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Isle of Wight Unitary Development Plan
Crockers Farm, Northwood (Minerals)

Agricultural Land Classification
ALC Map and Report

May 1997

Resource Planning Team
Eastern Region
FRCA, Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

ISLE OF WIGHT UNITARY DEVELOPMENT PLAN (UDP)
CROCKERS FARM, NORTHWOOD (MINERALS).

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately 8 hectares of land at Crockers Farm, to the south of Northwood, on the Isle of Wight. The survey was carried out during May 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 the Isle of Wight UDP. 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 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 majority of agricultural land was under permanent grassland with a small area of maize to the south of the site.

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 below.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% site area
2	4.4	55.7
3b	3.5	44.3
Total site area	7.9	100.0

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 6 borings and two soil inspection pits were described.

8. The majority of the agricultural land on this site has been classified as Grade 2 (very good quality), due to either soil droughtiness or soil wetness limitations. The soil profiles are generally deep and silty textured with a slight flint content. In this local climatic regime, the flint content reduces the amount of profile available water for crops thus restricting the level and consistency of crop yields. In other areas, deep clayey subsoils slightly impede drainage

through the profile causing slight soil wetness. This limits the timing and flexibility of mechanised operations and grazing during the wetter months. Occasional higher and lower quality profiles have also been included in this mapping unit due to their limited number and extent.

9. Subgrade 3b (moderate quality) land has also been mapped along the hilltop and through the centre of the site. This land comprises shallow flinty soils over gravel. The amount of profile available water for crops is therefore greatly depleted, resulting in a significant soil droughtiness limitation.

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).

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 (ATO, January to June), as a measure of the relative warmth of a locality.

Table 2: Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SZ 488 926	SZ 489 924
Altitude	m, AOD	58	65
Accumulated Temperature	day°C (Jan-June)	1498	1490
Average Annual Rainfall	mm	847	854
Field Capacity Days	days	173	174
Moisture Deficit, Wheat	mm	106	105
Moisture Deficit, Potatoes	mm	100	98
Overall climatic grade	N/A	Grade 1	Grade 1

14. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. However, climatic factors can interact with soil properties to influence soil wetness and droughtiness.

15. Local climatic factors such as frost risk and exposure are unlikely to adversely affect agricultural land use on this site. The site is climatically Grade 1.

Site

16. The land on this site slopes gently from 67m AOD in the east to 55m AOD in the north west.

17. Gradient, micro-relief and flooding do not affect land quality in this area.

Geology and soils

18. The relevant geological sheet (BGS, 1976) maps the entire site as the Hamstead Beds. However, these are shown to be overlain by plateau gravel deposits in the south east.

19. The most recently published soils information for this area (SSEW, 1983) maps the Wickham 4 soil association in the west of the site and the Sonning 1 soil association in the east. The Wickham 4 association is described as 'slowly permeable seasonally water-logged fine loamy over clayey and fine silty over clayey soils associated with similar clayey soils, often with brown subsoils.' (SSEW, 1983). The Sonning 1 soils, on the other hand, are said to be 'well drained flinty coarse loamy and sandy soils, mainly over gravel. Some coarse loamy over clayey soils with slowly permeable subsoils and slight seasonal water-logging.' (SSEW, 1983).

20. Detailed field examination broadly confirmed the existence of soils similar to those described above. However, additional well drained silty soils, resembling brickearth deposits, were found in the north of the site.

AGRICULTURAL LAND CLASSIFICATION

21. 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.

22. 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

23. The majority of the site has been classified as Grade 2 (very good quality land), due to a minor soil droughtiness or soil wetness limitation. These soil profiles are typified by soil inspection Pit 2. Here, slightly flinty (5-8% total stone, 3% >2cm in diameter), non-calcareous, silt loam or occasional medium silty clay loam topsoils, overlie medium and heavy silty clay loam upper subsoils with 2-15% flints. At 75cm depth the profile passes to clay with few to many ochreous mottles and few flints. The subsoils are generally moderately well structured and free draining, though the clay subsoils with many ochreous mottles are poorly structured and slowly permeable. These horizons slightly impede drainage through the profile, thus causing a minor soil wetness limitation. In this local climatic regime, these profiles have been assessed as either Wetness Class I or II, depending on the presence of the slowly permeable layer. Given the topsoil textures, the soils assigned to Wetness Class II, have been classified as Grade 2, because wet soils will inhibit seed germination and growth. They can also slightly limit the timing and flexibility of cultivations as over-trafficking by agricultural machinery and grazing livestock can lead to structural damage. Elsewhere, the combination of

soil textures, structures and stone contents, in this locally warm climatic regime, acts to slightly reduce the amount of profile available water for plants. As a result, the level and consistency of crop yields may be restricted.

24. Occasional profiles of slightly higher or lower quality are also included within this mapping unit as they are too limited in either number or extent to map separately.

Subgrade 3b

25. The central and higher land on this site has been classified as Subgrade 3b (moderate quality land), due to a significant soil droughtiness limitation. These soil profiles are typified by soil inspection Pit 1, where slightly flinty (12-18% total flints, 4-11% >2cm in diameter), medium silty clay loam topsoils overlie very flinty (55-60% total stones) upper subsoils of a similar texture. At approximately 50cm depth the profile became impenetrable due to a significant increase in the stone content as it passed to gravel. As a result the amount of profile available water for crops will be greatly depleted, so reducing the range of crops that can be grown and their yields.

