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Isle of Wight Unitary Development Plan
South East of Pan Estate, Newport

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)
SOUTH EAST OF PAN ESTATE, NEWPORT

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately 34.5 hectares of land to the south east of Pan Estate, 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 land use on the site comprised a mixture of permanent grassland and arable (winter wheat and spring rape). The areas shown as 'Other Land' include recreation grounds, garage buildings and areas of scrub.

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)	% surveyed area	% site area
3a	9.6	31.7	27.8
3b	18.6	61.4	53.9
4	2.1	6.9	6.1
Other land	4.2	N/A	12.2
Total surveyed area	30.3	100.0	87.8
Total site area	34.5	-	100.0

7. The fieldwork was conducted at an average density of one boring per hectare. A total of 36 borings and three soil inspection pits were described.

8. The land on the site has been classified as a mixture of Subgrades 3a and 3b (good and moderate quality, respectively), together with some Grade 4 (poor quality). The majority of land on the site suffers from soil wetness problems to varying degrees. Soil wetness acts to restrict the flexibility of cropping, stocking and cultivations and adversely affects yields. Across much of the site, the topsoils are medium textured. These profiles overlie similar upper subsoils and pass into poorly structured clay loams or clays which act to impede soil drainage. In general, the depth to the poorly structured horizons will determine the final ALC grade. Where these horizons are relatively deep, the land is classified as Subgrade 3a; where they are shallower within the profile, the land is classified as Subgrade 3b. Profiles similar to the latter, but with heavier topsoils, give rise to land classified as Grade 4.

9. The higher flatter land in the north of the site, classified as Subgrade 3a, is also equally limited by soil droughtiness. These profiles have gravelly upper subsoils before passing into the underlying clay. The interaction between these soil characteristics and the local climate results in a soil droughtiness limitation, which may act to lower the level and consistency of crop yields.

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).

Table 2: Climatic and altitude data

Factor	Units	Values		
Grid reference	N/A	SZ 510 887	SZ 508 884	SZ 513 892
Altitude	m, AOD	20	30	55
Accumulated Temperature	day°C (Jan-June)	1542	1531	1502
Average Annual Rainfall	mm	881	888	897
Field Capacity Days	days	181	182	183
Moisture Deficit, Wheat	mm	108	107	103
Moisture Deficit, Potatoes	mm	103	101	97
Overall climatic grade	N/A	Grade 1	Grade 1	Grade 1

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.

14. The combination of rainfall and accumulated temperature at this site mean that there is no overall climatic limitation. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. At this locality, the climate is relatively wet in regional terms. As a result, the likelihood of soil wetness problems may be increased. The high accumulated temperature in this area results in an early start to the growing season. No local climatic factors, such as frost risk or exposure, are believed to adversely affect the land quality on the site. All of the land on the site is climatically Grade 1.

Site

15. The lowest lying land on the site (15 m AOD) occurs proximate to the stream which runs through the southern third of the site. From this point the land rises gently to the south (1-4°) to lie at approximately 35 m AOD. The land also rises to the north of the stream, in a north-easterly direction, through both gentle and moderate slopes (2-10°). Where slopes occur in the range of 7-11°, the land can be classified no higher than Subgrade 3b because of slope limitations.

Geology and soils

16. The published geology map (BGS, 1976) shows the northern two-thirds of the site to be underlain by Hamstead Beds. Immediately south of this area, the land is underlain by Bembridge Marls passing into a narrow strip of Osborne and Headon Beds. Land in the south of the site is shown to be underlain by Bagshot Beds.

17. The published reconnaissance soil survey map (SSEW, 1983) for the area shows the northern half of the site to comprise soils of the Wickham 4 Association. These soils are described as 'Slowly permeable seasonally waterlogged fine loamy over clayey and fine silty over clayey soils associated with similar clayey soils, often with brown subsoils.' (SSEW, 1983). The southern half of the site is mapped as soils of the Bursledon Association. These soils are described as 'Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging associated with deep coarse loamy soils variably affected by groundwater.' (SSEW, 1983).

AGRICULTURAL LAND CLASSIFICATION

18. 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.

