WILTSHIRE MINERALS LOCAL PLAN
S76 BLACKFORD FARM, CASTLE EATON

AGRICULTURAL LAND CLASSIFICATION

Report of Survey

1. SUMMARY

Two hundred and sixty hectares of land at Blackford Farm, Castle Eaton were graded using the Agricultural Land Classification (ALC) System in November/December 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 223 auger borings and 8 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: Blackford Farm, Castle Eaton

Grade	Area (ha)	*% of* Survey Area	*% of* Agricultural Land	
3a	86.7	33.4	33.7	
3b	153.6	59.1	59.6	
4	17.2	6.6	6.7	
Non Agric	0.6	0.2	100%	(257.5 ha)
Urban	1.3	0.5		
Agric Bldgs	0.5	0.2		
TOTAL	259.9	100%		

There are no climatic or site limitations for the survey area. The main limitation across the site is wetness downgrading the site to Subgrade 3a and 3b. Some of the 3a soils are also limited by droughtiness to Subgrade 3a. Part of the site is affected by flooding resticting the grade to 3b and 4. A third of the site is best and most versatile.

2. INTRODUCTION

Two hundred and sixty hectares of land at Blackford Farm, Castle Eaton were graded using the Agricultural Land Classification (ALC) System in November/December 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 223 auger borings and 8 soil profile pits were examined.

The published Provisional 1" to the mile ALC map of this area (MAFF 1973) shows the northern half of the site to be Grade 2: the southern part as Grade 3. The area was surveyed in 1979 at 1:25,000 scale as part of the Cotswold water Park ALC survey and mapped the site as mainly Subgrade 3a with small areas of Grades 2 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 the site was under winter cereals with some oil seed rape and grass. 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 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: Blackford Farm, Castle Eaton

Grid Reference		SU 153 953	SU 173 959
Height (m)		75	70
Accumulated Temperature (day deg)		1441	1446
Average Annual Rainfall (mm)		679	680
Overall Climatic Grade		1	1
Field Capacity (Days)		153	151
Moisture Deficit,	Wheat (mm)	106	107
	Potatoes (mm)	98	99

4. RELIEF

The survey area is predominantly flat and lies at approximately 75m AOD. Neither gradient nor altitude impose a limitation to the ALC grade. There is a small area where microrelief imposes a limitation on agricultural versatility.

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 underlain by Alluvial drift. The north east, north west and south west corners of the site are underlain by First Terrace River deposits.

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 three associations. In the north is the Badsey 2 Association, described as mainly well drained fine loamy soils over calcareous gravel. In the south west the Evesham 2 Association is mapped (deep clays with slowly permeable subsoils). The Thames Association covers the remaining area: this is described as calcareous clays affected by groundwater.

During the recent survey three soil types were identified. Most have heavy clay loam topsoils, with some clays. The first soil has a light textured stoney subsoil from 40cm. The second soil has this subsoils at a greater depth with stony heavy

clay loam horizons above. The third soil has deep heavy clay loams and clay which overlie very stony light textures soil from 80cm.

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: Blackford Farm, Castle Eaton

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
3a	86.7	33.4	33.7	
3b	153.6	59.1	59.6	
4	17.2	6.6	6.7	
Non Agric	0.6	0.2	100%	(257.5 ha)
Urban	1.3	0.5		
Agric Bldgs	0.5	0.2		
TOTAL	259.9	100%		

Subgrade 3a

These soils are affected by groundwater and evidence of waterlogging of the profile for part of the year was seen in the form of mottling and manganese. Based on the definitions of Wetness Classes in Appendix 3 the soils are Wetness Class II. The water table was observed at a depth of 30-40cm over much of the site, however this was after a period of exceptionally wet weather conditions. The topsoil texture is mainly heavy clay loam. These soils have light textures and stones in the subsoils. Some of these are high enough in the profile and stoney enough to impose a droughtiness limitation also restricting the soils to Subgrade 3a. Stone contents were determined by sieving horizon samples and calculating volumetric displacement by the stones in water.

