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West Oxfordshire Local Plan
Site 450 : North Leigh
Agricultural Land Classification
ALC Map and Report
May 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

WEST OXFORDSHIRE LOCAL PLAN
SITE 450 : NORTH LEIGH

1. Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the West Oxfordshire District of Oxfordshire. The work forms part of MAFF's statutory input to the preparation of the West Oxfordshire Local Plan.

1.2 Site 450 comprises approximately 8 hectares of land to the south of North Leigh in Oxfordshire. An Agricultural Land Classification (ALC) Survey was carried out in May 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 7 soil auger borings and one soil inspection pit were assessed in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on its use for agriculture.

1.3 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of the survey the land was under permanent grass. The Urban area shown is a house and associated garden.

1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:5,000. It is accurate at this scale, but any enlargement would be misleading. This map supersedes any previous survey information for this site.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
3b	7.7	98.7
Urban	0.1	1.3
Total area of site	7.8 ha	100%

1.6 The agricultural land at this site has been classified as moderate quality (Subgrade 3b). The principal limitation is soil wetness. Clay loam topsoils with clear evidence of wetness overlie slowly permeable clay at shallow depths in the profile causing drainage to be severely impeded. This significantly restricts the opportunities for cultivation and/or stocking without the risk of

structural damage to the soil. Crop growth and development may also be affected by prolonged soil wetness.

2. Climate

2.1 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.

2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of a locality.

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office, 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site.

2.4 No local climatic factors such as exposure or frost risk affect the site. However, climatic and soil factors interact to influence soil wetness and droughtiness limitations.

Table 2: Climatic Interpolations

Grid Reference	SP387124	SP390127
Altitude, (m, AOD)	117	122
Accumulated Temperature (°days, Jan-June)	1380	1374
Average Annual Rainfall (mm)	718	721
Field Capacity Days	156	156
Moisture deficit, wheat (mm)	97	96
Moisture deficit, potatoes (mm)	87	86
Overall Climatic Grade	1	1

3. Relief

3.1 The site lies between approximately 117m and 122m AOD. Overall, the land rises gently from south and east to north and west. Microrelief and gradient are not sufficient to affect land utilisation, and as such do not affect the final classification.

4. Geology and Soils

4.1 The published geological information (BGS, 1982) shows the area surveyed to be entirely underlain by Eocene London Clay.

4.2 The published soils information (SSEW, 1983), shows the site to be underlain by soils of the Denchworth association. SSEW describes these as "slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils. Some fine loamy over clayey soils with only slight seasonal waterlogging and some slowly permeable calcareous clayey soils". Soils broadly similar to the initial description were encountered at this site.

5. Agricultural Land Classification

5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

5.2 The location of the soil observation points are shown on the attached sample point map.

Subgrade 3b

5.3 The whole of the agricultural area at this site has been assigned to Subgrade 3b, moderate quality land. The principal limitation is soil wetness due to drainage impedance. Profiles typically comprise stoneless or very slightly stony heavy, occasionally medium, clay loam topsoils which are often gleyed. These overlie poorly structured gleyed and slowly permeable clay horizons from between 19 and 28 cm as seen in Pit 1 (see Appendix III), which was considered typical of the site. The subsoil horizons lead to a reduction in permeability leading to a significant drainage impedance which, within local climatic parameters leads to Wetness Class IV (see Appendix II) being applied. This wetness class, in combination with the moderate and low workability status of the topsoils, leads to Subgrade 3b being appropriate. The limitations are such that there is a restricted number of days for cultivation and/or grazing without causing structural damage to the soil.

SOURCES OF REFERENCE

British Geological Survey (1982), Sheet 236, Witney, 1:50,000, Solid and Drift Edition.

MAFF (1988), Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

Meteorological Office (1989), Climatic datasets for Agricultural Land Classification.

Soil Survey of England and Wales (1983), Sheet No. 6, Soils of South-East England, 1:250,000, and Accompanying Legend.

Soil Survey of England and Wales (1984), Soils and their use in South-East England. Bulletin No. 15.

APPENDIX I

DESCRIPTION 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.

Urban
Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural
'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland
Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural Buildings
Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (e.g. polythene tunnels erected for lambing) may be ignored.

Open Water
Includes lakes, ponds and rivers as map scale permits.

Land Not Surveyed
Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, e.g. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

DEFINITION OF SOIL WETNESS CLASS

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class 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 180 days, but only wet within 40 cm depth for 31-90 days in most years.

