

A1

**CHERWELL DISTRICT LOCAL PLAN
Land north of Woodfield Bicester
Oxfordshire**

**Agricultural Land Classification
ALC Map and Report**

November 1998

**Resource Planning Team
Eastern Region
FRCA Reading**

**RPT Job Number 3301/080/98
MAFF Reference EL33/01588**

AGRICULTURAL LAND CLASSIFICATION REPORT

CHERWELL DISTRICT LOCAL PLAN LAND NORTH OF WOODFIELD BICESTER OXFORDSHIRE

INTRODUCTION

- 1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 9.5 ha of land to the north of Woodfield Bicester Oxfordshire. The survey was carried out during November 1998.
- 2 The work was undertaken by the Farming and Rural Conservation Agency (FRCA)¹ on behalf of the Ministry of Agriculture Fisheries and Food (MAFF). The survey was carried out in connection with MAFF's statutory input to the Cherwell District Local Plan. A previous survey (FRCA Ref 3301/034/83) covering all of the site was conducted in 1983 but this present survey now supersedes all previous ALC information for this land.
- 3 The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. 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 permanent grassland. The area mapped as Other land includes a private driveway and garden adjoining the property to the north of the site.

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)	% surveyed area	% site area
3b	9.3	100.0	97.9
Other land	0.2	N/A	2.1
Total surveyed area	9.3	100.0	97.9
Total site area	9.5		100.0

- 7 The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. A total of 10 borings and 1 soil pit was described.

¹ FRCA is an executive agency of MAFF and the Welsh Office.

- 8 The entire site is classified as Subgrade 3b (moderate quality agricultural land) The land is subject to a significant soil droughtiness limitation Profiles typically comprise medium loam topsoils which overlie brashy limestone at shallow depths The high volume of hard rock in the subsoil severely restricts the amount of water for plant growth as well as reducing the potential rooting depth for crops This limitation will reduce the level and consistency of crop yields

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 procedures (Met Office 1989)

Table 2 Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SP585 246	SP587 245
Altitude	m AOD	85	82
Accumulated Temperature	day C (Jan June)	1406	1410
Average Annual Rainfall	mm	684	683
Field Capacity Days	days	147	146
Moisture Deficit Wheat	mm	102	103
Moisture Deficit Potatoes	mm	93	94
Overall climatic grade	N/A	Grade 1	Grade 1

- 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 means that there is no overall climatic limitation In addition the site does not suffer from exposure or frost risk As such the site may be considered as being climatically Grade 1 Climatic factors do however interact with soil properties to influence soil wetness and soil droughtiness

Site

- 14 The site lies approximately 85m AOD and is flat lying. Nowhere on the site do gradient, microrelief or flooding adversely affect agricultural land quality.

Geology and soils

- 15 The most detailed published geological information for this area (BGS 1863) maps the whole site as Cornbrash Limestone.
- 16 The most recent published soils information covering the area (SSEW 1983) shows the site to consist of soils of the Aberford Association. These soils are described as well drained and fine loamy over limestone at moderate depth. Stoniness varies with the hardness of the underlying rock but normally increases down the profile (SSEW 1983). The soils are further described as being permeable and well drained (Wetness Class I) although drainage measures are required in places where thin mudstones or clays outcrop (SSEW 1984). Detailed survey work found soils similar to those described here.

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 and the details of the soils data are presented in Appendix II.

Subgrade 3b

- 19 The whole site has been classified as Subgrade 3b (moderate quality agricultural land) with the main limitation being soil droughtiness. Within this mapping unit profiles typically comprise very slightly to slightly stony calcareous medium clay loam topsoils. These either overlie a shallow slightly stony heavy clay loam over impenetrable limestone or lie directly over the impenetrable limestone. Such profiles are typified by soil pit 1P. Evidence from the pit indicated that the upper and lower subsoils are very stony (58% hard rock by volume) which causes a reduction in the reserves of water in the soil. In the local climate this acts to impart a soil droughtiness limitation which may lower the level and consistency of crop yields. In terms of soil wetness these soils have been placed in Wetness Class I since no evidence of gleying was present.
- 20 The evidence gathered from the pit is based on observations made down to 100 cm. From 80cm to 100cm depth the pit became very difficult to excavate and only a very small element of the resource was able to be examined. It was additionally noted that stoniness significantly increased with depth below 80cm although it was not possible to attain a sample for sieving. Based on the direct evidence to 100cm a grading of Subgrade 3b is appropriate. To assess the grading based on 120cm depth the pit would only qualify for Subgrade 3a if the stone content remained the same to depth. However given the increased stoniness between 80–100cm and a possible further increase between 100–120cm and given possible variation in

stone content across the site it is deemed appropriate to place this land in Subgrade 3b on the basis of droughtiness

