

AGRICULTURAL LAND CLASSIFICATION REPORT**SWALE BOROUGH LOCAL PLAN
SITE 11, LAND WEST OF KEMSLEY
AGRICULTURAL LAND CLASSIFICATION****Summary**

- 1 1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on Site 11 land west of Kemsley This work was in connection with the Swale Borough Local Plan
- 1 2 Approximately 8.4 hectares of land relating to this site was surveyed in October 1994 The survey was undertaken at a detailed level of approximately one boring per hectare A total of 7 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 Huntingdon Statutory Group of ADAS
- 1 4 At the time for survey the agricultural land use was set aside
- 1 5 Adjacent fieldwork has been carried out to the south of Bramblefield Lane (Ref 2011/127/92) Sites 1-8
- 1 6 The distribution of the 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 survey information for this site

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Area
3a	8.4	100	100
Total	8.4 ha	100%	100% (8.4 ha)

- 1 7 A general description of the grades, subgrades and land use categories is provided in Appendix 1 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 8 The land quality on the site has been classified as 3a (good quality land) as a result of moderate droughtiness limitations

2 0 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. The combination of rainfall and temperature at this site mean an overall climatic grade of 1

Table 2 Climatic Interpolation

Grid Reference	TQ904663
Altitude (m, AOD)	25
Accumulated Temperature (° days Jan-June)	1471
Average Annual Rainfall (mm)	597
Field Capacity Days	117
Moisture Deficit wheat (mm)	121
Moisture Deficit potatoes (mm)	118
Overall Climatic Grade	1

3 0 Relief

3 1 The site slopes gently from a maximum height of 22 m AOD in the south to its lowest point at c 13 m AOD in the extreme north. Neither gradient nor altitude are a limitation to land quality

4 0 Geology and Soils

4 1 The published geology map for the site area, (BGS Sheet 272 1977) shows the site to be underlain by predominantly Head Brickearth with a narrow strip of London Clay adjacent to Bramblefield Lane

4 2 The published soils information for the area (SSEW Sheet 6 1983 1 250 000) shows the site to comprise the Park Gate Association described as deep stoneless silty soils variably affected by groundwater

5 0 Agricultural Land Classification

5 1 The ALC classification of the site is shown on the attached ALC map

5 2 The location of the soil observation points is shown on the attached sample point map

Subgrade 3a

- 5 3 The entire site has been graded 3a* Profiles typically comprise non-calcareous very slightly stony medium clay loam or medium silty clay loam topsoils which overlie similar (or occasionally heavy clay loam) upper subsoils These in turn overlie gleyed slowly permeable clays at depths from 40/45 cms Profile wetness class has been assessed as II
- 5 4 Land has been graded 3a due to moderate droughtiness limitations caused by the relatively shallow depth to poorly structured clay in this relatively low rainfall area Occasionally clay was encountered directly below the topsoil (i.e. wetness class III) in these instances profiles were limited equally by droughtiness and wetness/workability constraints
- 5 5 At various locations profiles showed evidence of previous minor disturbance due to the presence of brick and clinker fragments in the upper layers

ADAS Reference 2011/239/94
MAFF Reference EL20/245B

Resource Planning Team
Huntingdon Statutory Group
ADAS Cambridge

* Occasional profiles were gleyed from 50 cms giving a drought grade of 2 but these covered too small an area to delineate separately

REFERENCES

- GEOLOGICAL SURVEY OF ENGLAND AND WALES 1977 Sheet 272
Chatham Drift Edition 1 50 000 scale
- MAFF 1968 Agricultural Land Classification Map Sheet 172 Provisional 1 63 360
scale
- MAFF 1988 Agricultural Land Classification (Revised guidelines and criteria for the
grading of agricultural land) Alnwick
- METEOROLOGICAL OFFICE 1989 Data extracted from the published 5 km grid
agroclimatic dataset
- SOIL SURVEY OF ENGLAND AND WALES 1983 Sheet 6 Soils of South East
England 1 250 000 scale
- SOIL SURVEY OF ENGLAND AND WALES 1984 Soils and their use in South
East England by M G Jarvis *et al* Harpenden

Appendix 1

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur typical cropping range and the expected level of consistency of yield. In practice the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls in Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where farmland predominates. The remainder is very poor quality land in Grade 5 which most occurs in the uplands.

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 include 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 and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where 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 levels of yields *It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yield of which are variable* In most 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 very severe limitations which restrict use to permanent pasture or rough grazing *except for occasional pioneer forage crops*

Descriptions of other land categories used on ALC maps

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/airfields 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

Where the land use includes more than one of the above land cover types 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 usually be shown

Appendix 2

FIELD ASSESSMENT OF SOIL WETNESS CLASS

Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging¹
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 <i>or</i> 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 <i>or</i> , 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 <i>or</i> 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 3

SOIL BORING AND SOIL PIT DESCRIPTIONS

Contents

- * Soil boring descriptions
- * Soil pit description
- * Soil Abbreviations Explanatory Note

