MAFF Ministry of Agriculture Fisheries and Food

NORTH-WEST LEICESTERSHIRE LOCAL PLAN; LAND AT MONEY HILL, ASHBY-DE-LA-ZOUCH, (post 2006 development area - north)

Agricultural Land Classification
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AGRICULTURAL LAND CLASSIFICATION

NORTH-WEST LEICESTERSHIRE LOCAL PLAN
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INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 22.5 hectares north-east of Money Hill Farm, on the eastern edge of Ashby-de-la-Zouch. The survey was commissioned by the Land Use Planning Unit (LUPU) of the Ministry of Agriculture, Fisheries and Food (MAFF) in connection with the North West Leicestershire Local Plan, wherein the land is the northernmost of two areas being considered for development post-2006.

2. The whole site was mapped in detail as part of a larger ALC survey carried out in February 1994 (ADAS, 1994). This survey was verified with additional soil pits by the Resource Planning Team (RPT) of the ADAS Huntingdon Statutory Group, Cambridge, in June 1996. The present report is based very largely on the 1994 survey, augmented and up-dated as appropriate, and now supersedes all previous work at the site. Prior to 1994, the published 1:63 360 scale provisional ALC map (MAFF, 1971) showed the northern part of the site to be Grade 3 and the southern part to be Grade 4.

3. At the time of survey in 1996 most of the site was a mixture of cereals and permanent grass.

4. The land has been classified in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

SUMMARY

5. The land classification of the site was established by a total of 23 soil auger borings (i.e. approximately 1 per hectare) to a depth of 120 cm or to impenetrable stony layers. Subsoil conditions were assessed from 4 inspection pits within the 1994 survey area, 1 of which lies within the present site. The location of the pits and the auger borings is shown on the accompanying Sample Point Map.

Table 1: Areas of grades and other land

Grade/Other land	Area (hectares)	% surveyed
2	13.8	61
3a	1.0	5
3b	7.7	34
Total agricultural land	22.5	100
Total survey area	22.5	100

6. The results of the ALC survey are summarised in Table 1 and the distribution of the grades and subgrades is shown on the accompanying ALC map. The map is accurate at its scale of 1:10 000 but any enlargement would be misleading.

7. More than half of the site is of very good (Grade 2) and good (Subgrade 3a) agricultural quality. These gradings are due primarily to minor or moderate droughtiness or wetness limitations (see Appendix II) associated with the occurrence of both coarse-textured or stony soils and slowly permeable clayey soils. The remainder of the site, in the west, is of moderate (Subgrade 3b) agricultural quality either because of the presence of slowly permeable clay soils with a moderately severe wetness limitation or because of localised steep slopes which hinder certain farming operations.

FACTORS INFLUENCING ALC GRADE

Climate

8. Climate criteria are considered first when classifying land because severe climatic limitations will restrict land to low grades irrespective of favourable site or soil conditions. The overall climate itself may affect grading, or grading may be affected through climatic factors interacting with soil properties to influence soil wetness and droughtiness.

9. The main parameters used in the assessment of the overall climate limitation for ALC purposes are average annual rainfall as a measure of wetness and accumulated temperature as a measure of the relative warmth of an area. Estimates of these variables were obtained from the published 5 km grid datasets using the standard interpolation methods (Met. Office, 1989). The results of this analysis are given in Table 2 and show that the combination of rainfall and temperature at the site present a minor limitation for agricultural use such that the land cannot be classified higher than Grade 2.

Table 2: Climatic and altitude data

Parameter	Value
Grid reference	SK 362 183
Altitude (m, AOD)	155
Accumulated Temperature (day °C, Jan.–June)	1291
Average Annual Rainfall (mm)	691
Field Capacity Days	156
Moisture Deficit, Wheat (mm)	94
Moisture Deficit, Potatoes (mm)	81
Overall Climatic Grade	2

Site

10. The land slopes gently southwards and westwards from approximately 162m AOD in the north-east to 134m AOD along the western boundary of the site. Most gradients are less than 7° and are therefore not limiting in ALC terms, but there is a small valley in the north of the site with sideslopes up to 9°. This land cannot be classified better than Subgrade 3b because such slopes reflect an increasing risk to the safe and efficient operation of certain farm machinery.

Geology and soils

11. The published 1:50 000 scale geology map (Geol. Survey, 1976) shows the western part of the site to be underlain by Carboniferous Shale with bands of sandstone and marl. Elsewhere, the underlying solid geology is Triassic Keuper Sandstone with bands of marl but in the north of the site this is overlain by Pleistocene Boulder Clay.

12. There is no detailed published soils information for the site. The relevant reconnaissance soil map and legend (Soil Survey, 1983) shows most of the site to be covered with soils of the Hodnet association, briefly described as reddish loamy soils with slowly permeable subsoils. The western edge of the site has slowly permeable loamy over clayey soils (overlying rock) belonging to the Bardsey association.

