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WILTSHIRE MINERALS LOCAL PLAN
S75 MANOR FARM, CASTLE EATON

AGRICULTURAL LAND CLASSIFICATION
REPORT OF SURVEY

Resource Planning Team
Taunton Statutory Unit

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Report of Survey

1. SUMMARY

Sixty six hectares of land at Manor Farm, Castle Eaton were graded using the Agricultural Land Classification (ALC) System in November 1992 and February 1993. The survey was carried out on behalf of MAFF as part of its statutory role in the preparation of the Wiltshire Minerals Local Plan.

The fieldwork was carried out by ADAS (Resource Planning Team, Taunton Statutory Unit) at a scale of 1:10,000. The information is correct at this scale but any enlargement would be misleading. A total of 64 auger borings and 4 soil profile pits were examined.

The distribution of ALC grades identified in the survey area is detailed below and illustrated on the accompanying map.

Distribution of ALC grades: Manor Farm, Castle Eaton

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
3a	12.5	19.0	19.2	
3b	40.9	62.1	62.9	
4	11.6	17.6	17.9	
Non Agric/Urban	0.9	1.3	100%	(65.0 ha)
TOTAL	65.9	100%		

There are no climatic or site limitations for the survey area. The main limitation across the site is the risk associated with flooding. This downgrades a large area to Subgrade 3b and some land to Grade 4. The remaining areas which are slightly higher are Subgrade 3a caused by a wetness limitation.

2. INTRODUCTION

Sixty six hectares of land at Manor Farm, Castle Eaton were graded using the Agricultural Land Classification (ALC) System in November 1992 and February 1993. The survey was carried out on behalf of MAFF as part of its statutory role in the preparation of the Wiltshire Minerals Local Plan.

The fieldwork was carried out by ADAS (Resource Planning Team, Taunton Statutory Unit) at a scale of 1:10,000 (approximately one sample point every hectare). The information is correct at this scale but any enlargement would be misleading. A total of 64 auger borings and 4 soil profile pits were examined.

The published Provisional 1" to the mile ALC map of this area (MAFF 1973) shows the site to be mainly Grade 2 with a small area of Grades 3 and 4 in the north west beside the River Thames. The area was surveyed in 1979 at 1:25,000 scale as part of the Cotswold Water Park ALC survey and the site was mapped as predominantly Grade 2 with some Subgrades 3a, 3b, amd 3c. The recent survey supersedes these maps having been carried out at a more detailed level and using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988).

The ALC provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The grading takes account of the top 120cm of the soil profile. A description of the grades used in the ALC System can be found in Appendix 2.

At the time of survey most of the site was under winter cereals with some oil seed rape. Some fields had not yet been ploughed in from the previous seasons crop.

3. CLIMATE

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to lower grades despite other favourable conditions.

Estimates of climatic variables were obtained for the site by interpolation from the 5km grid Meteorological Office Database (Meteorological Office 1989) and are shown inTable 1.

The parameters used for assessing overall climatic limitation are accumulated temperature, (a measure of therelative warmth of a locality) and average annual rainfall, (a measure of overall wetness). The values shown in Table 1

reveal that there is no overall climatic limitation.

No locally limiting climatic factors such as exposure were noted in the survey area. Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat (MDW) andpotatoes (MDP) are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in Section 6.

Table 1 Climatic Interpolations: Manor Farm, Castle Eaton

Grid Reference		SU 153 961
Height (m)		75
Accumulated Temperature (day deg)		1441
Average Annual Rainfall (mm)		681
Overall Climatic Grade		1
Field Capacity (Days)		153
Moisture Deficit,	Wheat (mm)	106
	Potatoes (mm)	98

4. RELIEF

Most of the site is fairly flat except for a slight rise in the south west. None of the fields have microrelief limitations. The site is at approximately 75m AOD.

5. GEOLOGY AND SOILS

The published one inch scale solid and drift geology map,sheet 252 (Geological Survey of England and Wales 1974) shows the majority of the site to be of First Terrace River deposits. There is a small area of Kellaway Clays in the south west. There is an area of Alluvium beside the River Thames.