Subgrade 3b

Some of the soils mapped as Subgrade 3b are similar to those described above but they experience flooding occasionally in winter. This also affects soils which are described below. The flooding usually lasts for more than 4 days. The soils are therefore downgraded to 3b.

The remaining areas mapped as 3b are downgraded because of a worse wetness limitation than the 3a soils. These soils have slowly permeable layers in the subsoils. The depth at which these are found is variable and the structures associated with them were confirmed in soil profile pits. These soils are either Wetness Class III or IV. The combination of the Wetness Class, the topsoil texture and Field Capacity Days restrict these soils to 3b. In the east of the site some of these soils have stonier subsoils but droughtiness is not a limiting factor in grading these soils. A small area has severe microrelief limitations limiting the versatility of the land and downgrading the land to 3b.

Grade 4

Two areas have been mapped as Grade 4. These experience worse flooding than the 3b areas. Here the flooding occurs frequently in winter and lasts for long periods.

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 :- 679	PARENT MATERIAL
Blackford Farm	Pit 1	0	Cereals	ATO :- 1441	First Terrace River Deposits
				FC Days :- 153	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
73/92	November 92	SU 152 958	NAD		

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	27	10YR42	HCL	1% hard rock	-	Recently been ploughed	Many	-	Friable	Common - fine	-	None	Clear, smooth
2	35	10YR44	C	2% hard rock				Too shallow to assess					Very shallow + variable
3	57	75YR46 Ped = 10YR53 at 45cm	C	0	75YR58 - few, faint	MCSAB to 45 cm; mod C+M prismatic	0.3-0.4%	Mod.	Friable	Common fine		Few	Clear, smooth
4	90+	10YR54 ped = 10YR53	C	2% hard rock	few faint 10YR58 10YR52	MCAB	0.2%	Mod.	Friable	Common fine		Few	

Profile Gleyed From:- Gleyed at 60 cm

Depth to Slowly Permeable Horizon:- 45cm

Wetness Class :- III

Wetness Grade :- 3B

Available Water Wheat :- 140mm
Potatoes :- 116mm

Moisture Deficit Wheat :- 107mm
Potatoes :- 99mm

Moisture Balance Wheat :- +33mm
Potatoes :- +17mm

Droughtiness Grade :- 1

Final ALC Grade :- 3B

Main Limiting Factor(s) :- Wetness

Remarks :-

Pit dug to 90cm

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 679	PARENT MATERIAL
Blackford Farm	Pit 2	0	Winter cereal	ATO :- 1441	First Terrace River Deposits
				FC Days :- 153	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
73/92	November 92	SU 161 959	NAD		

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	None	-	Good	-	-	Common fine	-	-	Smooth
2	45	10YR54	HCL	8-10% hard rock (visual)	Few, faint ochreous	WCSAB	<0.5	Mod.	Friable	Common fine very fine	-	Few	Under water
3	120	10YR64/53	LCS	50% hard rock (visual)	cdom	Too wet to assess	Good	Mod.	Loose	Few very fine		Few	

Profile Gleyed From:- None

Depth to Slowly Permeable Horizon:- None

Wetness Class :- II

Wetness Grade :- 3A

Available Water Wheat :- 93mm

Potatoes :- 82mm

Moisture Deficit Wheat :- 107mm

Potatoes :- 99mm

Moisture Balance Wheat :- -14mm

Potatoes :- -17mm

Droughtiness Grade :- 3A (to 120 cm)

Final ALC Grade :- 3A

Main Limiting Factor(s) :- Droughtiness/wetness

Remarks :-

Water table at 30 cm in pit.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 679	PARENT MATERIAL
Blackford Farm	Pit 3	0	Stubble	ATO :- 1441	Alluvium
				FC Days :- 153	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
73/92	November 92	SU 162 954	NAD		

