Land South of Dunton Bassett, Ashby Parva, Leics.

Agricultural Land Classification &
Statement of Site Physical Characteristics
May 1996

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AGRICULTURAL LAND CLASSIFICATION REPORT

Land South of Dunton Bassett, Ashby Parva, Leics.

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 20 ha of land south of Dunton Bassett in Leicestershire. The survey was carried out during May 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Cambridge in connection with an application to extend an existing sand and gravel quarry. This survey supersedes previous ALC surveys on this land.

3. The work was conducted by members of the Resource Planning Team in the Huntingdon Statutory Group in ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey the land use on the site was a mixture of winter cereals and set-aside land.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10 000 it is accurate at this scale but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% Total site area
2	5.7	28.5
3b	14.3	71.5
Total site area	20.0	100

7. The fieldwork was conducted at an approximate density of one borings per hectare. A total of seventeen borings and two soil pits were described.

8. Two blocks of land of Grade 2 quality (very good quality agricultural land) were found within the site. A larger block in a band running from the north to the west of the site and a

small block in the east. The remainder of the site was assessed as Subgrade 3b quality (moderate quality agricultural land).

Factors Influencing ALC Grade

Climate

9. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedure (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SP 538 891
Altitude	m, AOD	120
Accumulated Temperature	day°C (Jan-June)	1339
Average Annual Rainfall	mm	665
Field Capacity Days	days	152
Moisture Deficit, Wheat	mm	94
Moisture Deficit, Potatoes	mm	82

11. The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean there is no overall climatic limitation to land quality.

Site

14. The site is generally gently undulating with the land having only gentle slopes below 2 degrees. Therefore there are no relief or gradient limitations to the quality of the agricultural land.

Geology and soils

15. The published 1: 63 360 scale geology maps of the area (Geol. Survey, 1948 Drift edition, 1967 Solid edition) show Pleistocene Sand and Gravel to cover the centre of the site. The north and south east of the site is covered by Pleistocene Boulder Clay. The Pleistocene materials are shown as overlying Triassic Keuper Marl and in the east Rheatic Shales and Limestones.

16. The reconnaissance scale (1 : 250 000) soil survey map for the area (Soil Survey, 1983) shows the whole site to consist of the Beccles 3 association. This soil association is described as slowly permeable seasonally waterlogged fine loamy over clayey soils developed in chalky till. The present survey found the presence of two distinct soil types within the site.

Soil Type I : consisted of a heavy clay loam/clay textured topsoil overlying a clay textured upper subsoil which in turn overlies a calcareous clay textured lower subsoil.

Soil Type II : consisted of a sandy clay loam textured topsoil which overlies a similar textured subsoil. This subsoil usually extended to below sampling depth but occasionally was found to overlie a clay textured lower subsoil horizon.

Agricultural Land Classification

17. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

18. The location of the auger borings and pits is shown on the attached sample location map.

Grade 2

19. Land of this quality was associated principally with those areas of the site mapped as Soil Type II (paragraph 16). This soil type was found to be relatively free draining and was assessed as Wetness Class I or II (Appendix II). Hence there was a minor wetness and workability limitation over small areas of the site. At a number of locations droughtiness of the soil profile was found to be either limiting or as equally limiting as wetness and restricted the land quality to Grade 2. A very small area of the site associated with Soil Type I (paragraph 16) was also assessed as land of Grade 2 quality. In this area the subsoil was found not to contain evidence of wetness and hence the soil profile was assessed as Wetness Class I. This wetness class together with a heavy clay loam textured topsoil also result in a slight wetness and workability limitation.

Subgrade 3b

20. Land of Subgrade 3b quality covers the majority of the site and is associated with areas of the site identified as consisting of Soil Type I (paragraph 16). The clay textured upper subsoil of this soil type was found to constitute a slowly permeable layer, hence profiles were assessed as Wetness Class IV. A significant wetness and workability limitation therefore restricts such soil profiles to Subgrade 3b quality land.

Soil Resources

21. Two distinct soil types have been identified within the site and their distribution is shown on the accompanying soil resource map which is illustrative of the soil resources available within the site for restoration purposes but is not soil stripping map for the site. A statement of the physical characteristics of these two soil types is given in Appendix III. The thicknesses and volumes given in Table 3 below should be treated with some caution due to variability in the soils, additionaly the subsoils may extend below 120 cm.

Table 3: soil resources

	Area (ha)	Thickness (m)	Volume (m3)
Soil Type I: Topsoil	14.7	0.29	42630
Upper subsoil	14.7	0.35	51450
Lower subsoil	14.7	0.56	82320
Soil Type II: Topsoil	5.3	0.30	15900
Subsoil	5.3	0.90	47700

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SOURCES OF REFERENCE

Geological Survey of Great Britain (1948) *Sheet No.* 169, Coventry, Drift Edition, 1 : 63 360. BGS: London.

Geological Survey of Great Britain (1967) *Sheet No.* 169, Coventry, Solid Edition, 1 : 63 360. BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

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

Soil Survey of England and Wales (1983) *Sheet* 4, *Soils of Eastern England, 1 : 250 000 scale.* SSEW: Harpenden.

Soil Survey of England and Wales (1983) *Soils and their Use in Eastern England* SSEW: 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.

APPENDIX III

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE 1

Topsoil	Texture	: Heavy clay loam / clay
	Colour	: Dark greyish brown (10YR4/2)
	Stone	: Very slightly stony (3%)
	Boundary	: Sharp, abrubt
	Roots	: Many fine and very fine
	Depth	: 29 cm.
Upper Subsoil	Texture	: Clay
	Matrix colour	: Brown (10YR5/3)
	Mottles	: Common / very many
	Stone	: Very slightly stony (3%)
	Structure	: Moderately developed coarse and very coarse prismatic breaking to coarse and very coarse angular blocky.
	Consistence	: Firm
	Porosity	: <0.5% biopores
	Boundary	: Sharp, abrubt
	Roots	: Many fine and very fine
	Depth	: 64 cm.
Lower Subsoil	Texture	: Clay
	Matrix colour	:Brown (10YR5/3) plus grey (10YR5/1)
	Mottles	: Common / very many
	Stone	: Very slightly stony (4%)
	Calcium	: Calcareous
	Structure	: Moderately developed coarse and very coarse prismatic
	Porosity	: <0.5% biopores
	Roots	: Common fine and very fine
	Depth	: 120 cm.

Comments : Wetness class IV (with exception of a single sample location).

APPENDIX III

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE 2

Topsoil	Texture	: Sandy clay loam
	Colour	: Brown (7.5YR4/2, 10YR4/3)
	Stone	: Slightly stony (6%)
	Boundary	: Smooth, clear
	Roots	: Many fine and very fine
	Depth	: 30 cm.
Upper Subsoil	Texture	: Sandy clay loam
	Matrix colour	: Yellowish brown (10YR5/4, 5/6)
	Mottles	: None
	Stone	: Slightly stony (10%)
	Structure	: Weakly developed coarse subangular blocky
	Consistence	: Friable
	Porosity	: 2% biopores
	Roots	: Many fine and very fine
	Depth	: 120 cm (very occasionaly to only 57 cm)
Lower Subsoil	Texture	: Clay
(Occasionaly present)	Matrix colour	: Brown (10YR5/3), brownish yellow (10YR5/6)
	Mottles	: Few / common
	Stone	: Very slightly stony (4%)
	Structure	: Moderately developed coarse and very coarse prismatic
	Porosity	: <0.5% biopores
	Roots	: Common fine and very fine
	Depth	: Where present 57 - 120 cm.

Comments : Wetness Class I or II