19. 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, page 8.

Subgrade 3a

20. The highest, flattest land in the north of the site has been classified as Subgrade 3a (good quality); this land is equally limited by both soil wetness and soil droughtiness. Topsoils comprise medium clay loams which are slightly stony (3% flints larger than 2 cm and 10% total flints by volume). These overlie similarly textured upper subsoils and heavier (heavy clay loam passing into clay at 46 cm) lower subsoils. The subsoils are very stony (approximately 35-52% total flints). From Pit 1, which represents such profiles, it could be seen that the clay is gleyed, poorly structured and slowly permeable; all other subsoils are moderately structured and permeable. The relatively wet prevailing climate means that such profiles are assessed as imperfectly drained (Wetness Class III).

21. The interaction between the medium textured topsoils, imperfect drainage and prevailing climate means that this land will be subject to some restrictions on the flexibility of cropping, stocking and cultivations. In addition, the land is also equally restricted by soil droughtiness limitations. The interaction between the soil textures, relatively high flint content and the local climate means that the profile available water is not sufficient to fully meet crop needs. Consequently, there is a risk of drought stress for those crops which are grown.

22. In the south of the site, where the soil profiles are only very slightly stony, the key limitation is soil wetness and workability. Medium textured topsoils overlie similarly textured upper subsoils which are moderately structured and permeable. Occasionally, these pass into similar heavy clay loams slightly deeper within the profile. At approximately 60 to 75 cm these pass into poorly structured and slowly permeable heavy clay loams and clays. If gleyed within 40 cm, these profiles are assessed as imperfectly drained (Wetness Class III); if gleyed below 40 cm, the profiles are moderately well drained (Wetness Class II). Such profiles are represented by Pit 3. Given the relatively wet climate, Subgrade 3a is appropriate.

Subgrade 3b

23. All of the land classified as Subgrade 3b (moderate quality) is limited by soil wetness and workability. Medium textured topsoils directly overlie heavy clay loam and clay subsoils which are poorly structured and slowly permeable. All of these profiles are gleyed within 40 cm, and are assessed as poorly drained (Wetness Class IV). Such soil wetness can adversely affect seed germination and survival and can inhibit the development of a good root system. It also influences the sensitivity of soil to structural damage and is, therefore, a major factor in determining the number of days when cultivation, trafficking or grazing can take place.

24. In the northern third of the site, parts of the land are also equally limited by slope restrictions. Gradients of 7°-10.5° were recorded. These may act to limit the range of agricultural machinery which can be safely and efficiently used.

Grade 4

25. The remaining agricultural land has been classified as Grade 4 (poor quality). All of this land is subject to significant soil wetness and workability limitations. Profiles are similar to those described in paragraph 23 but have heavier topsoils (heavy (silty) clay loams and clays). The heavier topsoils exacerbate workability restrictions and, consequently, Grade 4 is appropriate.

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SOURCES OF REFERENCE

British Geological Survey (1976) *Special Sheet (Sheets 344 and 345 and parts of 330 and 331), Isle of Wight, 1:50,000 (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, 1:250,000 and accompanying legend.*
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 **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

SOIL PIT DESCRIPTION

Site Name : I OF WIGHT UDP PAN ESTAT Pit Number : 1P

Grid Reference: SZ51308920 Average Annual Rainfall : 888 mm
Accumulated Temperature : 1531 degree days
Field Capacity Level : 182 days
Land Use : Permanent Grass
Slope and Aspect : 02 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 21	MCL	10YR42 00	3	10	HR					
21- 34	MCL	10YR42 00	0	38	HR			FR	M	
34- 46	HCL	10YR53 00	0	52	HR			FR	M	
46-120	C	25Y 61 71	0	35	HR	M	WKCSAB	FM	P	

Wetness Grade : 3A Wetness Class : III
Gleying :046 cm
SPL :046 cm

Drought Grade : 3A APW : 94 mm MBW : -13 mm
APP : 79 mm MBP : -22 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Soil Wetness/Droughtiness