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	10YR42	HCL	2% hard rock	Few faint ochreous	-	Good	-	-	Many fine very fine	-	-	Smooth, clear
2	50	10YR53/51	C	Neg.	Common 10YR56	MCAB	0.1%	Poor	Firm	Common fine, very fine			Clear, smooth
3	110	10YR53 25Y52	C	Neg.	75YR58 Common	WCSAB	<0.1%	Poor	Firm	Few fine		Common	
(4)			SC										

Profile Gleyed From:- 25 cm

Depth to Slowly Permeable Horizon:- 25 cm

Wetness Class :- IV

Wetness Grade :- 3B

Available Water Wheat :- 119mm

Potatoes :- 103mm

Moisture Deficit Wheat :- 107mm

Potatoes :- 99mm

Moisture Balance Wheat :- +12mm

Potatoes :- +4mm

Droughtiness Grade :- 2 (to 110 cm)

Final ALC Grade :- 3B

Main Limiting Factor(s) :- Wetness

Remarks :-

Water table at 30 cm. Pit dug to 70 cm. Augered to 120 cm.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 679	PARENT MATERIAL
Blackford Farm	Pit 4	0	Oil Seed Rape	ATO :- 1441	Frist River Terrace Deposits
				FC Days :- 153	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
73/92	November 1992	SU 162 954	NAD		

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	10YR44	HCL	5% small hard rock	None						Slightly calc.		Clear, smooth
2	50	10YR54	HCL	18% hard rock sieved/displ.	None	WCSAB (very difficulty to assess therefore stones + wet)	>0.5%	Mod.	Friable	Common fine + very fine	Calc.	Few	Clear, smooth
3	120	10YR66/51	CS	55% hard rock sieved/displ.	10YR66/58 Gleyed	Too wet + stony	>0.5%	Mod.	Loose	Few, very fine	Very calc.	Com.	

Profile Gleyed From:- 50cm

Depth to Slowly Permeable Horizon:- None

Wetness Class :- II

Wetness Grade :- 3A

Available Water Wheat :- 97

Potatoes :- 82

Moisture Deficit Wheat :- 107

Potatoes :- 99

Moisture Balance Wheat :- -10

Potatoes :- -17

Droughtiness Grade :- 3A

Final ALC Grade :- 3A

Main Limiting Factor(s) :- Wetness/droughtiness

Remarks :-

Water table at 30 cm.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 679	PARENT MATERIAL
Blackford Farm	Pit 5	0	Winter Cereal	ATO :- 1441	Alluvium
				FC Days :- 153	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
73/92	27.11.92	SU 164 948	NAD		

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	10YR42	C	0	Common below 15cm - 10YR56	-	Many (e/ worms)				Non		Clear, smooth
2	45	10YR44/43	C	0	Few fine och. mottles	MC + VC SAB	0.4% (e/ worms)	Mod.	Friable	Fine + very fine common	Non		Clear, smooth
3	70	10YR51	C	10% hard rock	Many - 10YR58	SCAB	0.1 - 0.2%	Poor (if ped faces gleyed)	Firm	Common - ped faces but not within pds	Non	Few	-
4	120	10YR74	LMS	50% (visual)	Common 10YR66	Too wet	-	Mod.		Few, very fine	Yes		

Profile Gleyed From:- Gleyed 15cm

Depth to Slowly Permeable Horizon:- SPL 45cm

Wetness Class :- III

Wetness Grade :- 3B

Available Water Wheat :- 106mm

Potatoes :- 104mm

Moisture Deficit Wheat :- 107mm

Potatoes :- 99mm

Moisture Balance Wheat :- -1mm

Potatoes :- +5mm

Droughtiness Grade :- 3A (to 120 cm)

Final ALC Grade :- 3B

Main Limiting Factor(s) :- Wetness

Remarks :-

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 679	PARENT MATERIAL
Blackford Farm	Pit 6	0	Winter Cereals	ATO :- 1441	Alluvium
				FC Days :- 153	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
73/92	1.12.92	SU 164 959	NAD		

