured Limestone bedrock occurs at depth (60/120 cm⁺). The soil textures have a slight limiting effect on the available water capacity of these soil profiles. This minor droughtiness limitation combined with the minor workability constraints to exclude this land from a higher grade.

5. SUBGRADE 3a

5.1 South-west of Brackley Fields Cottages, land graded subgrade 3a is associated with the soils described in paragraph 2.4.1b). The soil textures and limestone fragments combine to reduce the moisture reserves of these soil profiles. As a result the overriding moderate droughtiness limitation excludes this land from grade 2.

5.2 In the north west corner of the site land graded 3a is associated with the soils described in paragraph 2.4.2. Soil profile pit observations indicate that these soils have slowly permeable horizons at depth (60/65 cm⁺) (ie Wetness Class II). The topsoils comprise heavy clay loams which are non calcareous. These factors combine to impose a moderate limitation on the agricultural potential of this land. Thus the land is restricted to subgrade 3a (good quality agricultural land).

6. SUBGRADE 3b

Two small areas of land in the south of the site have been graded subgrade 3b.

6.1 Land graded 3b is associated with the shallow brashy soils described in paragraph 2.4.1c). Topsoil stone volumes of over 15% (size >2 cm diameter) were recorded in these areas; stones comprised mainly medium and large limestone fragments. Such volumes of topsoil stone cause increased wear and tear to agricultural implements. Crop quality may be reduced because the stones cause distortion of roots and may impair crop establishment. The severity of these constraints limits the land to subgrade 3b.

7. NON-AGRICULTURAL

An old pond and rough grass with large blocks of building debris have been mapped as non-agricultural.

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Appendix 1

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 will affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. When 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 most climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable crop.

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.

References

INSTITUTE OF GEOLOGICAL SCIENCES 1983. Solid Geology Sheet 52°N-02°W, Scale 1:250,000.

MAFF, 1968. Agricultural Land Classification Map Sheet 146, 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. Climatic data extracted from the published agricultural climatic dataset.

SOIL SURVEY OF ENGLAND AND WALES 1983. 'The Soils of Eastern England' Sheet 4 1:250,000.

SOIL SURVEY OF ENGLAND AND WALES 1984. 'Soils and their Use in Eastern England' Bulletin No. 13. Harpenden.