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Isle of Wight Unitary Development Plan
Land at Garretts Farm, St. George's Lane, Newport (Minerals)

Agricultural Land Classification
ALC Map and Report

May 1997

Resource Planning Team
Eastern Region
FRCA Reading

RPT Job Number: 1600/080/97
FRCA Reference: EL 16/01251
LURET Job Number: 02782

AGRICULTURAL LAND CLASSIFICATION REPORT

ISLE OF WIGHT UNITARY DEVELOPMENT PLAN (UDP)
LAND AT GARRETTS FARM, ST. GEORGE'S LANE,
NEWPORT (MINERALS).

INTRODUCTION

1. This summary report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 11.8 hectares of land to the north of Garretts Farm on St. George's Lane to the south east of Newport 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 whole site was in agricultural production. The majority of the land was under permanent grass, for grazing and for silage production. To the east of the site, a single field was in arable use and had recently been drilled at the time of survey.

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 fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. A total of 15 borings and 1 soil pit were described.

7. All the agricultural land (11.8 ha) at this site has been classified as Subgrade 3b (moderate quality). Principal limitations include soil droughtiness and topsoil stoniness.

8. The soils comprise well drained moderately to very stony medium silts. In the local climate this combination of soil properties means that this land is limited by soil droughtiness. This can lead to a reduction in plant growth and yield. Some observations are also limited to Subgrade 3b by the size and volume of stones in the topsoil, which cause production costs to be increased and can adversely affect crop establishment, growth and yield.

FACTORS INFLUENCING ALC GRADE

Climate

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

10. The key climatic variables used for grading this site are given in Table 1 below obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

11. 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.

12. 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.

Table 1: Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SZ 515 876	SZ 512 873
Altitude	m, AOD	75	100
Accumulated Temperature	day°C (Jan-June)	1480	1452
Average Annual Rainfall	mm	923	938
Field Capacity Days	days	188	191
Moisture Deficit, Wheat	mm	100	96
Moisture Deficit, Potatoes	mm	92	87
Overall climatic grade	N/A	Grade 1	Grade 1

13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Other local climatic factors such as exposure and frost risk are also believed not to affect the site. The site is climatically Grade 1.

Site

14. The site lies at an altitude between approximately 70 and 100m AOD falling gently from south to north. Towards the north west of the site, a dry valley feature occurs which cuts back into the main slope on a north-south axis. The slopes in this area, although significant, are not of sufficient gradient to adversely affect agricultural land quality. In addition, microrelief and flood risk do not adversely affect land quality at this site.

Geology and soils

15. The published geological information for the site (BGS, 1976) shows the majority of the site to be underlain by plateau gravel drift deposits. To the north east of the site, this gives way to solid deposits of Cretaceous Upper, Middle and Lower Chalk.

16. The most detailed published soils information for the site (SSEW, 1983 and 1984) maps soils of the Upton 1 and Sonning 1 associations. The Upton soils are indicated towards the north east of the site where the Chalk is mapped. They are described as, 'Shallow well drained calcareous silty soils over chalk. Mainly on moderately steep, sometimes very steep land. Deeper fine silty calcareous soils in coombes and dry valleys.' (SSEW, 1983). The Sonning soils are indicated over the remainder of the site where the plateau gravel is mapped. These are described as, 'Well drained flinty coarse loamy and sandy soils, mainly over gravel. Some coarse loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.' (SSEW, 1983). Soils of the Sonning type were encountered over the entire site.

AGRICULTURAL LAND CLASSIFICATION

17. The details of the classification of the site are shown on the attached ALC map and in paragraph 7.

18. 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.

Subgrade 3b

19. Land of moderate quality has been mapped across this site. Principal limitations include soil droughtiness and topsoil stoniness. The soils are characterised by the soil pit observation, 1P (see Appendix II).

20. The soils were found to be of a single type comprising a moderately stony (up to 35% total flints by volume, including up to 20%>2cm diameter) medium silty clay loam topsoil. This passes to a very stony (up to 55% total flints) medium silty clay loam upper subsoil which was impenetrable to the soil auger. In the soil pit, 1P, the lower subsoil was observed to contain just under 70% angular flints in a medium silty clay loam matrix to depth. The volume of stones in these well drained (Wetness Class I) profiles restricts the water holding capability of the soil to the extent that Subgrade 3b is appropriate on the basis of soil droughtiness, given the local climatic conditions. On this basis crop growth and potential yields are likely to be restricted.

21. At the majority of the observation points, stones greater than 2cm diameter exceeded 15% (by volume) in the top 25cm of the profile. These observations are therefore equally limited to Subgrade 3b on the basis of topsoil stoniness. This limitation acts to increase production costs by increasing wear and tear on tyres and cultivation implements and may inhibit successful crop establishment affecting yield and the harvesting of some crops.

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SOURCES OF REFERENCE

British Geological Survey (1976) *Special Sheet. Isle of Wight. Drift Edition. 1:50 000 scale* 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) *Soils of South East England. 1:250 000 Scale.* SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils of South East England. Bulletin No. 15.* SSEW: Harpenden.

APPENDIX I

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.

