A1

Maidstone Borough Local Plan
Site 5 Land at Pested Bars Road, Maidstone
Agricultural Land Classification
ALC Map and Report
August 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 5 LAND AT PESTED BARS ROAD, MAIDSTONE

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 Maidstone Borough of Kent The work forms part of MAFF's statutory input to the preparation of the Maidstone Borough Local Plan

1 2 Site 5 comprises 9 4 hectares of land south of the Kent Constabulary Training School east of Pested Bars Road, near the village of Park Wood An Agricultural Land Classification (ALC) survey was carried out during August 1994 The survey was undertaken at a detailed level of approximately one boring per hectare A total of 9 borings and two soil inspection pits were described 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 a long term limitation on its use for agriculture

1 3 The work was carried out by the Resource Planning Team of the Guildford Statutory Group of ADAS

1 4 At the time of survey the land on the site was growing wheat

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 10 000 It is accurate at this scale but any enlargement would be misleading

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
3a	9 4	100 0
Total area of site	9 4	100 0

1 6 Appendix I 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 All of the agricultural land surveyed has been classified as Subgrade 3a, good quality because of a moderate soil droughtiness limitation The site comprises well drained, medium textured soils which are slightly stony in the topsoil and which become very stony with depth The interaction between these soil textures and profile stone contents with the local climatic regime at this site may act to

restrict plant growth and yield, resulting from insufficient amounts of profile water available for uptake by plant roots

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 (degree days Jan-June) 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 The crop adjusted soil moisture deficits at this locality are slightly higher than the regional average High soil moisture deficits increase the likelihood of soil droughtiness limitations

2 4 No local climatic factors such as exposure or frost risk are believed to affect the site

Table 2 Climatic Interpolation

Grid Reference	TQ778522
Altitude (m)	100
Accumulated Temperature (degree days, Jan June)	1394
Average Annual Rainfall (mm)	709
Field Capacity (days)	144
Moisture Deficit Wheat (mm)	111
Moisture Deficit Potatoes (mm)	104
Overall Climatic Grade	1

3 Relief

3 1 The majority of the site is flat and lies at approximately 100m AOD In the extreme south of the site the site occupies slightly lower land Nowhere on the site does gradient or relief impose any limitation to agricultural land quality

4 Geology and Soil

4 1 British Geological Survey (1976) Sheet 288 shows the entire site to be underlain by Hythe Beds (sandy limestone and calcareous sands)

4 2 Soil Survey of England and Wales (1983) Sheet 6 shows the entire site to comprise soils of the Malling Association These soils are described as 'well drained non calcareous fine loamy soils over limestone at variable depths Some deep well drained coarse loamy soils and similar fine loamy over clayey soils Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging' (SSEW 1983)

4 3 Detailed field examination found well drained loamy soils which become increasingly stony with depth

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 3a

5 3 All of the agricultural land surveyed has been classified as Subgrade 3a because of a moderate soil droughtiness limitation Topsoils typically comprise non calcareous medium clay loams These range from being very slightly to slightly stony (containing c 1-3% hard sandstone >2cm and 2 10% total hard sandstone by volume) Due to the very dry conditions at the time of survey all except one of the profiles proved impenetrable to a soil auger below the topsoil Consequently two soil inspection pits (Pits 1 and 2) were dug to assess subsoil conditions at depth Pit 1 was dug on the slightly sloping land in the south of the site Pit 2 in the centre of the site From Pit 2 it could be seen that the upper and lower subsoils comprise free draining medium clay loams Upper subsoils are moderately to very stony (containing c 35% total flints by volume) which pass into very stony (containing c 40% total flints by volume) at about 60 cm depth Crop roots are able to extract much less moisture from hard sandstone in comparison with soil and consequently these profiles have reduced available water The interaction between these soil textures and profile stone contents with the relatively dry climatic conditions at this site means that this land is likely to have reduced level and consistency of crop yields Thus this land can be classified as no higher than Subgrade 3a Land represented by Pit 1 was found to be slightly less droughty than land represented by Pit 2 This results from lower stone contents in the profile and lower subsoils comprised of more moisture retentive soils Upper subsoils were found to comprise slightly stony (containing c 8% total flints by volume) medium clay loams At about 50 cm depth these pass into medium sandy silt loams which continue to depth These lower subsoils are slightly stony (containing c 5-10% total flints by volume) The interaction between these soil textures and profile stone contents with the relatively dry climatic conditions at this site means that the

amount of profile available water is slightly restricted Consequently this land is classified as very good quality Grade 2 because of a minor soil droughtiness limitation However this land is likely to be limited in areal extent and thus has not been represented as a separate mapping unit

ADAS Ref 2007/173/94
MAFF Ref EL 20/328

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1976), Sheet No 288 Maidstone, 1 50,000 Series (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) Climatological Data for Agricultural Land Classification

Soil Survey of England and Wales (1983), Sheet 6 Soils of South East England, 1 250 000 and accompanying legend

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

SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile Six soil wetness classes are identified and are defined in the table below

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

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics site and climatic factors Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field The method adopted here is common to ADAS and the SSLRC

