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**DOVER DISTRICT LOCAL PLAN-OBJECTOR SITES
LAND AT KINGSDOWN, KENT.
(INCLUDING OBJECTOR SITES 16 AND 17)**

**Agricultural Land Classification
ALC Map and Report**

June 1998

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT
DOVER DISTRICT LOCAL PLAN - OBJECTOR SITES

LAND AT KINGSDOWN, KENT,
INCLUDING OBJECTOR SITES 16 AND 17

INTRODUCTION

1. This summary report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 13.6 ha of land located to the north of Kingsdown, Kent. The survey was carried out during June 1998.
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 its statutory input to the Dover District Local Plan. The survey covers objector sites 16 and 17 at Kingsdown, as detailed on the accompanying map. In order to provide a context for appraising the current objector sites further, adjacent land was also surveyed. 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 the 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 agricultural land use on the site comprised set-aside and permanent grazing.

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 objector sites and all of the surveyed land are summarised in Tables 1, 2 and 3.

Table 1: Area of grades - Objector Site 16

Grade/Other land	Area (hectares)	% site area
3a	-	-
3b	1.3	100
Total site area	1.3	100

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

Table 2: Area of grades - Objector Site 17

Grade/Other land	Area (hectares)	% site area
3a	0.4	26.7
3b	1.1	73.3
Total site area	1.5	100

Table 3: Area of grades - Land at Kingsdown

Grade/Other land	Area (hectares)	% site area
3a	1.4	10.3
3b	12.2	89.7
Total site area	13.6	100

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. In total, 15 borings and two soil pits were described.

8. The majority of the agricultural land at the site has been classified as Subgrade 3b (moderate quality) with two smaller, more discrete, units of Subgrade 3a (good quality) land occurring in the north (on the higher land) and in the south east corner of the site.

9. Soil droughtiness restricts the land quality across the majority of the site. Where Subgrade 3a is mapped the soils are deeper and comprise weathered chalk and wind blown drift (together with a substantial amount of flint) over solid chalk at moderate to deep depths. This causes profile available water to be restricted such that given the local climate there is a risk of drought stress to plants in most years. Where soils are shallower over solid chalk Subgrade 3b is appropriate due to the effect of restricting plant rooting depth, such that there is an increased reduction in the available water capacity of the soil which leads a higher risk of drought stress. Soil droughtiness will adversely affect crop yield, consistency of yield, and crop quality.

10. A small section of the Subgrade 3b area in the east of the site is limited by gradient. Here, slope measurements are within the range of 7.5-9°. Gradient has the effect of restricting the safe and effective use of farm machinery.

FACTORS INFLUENCING ALC GRADE

Climate

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

12. 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

Factors	Units	Values	Values
Grid reference	N/A	TR 377 489	TR 375 491
Altitude	m,AOD	20	40
Accumulated Temperature	day°C	1473	1450
Average Annual Rainfall	mm	724	740
Field Capacity Days	days	153	155
Moisture Deficit, Wheat	mm	119	116
Moisture Deficit, Potatoes	mm	116	111
Overall Climatic Grade	N/A	Grade 1	Grade 1

13. 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.

14. 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.

15. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. The site is believed not to be at risk from frost. It does however lie in an area which is indicated as being 'Exposed' (Met. Office, 1970). The area is exposed because of winds between north-north-east and east which occasionally bring prolonged periods of winds in winter with freezing or near freezing temperatures. It is these winds which are most detrimental to horticulture and as such the agricultural quality of the land will be affected to an extent that a grade of no higher than Grade 2 can be mapped at the site due to these local climatic factors.

Site

16. The survey area comprises land which falls in a general south-east direction at gradients mostly between 2° and 5°. The highest land lies along the north-west boundary of the site at about 46m AOD, whilst the lowest point lies at around 20m AOD in the south east of the site. Land quality is limited to Subgrade 3b by steep gradients (in excess of 7°) in a very limited area of the site towards the east.

Geology and Soils

17. The published geological information for the site (BGS, 1977) shows the whole site to consist of Upper Chalk deposits.

18. The most recently published soil information for the site (SSEW, 1983) shows the Coombe 1 association to cover the entire area. These soils are described as 'Well drained calcareous fine silty soils, deep in valley bottoms, shallow to chalk on valley sides in places. Slight risk of water erosion.' (SSEW, 1983).

19. Upon detailed field examination, soils were broadly consistent with the above description.

AGRICULTURAL LAND CLASSIFICATION

20. 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.

21. 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.