SOIL PIT DESCRIPTION

Site Name : I OF WIGHT UDP PAN ESTAT Pit Number : 2P

Grid Reference: SZ51108870 Average Annual Rainfall : 888 mm
Accumulated Temperature : 1531 degree days
Field Capacity Level : 182 days
Land Use : Oilseed Rape
Slope and Aspect : 03 degrees SW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MZCL	10YR42 00	2	3	HR					
25- 38	HZCL	10YR51 00	0	3	HR	C	MDCAB	FM	P	
38- 60	C	25Y 73 00	0	2	HR	M	MDCAB	FM	P	

Wetness Grade : 3B Wetness Class : IV
Gleying :025 cm
SPL :025 cm

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

FINAL ALC GRADE : 3B
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	SZ51108920	PGR	S	02	0	025	4	3B		0		0					WE	3B	Flatter,lower
1P	SZ51308920	PGR	S	02	046	046	3	3A	94	-13	79	-22	3A				WD	3A	Pit imp 80
2	SZ51208920	PGR	W	04			1	2	49	-58	49	-52	4				DR	3A	Imp 30 see 1P
2P	SZ51108870	OSR	SW	03	025	025	4	3B		0		0					WE	3B	Plastic 38
3	SZ51308920	PGR	W	04			1	2	49	-58	49	-52	4				DR	3A	Imp 30 see 1P
3P	SZ50908850	WHT	NE	03	065	071	2	3A	134	27	118	17	2				WE	3A	Sl gleyed 45
4	SZ51008910	PGR	S	05	030		2	2	58	-49	58	-43	3B				DR	3B	Imp 40 Q WC
5	SZ51108910	PGR	SE	03	0	035	4	3B		0		0					WE	3B	Plastic 35
6	SZ51208910	PGR	SW	06			1	2	42	-65	42	-59	4				DR	3A	Imp 25 see 1P
7	SZ51308910	PGR	S	05	0		2	3A	71	-36	71	-30	3B				WE	3A	I45see7A;Q3aWD
7A	SZ51288908	PGR	S	05	0	025	4	3B		0		0					WE	3B	V near asp7
8	SZ50908900	PGR	S	05	033	060	3	3A		0		0					WE	3A	
9	SZ51008900	PGR	S	06	030	030	4	3B		0		0					WE	3B	
10	SZ51108900	PGR	S	06	030	030	4	3B		0		0					WE	3B	
11	SZ51208900	PGR	SW	05	0	025	4	3B		0		0					WE	3B	Impen 55
12	SZ51308900	PGR	SE	06	0	035	3	3A		0		0					WE	3B	Near 3B slope
14	SZ50898873	SAS	S	02	028	028	4	3B		0		0					WE	3B	
15	SZ51138890	OSR	N	01	030	030	4	3B		0		0					WE	3B	
16	SZ51208890	OSR	N	01	030	030	4	3B		0		0					WE	3B	
17	SZ51008880	OSR	S	02	030	030	4	3B		0		0					WE	3B	
18	SZ51108880	OSR	S	03	030	030	4	3B		0		0					WE	3B	
19	SZ51208880	OSR	S	03	030	030	4	4		0		0					WE	4	
20	SZ50848867	CER					1	2	149	42	112	11	1				WK	2	
21	SZ51008870	RGR	N	02	023	023	4	3B		0		0					WE	4	Q heavy t/soil
22	SZ51108870	OSR	N	02	030	030	4	3B		0		0					WE	3B	
23	SZ50708860	CER			035	035	4	3B		0		0					WE	3B	
24	SZ50808860	CER	N	01	070	070	2	3A		0		0					WE	3A	
25	SZ50908860	CER	N	01	028		2	2	63	-44	63	-38	3B				DR	3A	Imp35 Q3A dr
26	SZ51008862	RGR	S	02	0	030	4	4		0		0					WE	4	
27	SZ51108860	RGR	S	02	0	025	4	4		0		0					WE	4	
28	SZ50708850	WHT	W	04	060	070	2	3A		0		0					WE	3A	
29	SZ50808850	WHT	NW	03	025	025	4	3B		0		0					WE	3B	Plastic 25
30	SZ50908850	CER	N	02	030	075	3	3A		0		0					WE	3A	
31	SZ51008850	WHT	N	02	045	060	3	3A		0		0					WE	3A	
32	SZ51108850	WHT	N	02	030	055	3	3A		0		0					WE	3A	