13. The detailed survey carried out on the site identified three soil types. The first, which occurs in the western third of the site, comprises a dark greyish brown heavy clay loam topsoil which overlies a strongly mottled grey, pale brown or brown, slowly permeable clay to depth. Locally, upper subsoils are heavy clay loam or sandy clay loam and occasional bands of red clay and / or coal or shale are found in the profile. The soils are non-calcareous and have been assessed as Wetness Class IV or occasionally, if the slowly permeable clay is encountered below about 40/45 cm, Wetness Class III.

14. The second soil type is found in the east of the site and is derived from Keuper Marl deposits. Profiles typically comprise a brown medium clay loam topsoil to 30/35 cm overlying a reddish brown medium or heavy clay loam upper subsoil. This in turn overlies a dark reddish brown clay at depths between 45 / 70 cm. This clay has prismatic structures and, despite the

presence of occasional large earthworm channels, is considered to be slowly permeable. Weathering sandstone is occasionally encountered deep in the profile. The soils have been assessed as predominately Wetness Class II, (occasionally Wetness Class III), depending upon the depth at which clay is encountered.

15. The third soil type occurs in a small area in the vicinity of Money Hill itself and corresponds to outcrops of sandstone within the Keuper Marl. Profiles comprise medium clay loam or sandy loam topsoils over loamy medium sand / medium sandy loam upper subsoils, over medium sand or loamy medium sand. Profiles are frequently stony and weathering sandstone may be present in the subsoil. Some profiles may overlie sandy clay loam, sandy clay or slowly permeable reddish clay below 70 cm. The soils have been assessed as Wetness Class I or II.

AGRICULTURAL LAND CLASSIFICATION

Grades, Subgrades

16. The Agricultural Land Classification of the site is shown on the attached ALC Map and the areas of each grade and subgrade have been given in Table 1. Within any grade or subgrade small areas of land of better or poorer quality may occur but cannot be delineated separately at the scale of survey. At this site none of the land can be classified higher than Grade 2 because of a minor climatic restriction.

Grade 2

17. Much of the eastern half of the site has been mapped as Grade 2, corresponding with both the clayey and the sandy soil types developed on the Keuper Marl deposits. The better drained (i.e. Wetness Class II) soils developed on red clay loams and clays (paragraph 14) are placed in this grade due to a minor wetness and workability limitation. In the case of the sandy soils described in paragraph 15, the land has been included within Grade 2 due to a minor droughtiness impediment.

Subgrade 3a

18. A small part of the site, in the south-east, has been mapped as Subgrade 3a because of a moderate wetness / workability limitation. Here, the slowly permeable subsoil of the red clayey soils (paragraph 14) is closer to the surface and the soils have been assessed as Wetness Class III. With the clay loam topsoils and slowly permeable subsoils care and timeliness with cultivations are required to avoid damage to soil structures.

Subgrade 3b

19. Land classified as Subgrade 3b occurs in the west of the site and mostly corresponds to the poorly drained, clayey soils described in paragraph 13. These soils have a heavy clay loam topsoil overlying a slowly permeable clay subsoil and the land consequently suffers from a moderately severe winter wetness and workability limitation. Considerable care and timeliness with cultivations are required to avoid damage to soil structures, and this restricts the range of crops that can be successfully grown.

20. A small area of land has been mapped as Subgrade 3b where slopes are 7-9°; these gradients may cause difficulties in operating some machinery safely and efficiently.

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SOURCES OF REFERENCE

ADAS (1994) *Agricultural Land Classification; North West Leicestershire Local Plan, Money Hill & Hugglescote.* 8/94, Resource Planning Team, ADAS Cambridge.

GEOLOGICAL SURVEY OF GREAT BRITAIN (1976) *Sheet 141, Loughborough, Solid and Drift edition, 1:50 000 scale.*

MAFF (1971) *Agricultural Land Classification Map, Sheet 121, Provisional, 1:63 360 scale.*

MAFF (1988) *Agricultural Land Classification of England and Wales. Revised Guidelines and Criteria for Grading the Quality of Agricultural Land.* MAFF: London.

METEOROLOGICAL OFFICE (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

SOIL SURVEY OF ENGLAND AND WALES (1983) *Soils of England and Wales, Sheet 3, Midland and Western England, 1:250 000 scale map and legend.* Soil Survey of England and Wales: Harpenden.

APPENDIX I

DESCRIPTIONS OF THE GRADES AND SUBGRADES

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 or horticultural crops can usually be grown but on some land of this 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 land.

Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the 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 the level of yields. It is mainly suited to grass with occasional arable crops (e.g. 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

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 only wet within 40 cm depth for 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 present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present 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.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

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

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