APPENDIX II

SOIL DATA

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	**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. **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	**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. **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	**FSST**:	soft, fine grained sandstone
ZR:	soft, argillaceous, or silty rocks	**CH**:	chalk
MSST:	soft, medium grained sandstone	**GS**:	gravel with porous (soft) stones
SI:	soft weathered igneous/metamorphic rock	**GH**:	gravel with non-porous (hard) stones

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

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

SOIL PIT DESCRIPTION

Site Name : I OF WIGHT UDP ST GEORGE Pit Number : 1P

Grid Reference: SZ51508740 Average Annual Rainfall : 923 mm
Accumulated Temperature : 1480 degree days
Field Capacity Level : 188 days
Land Use : Arable
Slope and Aspect : 3 degrees N

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	MZCL	10YR32 00	12	24	HR					
28- 50	MZCL	10YR42 00	35	55	HR				M	
50- 68	MZCL	10YR54 00	50	68	HR				P	
68- 83	MZCL	10YR54 58	50	67	HR				P	

Wetness Grade : 2 Wetness Class : I
Gleying : cm
SPL : cm

Drought Grade : 3B APW : 67 mm MBW : -33 mm
APP : 68 mm MBP : -24 mm

FINAL ALC GRADE : 3B
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	SZ51308760	SIL	NE	3			1	2	44	-56	44	-48	4				DR	3B	IMP 35 3A TS
1P	SZ51508740	ARA	N	3			1	2	67	-33	68	-24	3B				DR	3B	PIT IMP 83
2	SZ51408760	SIL	N	2			1	2	48	-52	48	-44	4				TS	3B	IMP 40 3B DR
3	SZ51508760	ARA	E	1			1	2	50	-50	50	-42	3B				TS	3B	IMP 40 3B DR
4	SZ51608760	ARA	E	3			1	2	44	-56	44	-48	4				DR	3B	IMP 30 SEE 1P
5	SZ51208750	SIL	N	3			1	2	43	-57	43	-49	4				TS	3B	IMP 35 3B DR
6	SZ51308750	SIL	E	5			1	2	41	-59	41	-51	4				TS	3B	IMP 35 3B DR
7	SZ51408750	PGR	N	4			1	2	37	-63	37	-55	4				TS	3B	IMP 30 3B DR
8	SZ51508750	ARA	NE	4			1	2	49	-51	49	-43	4				TS	3B	IMP 40 3B DR
9	SZ51608750	ARA	NE	9			1	2	67	-33	67	-25	3B				DR	3B	IMP 50 3B GR
10	SZ51208740	PGR	S	4			1	2	50	-50	50	-42	3B				DR	3B	IMP 35 SEE 1P
11	SZ51308740	SIL	E	4			1	2	47	-53	47	-45	4				DR	3B	IMP 35 3A TS
12	SZ51408740	PGR	N	2			1	2	44	-56	44	-48	4				TS	3B	IMP 30 3B DR
13	SZ51508740	ARA	NE	2			1	2	51	-49	51	-41	3B				TS	3B	IMP 42 3B DR
14	SZ51608740	ARA	NE	1			1	2	52	-48	52	-40	3B				TS	3B	IMP 40 3B DR
15	SZ51208730	PGR	N	4			1	2	37	-63	37	-55	4				TS	3B	IMP 30 3B DR

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
1	0-25	mzcl	10YR42 00						11	5	HR	30						SIEVED
	25-35	c	10YR58 00						0	0	HR	40		M				IMP FLINTS 35
1P	0-28	mzcl	10YR32 00						12	4	HR	24						SIEVED
	28-50	mzcl	10YR42 00						35	15	HR	55		M				SIEVED
	50-68	mzcl	10YR54 00						50	25	HR	68		P				SIEVED
	68-83	mzcl	10YR54 58						50	30	HR	67		P				IMP PIT 83 SIEVED
2	0-25	mzcl	10YR42 00						16	5	HR	35						SIEVED
	25-40	mzcl	10YR44 54	00MN00	00	F			0	0	HR	40		M				IMP FLINTS 40
3	0-30	mzcl	10YR33 00						18	9	HR	35						SIEVED
	30-40	mzcl	10YR56 00						0	0	HR	35		M				IMP FLINTS 40
4	0-30	mzcl	10YR33 00						13	2	HR	25						IMP FLINTS 30 SIEVE
5	0-28	mzcl	10YR41 00						17	5	HR	35						SIEVED
	28-35	mzcl	10YR42 43						0	0	HR	40		M				IMP FLINTS 35
6	0-28	mcl	10YR42 00						17	8	HR	35						SIEVED
	28-35	hcl	10YR58 00						0	0	HR	40		M				IMP FLINTS 35
7	0-25	mzcl	10YR33 00						18	9	HR	35						SIEVED
	25-30	mzcl	10YR54 00						0	0	HR	35		M				IMP FLINTS 30
8	0-25	mzcl	10YR33 00						18	9	HR	35						SIEVED
	25-40	mzcl	10YR54 00						0	0	HR	35		M				IMP FLINTS 40
9	0-25	mzcl	10YR33 00						13	3	HR	25						SIEVED
	25-50	mzcl	10YR54 00						0	0	HR	30		M				IMP FLINTS 50
10	0-25	mzcl	10YR42 00						6	0	HR	20						SIEVED
	25-35	mzcl	10YR44 54						0	0	HR	35		M				IMP FLINTS 35
11	0-25	mzcl	10YR41 42						12	5	HR	25						SIEVED
	25-35	mzcl	10YR44 54						0	0	HR	40		M				IMP FLINTS 35
12	0-30	mzcl	10YR43 00						16	5	HR	25						IMP FLINTS 30 SIEVE
13	0-25	mzcl	10YR33 00						20	10	HR	35						SIEVED
	25-42	mzcl	10YR42 00						0	0	HR	35		M				IMP FLINTS 42
14	0-25	mzcl	10YR32 00						17	4	HR	30						SIEVED
	25-40	mzcl	10YR42 00						0	0	HR	30		M				IMP FLINTS 40
15	0-25	mzcl	10YR42 00						18	8	HR	35						SIEVED
	25-30	mzcl	10YR44 54						0	0	HR	40		M				IMP FLINTS 30