

0202-101-97

A1

**Newbury District Local Plan
Housing Omission Site 5647:
Land North of the A4 at Thatcham**

**Agricultural Land Classification
ALC Map and Report**

August 1997

**Resource Planning Team
Eastern Region
FRCA Reading**

**RPT Job Number:0202/101/97
MAFF Reference:EL02/00297**

AGRICULTURAL LAND CLASSIFICATION REPORT

NEWBURY DISTRICT LOCAL PLAN HOUSING OMISSION SITE 5647: LAND NORTH OF THE A4 AT THATCHAM

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 13.9 ha of land north of the A4 at Thatcham. The survey was carried out during August 1997.
2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA) on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with its statutory input to the Newbury District Local Plan. This survey supersedes previous ALC information for this land. The western field of this site is included in an adjacent survey (FRCA Ref: 0202/100/97). Information from the adjacent survey was also used in the grading of this site.
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 predominantly arable. A small area to the west was in permanent grassland. The area mapped as 'Other Land' comprises a narrow strip of woodland.

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
2	0.2	1.5	1.4
3a	1.6	11.9	11.5
3b	11.6	86.6	83.5
Other land	0.5	N/A	3.6
Total surveyed area	13.4	100	96.4
Total site area	13.9	-	100

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 14 borings and 1 soil pit were described.

8. The site comprises a very small area of Grade 2 (very good quality) agricultural land, some Subgrade 3a (good quality) land, but mainly comprises Subgrade 3b (moderate quality) land. Soils typically comprise fine or coarse loamy topsoils, overlying similar or clayey upper subsoils, which generally overlie clayey lower subsoils. These clayey subsoils impede soil drainage causing a slight to moderate soil wetness limitation. This soil wetness can reduce the number of days when trafficking by machinery or grazing by animals may occur without damaging the soil, making the land less flexible for agricultural production. On the higher land, where the clayey subsoil occurs lower in the profile and/or in association with lighter topsoil textures, the soil wetness limitation is not as severe and the land is of a very good or good quality.

9. In the west of the site the land is downgraded due to a significant soil droughtiness limitation. These profiles are influenced by the underlying valley gravel and are shallow over gravelly horizons. This reduces the amount of profile available water and in this locally dry climate the land is limited to Subgrade 3b. The range of crops that can tolerate such conditions is significantly restricted.

FACTORS INFLUENCING ALC GRADE

Climate

10. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

11. 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	
		SU 537 671	SU 537 673
Grid reference	N/A	SU 537 671	SU 537 673
Altitude	m, AOD	75	90
Accumulated Temperature	day°C (Jan-June)	1444	1427
Average Annual Rainfall	mm	705	715
Field Capacity Days	days	152	153
Moisture Deficit, Wheat	mm	107	105
Moisture Deficit, Potatoes	mm	100	97
Overall climatic grade	N/A	Grade 1	Grade 1

12. 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.

13. 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.

14. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation (Climatic Grade 1). However, climatic factors do interact with soil properties to influence soil wetness and droughtiness. At this location the climate is relatively dry thus increasing the likelihood of soil droughtiness.

15. Local climatic factors such as frost risk and exposure do not affect land quality on this site.

Site

16. This site typically slopes southerly by 1-3 degrees, towards the A4 Bath Road, and lies at an altitude between 75 and 90m AOD. There is a small valley running north-south in the west of the site. There is no site limitation due to gradient, microrelief or flooding.

Geology and soils

17. The published geological information (BGS, 1946) maps the site as predominantly London Clay; a solid deposit of the Eocene, with a small area of valley gravel along the southern edge; which is a drift deposit of the recent and pleistocene.

18. The published soil map (SSEW, 1983) shows the whole site as Wickham 4 soil association. These soils are described as 'slowly permeable seasonally waterlogged fine loamy over clayey and fine silty over clayey soils associated with similar and clayey soils, often with brown subsoils.' (SSEW,1983). This description typically represents the soils which were found on site.

AGRICULTURAL LAND CLASSIFICATION

19. 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.

20. 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.

Grade 2

21. A very small area of Grade 2 (very good quality) agricultural land is mapped in the northwest corner of the site. This is mapped in association with the adjacent survey (FRCA Ref: 0202/100/97). These soils are typically similar to those described in paragraph 22.

below, however the slowly permeable clayey subsoil occurs at a greater depth and therefore causes only a minor soil wetness limitation.