[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 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	**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 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	**EX**	Exposure
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
ST	Topsoil Stoniness				

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	**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	**GS**	gravel with porous (soft) stones
SI	soft weathered igneous/metamorphic rock		

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	**VC** very 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 **VF** very friable **FR** friable **FM** firm **VM** very firm
EM extremely firm **EH** extremely hard

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 appropiate 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

SOIL PIT DESCRIPTION

Site Name MAIDSTONE LP SITE 5 Pit Number 1P

Grid Reference TQ77905200 Average Annual Rainfall 709 mm
Accumulated Temperature 1394 degree days
Field Capacity Level 144 days
Land Use Wheat
Slope and Aspect 01 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MCL	10YR42 00	2	5	HR					
25- 50	MCL	10YR56 53	0	8	HR		MDCSAB	FR	M	
50- 80	MSZL	10YR54 00	0	5	HR				M	
80-120	MSZL	10YR54 00	0	10	HR				M	

Wetness Grade 1 Wetness Class I
Gleying cm
SPL No SPL

Drought Grade 2 APW 151mm MBW 40 mm
APP 112mm MBP 8 mm

FINAL ALC GRADE 2
MAIN LIMITATION Droughtiness

SOIL PIT DESCRIPTION

Site Name MAIDSTONE LP SITE 5 Pit Number 2P

Grid Reference TQ77805218 Average Annual Rainfall 709 mm
Accumulated Temperature 1394 degree days
Field Capacity Level 144 days
Land Use Wheat
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 25	MCL	10YR42 00	3	7	HR					
25 60	MCL	10YR43 54	0	35	HR		MDCSAB	FM	M	
60 120	MCL	10YR56 00	0	40	HR			FM	M	

Wetness Grade 1 Wetness Class I
Gleying cm
SPL No SPL

Drought Grade 3A APW 113mm MBW 2 mm
APP 90 mm MBP -14 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Droughtiness

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	TQ77705230	WHT					1	1	40	-71	40	64	4				DR	3A	Imp23 Re2P
1P	TQ77905200	WHT	S	01			1	1	151	40	112	8	2				DR	2	P85 Pots limit
2	TQ77805230	WHT					1	1	43	-68	43	61	4				DR	3A	Imp25 Re 2P
2P	TQ77805218	WHT					1	1	113	2	90	-14	3A				DR	3A	Pit dug to 70
3	TQ77905230	WHT					1	1	42	-69	42	62	4				DR	3A	Imp25 Re 2P
4	TQ77705220	WHT					1	1	38	-73	38	-66	4				DR	3A	Imp22 Re 2P
5	TQ77805220	WHT					1	1	44	-67	44	-60	4				DR	3A	Imp25 Re 2P
6	TQ77905220	WHT					1	1	104	7	110	6	3A				DR	3A	Impen 82
7	TQ77805210	WHT					1	1	43	68	43	-61	4				DR	3A	Imp25 Re 2P
8	TQ77905210	WHT					1	1	41	70	41	-63	4				DR	3A	Imp26 Re 2P
9	TQ77905200	WHT	S	01			1	1	48	-63	48	-56	4				DR	2	Imp30 Re 1P

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
1	0 22	mcl	10YR43 53						1	0	HR	2							
	22 23	mcl	10YR54 00						0	0	HR	8		M				Imp	dry+stony
1P	0-25	mcl	10YR42 00						2	0	HR	5							
	25 50	mcl	10YR56 53						0	0	HR	8	MDCSAB	FR M					
	50-80	mszl	10YR54 00						0	0	HR	5		M					
	80-120	mszl	10YR54 00						0	0	HR	10		M					
2	0-22	mcl	10YR43 00						1	0	HR	2							
	22-25	mcl	10YR43 00						0	0	HR	8		M				Imp	dry+stony
2P	0-25	mcl	10YR42 00						3	0	HR	7							
	25 60	mcl	10YR43 54						0	0	HR	35	MDCSAB	FM M					
	60-120	mcl	10YR56 00						0	0	HR	40		FM M					
3	0-25	mcl	10YR43 00						3	0	HR	8						Imp	dry+stony
4	0-22	mcl	10YR43 00						2	0	HR	3						Imp	dry+stony
5	0-24	mcl	10YR53 00						1	0	HR	2							
	24-25	mcl	10YR43 00						0	0	HR	8		M				Imp	dry+stony
6	0-25	mcl	25Y 53 43						2	0	HR	8							
	25 40	mcl	10YR54 00	10YR56 00	F		00MN00	00	0	0	HR	5		M					
	40-82	c	75YR56 00						0	0	HR	5		M				Imp	dry+stony
7	0-22	mcl	10YR43 00						2	0	HR	3							
	22-25	mcl	10YR54 00						0	0	HR	8		M				Imp	dry+stony
8	0 24	mcl	10YR43 00						3	0	HR	10							
	24-26	mcl	10YR44 00						0	0	HR	30		M				Imp	dry+stony
9	0 28	mcl	10YR42 00						3	0	HR	10							
	28 30	mcl	10YR44 00						0	0	HR	30		M				Imp	dry+stony