AGRICULTURAL LAND CLASSIFICATION

Subgrade 3a

22. Land of good quality has been mapped in two discrete areas. One is mapped on the higher land, (in the north of the site) and the other is mapped in the far south-east corner of the site (on the lower land). In these areas soils are developed from deeper drift deposits which cap the solid chalk. The principal limitation is soil droughtiness.

23. The topsoils within these mapping units comprise calcareous medium silty clay loams which are very slightly to moderately stony, containing up to 15% total flints and/or 20% total chalk (6% >2cm, 3% > 6cm diameter). These overlie heavy silty clay loam subsoils which vary in terms of stone content and depth over the chalk below. The subsoils contain a combination of flint and/or weathered chalk fragments which vary in quantity (up to 50% chalk fragments and/or up to 40% flint). Many of these subsoils become impenetrable to the soil auger at depths between 45cm and 65cm, either due to the high proportion of flint fragments or when solid chalk is encountered. On the whole, soils within this unit are typically well drained (Wetness Class I) Pit 1 typifies these soils (Appendix II). As a result of the high proportion of flints and/or the chalk at moderate depths, there is a significant reduction in the plant available water which causes a risk of drought stress that will affect both plant growth and yield. The nature and extent of the soils within this unit varies considerably depending on the proportion of rock fragments in the profiles and/or the depth to chalk bedrock. Some borings of slightly better quality are found within this unit but are too sporadic to be mapped separately at this scale.

Subgrade 3b

24. Moderate quality land is mapped over the majority of the site where the main limitation is soil droughtiness. Soils in this unit are well drained (Wetness Class I) and shallow and rest directly over chalk bedrock. The chalk is noticeably hard and dry and as a result rooting is more restricted than for the Subgrade 3a areas and the available water in these soils is low. In addition to this, a small area of land towards the eastern boundary of the site is restricted to Subgrade 3b quality on the basis of gradient limitations.

25. Typical topsoils in the Subgrade 3b unit comprise calcareous medium silty clay loams which are slightly to moderately stony (containing up to 20% chalk and/or 15% flints of which up to 5% is greater than 2cm, and up to 2% is greater than 6cm diameter). These topsoils often pass to very shallow, extremely chalky (50-60% v/v weathered chalk) upper subsoils which are of similar (or slightly heavier) texture to the topsoils. These typically overlie blocky chalk between 28 and 44cm depth which tends to be impenetrable to the soil auger. In Pit 1

(Appendix II) roots were visible to a depth of 26cm into the chalk. The shallow soil resource together with the restricted rooting into the underlying chalk in this mapping unit means that these soils typically have a moderate droughtiness restriction to an extent that Subgrade 3b is appropriate for this land.

26. A small area of the site has been mapped as Subgrade 3b on the basis of a gradient restriction. The gradients were measured (with an optical reading clinometer) between 7° and 10°. Slopes in this gradient range are sufficient to compromise the safe and efficient operation of farm machinery.

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SOURCES OF REFERENCE

British Geological Survey (1977) Sheet No. 290, Dover 1:50,000 scale (Drift Edition). 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.

Met. Office (1971) *Unpublished Climatological Data*. Map Sheet 173.
Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South East England*. 1:250,000 scale. SSEW: Harpenden.

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 that 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 that restricts 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. **GLEYS/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. **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	SLST: soft oolitic or dolomitic 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 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	GRDNT	SPL	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
					CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT		
1	TR37504910	SAS SE	2	23S	1	1	75	-42	78	-35	3B					DR	3B CH 35 SEE 1P
2	TR37604910	SAS SE	4		1	1	62	-55	62	-51	4					DR	3A IMP 45 SEE 2P
2A	TR37584912	SAS SE	2		1	1	90	-27	99	-14	3B					DR	3A IMP 65 SEE 2P
3	TR37704910	SAS S	3		1	1	76	-41	78	-35	3B					DR	3B IMP 42 SEE 1P
4	TR37804910	SAS S	1		1	1	161	44	125	12	1					EX	2
5	TR37404900	SAS SE	3		1	1	88	-29	93	-20	3B					DR	3B SEE PIT 1
6	TR37504900	SAS SE	3		1	1	69	-48	91	-22	3B					DR	3B CH 30 SEE 1P
7	TR37604900	SAS S	3		1	1	83	-34	89	-24	3B					DR	3B IMP 50 SEE 1P
8	TR37704900	SAS S	3		1	1	83	-34	88	-25	3B					DR	3A IMP 60 SEE 2P
9	TR37804900	PGR SE	3		1	1	66	-51	66	-47	4					DR	3B IMP 40
10	TR37404890	SAS SE	3		1	1	84	-33	86	-27	3B					DR	3B SEE PIT 1
11	TR37504890	SAS SE	2		1	1	76	-41	80	-38	3B					DR	3B SEE PIT 1
12	TR37604890	SAS S	3		1	1	87	-30	92	-21	3B					DR	3B CH 45 SEE 1P
13	TR37704890	SAS S	3		1	1	102	-15	104	-9	3A					DR	3A CH 50CM
14	TR37404880	SAS S	3		1	1	89	-41	94	-33	3B					DR	3B I45 CH SEE 1P
P	TR37504890	SAS SE	2		1	1	76	-41	80	-33	3B					DR	3B HARD CHALK
2P	TR37604910	SAS SE	5		1	1	144	27	121	8	2					DR	2 CHALKY DRIFT