Subgrade 3a

22. An area of Subgrade 3a (good quality) agricultural land is mapped on the higher land in the north of the site. These soils typically comprise very slightly stony (2-3% total flints, 1% > 2cm) fine sandy loam topsoils overlying stoneless to very slightly stony (up to 5% total flints) medium clay loam, heavy clay loam and sandy clay loam upper subsoils. These overlie clay and sandy clay lower subsoils with similar stone contents. The clay and sandy clay horizons are poorly structured and impede drainage causing a soil wetness limitation. Wetness Class IV is appropriate for these soils which combines with light topsoil textures to result in a classification of Subgrade 3a. Soil wetness can reduce the number of days when trafficking by machinery or grazing by animals may occur without damaging the soil, making the land less flexible for agricultural production. There are occasional better quality profiles which are better drained within this mapping unit.

Subgrade 3b

23. Most of the site has been classified as Subgrade 3b (moderate quality) agricultural land on the basis of a significant soil wetness limitation. The soils typically comprise stoneless to slightly stony (up to 15% total flints, up to 7% > 2cm) medium clay loam topsoils over similar, fine sandy clay loam, sandy clay or clay subsoils which are stoneless or slightly stony (up to 8% total flints). The clay subsoils are similar to those described in paragraph 22. and occur at shallow depth placing these soils in Wetness Class IV. Such drainage status combines with the topsoil textures and the prevailing climate to result in a classification of Subgrade 3b. A small area in the valley bottom is classified due to the high groundwater level which would be difficult to control. Such soil wetness can reduce the number of days when trafficking by machinery or grazing by animals may occur without damaging the soil, making the land less flexible for agricultural production. Occasionally soils which are better drained are found but they cover too small an area to be mapped as a separate unit.

24. Land in the west of the site is classified due to a significant soil droughtiness limitation. These soils comprise very slightly stony (3-5% total flints) medium clay loam topsoils and slightly stony (10% total flints) similar subsoils. These soils overlie gravelly horizons which restrict the amount of available water to crops. In this locally dry climate the range of crops that can tolerate such conditions is significantly limited and the land is classified as Subgrade 3b.

Judith Clegg
Resource Planning Team
Eastern Region
FRCA Reading

SOURCES OF REFERENCE

British Geological Survey (1946) *Sheet No. 268, Reading*. 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, Soils of England and Wales*.
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 descriptions

