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Maidstone Borough Local Plan
Site 11 Land at Gravelly Bottom Road, Kingswood
Agricultural Land Classification
ALC Map and Report
October 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
SITE 51 LAND AT GRAVELLY BOTTOM ROAD, KINGSWOOD

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 Maidstone Borough Local Plan

1 2 Site 11 comprises 5 1 hectares of land to the south west of Kingswood in Kent An Agricultural Land Classification (ALC) survey was carried out in October 1994 The survey was undertaken at a detailed level A total of 5 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 carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS

1 4 At the time of survey the land on the site had been ploughed and drilled with winter wheat for harvest in 1995

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 This map supersedes any previous ALC survey information for this site

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
3a	3 2	62 7
3b	1 9	37 3
Total area of site	5 1ha	100%

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 The land at this site has been classified Subgrade 3a good quality and Subgrade 3b moderate quality with soil wetness as the main limitation The majority of observations encountered a slowly permeable poorly structured clay horizon between 18 and 55cm depth This causes drainage to be moderately or severely

restricted dependant on depth to the clay horizon such that classifications of Subgrade 3a and Subgrade 3b are appropriate given the local climatic regime Poorly drained soils can inhibit plant and root development and may be more susceptible to structural damage through trafficking by machinery or poaching by grazing livestock

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 are believed to affect the site However climatic and soil factors interact to influence soil wetness and droughtiness limitations

Table 2 Climatic Interpolation

Grid Reference	TQ839507
Altitude (m AOD)	135
Accumulated Temperature (°days Jan -June)	1353
Average Annual Rainfall (mm)	721
Field Capacity Days	150
Moisture deficit wheat (mm)	105
Moisture deficit potatoes (mm)	97
Overall Climatic Grade	1

3 Relief

3 1 The site lies at approximately 135m AOD Overall it is relatively flat falling slightly towards the centre from the south and north

4 Geology and Soils

4 1 The published geological information (BGS 1976) shows the entire site to be underlain by head drift deposits

4 2 The published soils information (SSEW 1980 1983 and 1984) shows the site to be underlain by soils from the Marlow Association These are briefly described as well drained fine loamy over clayey and clayey soils Some coarse and fine loamy

over clayey soils with slowly permeable subsoils and slight seasonal waterlogging (SSEW 1983) The soils encountered at the site were typically fine loamy over slowly permeable clayey subsoils

5 Agricultural Land Classification

5 1 Paragraph 1 5 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 Land of good quality has been mapped towards the centre of the site The principal limitation is soil wetness caused by impeded drainage Soil profiles in this area are typified by the pit observation (1p see Appendix III) which comprised a very slightly stony (c 5% v/v flints) medium clay loam topsoil This overlies a slightly stony (c 10% v/v flints) moist gleyed medium clay loam upper subsoil At 51cm this abruptly passes to a very slightly stony (c 5% v/v flints) poorly structured gleyed and slowly permeable clay lower subsoil horizon to depth Within local climatic parameters the drainage impedance caused by the slowly permeable clay causes Wetness Class III (see Appendix II) to be appropriate and subsequently Subgrade 3a is applied when the medium workability status of the topsoil is taken into account A drainage impedance such as this causes plant growth and development to be affected as well as reducing the number of days when cultivations or stocking may occur without causing structural damage to the soil

Subgrade 3b

5 4 Land of moderate quality is shown for areas to the east and west of the site The principal limitation is soil wetness caused by a severe drainage impedance Essentially soils encountered in this area were similar to those described above (para 5 3) except that the slowly permeable clay subsoil horizon occurred at a shallower depth (between 18 and 28cm) Because of this the drainage impedance in this area is more severe than that described above such that Wetness Class IV (see Appendix II) is appropriate and subsequently Subgrade 3b is applied when topsoil workability is taken into account The drainage impedance encountered in this area of the site leads to a severe restriction on the number of days when cultivations and/or stocking may occur without causing structural damage to the soil Similarly plant growth and development may be affected to a greater degree than that described above (para 5 3)

SOURCES OF REFERENCE

British Geological Survey (1976) Sheet 288 Maidstone 1 50 000 Solid & 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 (1980) Soils of Kent Bulletin No 15 Map scale 1 250 000

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 and their use in 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 (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 MAIDSTONE LP SITE 11 Pit Number 1P

Grid Reference TQ83905070 Average Annual Rainfall 721 mm
Accumulated Temperature 1353 degree days
Field Capacity Level 150 days
Land Use Ploughed
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 26	MCL	10YR43 00	0	5	HR					
26- 51	MCL	10YR63 00	0	10	HR	C	MDCSAB	FR	M	
51- 75	C	10YR53 00	0	5	HR	M	WKCSAB	FM	P	

Wetness Grade 3A Wetness Class III
Gleying 26 cm
SPL 51 cm

Drought Grade APW mm MBW 0 mm
APP mm MBP 0 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Wetness

SAMPLE NO	GRID REF	ASPECT USE	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	TQ83705070	PLO		18	18	4	3B		0		0					WE	3B	SPL 18
1P	TQ83905070	PLO		26	51	3	3A		0		0					WE	3A	PIT 75 @ BOR 3
2	TQ83805070	PLO		26		2	2	87	18	92	-5	3A				WD	2	IMP 60 STONES
3	TQ83905070	PLO		25	55	3	3A		0		0					WE	3A	SPL 55
4	TQ84005070	PLO		28	28	4	3B		0		0					WE	3B	SPL 28
5	TQ84005060	PLO		25	25	4	3B		0		0					WE	3B	SPL 25

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 18	hcl	10YR43 00						0	0		0						
	18 55	c	10YR53 00	75YR56 00	M		25YR46 00	Y	0	0		0		P			Y	
1P	0-26	mcl	10YR43 00						0	0	HR	5						
	26-51	mcl	10YR63 00	10YR56 00	C			Y	0	0	HR	10	MDCSAB FR	M				MOIST
	51-75	c	10YR53 00	25YR46 00	M		75YR56 00	Y	0	0	HR	5	WKCSAB FM	P	Y		Y	DRY PEDCOL=2xMOTCOL
2	0 26	mcl	10YR43 00						0	0	HR	5						
	26-50	mcl	10YR63 64	10YR58 00	C			Y	0	0	HR	10		M				
	50-60	mcl	10YR63 64	10YR58 00	C			Y	0	0	HR	25		M				IMP STONES 60cm
3	0-25	mcl	10YR42 00						0	0	HR	2						
	25 35	mcl	10YR53 00	10YR56 00	C			Y	0	0	HR	5		M				MOIST
	35 55	mcl	25Y 53 00	10YR58 00	C			Y	0	0	HR	5		M				WET
	55 80	c	25Y 53 00	75YR58 00	M			Y	0	0	HR	5		P			Y	DRY
4	0 28	mcl	10YR53 00						0	0	HR	2						
	28 65	c	25Y 53 00	75YR58 00	M			Y	0	0	HR	5		P			Y	
5	0-25	mzcl	10YR53 00						0	0	HR	5						
	25 60	c	25Y 53 00	76YR56 00	M			Y	0	0	HR	10		P			Y	