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Newbury District Local Plan
Site 51: New Road, Greenham
Agricultural Land Classification
ALC Map and Report
February 1994

NEWBURY DISTRICT LOCAL PLAN
SITE 51: NEW ROAD, GREENHAM, BERKSHIRE
AGRICULTURAL LAND CLASSIFICATION REPORT

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 Newbury District of Berkshire. The work forms part of MAFF's statutory input to the preparation of the Newbury District Local Plan.

1.2 Approximately 1 hectare of land relating to site 51, New Road, Greenham, Berkshire was surveyed in February 1994. The survey was undertaken at a detailed level of approximately three borings per hectare. A total of 3 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 not in an agricultural use, being rough overgrown grassland, affected by trespass.

1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent 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 a previous survey carried out in 1988, by ADAS, for the proposed Newbury by-pass.

Table 1: Distribution of Grades and Subgrades

Grade	Area(ha)	% of Site	% of Agricultural Area
3b	0.8	80.0	88.9
4	0.1	10.0	11.1
Non-agricultural	0.1	10.0	100% (0.9 ha)
Total Area of Site	1.0 ha	100%	

1.6 Appendix 1 gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.7 The land has been classified as Subgrade 3b (moderate quality) and Grade 4 (poor quality), soil wetness being the principal limitation. Soils are generally poorly drained having slightly to moderately stony upper horizons, resting above gleyed and slowly permeable very stony clay at c.40cm. The section of the site mapped as Grade 4 is a very wet area around a spring originating in woodland beyond the site boundary. The area is characterised by wetland flora indicating almost permanently wet conditions, such that utilisation may be difficult.

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:	SU 484659
Altitude (m) :	95
Accumulated Temperature (°days) :	1423
Average Annual Rainfall (mm) :	731
Field Capacity (days) :	160
Moisture Deficit, Wheat (mm) :	104
Moisture Deficit, Potatoes (mm) :	95
Overall Climatic Grade :	1

3. Relief

3.1 The site lies at approximately 95 m AOD. The land rises slightly from north to south, however at no point does gradient or microtopography affect the final land quality.

4. Geology and Soil

4.1 The published British Geological Survey map, Sheet 267, Hungerford (1971, 1:63,360 scale), shows the majority of the site to be underlain by London Clay. A small area to the south is shown as plateau gravel.

4.2 The published Soil Survey of England and Wales map, Sheet 6, Soils of South East England (1983, 1:250,000 scale), shows the site as the Sonning 2 Association. These soils are described by the SSEW as "well drained flinty coarse loamy and gravelly soils. Associated with slowly permeable seasonally waterlogged fine loamy over clayey soils, and coarse loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging". (SSEW, 1983). Soils which may be attributed to the slowly permeable type encompassed in this association 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 Land of moderate quality occurs across the majority of this site. The principal limitation is soil wetness due to slowly permeable and very stony (c.50% v/v flints) clay horizons at shallow depths (c.28-50 cm) in the profile. These underlie a slightly stony (up to 12% v/v flints) medium clay loam topsoil. A moderately or very stony (up to 60% v/v flints) medium clay loam or coarse sandy loam upper subsoil may occur passing to the clay within 50 cm. (See pit 1, see Appendix III). The clay may become stoneless at c.80+ cm. These soils are poorly drained, (Wetness Class IV, see Appendix II) and are therefore limited to Subgrade 3b on this basis. This results in lower and/or less consistent yields of a narrow range of crops, principally cereals and grass.

Grade 4

5.4 Land of poor quality occurs in a small area to the south east of the site. The principal limitation is soil wetness, due to the area being almost permanently saturated by a spring originating in woodland beyond the site boundary. The area is characterised by wetland flora and as such was judged to be of poor quality, and due to the wet conditions encountered utilisation may be difficult.

5.5 The area shown on non-agricultural toward the south of the site is scrub..

SOURCES OF REFERENCE

* British Geological Survey (1971), Sheet No. 267, Hungerford, 1:63,360.

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

* Meteorological Office (1989), Climatological Data 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 of 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 (eg. 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, religous buildings, cemetries. 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 (eg. 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, eg. 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

FIELD ASSESSMENT OF SOIL WETNESS CLASS

Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years[2].
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 90 days, but not wet within 40 cm depth for more than 30 days in most years.
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 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 and 90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years *or*, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

[1] The number of days specified is not necessarily a continuous period.

[2] 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil profile and pit information obtained during ALC surveys is held on a database. This has commonly used notations and abbreviations as set out below.

BORING HEADERS

1. GRID REF : National grid square followed by 8 figure grid reference.

2. USE : Land-use at the time of survey.
   The following abbreviations are used.

ARA - arable	PAS/PGR - permanent pasture
WHT - wheat	RGR - rough grazing
BAR - barley	LEY - ley grassland
CER - cereals	CFW - coniferous woodland
OAT - oats	DCW - deciduous woodland
MZE - maize	SCR - scrub
OSR - oilseed rape	HTH - heathland
BEN - field beans	BOG - bog or marsh
BRA - brassicae	FLW - fallow
POT - potatoes	PLO - ploughed
SBT - sugarbeet	SAS - set-aside
FDC - fodder crops	OTH - other
FRT - soft and top fruit	LIN - linseed
HOR/HRT - horticultural crops	

3. GRDNT : Gradient as measured by optical reading clinometer.

4. GLEY/SPL : Depth in centimetres (cm) to gleyed and/or slowly permeable horizons.

5. AP (WHEAT/POTS) : Crop-adjusted available water capacity. The amount of soil water (in millimetres) held in the soil profile that is available to a growing crop (wheat and potatoes are used as reference crops).