33	SZ50708840	CER	N	01			1	2	54	-53	54	-47	4				DR	3A	Imp35 Q3A dr
34	SZ50808840	CER	W	02	030	038	4	3B		0		0					WE	3B	
35	SZ50908840	CER	E	02	025	025	4	3B		0		0					WE	3B	
36	SZ51008840	CER	E	01	095	095	1	2	144	37	117	16	1				WK	2	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	STR	POR	IMP	SPL	CALC	
1	0-25	mcl	10YR41 00	10YR58 00	C			Y	0	0	HR	2							
	25-35	hcl	25Y 51 00	10YR58 00	M			Y	0	0	HR	2		P			Y		Pale-spl (see 2P
	35-70	c	05Y 72 00	10YR68 00	M			Y	0	0		0		P			Y		
1P	0-21	mcl	10YR42 00						3	1	HR	10							
	21-34	mcl	10YR42 00						0	0	HR	38		FR	M				estimated 50 HR
	34-46	hcl	10YR53 00						0	0	HR	52		FR	M				estimated 65 HR
	46-120	c	25Y 61 71	75YR58 00	M			Y	0	0	HR	35	WKCSAB	FM	P	Y	Y		Q less stone
2	0-25	mcl	10YR42 00						5	0	HR	7							
	25-30	mcl	10YR42 00						0	0	HR	15		M					Imp 30 see 1P
2P	0-25	mzcl	10YR42 00						2	0	HR	3							
	25-38	hzcl	10YR51 00	10YR56 46	C	00MN00 00	Y		0	0	HR	3	MDCAB	FM	P	Y	Y		Pale matrix
	38-60	c	25Y 73 00	75YR68 00	M	25Y 62 00	Y		0	0	HR	2	MDCAB	FM	P	Y	Y		Plastic
3	0-25	mcl	10YR42 00						5	0	HR	7							
	25-30	mcl	10YR42 00						0	0	HR	15		M					Imp 30 see 1P
3P	0-29	mzcl	10YR43 00						4	0	HR	7							
	29-45	mzcl	10YR43 44			10YR43 00			0	0	HR	10	MDCSAB	FR	M				
	45-65	mzcl	10YR44 00	10YR46 00	C	00MN00 00	S		0	0	HR	1	MDCSAB	FR	M				
	65-71	hzcl	10YR53 54	10YR58 00	C	00MN00 00	Y		0	0	HR	1	MDCSAB	FR	M				Brownish matrix
	71-120	hzcl	10YR63 62	75YR56 00	M	10YR54 00	Y		0	0	HR	1	WKCPR	FM	P	Y	Y		Pale matrix
4	0-30	mcl	10YR42 00	10YR46 00	F				2	0	HR	10							
	30-40	c	10YR53 54	10YR58 00	C	00MN00 00	Y		0	0	HR	35		P					Imp 40 Q WC
5	0-35	mcl	10YR42 00	10YR58 00	C	00MN00 00	Y		3	0	HR	5							
	35-70	c	05Y 72 00	10YR68 00	M	00MN00 00	Y		0	0	HR	2		P			Y		
6	0-25	mcl	10YR42 00						5	0	HR	7							Imp 25 see 1P
7	0-30	mzcl	10YR42 00	10YR58 00	C			Y	0	0	HR	5							
	30-45	c	25Y 62 61	10YR68 00	M	00MN00 00	Y		0	0	HR	15		P					Imp45dry see 7A
7A	0-25	mzcl	10YR42 00	10YR58 00	C			Y	0	0	HR	5							
	25-70	c	05Y 72 00	10YR68 00	M			Y	0	0	HR	2		P			Y		c. 2m from asp7
8	0-33	mcl	10YR42 00						0	0	HR	5							
	33-60	hcl	10YR53 00	10YR66 00	C	00MN00 00	Y		0	0	HR	5		M					
	60-90	c	25Y 61 62	75YR58 00	M	00MN00 00	Y		0	0		0		P			Y		
9	0-30	mzcl	10YR42 00						0	0	HR	5							
	30-70	hcl	25Y 62 63	10YR68 00	C	00MN00 00	Y		0	0	HR	5		P			Y		Pale-prob spl
	70-120	mcl	25Y 62 63	10YR68 00	C	00MN00 00	Y		0	0		0		M					
10	0-30	mcl	10YR42 00	10YR46 00	F				0	0	HR	5							
	30-48	c	25Y 63 62	10YR68 00	C	00MN00 00	Y		0	0	CH	10		P			Y	Y	
	48-70	c	25Y 61 62	10YR68 00	C	00MN00 00	Y		0	0		0		P			Y		
	70-120	mcl	25Y 71 00	10YR68 00	C			Y	0	0		0		M			Y		V pale-prob spl

