MAFF Ministry of Agriculture Fisheries and Food

NORTH-WEST LEICESTERSHIRE
LOCAL PLAN
LAND EAST OF SAWLEY CROSSROADS, CASTLE DONINGTON
Agricultural Land Classification, Reconnaissance Survey
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AGRICULTURAL LAND CLASSIFICATION, RECONNAISSANCE SURVEY

NORTH-WEST LEICESTERSHIRE LOCAL PLAN
LAND EAST OF SAWLEY CROSSROADS, CASTLE DONINGTON

INTRODUCTION

1. This report presents the findings of a reconnaissance Agricultural Land Classification (ALC) survey of 55.2 hectares about 2 km north of Hemington village, near Castle Donington. The triangular site is enclosed by the A6 and the B6540 roads and by Netherfield Lane. The site was worked for sand and gravel between 1955 and 1980 and has, since then, been largely restored with topsoil overlying pulverised fuel ash (PFA). The south-east of the site has been restored over inert fill (builders' rubble, gravel, soil) or left as open water areas.

2. 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. The site was inspected in detail by Hunting Land & Environment (HLE, 1996) and the objective of the present reconnaissance survey is to verify their findings. Survey work was carried out by the Resource Planning Team (RPT) of the ADAS Huntingdon Statutory Group, Cambridge, in June 1996. The present report now supersedes previous ALC surveys at the site, notably the provisional 1:63 360 scale ALC map (MAFF, 1971) which showed all the site to be Non-agricultural land.

3. At the time of survey the majority of the site was growing cereals and grass. There are considerable areas of other, non-agricultural, land (not surveyed) in the southern half of the site, including woodland, roadworks, three flooded pits and large soil mounds.

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 was established by a total of 16 soil auger borings (i.e. about 1 per 3.5 hectares) to a depth of 120 cm or to impenetrable stony layers. Subsoil conditions were assessed from 4 inspection pits. 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
4	35.9	65
Other land	19.3	35
Total agricultural land	35.9	65
Total survey area	55.2	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. For clarity, the map is presented at a scale of 1:10 000 and is generally accurate at that scale, but any enlargement may be misleading.

7. Much of the southern part of the site comprises non-agricultural land. All of the agricultural area is classified as poor quality (Grade 4) land, primarily because of a severe droughtiness limitation. Either, plant growth is restricted to the topsoil because roots do not penetrate the underlying PFA, or, where the soil profile contains much stone and rubble, the soil moisture is reduced by the high proportion of inert material. Further, the presence of rubble at or close to the soil surface severely hinders mechanised cultivation.

8. The reconnaissance survey agrees with the survey carried out by Hunting Land and Environment Ltd (HLE) of the soil types but interprets much of the agricultural land to be of poorer quality than the HLE assessment, which suggested the PFA would provide some moisture to crops resulting in the land being slightly less droughty (Subgrade 3b) than stated herein. However, observations within the soil pits indicate no, or very limited, rooting into the PFA by a vigourously growing crop.

FACTORS INFLUENCING ALC GRADE

Climate

9. 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.

10. 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 no limitation for agricultural use.

Table 2: Climatic and altitude data

Parameter	Value
Grid reference	SK 460 298
Altitude (m, AOD)	33
Accumulated Temperature (day °C, Jan.–June)	1423
Average Annual Rainfall (mm)	627
Field Capacity Days	137
Moisture Deficit, Wheat (mm)	111
Moisture Deficit, Potatoes (mm)	103
Overall Climatic Grade	1

Site

11. The site comprises an almost flat river terrace at 31-33m AOD. Gradients on the agricultural land do not exceed 2° and are therefore not limiting for the agricultural usage of the site. However, as detailed in the Introduction, the site has been disturbed in the past and the southern part now contains considerable non-agricultural land including large soil mounds.

Geology and soils

12. The published 1:50 000 scale geology map (Geol. Survey, 1976) shows all the site, prior to its excavation, to have been underlain by Recent Alluvium.

13. There is no detailed published soils information for the site. The relevant reconnaissance soil map and legend (Soil Survey, 1983) shows all the site to have been covered by deep, stoneless, permeable, fine loamy soils with a risk of flooding (Wharfe association).

14. The reconnaissance survey carried out on the site has identified three distinct soil types. The most extensive soil, covering the northern half of the site and the south-western-most part of the agricultural land, consists of a variable depth (20/40 cm) of very slightly stony, brown, sandy clay loam or medium sandy loam (occasionally loamy medium sand or medium clay loam) overlying grey PFA. The lower part of the topsoil is frequently mixed with the underlying PFA. The PFA itself has a fine or medium sandy loam texture and is commonly compact in its uppermost 20/30 cm. Soil pits show that roots do not penetrate the PFA.

15. Though the majority of the site has been filled and restored, at places along the north-west and northern margins of the site occur a limited number of profiles which are disturbed but where PFA was not encountered. The soil here is deep and comprises a brown medium sandy loam topsoil overlying a mottled sandy clay and sandy clay loam subsoil. These profiles are likely to be of better quality than the land restored with PFA but do not constitue a large enough area to delineate seperately.

16. The third soil type is found in the south of the site. A brown sandy clay loam, heavy clay loam or clay to about 20 cm overlies inert fill comprising soil material, reject gravel and builder's rubble (concrete, asphalt, wood, metal). The rubble protrudes through the soil surface in several places. At the time of tyhe survey this soil type was impossible to auger below 20/30cm, due to stone or very compact subsoils.

AGRICULTURAL LAND CLASSIFICATION

Grades, Subgrades

17. The Agricultural Land Classification of the land is shown on the attached ALC Map and the areas of each grade and subgrade have been given in Table 1.

Grade 4

18. All the agricultural area of the site has been mapped as Grade 4, primarily on the basis of a severe droughtiness limitation. In the case of the soils overlying the PFA (paragraph 14),

plant growth is confined to the topsoil because the chemistry of the ash (samples tested by HLE indicate that the PFA is very alkaline) and its compaction beneath the topsoil are both likely to inhibit root penetration. Moisture balance calculations indicate that the available water in the topsoil is greatly insufficient to offset the potential moisture deficits in this area and the land is restricted to Grade 4. Where the topsoil is deepest the land is less droughty and warrants a Subgrade 3b classification, but overall, Grade 4 land predominates.

19. The soils overlying the inert fill (paragraph 16) are equally droughty on account of the sizeable proportion of stone and rubble in the soil profile. Also, the rubble itself, occurring near or at the soil surface, presents a severe limitation for mechanised farming, restricting the land to Grade 4.

20. At the northern edge of the site some deep soils (paragraph 15) occur sporadically. These soils warrant a Grade 2 or Subgrade 3a classification based on their wetness or droughtiness characteristics, but their extent is too limited to delineate separately at the scale of survey.

21. This comprises a variety of uses. The western corner of the site is now taken up by road construction. Small areas of scrub are also found in the western part. The south east corner comprises water filled gravel pits, willow scrub, a new decidious plantation, tracks and soil mounds.

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SOURCES OF REFERENCE

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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.

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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.