Edgar Black & Andy Barton
Resource Planning Team
Eastern Region
FRCA Reading

SOURCES OF REFERENCE

British Geological Survey (1863) *Sheet No 45 SE Old Series Banbury Woodstock Bicester and Buckingham* 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 6 South East England*
SSEW Harpenden

Soil Survey of England and Wales (1984) *Soils and their Use in South East 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 DATA

Contents

Sample location map

Soil abbreviations explanatory note

Soil pit and soil boring descriptions (boring and horizon levels)

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF:** national 100 km grid square and 8 figure grid reference.
2. **USE:** Land use at the time of survey. The following abbreviations are used:

ARA: Arable	WHT: Wheat	BAR: Barley
CER: Cereals	OAT: Oats	MZE: Maize
OSR: Oilseed rape	BEN: Field beans	BRA: Brassicae
POT: Potatoes	SBT: Sugar beet	FCD: Fodder crops
LIN: Linseed	FRT: Soft and top fruit	FLW: Fallow
PGR: Permanent pasture	LEY: Ley grass	RGR: Rough grazing
SCR: Scrub	CFW: Coniferous woodland	OTH: Other
DCW: Deciduous woodland	BOG: Bog or marsh	SAS: Set-Aside
HTH: Heathland	HRT: Horticultural crops	PLO: Ploughed

3. **GRDNT:** Gradient as estimated or measured by a hand-held optical clinometer.
4. **GLEYSPL:** Depth in centimetres (cm) to gleying and/or slowly permeable layers.
5. **AP (WHEAT/POTS):** Crop-adjusted available water capacity.
6. **MB (WHEAT/POTS):** Moisture Balance. (Crop adjusted AP - crop adjusted MD)
7. **DRT:** Best grade according to soil droughtiness.
8. If any of the following factors are considered significant, 'Y' will be entered in the relevant column:

MREL: Microrelief limitation	FLOOD: Flood risk	EROSN: Soil erosion risk
EXP: Exposure limitation	FROST: Frost prone	DIST: Disturbed land
CHEM: Chemical limitation		

9. **LIMIT:** The main limitation to land quality. The following abbreviations are used:

OC: Overall Climate	AE: Aspect	ST: Topsoil Stoniness
FR: Frost Risk	GR: Gradient	MR: Microrelief
FL: Flood Risk	TX: Topsoil Texture	DP: Soil Depth
CH: Chemical	WE: Wetness	WK: Workability
DR: Drought	ER: Erosion Risk	WD: Soil Wetness/Droughtiness
EX: Exposure		

Soil Pits and Auger Borings

1. **TEXTURE:** soil texture classes are denoted by the following abbreviations:

S: Sand	LS: Loamy Sand	SL: Sandy Loam
SZL: Sandy Silt Loam	CL: Clay Loam	ZCL: Silty Clay Loam
ZL: Silt Loam	SCL: Sandy Clay Loam	C: Clay
SC: Sandy Clay	ZC: Silty Clay	OL: Organic Loam
P: Peat	SP: Sandy Peat	LP: Loamy Peat
PL: Peaty Loam	PS: Peaty Sand	MZ: Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:

F: Fine (more than 66% of the sand less than 0.2mm)
M: Medium (less than 66% fine sand and less than 33% coarse sand)
C: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content:
M: Medium (<27% clay) **H:** Heavy (27-35% clay)

2. **MOTTLE COL:** Mottle colour using Munsell notation.

3. **MOTTLE ABUN:** Mottle abundance, expressed as a percentage of the matrix or surface described:

F: few <2% **C:** common 2-20% **M:** many 20-40% **VM:** very many 40% +

4. **MOTTLE CONT:** Mottle contrast:

F: faint - indistinct mottles, evident only on close inspection

D: distinct - mottles are readily seen

P: prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL:** Ped face colour using Munsell notation.