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
11	0-25	mcl	10YR42 00	10YR58 00	C			Y	0	0	HR	2							
	25-45	c	25 Y62 61	10YR56 00	M			Y	0	0	HR	5		P			Y		
	45-55	c	25 Y61 62	10YR56 00	M		00MN00 00	Y	0	0	HR	5		P			Y		Imp 55 flint
12	0-35	mzcl	10YR42 00	10YR56 00	C			Y	0	0	HR	2							
	35-55	hzcl	25 Y63 00	10YR58 71	M			Y	0	0	HR	5		P			Y		Pale-prob spl
	55-65	c	25 Y63 00	10YR58 71	M		00MN00 00	Y	0	0	HR	15		P			Y		
	65-80	c	25 Y63 00	10YR58 71	M		00MN00 00	Y	0	0	HR	5		P			Y		
14	0-28	mcl	10YR42 00	10YR46 00	F				0	0	HR	5							
	28-45	c	25Y 63 62	10YR68 00	M		00MN00 00	Y	0	0	HR	10		P			Y		
	45-70	c	25Y 63 62	10YR68 00	M			Y	0	0		0		P			Y		
15	0-30	mcl	10YR43 00						1	0	HR	5							
	30-70	c	25Y 61 62	75YR68 00	M			Y	0	0	HR	5		P			Y		
16	0-30	mcl	10YR43 00						2	0	HR	8							
	30-70	c	25Y 62 63	75YR58 68	M			Y	0	0	HR	5		P			Y		
17	0-30	mcl	10YR42 00	10YR46 00	F				1	0	HR	5							
	30-70	c	25Y 61 62	75YR58 00	M			Y	0	0	HR	5		P			Y		
18	0-30	mzcl	10YR43 00						2	0	HR	5							
	30-70	c	25Y 62 63	10YR68 00	M		00MN00 00	Y	0	0	CH	5		P			Y	Y	
19	0-30	hzcl	10YR43 00						1	0	HR	3							
	30-70	c	25Y 62 63	10YR68 00	C		00MN00 00	Y	0	0	CH	5		P			Y	Y	
20	0-30	mcl	10YR43 00						1	0	HR	5							
	30-63	mcl	10YR54 00	10YR58 00	F				0	0	HR	5		M					
	63-120	hcl	10YR54 64	10YR56 00	C		00MN00 00	S	0	0	HR	5		M					Sl.gley-not spl
21	0-23	mzcl	25Y 41 00	10YR46 00	F				0	0		0							Borderline hzcl
	23-60	c	25Y 62 63	10YR68 00	C			Y	0	0		0		P			Y		
	60-70	c	25Y 61 00	10YR68 00	M		00MN00 00	Y	0	0	CH	10		P			Y	Y	
22	0-30	mzcl	25Y 42 43	10YR58 00	F				0	0	HR	2							
	30-70	c	25Y 62 63	10YR68 00	M			Y	0	0		0		P			Y		
23	0-30	mcl	10YR42 43						1	0	HR	5							
	30-35	mcl	10YR43 00						0	0	CH	10		M				Y	
	35-70	c	25Y 63 62	10YR68 00	M			Y	0	0		0		P			Y		
24	0-30	mcl	10YR42 00						0	0	HR	5							
	30-70	mcl	10YR54 00	10YR56 00	F		00MN00 00		0	0		0		M					
	70-120	c	10YR53 52	10YR56 00	C		00MN00 00	Y	0	0	HR	5		P			Y		
25	0-28	fszl	10YR43 00						3	1	HR	10							
	28-35	mcl	10YR53 00	10YR56 00	C		00MN00 00	Y	0	0	HR	35		M					Imp 35 flinty