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES-----			STRUCT/ CONSIST	SUBS STR POR IMP SPL CALC
				COL	ABUN	CONT		GLEYS	>2	>6		
1	0-23	MZCL	10YR32					5	2	HR	15	Y
	23-35	C	10YR43	10YR46	C	D	S	0	0	HR	15	Y + 5% CHALK
	35-61	CH	10YR81					0	0	HR	5	Y HARD CHALK
2	0-27	MZCL	10YR43					6	2	CH	20	Y + 5% HR
	27-45	HZCL	10YR44					0	0	HR	40	Y IMP FLINTS
2A	0-30	MZCL	10YR4342					0	0	CH	15	Y + 5% HR
	30-65	HZCL	10YR44					0	0	HR	20	Y IMP FLINTS
3	0-30	MZCL	10YR53					3	0	HR	8	Y
	30-56	CH	10YR81					0	0	HR	5	Y IMP HARD CHALK
4	0-42	MZCL	10YR43					0	0		0	Y
	42-120	HZCL	10YR53					0	0	CH	10	Y Q DISTURBED
5	0-32	MZCL	10YR53					0	0	HR	5	Y
	32-40	HZCL	10YR63					0	0	CH	60	Y WEATHERED CHALK
	40-66	CH	10YR81					0	0	HR	5	Y HARD CHALK
6	0-30	MZCL	10YR43					4	0	CH	20	Y + 10% HR
	30-56	CH	10YR81					0	0	HR	5	Y HARD CHALK
7	0-30	MZCL	10YR43					5	0	CH	15	Y + 10% HR
	30-44	MZCL	10YR4344					0	0	CH	50	Y + 10% HR
	44-70	CH	10YR81					0	0	HR	5	Y HARD CHALK
8	0-32	MZCL	10YR53					2	0	HR	15	Y
	32-60	HZCL	10YR64					0	0	HR	5	Y IMP FLINTS
9	0-30	MZCL	10YR43					0	0	HR	5	Y +10%CH
	30-40	MZCL	10YR5464					0	0	HR	10	Y +15%CH IMP FLINTS
10	0-28	MZCL	10YR53					0	0	HR	5	Y
	28-56	CH	25Y81					0	0	HR	5	Y HARD CHALK
11	0-30	MZCL	10YR43					4	0	HR	10	Y + 15% CH
	30-50	MZCL	10YR43					0	0	CH	50	Y + 5% HR
	50-76	CH	10YR81					0	0	HR	5	Y HARD CHALK
12	0-25	MZCL	10YR43					4	0	CH	10	Y + 5% HR
	25-45	HZCL	10YR4344					0	0	CH	50	Y + 5% HR
	45-71	CH	10YR81					0	0	HR	5	Y HARD CHALK
13	0-35	MZCL	10YR53					2	0	HR	5	Y
	35-50	HZCL	10YR64					0	0	CH	50	Y WEATHERED CHALK
	50-76	CH	25Y81					0	0		0	Y HARD CHALK

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED		----STONES----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR		IMP
14	0-35	MZCL	10YR53						0	0	CH	10				Y	+10% HR
	35-45	MZCL	10YR53						0	0	CH	50		M		Y	+5% HR
	45-71	CH	10YR81						0	0	HR	5		P		Y	HARD CHALK
1P	0-32	MZCL	10YR4243						6	3	HR	18				Y	
	32-37	MZCL	10YR43						0	0	CH	60		FR M		Y	WEATHERED CHALK
	37-63	CH	10YR81						0	0	HR	5		FM P		Y	ROOTS 26CM
2P	0-30	MZCL	10YR4243						5	3	CH	15				Y	
	30-45	MZCL	10YR44						0	0	HR	15	MDMSAB	FR G		Y	+ 15% CHALK
	45-80	HZCL	10YR44						0	0	HR	16	MDMSAB	FR G		Y	+ 32% CHALK
	80-120	HZCL	10YR44						0	0	CH	60		FM M		Y	+ 15% HR