Wetness Class 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.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth fro 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.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

Sample Point Map

Soil Abbreviations - explanatory note

Database Printout - soil pit information

Database Printout - boring level information

Database Printout - horizon level information

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

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

Boring Header Information

1. **GRID REF** : national 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	**DCW** : Deciduous Wood
HTH : Heathland	**BOG** : Bog or Marsh	**FLW** : Fallow
PLO : Ploughed	**SAS** : Set aside	**OTH** : Other
HRT : Horticultural Crops		

3. **GRDNT** : Gradient as measured by a hand-held optical clinometer.

4. **GLEY/SPL** : Depth in cm to gleying or slowly permeable layers.

5. **AP (WHEAT/POTS)** : Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)** : Moisture Balance.

7. **DRT** : Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, an entry of 'Y' will be entered in the relevant column.

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

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

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

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	**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 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

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

6. **STONE LITH** : One of the following is used.

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

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

7. **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 **VC** : very coarse
   ped shape **S** : single grain **M** : massive **GR** : granular **AB** : angular blocky **SAB** : sub-angular blocky **PR** : prismatic **PL** : platy

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

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

9. **SUBS STR** : Subsoil structural condition recorded for the purpose of calculating profile droughtiness : **G** : good **M** : moderate **P** : poor

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

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

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

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

14. 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

SOIL PIT DESCRIPTION

Site Name : W OXON LP SITE 450 Pit Number : 1P

Grid Reference: SP38801250 Average Annual Rainfall : 718 mm
Accumulated Temperature : 1380 degree days
Field Capacity Level : 156 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 19	HCL	10YR32 42	0	0		C				
19- 33	C	25Y 51 00	0	2	HR	M	MDCPR	FM	P	
33- 60	C	05Y 61 00	0	0		M	STCAB	FM	P	

Wetness Grade : 3B Wetness Class : IV
Gleying : 0 cm
SPL : 19 cm

Drought Grade : APW : mm MBW : 0 mm
APP : mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
1	0-27	mcl	10YR42 00	10YR56 00	C			Y	0	0	HR	4						
	27-60	c	05Y 71 00	75YR58 00	M			Y	0	0	HR	2		P				Y
1P	0-19	hcl	10YR32 42	10YR56 00	C			Y	0	0		0						
	19-33	c	25Y 51 00	75YR56 00	M		05Y 51 61	Y	0	0	HR	2	MDCPR	FM P	Y			Y
	33-60	c	05Y 61 00	75YR58 00	M		05GY61 00	Y	0	0		0	STCAB	FM P	Y			Y
2	0-28	mcl	10YR42 00	10YR56 00	C			Y	0	0	HR	1						
	28-60	c	05Y 71 00	75YR58 00	M			Y	0	0		0		P				Y
3	0-27	hcl	10YR53 00	10YR56 00	C			Y	0	0	HR	3						
	27-60	c	05Y 71 00	75YR58 00	M			Y	0	0		0		P				Y
4	0-26	hcl	10YR42 00	10YR56 00	F				0	0	HR	5						
	26-60	c	05Y 71 00	75YR58 00	M			Y	0	0	HR	5		P				Y
5	0-20	hcl	10YR42 00	10YR46 00	F				0	0		0						
	20-37	c	25Y 52 53	10YR56 00	C		00MN00 00	Y	0	0		0		P				Y
	37-70	c	05Y 61 00	75YR68 00	M			Y	0	0		0		P				Y
6	0-19	hcl	10YR32 00	10YR56 00	C			Y	0	0		0						
	19-35	c	25Y 51 00	10YR56 00	M			Y	0	0		0		P				Y
	35-70	c	05Y 61 00	75YR58 68	M		00MN00 00	Y	0	0		0		P				Y
7	0-22	hcl	10YR42 00	10YR46 00	C			Y	0	0		0						
	22-35	c	25Y 53 00	10YR56 00	C		00MN00 00	Y	0	0		0		P				Y
	35-80	c	05GY61 00	75YR68 00	M			Y	0	0		0		P				Y

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SP38901270	PGR	E	02	0	27	4	3B		0		0					WE	3B	SPL 27
1P	SP38801250	PGR			0	19	4	3B		0		0					WE	3B	SPL 19 PIT 60
2	SP39001270	PGR			0	28	4	3B		0		0					WE	3B	SPL 28
3	SP38801260	PGR	S	02	0	27	4	3B		0		0					WE	3B	SPL 27
4	SP38901260	PGR	S	02	26	26	4	3B		0		0					WE	3B	SPL 26
5	SP38701250	PGR	SW	01	20	20	4	3B		0		0					WE	3B	SPL 20
6	SP38801250	PGR			0	19	4	3B		0		0					WE	3B	SPL 19
7	SP38701240	PGR	SW	01	0	22	4	3B		0		0					WE	3B	SPL 22