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WILTSHIRE MINERALS LOCAL PLAN
S73 COX'S FARM MARSTON MEYSEY

AGRICULTURAL LAND CLASSIFICATION
REPORT OF SURVEY

Resource Planning Team
Taunton Statutory Unit

November 1992

ADAS

WILTSHIRE MINERALS LOCAL PLAN
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AGRICULTURAL LAND CLASSIFICATION

Report of Survey

1. SUMMARY

One hundred and five hectares of land at Cox's Farm, Marston Meysey were graded using the Agricultural Land Classification (ALC) System in November 1992. 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 105 auger borings and 5 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: Cox's Farm, Marston Meysey

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
2	44.9	42.7	43.2	
3a	41.0	39.0	39.5	
3b	18.0	17.1	17.3	
Non Agric	1.3	1.2	100%	(103.9 ha)
TOTAL	105.2	100%		

There are no climatic or site limitations for the survey area. There are several limitations across the survey area, which affect the grading. The two main limitations are wetness and droughtiness. The effects of these are variable and a range of grades can be seen in the area, from Grade 2 through to Subgrade 3b. The majority of the site has been classified as best and most versatile land.

2. INTRODUCTION

One hundred and five hectares of land at Cox's Farm were graded using the Agricultural Land Classification (ALC) System in November 1992. 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 105 auger borings and 5 soil profile pits were examined.

The published Provisional 1" to the mile ALC map of this area (MAFF 1973) shows the site to be Grade 2 in the south and Grade 3 in the north. The area was surveyed in 1979 at 1:25,000 scale as part of the Cotswold Water Park ALC survey which mapped the site as Grades 2, 3a and 3b. 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.

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 Meteorolgical Office Database (Meteorological Office 1989) and are shown in Table 1.

The parameters used for assessing overall climatic limitation are accumulated temperature, (a measure of the relative 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) and potatoes (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: Cox's Farm, Marston Meysey

Grid Reference		SU 139 975
Height (m)		80
Accumulated Temperature (day deg)		1435
Average Annual Rainfall (mm)		701
Overall Climatic Grade		1
Field Capacity (Days)		158
Moisture Deficit,	Wheat (mm)	104
	Potatoes (mm)	95

4. RELIEF

Most of the site is fairly flat except for a rise in the north near Dunfield. None of the fields have microrelief limitations. The site is at approximately 80m 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 north and some Second Terrace River Deposits in the west by Marston Meysey.

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 a single association, that of the Badsey 2 Association, described as mainly well drained fine loamy soils over calcareous gravel.

The soils found in the recent survey show evidence of restricted drainage and high water tables in some areas, whilst other parts of the site have very stony subsoils and this 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: Cox's Farm

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
2	44.9	42.7	43.2	
3a	41.0	39.0	39.5	
3b	18.0	17.1	17.3	
Non Agric	1.3	1.2	100%	(103.9 ha)
TOTAL	105.2	100%		

Grade 2

Nearly half the site has been classified as Grade 2. The main limitation in these soils is droughtiness. The soils are well drained but have high stone contents and light textures in the subsoil which restricts the available water for crop growth. Stone contents were measured in soil profile pits. These soils have mainly heavy clay loam topsoils but there area some medium clay loam topsoils.Some of the land in this grade has lower stone contents and is downgraded to Grade 2 on the basis of topsoil texture. The heavy clay loam topsoil means that for an area with a Field Capacity Day value of 158 the land is limited to Grade 2.

Subgrade 3a

The small area of Subgrade 3a in the north by Dunfield is downgraded on the basis of droughtiness. These soils are stony throughout the profile, and the texture of the lower subsoils is sand. A soil profile pit was dug in this area and the topsoil stone content was measured, by sieving and displacement in water, to be 19%, mainly small stones. The stone content in the subsoil rose to 28% and then 48%, before dropping in the lowest subsoil to 11%. The combination of this, the texture of the horizons and the moisture deficits for the area means that the soils are limited to Subgrade 3a. The reduced available water limits the versatility of the land. The remaining areas of Subgrade 3a are downgraded on the basis of wetness. These soils show evidence of higher water tables for part of the year which keeps the profile wet. The soils are Wetness Class II as defined in Appendix 3. The topsoil textures of these soils are heavy clay loams.

Some of the profiles also have stony subsoils, but this does not impose a greater limitation.

Subgrade 3b

The area of Subgrade 3b in the south west is downgraded on the basis of droughtiness. These soils have a lower available water than those described above because the stone content in the subsoil is greater. The other areas of 3b land are poorly drained soils. These soils have slowly permeable layers which restrict free drainage of the soil. They are Wetness Class IV. Most of these soils have clay topsoils but a few have heavy clay loam.

Non Agricultural

There are small areas of woodland amounting to 1.3 ha which have been classified 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 :- 701	PARENT MATERIAL
Cox's Farm	Pit 1	-	Cereals	ATO :- 1435	First Terrace River Deposits
				FC Days :- 158	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
71/92	November 1992	SU 129 968	GMS/RC		

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	24	10YR43	HCL	14% hard rock sieved/displ.	-	Mod. dev. CSAB	-	-	Friable				
2	43	10YR56	HCL	28% hard rock sieved/displ.		Mod. dev. CSAB	-	Mod.	Friable			Few	
3	60	10YR56	LMS	45% hard rock sieved/displ.	-	Weakly dev. CSAB	-	Mod.	Very friable				
4	120	10YR56	LMS	55% hard rock sieved/displ.	-	Too stony to assess	-	Mod.	-				