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEYSPL	WETNESS-CLASS	GRADE	-WHEAT AP	MB	POTS-AP	MB	M REL DRT	EROSN FLOOD	FROST EXP	DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ90306650	CER	NE	01	050 050	2	2	126	5	103	-15	3A			Y	DR	3A	BK CLINK
1P		CER	S	01	040 040	2	2	121	0	100	18	3A				DR	3A	
2	TQ90206640	CER	NE	01	050 050	2	2	139	18	116	2	2				DR	2	WETNESS
3	TQ90306640	CER	NE	01	040	2	2	155	34	117	-1	2				DR	2	WE
4	TQ90106630	CER	NE	01	040 040	2	2	131	10	108	-10	2			Y	WE	2	BORDER
5	TQ90206630	CER	S	01	030	2	3A	73	48	75	43	3B			Y	DR	3B	DIST
6	TQ90106620	CER	S	01	045 045	2	2	132	11	107	-11	3A				DR	3A	MN 45
7	TQ90206620	CER	N	01	030 030	3	3A	131	10	108	10	2				WE	3A	DR

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---			PED	- -STONES			- STRUCT/	SUBS			SPL	CALC	
				COL	ABUN	CONT	COL	GLE	>2	>6	LITH	TOT	CONSIST	SIR			POR
1	0-30	mzcl	10YR43 00						2	0	HR	2					
	30-50	mzcl	10YR55 00						0	0	HR	15	P	Y			
	50-120	c	05 Y62 00	10YR66	00	M		Y	0	0		0	P	Y		Y	
1P	0-30	mcl	10YR43 00						1	0	HR	1					
	30-40	mcl	10YR54 00						0	0	HR	5	MDCSAB	M	Y		
	40-75	hcl	10YR62 00	10YR56	00	M	10YR63	00	Y	0	0	HR	15	MDCAB	P	Y	Y
	75-120	c	10YR62 00	10YR56	00	M			Y	0	0	HR	15	MDCAB	FM	P	Y
2	0-30	mzcl	10YR43 00						0	0	HR	1					
	30-50	mzcl	10YR54 00						0	0		0	M	Y			
	50-120	c	05 Y62 00	10YR56	00	C		Y	0	0		0	P	Y		Y	
3	0-25	mcl	10YR43 00						0	0	HR	1					
	25-40	hcl	10YR54 00						0	0		0	M	Y			
	40-120	hcl	10YR54 00	10YR66	00	C		Y	0	0		0	M	Y			
4	0-30	mcl	10YR43 00						1	0	HR	1					
	30-40	mcl	10YR54 00						0	0		0	M	Y			
	40-120	c	25 Y52 00	10YR66	00	M		Y	0	0		0	P	Y		Y	
5	0-30	hcl	10YR43 00						1	0	HR	1				Y	
	30-40	hcl	10YR52 00	10YR66	00	C		Y	0	0	HR	5	P	Y			
	40-55	hcl	10YR52 00					Y	0	0	HR	50	P	Y			
6	0-25	mcl	10YR43 00						0	0	HR	1				Y	
	25-45	mcl	10YR54 00	10YR56	00	F			0	0		0	M	Y			
	45-120	hcl	10YR53 00	10YR66	00	C		Y	0	0		0	P	Y		Y	
7	0-30	mzcl	10YR43 00						0	0	HR	1			Y		
	30-120	c	05 Y62 00	10YR66	00	M		Y	0	0		0	P	Y		Y	

Appendix 3

SOIL PIT DESCRIPTION

SITE NAME Site 11 West of Kemsley Pit 1 (east of AB6)

Grid Reference	TQ90106620	Average Annual Rainfall	597
		Accumulated Temperature	1471
		Field Capacity Days	117
		Land Use	Set aside
		Slope & Aspect	1° South

Horizon	Texture	Colour	Stones >2	Tot Stone	Mottles	Structure
0-30	M(Z)CL	10YR4/3	1-2	1-2	-	-
30-40	MCL	10YR5/4 & 10YR4/4	5	5	None	MDCSAB
40-75	HCL	10YR6/2	15	15	MD	MDCAB
75-125	C	10YR6/2	15	15	MD	MDCAB

Wetness Grade	2	Wetness class	II
		Gleying	40
		SPL	40

Drought Grade	3a	APW = 121	MBW = 0
		APP = 100	MBP = -18

Final ALC grade 3a
Main Limitation Droughtiness

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) If any of these factors are
EROSN Soil erosion) considered significant in terms
of
EXP Exposure) the assessment of agricultural
land
FROST Frost prone) quality a y will be entered in the
DIST Disturbed land) relevant column
CHEM Chemical limitation)

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

OC - overall climate

CH - chemical limitations

AE - aspect

WE - wetness

EX - exposure

WK - workability

FR - frost

DR - drought

GR - gradient

ER erosion

MR - micro-relief

WD - combined soil wetness/soil droughtiness

TX - soil texture

ST - topsoil stoniness

DP - soil depth

PROFILES AND 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 $\frac{2}{3}$ of the sand less than 0.2 mm)
- C - coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
- M - medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ 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 (>2 cm, >6 cm 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 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 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