The Soil Survey of England and Wales mapped the soils of the area in 1983, at a reconnaisance scale of 1:250,000. This map shows the soils at the site to be of two associations. In the south is the Badsey 2 Association, described as mainly well drained fine loamy soils over calcareous gravel. In the north the Thames Association is mapped and this is described as calcareous clays affected by groundwater.

The soils found in the recent survey show evidence of restricted drainage and high water tables in some areas. Some parts of the site have stony subsoils and this slightly restricts the available water for crop growth.

6. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades identified in the survey area is detailed below and illustrated on the accompanying ALC map. The information is correct at the scale shown but any enlargement would be misleading.

Table 2 Distribution of ALC grades: Manor Farm, Castle Eaton

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
3a	12.5	19.0	19.2	
3b	40.9	62.1	62.9	
4	11.6	17.6	17.9	
Non Agric/Urban	0.9	1.3	*100%*	*(65.0 ha)*
TOTAL	65.9	100%		

Subgrade 3a

Although all the soils are similar across the site only a small area of the site is unaffected by flooding and can be Subgrade 3a. The majority of these soils are affected by groundwater and are Wetness Class II. The topsoils are heavy clay loams as confirmed by Particle Size Distribution analysis. The soils have variable textures and stone contents at depth. Stone contents were measured in soil profile pits. The least stony and heaviest textures were found by the River Thames. Elsewhere the soils became lighter in texture and stonier with depth. The variability means that the effect of available water on the grade in terms of droughtiness is also variable.

Subgrade 3b

The majority of the site has been downgraded on the basis of flooding. The flooding occurs in winter occasionally, but when it does occur it lasts for more than 4 days. This reduces the versatility of the land.

Grade 4

Part of the site experiences worse flooding than that described above. Here the winter flooding is frequent and of long duration, further reducing the versatlilty of the land.

Urban and Non Agricultural

The road and sewage works have been classified as urban and the farm track beyond the works as non agricultural.

APPENDIX 1

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1974) Solid and drift edition. Sheet 252 Swindon, 1:63,360 scale

MAFF (1973) *Agricultural Land Classification Map sheet 157 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) Alnwick

METEOROLOGICAL OFFICE (1989) Published climatic data extracted from the agroclimatic dataset, compiled by the Meteorological Office

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 5 Soils of South West England 1:250,000

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall : 681	PARENT MATERIAL
Manor Farm, Castle Eaton	1	0	Stubble	ATO : 1441	First Terrace River Deposits
				FC Days : 153	
JOB NUMBER 72/92	DATE Nov 92	GRID REFERENCE SU 152 962	DESCRIBED BY NAD	Climatic Grade : 1	

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
1	20	10YR43	HCL	Neg	Ffom	WCSAB	< 0.5	-	Friable	Few, fine fibrous	No	-	Clear Smooth
2	60	10YR54	C	8% hard rock	None	Med dev VC + C SAB	< 0.5	Mod	Friable	Few fine	Very slightly	Few	Too wet to assess
3	90+	10YR53	C	3-4% hard rock	10YR58/61 common	Massive structure	< 0.5	Poor	Plastic/ firm	None observed	Slightly	Common	

Profile Gleyed From : 60 cm

Depth to Slowly Permeable Horizon : 60 cm

Wetness Class : II

Wetness Grade : 3A

Available Water Wheat : 128 mm

Potatoes : 108 mm

Moisture Deficit Wheat : 106 mm

Potatoes : 98 mm

Moisture Balance Wheat : +22 mm

Potatoes : +10 mm

Droughtiness Grade : 2 (to 120 cm)

Final ALC Grade : 3A

Main Limiting Factor(s) : Wetness

Remarks

Water table at 80 cm (rising to 60 cm).
Pit dug to 90 cm.
Minimal stone content at depth for mapping unit.
Visual estimates of stone contents.