6. MB (WHEAT/POTS) : The moisture balance for wheat and potatoes obtained by subtracting the soil moisture deficit from the crop-adjusted available water capacity.

7. DRT: Grade according to soil droughtiness assessed against soil moisture balances.

8. M REL : Micro-relief)
   FLOOD : Flood risk)
   EROSN : Soil erosion)
   EXP : Exposure) If any of these factors are considered significant in terms of the assessment of agricultural land quality a 'y' will be entered in the relevant column.
   FROST : Frost prone)
   DIST : Disturbed land)
   CHEM : Chemical limitation)

9. LIMIT : Principal limitation to agricultural land quality.
The following abbreviations are used:

OC - overall climate
AE - aspect
EX - exposure
FR - frost
GR - gradient
MR - micro-relief
FL - flooding
TX - soil texture
DP - soil depth
CH - chemical limitations
WE - wetness
WK - workability
DR - drought
ER - erosion
WD - combined soil wetness/soil droughtiness
ST - topsoil stoniness

PROFILES & PITS

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

S - sand
LS - loamy sand
SL - sandy loam
SZL - sandy silt loam
ZL - silt loam
MZCL - medium silty clay loam
MCL - medium clay loam
SCL - sandy clay loam
HZCL - heavy silty clay loam
HCL - heavy clay loam
SC - sandy clay
ZC - silty clay
C - clay

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction may be indicated by the use of prefixes.

F - fine (more than ⅔ of the sand less than 0.2 mm)
C - coarse (more than ⅓ of sand greater than 0.6 mm)
M - medium (less than ⅔ fine sand and less than ⅓ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows:

M - medium (less than 27% clay)
H - heavy (27-35% clay)

Other possible texture classes include:

OL - organic loam
P - peat
SP - sandy peat
LP - loamy peat
PL - peaty loam
PS - peaty sand
MZ - marine light silts

2. MOTTLE COL : Mottle colour

3. MOTTLE ABUN : Mottle abundance

F - few - less than 2% of matrix or surface described
C - common - 2-20% of the matrix
M - many - 20-40% of the matrix
VM - very many - 40% + of the matrix

4. MOTTLE CONT : Mottle continuity

F - faint - indistinct mottles, evident only on close examination
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 : Stone lithology. One of the following is used.

HR - all hard rocks or stones
MSST - soft, medium or coarse grained sandstone
SI - soft weathered igneous or metamorphic
SLST - soft oolitic or dolomitic limestone
FSST - soft, fine grained sandstone
ZR - soft, argillaceous, or silty rocks
CH - chalk
GH - gravel with non-porous (hard) stones
GS - gravel with porous (soft) stones

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.

- <u>degree of development</u>
  WK - weakly developed
  MD - moderately developed
  ST - strongly well developed

- ped size

F - fine
M - medium
C - coarse
VC - very coarse

- ped shape

S - single grain
M - massive
GR - granular
SB/SAB - sub-angular blocky
AB - angular blocky
PR - prismatic
PL - platy

8. CONSIST : Soil consistence is decribed 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 : NEWBURY LP SITE 51 Pit Number : 1P

Grid Reference: SU48376587
Average Annual Rainfall : 741 mm
Accumulated Temperature : 1412 degree days
Field Capacity Level : 161 days
Land Use : Rough Grazing
Slope and Aspect : 01 degrees SE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 18	MCL	10YR53 00	0	3		
18- 33	MCL	10YR53 00	0	18		WKCSAB
33- 40	CSL	10YR53 00	0	61		
40- 80	C	25Y 52 00	0	48	M	
80-120	C	10YR53 00	0	0	M	

Wetness Grade : 3B
Wetness Class : IV
Gleying :040 cm
SPL :040 cm

Drought Grade :
APW : 106mm MBW : 0 mm
APP : 083mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SAMPLE No.	GRID REF	USE	ASPECT	GRDNT	--WETNESS-- GLEY	SPL	CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SU48336895	RGR	NE	03	028	028	4	3B		0		0					WE	3B	IMPST 75
1P	SU48376587	RGR	SE	01	040	040	4	3B		0		0					WE	3B	PIT 65 AUG 120
2	SU48376587	RGR	SE	01			4	3B		0		0					WE	3B	IMP 35 SEE 1P
3	SU48386584	RGR	NE	01			4	3B		0		0					WE	3B	IMP 30 SEE 1P

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
1	0-28	mcl	10YR43 53						0	0	HR	5						
	28-50	c	10YR53 00	10YR56 00	M			Y	0	0	HR	15		P			Y	
	50-75	c	10YR58 00	10YR53 00	F			Y	0	0	HR	20		P			Y	IMP STONES 75
1P	0-18	mcl	10YR53 00						0	0	HR	3						
	18-33	mcl	10YR53 00						0	0	HR	18	WKCSAB FR	M				
	33-40	csl	10YR53 00						0	0	HR	61		M				
	40-80	c	25Y 52 00	75YR58 00	M			Y	0	0	HR	48		P	Y		Y	
	80-120	c	10YR53 00	75YR58 00	M			Y	0	0		0		P	Y		Y	
2	0-33	mcl	10YR41 00	10YR46 00	C			Y	0	0	HR	12						
	33-35	csl	10YR53 00					Y	0	0	HR	60		P				IMP GRAVEL 35
3	0-27	mcl	10YR41 00	75YR46 00	C			Y	0	0	HR	10						
	27-30	mcl	10YR53 00	10YR46 56	C			Y	0	0	HR	60		P				IMP GRAVEL 30