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NEWBURY DISTRICT LOCAL PLAN
Housing Omission Site 5348
Land south of Newbury Racecourse

Agricultural Land Classification
ALC Map and Report

August 1997

Resource Planning Team
Eastern Region
FRCA Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

NEWBURY DISTRICT LOCAL PLAN
HOUSING OMISSION SITE 5348
LAND SOUTH OF NEWBURY RACECOURSE

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 25.5 ha of land south of the racecourse in Newbury, Berkshire. The survey was carried out during August 1997.

2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)[1] on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with MAFF's statutory input to the Newbury District Local Plan; the survey area relates to housing omission site 5348. This survey supersedes any 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. Part of the site had been surveyed in 1994. The data from this earlier survey (0202/10/94) was used in the current classification.

4. At the time of survey the land use on the site was temporary grassland. The areas mapped as 'Other land' include areas of woodland and scrub.

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 statistics are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% site area
3b	18.8	73.7
Other land	6.7	26.3
Total surveyed area	18.8	73.7
Total site area	25.5	100

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

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. A total of 19 borings (including 3 from the 1994 survey) and 1 soil pit was described.

8. All of the agricultural land has been classified as Subgrade 3b (moderate quality) with a mixture of soil droughtiness and soil wetness as the main limiting factors. The droughtier soils have very high stone contents at shallow depths which significantly limit the amount of water available for extraction by roots, restricting the range of cropping and adversely affecting the level and consistency of yields. The heavier, wetter soils have poorly structured clay subsoil horizons that restrict the drainage of the profiles causing these soils to be wet for significant periods of the year, again adversely affecting the versatility of the land.

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	SU482663	SU492659	SU488658
Altitude	m, AOD	77	87	99
Accumulated Temperature	day°C (Jan-June)	1444	1433	1419
Average Annual Rainfall	mm	712	727	736
Field Capacity Days	days	158	159	161
Moisture Deficit, Wheat	mm	107	105	103
Moisture Deficit, Potatoes	mm	99	98	95
Overall climatic grade	N/A	Grade 1	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 (ATO, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Local climatic factors such as frost risk or exposure are also not significant. The site is climatically Grade 1.

Site

14. The site is flat to gently sloping throughout, with altitudes in the range 75–100 metres. No site factors such as gradient, microrelief or flooding are significant.

Geology and soils

15. The most detailed published geological information for the site (BGS, 1971) shows the majority of the area to be underlain by London Clay, with Reading Beds in the north-west.

16. The most detailed published soils information for the site (SSEW, 1985 and 1986) shows the area to be underlain by soils of the Wickham III association. These are described as 'slowly permeable, seasonally waterlogged, fine loamy over clayey and coarse loamy over clayey soils, ... Some deep loamy soils affected by groundwater.' The soils observed during fieldwork were different than these; most were shallow over gravel.

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. All of the agricultural land on the site has been placed in this grade, and is described as moderate quality agricultural land. Soil droughtiness is the single most limiting factor to land quality, affecting both the range of crops that can tolerate such conditions and the level and consistency of yield. Two soils pits were dug on the site; together, these represent the range of soil conditions that exist.

20. Generally, the profiles contain medium clay loam topsoils and upper subsoils which increase in sand content and stone content with depth. Pit 1, for example, describes a gravel resource from 70 cm. Subsoil structural conditions have been assessed as 'moderate' in the upper subsoils but, where the stone contents approach 70% in the lower subsoils, little rooting was observed, and a subsoil structural condition of 'poor' has been assumed.

21. Many of the borings around Pit 1 could not be penetrated beyond the upper subsoil. As a result, some better or poorer soils may exist within this general unit of Subgrade 3b. Pit 2 itself is technically classified as Grade 4, for example, and represents the droughtiest conditions that exist on the site. Here, medium sandy silt loam topsoils directly overlie gravel. Such a degree of stoniness at a shallow depth significantly restricts both root penetration and the availability of moisture. Again, this type of soil is limited in extent and has been subsumed within the larger Subgrade 3b unit. In addition, scattered borings of Subgrade 3b wetness also exist where slowly permeable clay horizons are believed to lie directly below the topsoil; no pit was dug to investigate these soils.

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet No.267, Hungerford.*
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 (1985) *Sheet 6.*
SSEW: Harpenden.