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SOURCES OF REFERENCE

British Geological Survey (1976) *Sheet No's. 344, 345, 330, & 331. Isle of Wight. 1:50,000 Series. 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.

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

Soil Survey of England and Wales (1984), *Soils and their Use in South East England.*
SSEW: Harpenden.

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.

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 **ST**: strongly developed	**MD**: moderately developed
ped size	**F**: fine **C**: coarse	**M**: medium **VC**: very coarse
ped shape	**S** : single grain **GR**: granular **SAB**: sub-angular blocky **PL**: platy	**M**: massive **AB**: angular blocky **PR**: prismatic

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 : I OF WIGHT UDP CROCKERS Pit Number : 1P

Grid Reference: SZ48809250 Average Annual Rainfall : 847 mm
Accumulated Temperature : 1498 degree days
Field Capacity Level : 173 days
Land Use : Permanent Grass
Slope and Aspect : 02 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MZCL	10YR43 00	6	12	HR					
25- 35	MZCL	10YR43 00	0	55	HR				M	
35- 50	MZCL	10YR44 00	0	60	HR				M	
50-120	GH	10YR44 00	0	0					P	

Wetness Grade : 1 Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 3B APW : 068mm MBW : -38 mm
APP : 065mm MBP : -35 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : I OF WIGHT UDP CROCKERS Pit Number : 2P

Grid Reference: SZ48909240
Average Annual Rainfall : 847 mm
Accumulated Temperature : 1498 degree days
Field Capacity Level : 173 days
Land Use : Maize
Slope and Aspect : 02 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 32	ZL	10YR43 00	3	8	HR					
32- 55	MZCL	10YR44 00	0	15	HR		MDCSAB	FR	M	
55- 75	HCL	10YR66 00	0	10	HR	C	MDCSAB	FR	M	
75- 95	ZC	10YR72 74	0	5	HR	M	MDCAB	FM	P	
95-120	C	10YR72 00	0	0		M	STCAB	VM	P	

Wetness Grade : 2
Wetness Class : II
Gleying :075 cm
SPL :075 cm

Drought Grade : 1
APW : 147mm MBW : 41 mm
APP : 123mm MBP : 23 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Wetness

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	SZ48809260	PGR	W	01			1	1	157	51	131	31	1					1	
1P	SZ48809250	PGR	W	02			1	1	068	-38	065	-35	38				DR	3B	At AB3
2	SZ48909260	PGR	W	02			1	1	134	28	118	18	2				DR	2	I100 Prob 1
2P	SZ48909240	MZE	W	02	075	075	2	2	147	41	123	23	1				WE	2	At AB5
3	SZ48809250	PGR	W	02			1	1	044	-62	044	-56	4				DR	3B	I25 See 1P
4	SZ48909250	PGR	W	02			1	1	037	-69	037	-63	4				DR	3B	I25 See 1P
5	SZ48809240	MZE	W	02	076	075	2	2	137	31	114	14	1				WE	2	See 2P
6	SZ48909240	MZE	W	04			1	1	103	-3	115	15	3A				TS	3A	I68 Flints

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	0-30	zl	10YR42 00	10YR46 00	C				3	0	HR	5							Root Mottles
	30-42	mzcl	10YR42 52						0	0	HR	10		M					
	42-75	hzcl	10YR44 00	7SYR46 00	F				0	0	HR	2		M					
	75-120	c	10YR56 58	7SYR46 00	F				0	0	HR	2		M					
1P	0-25	mzcl	10YR43 00						6	1	HR	12							
	25-35	mzcl	10YR43 00						0	0	HR	55		M					
	35-50	mzcl	10YR44 00						0	0	HR	60		M					Well rooted
	50-120	gh	10YR44 00						0	0		0		P					I50 prob GH-120
2	0-30	mzcl	10YR42 00						3	0	HR	5							
	30-50	mzcl	10YR43 00						0	0	HR	10		M					
	50-70	hzcl	10YR56 00						0	0	HR	2		M					
	70-100	hzcl	10YR66 00	7SYR58 00	F				0	0	HR	2		M					Imp Flints
2P	0-32	zl	10YR43 00						3	0	HR	8							
	32-55	mzcl	10YR44 00						0	0	HR	15	MDCSAB FR	M					
	55-75	hcl	10YR66 00	7SYR68 00	C		10YR54 00	S	0	0	HR	10	MDCSAB FR	M					
	75-95	zc	10YR72 74	7SYR68 00	M		10YR64 00	Y	0	0	HR	5	MDCAB FM	P	Y		Y		
	95-120	c	10YR72 00	05YR68 00	M			Y	0	0		0	STCAB VM	P	Y		Y		
3	0-25	mzcl	10YR42 00						4	1	HR	8							Imp V.Flinty/Dry
4	0-25	mzcl	10YR42 00						11	3	HR	18							Imp V.Flinty/Dry
5	0-30	zl	10YR42 00						3	0	HR	8							
	30-65	mzcl	10YR44 00						0	0	HR	10		M					
	65-75	hcl	10YR54 00	10YR68 00	M			S	0	0	HR	2		M					
	75-95	c	10YR64 74	7SYR68 00	M			Y	0	0	HR	2		P			Y		
	95-120	c	10YR72 00	05YR58 00	M			Y	0	0	HR	5		P			Y		
6	0-35	zl	10YR42 00						11	0	HR	20							
	35-50	mzcl	10YR44 00						0	0	HR	15		M					
	50-68	mzcl	75YR54 00						0	0	HR	10		M					Imp Flints