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
26	0-30	c	25Y 41 51	10YR58 00	C			Y	0	0	CH	2						Y	
	30-70	c	25Y 62 61	10YR68 00	C			Y	0	0		0		P			Y	Y	
27	0-25	hcl	25Y 42 00	10YR56 00	C			Y	0	0	HR	1						Y	
	25-60	c	25Y 62 63	10YR66 00	C			Y	0	0	CH	5		P			Y	Y	
	60-70	c	05Y 62 00	10YR66 00	C			Y	0	0		0		P			Y	Y	
28	0-25	mzcl	10YR43 42						0	0	HR	3							
	25-40	mcl	10YR43 44						0	0	HR	5		M					
	40-60	mcl	10YR54 00						0	0	HR	3		M					
	60-70	mcl	25Y 53 54	10YR58 00	C		00MN00 00	Y	0	0	HR	3		M					
	70-100	hcl	25Y 53 00	10YR58 00	M			Y	0	0		0		P			Y		Rel.pale- spl
29	0-25	mcl	10YR43 44						2	0	HR	4							
	25-70	c	25Y 62 63	10YR58 00	M			Y	0	0		0		P			Y		
30	0-30	mcl	10YR42 00						1	0	HR	8							
	30-50	mcl	10YR53 54	10YR56 00	C			Y	0	0	HR	15		M					
	50-60	mzcl	10YR53 54	10YR56 00	C		00MN00 00	Y	0	0	HR	5		M					
	60-75	hcl	10YR53 63	10YR56 00	C		00MN00 00	Y	0	0		0		M					Prob not spl (3P)
	75-120	c	25Y 62 00	10YR58 00	M			Y	0	0		0		P			Y		
31	0-25	mzcl	10YR43 00						2	0	HR	4							
	25-45	mzcl	10YR54 44	10YR56 00	F				0	0	CH	2		M					
	45-60	hzcl	10YR53 00	10YR58 00	C		00MN00 00	Y	0	0		0		M					Prob not spl (3P)
	60-120	c	25 Y53 00	10YR58 00	M			Y	0	0		0		P			Y		
32	0-30	mcl	10YR42 00	10YR56 00	F				1	2	HR	5							
	30-55	fsl	25 Y62 63	10YR58 00	M			Y	0	0	HR	2		M					
	55-75	hcl	25 Y63 00	10YR58 00	M		00MN00 00	Y	0	0		0		P			Y		Pale- spl (3P)
	75-120	lms	05GY08 00	10YR68 00	M			Y	0	0		0		M					
33	0-28	mcl	10YR42 43						2	0	HR	10							
	28-35	mcl	10YR54 00						0	0	HR	30		M					Imp 35 flinty
34	0-30	mcl	10YR42 00						0	0	HR	3						Y	
	30-38	hcl	10YR53 54	10YR56 00	C			Y	0	0	CH	10		M				Y	
	38-90	c	25Y 61 62	10YR68 00	M			Y	0	0		0		P			Y		
35	0-25	mcl	10YR42 00						1	0	HR	10							
	25-70	c	25Y 62 63	10YR58 00	M		05YR58 00	Y	0	0		0		P			Y		
36	0-30	mzcl	10YR43 53						1	0	HR	8							
	30-50	mzcl	10YR54 00	10YR56 00	F				0	0	HR	5		M					
	50-75	mzcl	10YR54 00	10YR56 00	F		00MN00 00		0	0	HR	5		M					
	75-95	hzcl	75YR54 00	75YR56 00	F		00MN00 00		0	0	HR	15		M					
	95-120	c	10YR62 00	75YR58 00	M		00MN00 00	Y	0	0		0		P			Y		