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	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1	SU53306740	PGR SE	02		1	1	000	0	000	0				DR 3B	Imp 30 Flints
1P	SU53606720	WHT S	02	030 030	4	3B	091	-16	103	3	3A			WE 3B	
2	SU53306730	PGR SE	02		1	1	000	0	000	0				DR 3B	Imp 35 Stones
3	SU53406730	PGR		0 055	3	3A	000	0	000	0				WE 3B	WC4Groundwater
4	SU53506730	WHT NW	03	025 025	4	3B	000	0	000	0				WE 3B	
5	SU53606730	WHT S	01	025 038	4	3A	000	0	000	0				WE 3A	
6	SU53706730	WHT S	02	030 070	2	1	122	15	113	13	2			DR 2	Imp Gravelly
7	SU53806730	WHT S	02	032 032	4	3B	000	0	000	0				WE 3B	Imp 65 Stones
8	SU53406720	WHT SW	01	065 065	2	2	132	25	105	5	2			WD 2	TSStoneGrade2
9	SU53506720	WHT SE	01	028 028	4	3B	000	0	000	0				WE 3B	
10	SU53606720	WHT S	02	028 028	4	3B	000	0	000	0				WE 3B	Pit 1
11	SU53706720	WHT S	01	033 033	4	3B	000	0	000	0				WE 3B	
12	SU53806720	WHT S	02	025 036	4	3B	000	0	000	0				WE 3B	Imp Gravel
13	SU53606710	WHT S	01	028 028	4	3B	000	0	000	0				WE 3B	
14	SU53706710	WHT S	01	028 028	4	3B	000	0	000	0				WE 3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES-----			STRUCT/	SUBS				CALC		
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	CONSIST	STR	POR		IMP	SPL
1	0-30	mc1	10YR42 00						0	0	HR	3							Imp Flints
1P	0-30	mc1	10YR32 42						3	0	HR	5							+Fine Sand
	30-70	c	10YR52 53	75YR58 00 M			25 Y61 00 Y		0	0		0	MDCAB	FM	P	Y		Y	Tending VC Peds
2	0-30	mc1	10YR42 00						0	0	HR	5							S1. Sandy
	30-35	mc1	10YR43 44						0	0	HR	10			M				Imp Stones
3	0-25	mc1	25 Y53 52	75YR58 00 M				Y	0	0		0							
	25-55	hc1	25 Y51 52	75YR58 00 M				Y	0	0		0			M				
	55-80	c	10YR52 00	10YR58 00 M				Y	0	0		0			P		Y		SomegravelMoist
4	0-25	mc1	10YR42 00						0	0	HR	1							
	25-70	c	10YR52 00	75YR58 00 M			10YR61 00 Y		0	0		0			P		Y		Plastic
5	0-25	fs1	10YR32 00						1	0	HR	3							Q MCL
	25-38	hc1	25 Y53 63	10YR58 00 M				Y	0	0		0			M				+Alot FineSand
	38-100	sc	25 Y53 00	75YR56 00 M			00M00 00 Y		0	0		0			P		Y		Fine Sand
6	0-30	fs1	10YR42 00						1	0	HR	2							2% of FSZL
	30-45	sc1	10YR53 00	75YR56 00 C			10YR61 00 Y		0	0	HR	2			M				Fine Sand
	45-70	mc1	10YR61 62	75YR44 00 M			00M00 00 Y		0	0	HR	5			M				+Fe concs.
	70-100	c	10YR62 00	75YR56 00 M				Y	0	0	HR	5			P		Y		Imp gravelly
7	0-32	mc1	10YR33 00						1	0	HR	3							+Fine Sand
	32-65	c	10YR52 00	75YR56 00 M			10YR71 00 Y		0	0	HR	2			P		Y		Imp Flints
8	0-35	mc1	10YR32 00						7	0	HR	15							+Fine Sand
	35-65	mc1	10YR44 00						0	0	HR	8			M				+Alot FineSand
	65-120	sc	10YR53 00	10YR58 00 M				Y	0	0	HR	5			P		Y		Fine Sand
9	0-28	mc1	10YR42 00						4	0	HR	10							
	28-35	c	10YR52 00	75YR56 00 C				Y	0	0	HR	5			P		Y		Plastic
	35-80	c	10YR52 00	75YR56 00 M				Y	0	0		0			P		Y		Plastic
10	0-28	mc1	10YR32 00						4	0	HR	6							Alot FineSand
	28-100	c	25 Y53 52	10YR58 00 M				Y	0	0		0			P		Y		Alot FineSand
11	0-33	mc1	10YR42 00						1	0	HR	2							+Fine Sand
	33-80	c	10YR52 00	75YR56 00 M			10YR61 00 Y		0	0	HR	2			P		Y		Plastic
12	0-25	mc1	10YR32 00						2	0	HR	4							Alot FineSand
	25-36	fsc1	10YR52 53	10YR58 00 C				Y	0	0	HR	2			M				
	36-100	c	25 Y53 00	10YR58 00 M				Y	0	0		0			P		Y		+FineSand Firm
13	0-28	mc1	10YR43 00						2	0	HR	4							Alot FineSand
	28-120	c	25 Y53 00	10YR58 00 M			00M00 00 Y		0	0		0			P		Y		AlotFineS VFirm

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT		GLEY >2	>6 LITH	TOT		STR	POR	IMP	SPL	CALC	
14	0-28	mc1	10YR42 00					1	0	HR	2						
	28-80	c	10YR51 52	75YR56	00	M		Y	0	0	0	P		Y			Plastic

SOIL PIT DESCRIPTION

Site Name : NEWBURY DLP SITE 5647 Pit Number : 1P

Grid Reference: SU53606720 Average Annual Rainfall : 705 mm
 Accumulated Temperature : 1444 degree days
 Field Capacity Level : 152 days
 Land Use : Wheat
 Slope and Aspect : 02 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MCL	10YR32 42	3	5	HR					
30- 70	C	10YR52 53	0	0		M	MDCAB	FM	P	

Wetness Grade : 3B Wetness Class : IV
 Gleying : 030 cm
 SPL : 030 cm

Drought Grade : 3A APW : 091mm MBW : -16 mm
 APP : 103mm MBP : 3 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Wetness