6. **GLEYS:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH:** Stone Lithology - one of the following is used:

HR:	all hard rocks and stones	FSST:	soft, fine grained sandstone
ZR:	soft, argillaceous, or silty rocks	CH:	chalk
MSST:	soft, medium grained sandstone	GS:	gravel with porous (soft) stones
SI:	soft weathered igneous/metamorphic rock	GH:	gravel with non-porous (hard) stones

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

8. **STRUCT:** the degree of development, size and shape of soil peds are described using the following notation:

Degree of development	WK: weakly developed	MD: moderately developed
	ST: strongly developed	
Ped size	F: fine	M: medium
	C: coarse	
Ped shape	S: single grain	M: massive
	GR: granular	AB: angular blocky
	SAB: sub-angular blocky	PR: prismatic
	PL: platy	

9. **CONSIST:** Soil consistence is described using the following notation:

L: loose	FM: firm	EH: extremely hard
VF: very friable	VM: very firm	
FR: friable	EM: extremely firm	

10. **SUBS STR:** Subsoil structural condition recorded for the purpose of calculating profile droughtiness:

G: good **M:** moderate **P:** poor

11. **POR:** Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP:** If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

13. **SPL:** Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC:** If the soil horizon is calcareous, a 'Y' will appear in this column.

15. Other notations:

APW:	available water capacity (in mm) adjusted for wheat
APP:	available water capacity (in mm) adjusted for potatoes
MBW:	moisture balance, wheat
MBP:	moisture balance, potatoes

SAMPLE NO	GRID REF	ASPECT USE	WETNESS		WHEAT		POTS		M REL		EROSN	FROST	CHEM	ALC	COMMENTS	
			GRDNT	GLEY SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST		LIMIT
1	SP58402470	PGR			1	1	43	59	43	50	4			DR	3B	I25X2 SEE1P
2	SP58502470	PGR			1	1	47	55	47	46	4			DR	3B	IMP SEE1P
3	SP58602470	PGR			1	1	41	61	41	52	4			DR	3B	I25X2 SEE1P
4	SP58402460	PGR			1	1	47	55	47	46	4			DR	3B	IMP SEE1P
5	SP58502460	PGR			1	1	43	59	43	50	4			DR	3B	IMP SEE1P
6	SP58602460	PGR			1	1	54	48	54	39	38			DR	3B	IMP SEE1P
7	SP58402450	PGR			1	1	43	59	43	50	4			DR	3B	IMP25X2 SEE1P
8	SP58502450	PGR			1	1	43	59	43	50	4			DR	3B	IMP SEE1P
9	SP58602450	PGR			1	1	41	61	41	52	4			DR	3B	IMP SEE1P
10	SP58702450	PGR			1	2	109	7	106	13	2			WD	2	I85
1P	SP58602470	PGR			1	1	75	27	67	26	38			DR	3B	PIT TO 100CM

SAMPLE	DEPTH	TEXTURE	COLOUR	-MOTTLES-		PED	STONES			STRUCT/	SUBS			SPL	CALC	
				COL	ABUN	CONT	COL	GLE	2	6	LITH	TOT	CONSIST			STR
1	0 25	MCL	10YR44						2	0	HR	5				Y
2	0-25	MCL	10YR44						2	0	HR	5				Y
	25-28	HCL	10YR54						0	0	HR	5	M			Y
3	0 25	MCL	10YR44						2	0	HR	10				Y
4	0 20	MCL	10YR44						2	0	HR	5				Y
	20 28	HCL	75YR44						0	0	HR	5	M			Y
5	0 25	MCL	10YR44						2	0	HR	5				Y
6	0 20	MCL	10YR44						2	0	HR	10				Y
	20 35	HCL	10YR54						0	0	HR	10	M			Y
7	0 25	MCL	10YR44						2	0	HR	5				Y
8	0 25	MCL	10YR44						2	0	HR	5				Y
9	0 25	MCL	10YR44						2	0	HR	10				Y
10	0 20	HCL	10YR44						2	0	HR	5				Y
	20-40	HCL	10YR54						0	0	HR	5	M			Y
	40 75	HCL	10YR66						0	0	HR	15	M			Y
	75-85	MCL	10YR64						0	0	HR	15	M			Y
1P	0 20	MCL	10YR43						12	0	HR	15				Y
	20 50	MCL	10YR54						0	0	HR	58	M			Y WET SIEVED
	50 100	HCL	10YR64						0	0	HR	58	M			Y WET SIEVED