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West Oxfordshire Local Plan
Site 553c : Aston
Agricultural Land Classification
ALC Map and Report
May 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

WEST OXFORDSHIRE LOCAL PLAN
SITE 553C : ASTON

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 553c comprises approximately 1 hectare of land to the south of Bampton Road in Aston, Oxfordshire. An Agricultural Land Classification (ALC) survey was carried out in May 1994. 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 pasture.

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 ALC survey information for this site.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
2	0.2	18.2
3a	0.9	81.8
Total area of site	1.1 ha	100%

1.6 The land at this site has been classified as very good quality (Grade 2) and good quality (Subgrade 3a). The principal limitation is soil droughtiness due to high stone contents in the variable profiles inspected. Profiles comprise very slightly stony clay loam topsoils over moderately and very stony clay loam and clay subsoils passing to very stony sandy and gravelly horizons at depth. The stones in the profile restrict water availability such that in most years there is a slight to moderate risk of drought stress occurring in crops.

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 Interpolation

Grid Reference	SP339029
Altitude, (m, AOD)	69
Accumulated Temperature (°days, Jan-June)	1440
Average Annual Rainfall (mm)	676
Field Capacity Days	146
Moisture deficit, wheat (mm)	108
Moisture deficit, potatoes (mm)	100
Overall Climatic Grade	1

3. Relief

3.1 The site lies at an altitude of approximately 69m AOD. Overall it is flat and as such neither microrelief or gradient affect land utilisation and subsequent classification.

4. Geology and Soils

4.1 The published geological information (BGS, 1982) shows the entire site to be underlain by the Second (Summertown - Radley) Terrace deposits of river gravels.

4.2 The published soils information (SSEW, 1983), shows the entire site to be underlain by soils of the Badsey series. These are described as typical brown calcareous earths and are generally loamy over calcareous gravel or sandy gravel (limestone gravel) with, "an irregular contact between the loamy upper horizons and lower gravely horizons so that depth to gravel can vary rapidly

but rarely exceeds 60 cm". Soils of this broad nature were found at this site, however on occasion gravelly horizons were not encountered in all the inspected profiles.

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.

Grade 2

5.3 A very small area of very good quality land is shown in the south east of the site. This area has been pulled out as better than the adjacent Subgrade 3a land due to the heavier subsoils that improve the water holding capacity, extending to greater depth, but the principal limitation is still soil droughtiness. Profiles typically comprise a very slightly stony calcareous medium clay loam topsoil, passing to a very slightly stony calcareous heavy clay loam upper subsoil. This overlies a very slightly stony or moderately stony calcareous clay passing to either a very stony calcareous clay to depth or a very stony calcareous loamy medium sand becoming impenetrable to the soil auger around 110 cm (see para 5.4).

Subgrade 3a

5.4 Land of good quality is mapped for the majority of this site with soil droughtiness as the principal limitation. Typical profiles comprise a very slightly stony calcareous medium or heavy clay loam topsoil passing to a moderately stony calcareous heavy clay loam upper subsoil. This passes to a moderately stony calcareous heavy clay loam or clay which either becomes impenetrable to the soil auger between 65 and 80 cm or passes to very stony calcareous loamy medium sand, medium sand or medium sandy loam lower subsoil horizons. Pit 1 (see Appendix III) is as typical as possible given the variability of the soils, i.e. the depth to the very stony sandy horizons varies between 60 and 105cm. Wet sieving of the soils established the stone contents of each horizon. The combination of stones in the moisture retentive upper subsoils and the freely draining (Wetness Class I, despite gleying at depth) stony lower subsoils leads to a moderate risk of drought stress to plants in most years.

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), Soils in Oxfordshire, 1 (Witney South), Sheet SP30, 1:25,000 scale.