Profile Gleyed From:- Not

Depth to Slowly Permeable Horizon:- None

Wetness Class :- I

Wetness Grade :- 2

Available Water Wheat :- 80mm

Potatoes :- 71mm

Moisture Deficit Wheat :- 104mm

Potatoes :- 95mm

Moisture Balance Wheat :- -24mm

Potatoes :- -24mm

Droughtiness Grade :- 3B (to 120 cm)

Final ALC Grade :- 3B

Main Limiting Factor(s) :- Droughtiness

Remarks :-

Water table at 85 cm.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 701	PARENT MATERIAL
Cox's Farm	Pit 2	-	Cereals (recently drilled)	ATO :- 1435	First Terrace River Deposits
				FC Days :- 158	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
71/92	20.11.92	SU 131 969	GMS/RC		

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	24	10YR43	HCL	-	-	Mod. dev. CSAB	Good	Mod.	Friable	Many medium & fine	Low	-	Clear, wavy
2	64	75YR46	HCL	-	-	Strongly dev. CSAB	Good	Mod.	Friable	Many fine	-	-	Clear, wavy
3	120	10YR54	MCL	20% hard rock sieved/displ.	-	Mod. develop. CSAB (tending towards AB)	Good	Mod.	Friable	Few very fine	High	-	

Profile Gleyed From:- Not

Depth to Slowly Permeable Horizon:- None

Wetness Class :- I

Wetness Grade :- 2

Available Water Wheat :- 144mm

Potatoes :- 115mm

Moisture Deficit Wheat :- 104mm

Potatoes :- 95mm

Moisture Balance Wheat :- +40mm

Potatoes :- +20mm

Droughtiness Grade :- 1 (to 120 cm)

Final ALC Grade :- 2

Main Limiting Factor(s) :- Workability

Remarks :-

Pit dug to 115 cm

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 701	PARENT MATERIAL
Cox's Farm	4	-	Cereals	ATO :- 1435	First Terrace River Deposits
				FC Days :- 158	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
71/92	26/11/92	Su 141 968	PRW		

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
Topsoil	0-26	10YR43	HCL	0 Visual	None	MMSAB		Mod.					
Sub 1	26-75	10YR66	MSL	0 Visual	None	MMAB (Strong cutans round peds)	>.5%	Mod.		Many			
Sub 2	75-120	10YR56	LMS	55% Visual estimate	None	Too many to assess		Mod.					

Profile Gleyed From:- Not gleyed

Depth to Slowly Permeable Horizon:- None

Wetness Class :- 1

Wetness Grade :- 2

Available Water Wheat :- 121mm

Potatoes :- 113mm

Moisture Deficit Wheat :- 104mm

Potatoes :- 95mm

Moisture Balance Wheat :- +17mm

Potatoes :- +18mm

Droughtiness Grade :- 2 (to 120 cm)

Final ALC Grade :- 2

Main Limiting Factor(s) :- Workability/Droughtiness

Remarks :-

Water table 75 cm.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 701	PARENT MATERIAL
Cox's Farm	Pit 3	-	Oil seed rape	ATO :- 1435	First Terrace River Deposits
				FC Days :- 158	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
71/92	24.11.92	SU 141 976	GMS/RC		

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	21	10YR43	HCL	19% total 1% >2cm 18% >2mm - hard rock	-	Mod. CSAB	>0.5	Mod.	Friable	Few fine	Low	-	Abrupt, smooth
2	65	10YR54	C	28% HR: 2% >2cm 26% >2mm	-	Weak CSAB	>0.5	Mod.	Very friable	Few fine	Medium	-	Clear, wavy
3	80	10YR56	CS	48% HR: 3% >2cm 45% >2mm	-	Weak granular	>0.5	Good	Very friable	No	High		Clear, wavy
4	115	10YR46	CS	11% HR	-	Weak granular	>0.5	Good	Very friable	No	High		

Profile Gleyed From:- Not

Depth to Slowly Permeable Horizon:- None

Wetness Class :- I

Wetness Grade :- 2

Available Water Wheat :- 87mm

Potatoes :- 84mm

Moisture Deficit Wheat :- 104mm

Potatoes :- 95mm

Moisture Balance Wheat :- -17mm

Potatoes :- -11mm

Droughtiness Grade :- 3A (to 115 cm)

Final ALC Grade :- 3A (Nearly 3B)

Main Limiting Factor(s) :- Droughtiness

Remarks :-

Droughtiness - Subgrade 3A almost into Subgrade 3B stone contents by sieving and displacement.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 701	PARENT MATERIAL
Cox's Farm	5	-	Cereals	ATO :- 1435	First Terrace River Deposits
				FC Days :- 158	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
71/92	26/11/92	SU 140 969	PRW		

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
Topsoil	0-24	10YR43	HCL	0	-	MMSAB		Mod					
Sub 1	24-53	10YR53	HCL	0	Gleyed 10YR58 *Common*	MMAB	<0.5%	Poor		Few			
Sub 2	53-120	10YR74	LMS	55% Visual		Too stony to assess		Mod.					

Profile Gleyed From:- 24cm

Depth to Slowly Permeable Horizon:- None

Wetness Class :- II

Wetness Grade :- 3a

Available Water Wheat :- 92mm

Potatoes :- 84mm

Moisture Deficit Wheat :- 104mm

Potatoes :- 95mm

Moisture Balance Wheat :- -12mm

Potatoes :- -11mm

Droughtiness Grade :- 3A (to 120 cm)

Final ALC Grade :- 3A

Main Limiting Factor(s) :- Droughtiness + wetness equal limitations

Remarks :-

Water table at 55 cm.