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	30	10YR32	HCL	0	None	-	>0.5	-	-	-	-	-	Clear, smooth
2	40	10YR53/54	C	0	Common distinct 10YR56	MC Prismatic	>0.5	Mod.	Friable	Common fine + very fine		Few common at boundary	
3	80	10YR53	C	0	Many coarse distinct ochreous and grey 10YR58 2.5Y52	MCAB (prismatic around upper boundary)	0.2-0.3%	Mod.	Friable	Few fine fibrous		Few common	
4	120	25Y62	CSL	Increasing	10YR56								

Profile Gleyed From:- 30 cm

Depth to Slowly Permeable Horizon:- 40 cm

Wetness Class :- IV

Wetness Grade :- 3B

Available Water Wheat :- 110mm

Potatoes :- 118mm

Moisture Deficit Wheat :- 107mm

Potatoes :- 99mm

Moisture Balance Wheat :- +3mm

Potatoes :- +19mm

Droughtiness Grade :- 3A (to 120 cm)

Final ALC Grade :- 3B

Main Limiting Factor(s) :- Wetness

Remarks :-

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 679	PARENT MATERIAL
Blackford Farm	Pit 7	0	Cereals	ATO :- 1441	Alluvium
				FC Days :- 155	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
73/92	16/2/93	SU156 955	PRW/GMS		

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	10YR53	C	None	None	MCSAB	Many	Mod.	Friable	Many fine	No	No	Sharp, smooth
2	45	2.5Y56	C	None	Few ochreous not gleyed	MCSAB	>0.5%	Mod.	Friable	Few fine	No	No	Clear, smooth
3	80	2.5Y64	C	None	Common ochreous	MCSAB (tending to angular)	>0.5% NO SPL	Mod.	Friable	Few fine	No	No	-
4	110	2.5Y66	MS	40% hard rock sieved/displ.	Ochreous staining	-	Many	Mod.	Loose	None	Calcareous	No	-

Profile Gleyed From:- 45cm

Depth to Slowly Permeable Horizon:- None

Wetness Class :- I

Wetness Grade :- 3a

Available Water Wheat :- 118mm

Potatoes :- 116mm

Moisture Deficit Wheat :- 107mm

Potatoes :- 99mm

Moisture Balance Wheat :- +11mm

Potatoes :- +17mm

Droughtiness Grade :- 2 (to 120 cm)

Final ALC Grade :- 3a

Main Limiting Factor(s) :- Wetness

Remarks :-

Water table 75 cm.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Blackford Farm	Pit 8	0	Crop	Av Rainfall :- 679 ATO :- 1441 FC Days :- 153 Climatic grade :- 1	First Terrace River Deposits
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		
73/92	16/2/93	SU 167 956	GMS/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
1	28	10YR43	C	12% HR sieved/displ.	-	MMSAB	Good	-	Friable	Many fine	Slightly	-	Abrupt smooth
2	52	2.5Y52	C	None	cdom gleyed	WCP	Low	M	Friable	Common fine	X	X	-
3	65	2.5Y54	LMS	18% HR sieved/displ.	cdom	-	-	M	-	-	/	-	-
4	120	10YR73	MS	52% HR sieved/displ.	cdom			M	-	-	/	-	-

Profile Gleyed From:- 28cm

Depth to Slowly Permeable Horizon:- 35cm

Wetness Class :- IV

Wetness Grade :- 3B

Available Water Wheat :- 96mm
Potatoes :- 90mm

Moisture Deficit Wheat :- 107mm
Potatoes :- 99mm

Moisture Balance Wheat :- -11mm
Potatoes :- -9mm

Droughtiness Grade :- 3A

Final ALC Grade :- 3B

Main Limiting Factor(s) :- Wetness

Remarks :-