Soil Survey of England and Wales (1986) *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:

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. **GLEY/SPL**: 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. **GLEY:** 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	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
3	SU483 662	PGR	N	1			1	1	46	-61	46	-53	4				DR	3b	imp 30cm P2
4	SU484 662	PGR	N	1	18		1	1	62	-45	62	-37	3b				DR	3B	imp 45cm P2
5	SU484 661	PGR	N	1			1	1	39	-68	39	-60	4				DR	4	imp 25cm P2
6	SU488 661	LEY					1	1	41	-66	41	-58	4				DR	3b	P1
9	SU485 660	PGR	E	1	22		1	1	77	-30	79	-20	3b				DR	3a	imp 55cm
10	SU488 660	LEY			30	30	4	3B	81	-26	84	-15	3a				WE	3B	
11	SU489 660	LEY					1	1	49	-58	49	-50	4				DR	3b	P1
12	SU490 660	LEY			20		2	2	47	-60	47	-52	4				DR	3b	P1
14	SU492 660	LEY					1	1	49	-58	49	-50	4				DR	3b	P1
16	SU486 659	PGR			000		2	2	67	-40	67	-32	3b				DR	3b	P1
18	SU488 659	PGR	NE	4	000	22	4	3B	73	-34	73	-26	3b				WE	3B	
19	SU489 659	PGR			000		2	2	53	-54	53	-46	4				WE	3B	impx2qwe
20	SU490 659	LEY	N	2	25		2	2	57	-50	57	-42	3b				DR	3b	P1
21	SU491 659	LEY	N	2	25		2	2	55	-52	55	-44	4				DR	3b	P1
22	SU492 659	LEY	N	2			1	1	41	-66	41	-58	3b				DR	3b	P1
25	SU488 658	PGR	NE	3	10	10	4	3B	67	-40	67	-32	3b				WE	3B	
1P	SU48956595	PGR	N	1			1	1	82	-25	84	-15	3b				DR	3B	
2P	SU484 661	PGR	N	1			1	1	52	-55	49	-50	4				DR	4	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	-----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
1P	0-30	MCL	10YR33						4	0	HR	10						N
	30-60	MCL	10YR43						0	0	HR	38		M				N
	60-70	MSL	10YR43						0	0	HR	66		P				N
	70-120	GH							0	0	HR	70		P				N
2P	0-28	MSZL	10YR42						7	2	HR	25						N
	28-120	GH							0	0		0		P				N

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
3	0-30	MSZL	10YR41						0	0	HR	20						N
4	0-18	MSZL	10YR42						0	0	HR	15						N
	18-45	MSL	10YR42	10YR56	C	D		Y	0	0	HR	20		M		N		N
5	0-25	MSZL	10YR41						0	0	HR	20						N
6	0-25	MCL	10YR53						0	0	HR	10						
9	0-22	MCL	10YR53	10YR66	C	D		Y	0	0	HR	15						N
	22-38	MCL	10YR63	10YR56	C	D		Y	0	0	HR	15		M		N		N
	38-55	MCL	10YR62	10YR56	C	D		Y	0	0	HR	15		M		N		N
10	0-30	MCL	10YR42						0	0	HR	5						
	30-55	C	10YR53	000C00	C			Y	0	0	HR	1		P		Y		
11	0-30	MCL	10YR43						0	0	HR	10						
12	0-20	MCL	10YR43						0	0	HR	10						
	20-30	MCL	10YR53	000C00	C			Y	0	0	HR	10		M				
14	0-30	MCL	10YR43						0	0	HR	10						
16	0-20	MZCL	10YR32	000C00	C			Y	0	0	HR	5						
	20-40	HCL	10YR53	000C00	C			Y	0	0	HR	5		M				
18	0-22	MCL	10YR42	000C00	C			Y	0	0	HR	5						
	22-50	C	10YR53	000C00	M			Y	0	0		0		P		Y		
19	0-20	HCL	10YR42	000C00	C			Y	0	0	HR	5						
	20-32	C	25Y 52	000C00	M			Y	0	0	HR	5		M		N		
20	0-25	MCL	10YR43						0	0	HR	5						
	25-35	MCL	10YR53	000C00	C			Y	0	0	HR	10		M				
21	0-25	MCL	10YR43						0	0	HR	10						
	25-35	HCL	25Y 53	000C00	C			Y	0	0	HR	10		M				
22	0-25	MCL	10YR43						0	0	HR	10						
25	0-10	MZCL	10YR32	75YR46	M	D		Y	0	0		0						N
	10-50	ZC	10YR61	10YR56	M	D		Y	0	0		0		P		Y		N