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 :

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 553C Pit Number : 1P

Grid Reference: SP33720287 Average Annual Rainfall : 676 mm
Accumulated Temperature : 1440 degree days
Field Capacity Level : 146 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 20	MCL	10YR32 00	0	2	HR					Y
20- 45	HCL	10YR42 00	0	17	HR		WKCSAB	FR	M	Y
45- 70	C	10YR43 00	0	21	HR		WKCSAB	FR	M	Y
70-120	LMS	10YR66 00	0	46	HR				M	Y

Wetness Grade : 1 Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 3A APW : 102mm MBW : -6 mm
APP : 101mm MBP : 1 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Droughtiness

SAMPLE NO.	GRID REF	USE	ASPECT		--WETNESS--		-WHEAT-		-POTS-		M.REL	EROSN	FROST	CHEM	ALC	
			GRDNT	GLEY SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	COMMENTS
1	SP33700284	PGR			1	2	98	-10	109	9	3A				DR 3A	IMP 80 SEE 1P
1P	SP33720287	PGR			1	1	102	-6	101	1	3A				DR 3A	PIT 95 AUG 120
2	SP33830293	PGR	80		1	2	109	1	99	-1	3A				DR 3A	
3	SP33740287	PGR	80		1	2	108	0	98	-2	3A				DR 3A	
4	SP33760289	PGR	75		1	2	104	-4	109	9	3A				DR 3A	IMP 85 SEE 1P
5	SP33820300	PGR			1	2	80	-28	85	-15	3B				DR 3B	IMP 65 SEE 1P
6	SP33800280	PGR			1	1	116	8	114	14	2				DR 2	
7	SP33870283	PGR			1	1	117	9	104	4	2				DR 2	IMP 110 DR 120

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	POR	IMP	SPL	CALC	
1	0-25	hcl	10YR32 00						0	0	HR	5						Y	
	25-45	hcl	10YR42 00						0	0	HR	15		M				Y	
	45-75	c	10YR42 00						0	0	HR	5		M				Y	
	75-80	lms	10YR44 00						0	0	HR	50		M				Y	IMP STONES 80
1P	0-20	mcl	10YR32 00						0	0	HR	2						Y	
	20-45	hcl	10YR42 00						0	0	HR	17	WKCSAB FR	M				Y	STONES MEASURED
	45-70	c	10YR43 00						0	0	HR	21	WKCSAB FR	M				Y	STONES MEASURED
	70-120	lms	10YR66 00						0	0	HR	46		M				Y	STONES MEASURED
2	0-30	hcl	10YR32 00						0	0	HR	2						Y	
	30-45	hcl	10YR43 00						0	0	HR	15		M				Y	
	45-65	hcl	10YR44 54						0	0	HR	30		M				Y	
	65-80	lms	10YR58 00						0	0	HR	50		M				Y	
	80-90	msl	05YR61 00	10YR68 00	M			Y	0	0	HR	60		M				Y	
	90-120	ms	10YR56 00						0	0	HR	20		M				Y	
3	0-30	hcl	10YR32 00						0	0	HR	2						Y	
	30-45	hcl	10YR43 00						0	0	HR	15		M				Y	
	45-65	hcl	10YR44 54						0	0	HR	30		M				Y	
	65-80	ms	10YR58 00						0	0	HR	50		M				Y	
	80-90	msl	05YR61 00	10YR68 00	C			Y	0	0	HR	60		M				Y	
	90-120	ms	10YR56 00						0	0	HR	20		M				Y	
4	0-28	hcl	10YR32 00						0	0	HR	2						Y	
	28-40	hcl	10YR42 00						0	0	HR	5		M				Y	
	40-75	c	10YR42 00						0	0	HR	15		M				Y	
	75-85	c	25Y 64 00	10YR56 00	C			Y	0	0	HR	30		M				Y	IMP STONES 85
5	0-30	mcl	10YR32 00						0	0	HR	2						Y	
	30-60	hcl	10YR42 00						0	0	HR	40		M				Y	
	60-65	lms	10YR56 00						0	0	HR	50		M				Y	IMP STONES 65
6	0-28	mcl	10YR32 00						0	0	HR	1						Y	
	28-45	hcl	10YR42 00						0	0	HR	3		M				Y	
	45-68	c	10YR42 00						0	0	HR	3		M				Y	
	68-120	c	10YR44 00						0	0	HR	60		M				Y	
7	0-25	mcl	10YR33 00						0	0	HR	2						Y	
	25-55	hcl	10YR43 00						0	0	HR	15		M				Y	
	55-85	c	10YR56 00						0	0	HR	25		M				Y	
	85-105	c	10YR68 00						0	0	HR	30		M				Y	
	105-120	lms	10YR68 00						0	0	HR	50		M				Y	IMP STONES 110