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SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall : 681	PARENT MATERIAL
Manor Farm, Castle Eaton	2	0	Cereal stubble	ATO : 1441	First Terrace River Deposits
				FC Days : 153	
JOB NUMBER 72/92	DATE Nov 92	GRID REFERENCE SU 158 960	DESCRIBED BY NAD	Climatic Grade : 1	

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
1	25	10YR43	HCL	2% hard rock	-	-	-	-	-	Common fine	No	-	Clear smooth
2	35	25Y56/54	HCL + pockets SCL	32% hard rock sieved/displ	Few feint 10YR58	Weakly dev CSAB (very shallow horizon therefore diff to get proper structure)	< 0.5	Mod	Friable	Common fine and v fine fibrous	Yes	Few	Clear wavy
3	100	25Y74/66	LMS with clay pockets	46% hard rock sieved/displ > 70% from 100 cm	Common: 10YR58 75YR74 + pale mottles	Too stony to assess	70.5	Mod	Loose/very friable	No roots observed but very wet	Yes	Common	

Profile Gleyed From : Not gleyed

Depth to Slowly Permeable Horizon : None

Wetness Class : II

Wetness Grade : 3A

Available Water	Wheat	:	77 mm
	Potatoes	:	70 mm
Moisture Deficit	Wheat	:	106 mm
	Potatoes	:	98 mm
Moisture Balance	Wheat	:	-29 mm
	Potatoes	:	-28 mm

Droughtiness Grade : 3B (to 120 cm)

Final ALC Grade : 3B

Main Limiting Factor(s) : Droughtiness

Remarks

Water table at 50 cm (Nov).
Gravel below 100 cm.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall : 681	PARENT MATERIAL
Manor Farm, Castle Eaton	3	0	Brassica	ATO : 1441	Alluvium
				FC Days : 155	
JOB NUMBER 72/92	DATE 16/2/93	GRID REFERENCE SU 147 964	DESCRIBED BY GMS/PRW	Climatic Grade : 1	

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
1	23	10YR42	HCL	None	None	MCSAB	Many	Mod	Friable	Many fine	Weakly $CaCO_3$	-	Sharp smooth
2	75	2.5Y62	C	None	10YR58C (gleyed)	MCSAB*	< 0.5	Mod	Friable	Common fine	No	-	Abrupt smooth
3	110	10YR73	CS	49% hard rock sieved/displ	Ochreous staining	-	< 0.5	Mod	Loose	None	$CaCO_3$	-	-

Profile Gleyed From : Not gleyed

Depth to Slowly Permeable Horizon : None

Wetness Class : II

Wetness Grade : 3A

Available Water Wheat : 113 mm

Potatoes : 117 mm

Moisture Deficit Wheat : 106 mm

Potatoes : 98 mm

Moisture Balance Wheat : +7 mm

Potatoes : +19 mm

Droughtiness Grade : 2 (to 120 cm)

Final ALC Grade : 3A

Main Limiting Factor(s) : Wetness

Remarks

* Tending to angular, but still well within SAB, therefore not SPL despite low porosity.
5 cm clayey/stoney transition 75-80 cm.

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SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall : 681	PARENT MATERIAL
Manor Farm, Castle Eaton	4	0	Cereals	ATO : 1441	First Terrace River Deposits
				FC Days : 155	
JOB NUMBER 72/92	DATE 16/2/93	GRID REFERENCE SU 159 961	DESCRIBED BY PRW/GMS	Climatic Grade : 1	

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
1	26	10YR43	HCL	-	-	MMSAB	Good	-	Friable	Many fine	Weakly	x	Abrupt smooth
2	50	10YR46	HCL	-	-	MCSAB	Good	Mod	Friable	Common fine	No	Yes few	Abrupt smooth
3	75	10YR64	MS	23% sieved/displ	-	-	Good	Mod	Loose	Lowest observed 70 cm	Yes	-	-
4	120	10YR64	MS	46% sieved/displ	-	-	Good	Mod	Loose		Yes	-	-

Profile Gleyed From : Not gleyed

Depth to Slowly Permeable Horizon : None

Wetness Class : I

Wetness Grade : 2

Available Water Wheat : 104 mm

Potatoes : 94 mm

Moisture Deficit Wheat : 106 mm

Potatoes : 98 mm

Moisture Balance Wheat : -2 mm

Potatoes : -4 mm

Droughtiness Grade : 3A (to 120 cm)

Final ALC Grade : 3A

Main Limiting Factor(s) : Droughtiness

Remarks

Pit dug to 100 cm.
Water at 97 cm.