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**KENT MINERALS LOCAL PLAN REVIEW
Land at Paradise Farm, Newington, Kent**

**Agricultural Land Classification
ALC Map and Report**

June 1998

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT

KENT MINERALS LOCAL PLAN REVIEW LAND AT PARADISE FARM, NEWINGTON, KENT

INTRODUCTION

- 1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 55.6 ha of land to the south of the Newington in 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 Kent Minerals Local Plan Review. 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, agricultural land use was divided between apple and pear orchards, winter wheat and hemp. The areas mapped as Other land comprise tracks, residential dwellings and disused farm buildings at Paradise Farm.

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.

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
1	38.8	72.7	69.8
2	10.3	19.3	18.5
3a	4.3	8.0	7.7
Other Land	2.2		4.0
Total surveyed area	53.4	100	96.0
Total site area	55.6		100

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

- 7 The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. In total 57 borings and three soil pits were described.
- 8 The agricultural land at this site has been classified in the range Grade 1 (excellent quality) to Subgrade 3a (good quality) including an area of Grade 2 (very good quality) land towards the south of the site. Where they exist the principal limitations include soil wetness and soil droughtiness.
- 9 The land classified as Grade 1 is mainly located towards the centre of the site and is generally co-incident with the lower lying land. Soils in this area comprise deep light and medium silty textured topsoils and subsoils. The soils are either stoneless or very slightly stony and given the local climate the reserves of soil available water are high enough to be sufficient to meet crop needs throughout the growing season in most years. As a result this land has no or very minor limitations to agricultural use and is suitable for a very wide range of agricultural or horticultural crops.
- 10 Where Grade 2 land is mapped the soils are also deep but have a higher clay and sand content mostly comprising medium loamy topsoils overlying similar and more clayey subsoils. These soils have a slightly lower available moisture content compared with the land in Grade 1. In the local climate this acts to impart a slight soil droughtiness limitation which may act to slightly lower the level and consistency of crop yields. In many cases they also exhibit some signs of soil wetness which is also sufficient to limit them to Grade 2.
- 11 Towards the north and east of the site three relatively small areas have been classified as Subgrade 3a. The soils in this area comprise a medium silty topsoil which overlies deep clayey subsoils. These exhibit indications of soil wetness to the extent that in the local climate Subgrade 3a is appropriate. The effects of soil wetness in this area are likely to be more severe than in the areas mapped as Grade 2.
- 12 Soil wetness reduces the versatility of the land in terms of access by machinery (e.g. for cultivations or harvesting) and grazing by livestock if damage to the soil is to be avoided. Soil wetness will also adversely affect seed germination and root growth and will therefore reduce the level and consistency of yields.

FACTORS INFLUENCING ALC GRADE

Climate

- 13 Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.
- 14 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).
- 15 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.

Table 2 Climatic and altitude data

Factor	Units	Values	
		TQ 848 643	TQ 848 636
Grid reference	N/A		
Altitude	m AOD	35	55
Accumulated Temperature	day°C (Jan June)	1461	1438
Average Annual Rainfall	mm	643	655
Field Capacity Days	days	131	133
Moisture Deficit Wheat	mm	115	112
Moisture Deficit Potatoes	mm	109	106
Overall climatic grade	N/A	Grade 1	Grade 1

- 16 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
- 17 The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. The site is not believed to be either frost prone or to suffer from exposure. As such the site may be considered as being climatically Grade 1. However climatic factors do interact with soil properties to influence soil wetness and soil droughtiness. At this locality the high moisture deficits present as a result of the local climate may enhance the likelihood of soil droughtiness problems.

Site

- 18 The survey area lies between approximately 35m and 60m AOD. The highest land is located towards the south and north east of the site with gentle slopes towards the centre and north west of the site so forming a shallow dry valley which continues to fall to the north west beyond the site boundary. Nowhere on the site does gradient or microrelief adversely affect agricultural land quality.

Geology and soils

- 19 The most detailed published geological information for this area (BGS 1977) maps the majority of this area to comprise drift deposits of head brickearth. To the south west and north east solid Thanet Beds are shown. This broadly equates to the areas of higher land within the site.
- 20 The most recent published soils information covering the area (SSEW 1983) shows the site to consist of soils from the Hamble 1 Association. These soils are described as Deep well drained often stoneless fine silty soils. Some similar soils affected by groundwater and some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging (SSEW 1983). These soils are similarly described in Soils of Kent (SSEW 1980) and are represented throughout the site.
- 21 The 1:10,000 sheet indicates the presence of deneholes which are believed to indicate the presence of small localised areas where brickearth was worked by hand in former times. These do not appear to have had a significant effect on soils found within the site.

AGRICULTURAL LAND CLASSIFICATION

- 22 The details of the classification of the survey area are shown on the attached ALC map and the area statistics of each grade are given in Table 1
- 23 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 1

- 24 Grade 1 excellent quality land occurs on the lower lying land through the centre of the site and towards the north east of the site. This land has no or very minor limitations to agricultural use. Profiles comprise non-calcareous silt loam and medium silty clay loam topsoils which overlie similarly textured or slightly heavier (heavy silty clay loam) subsoils some of which become calcareous at moderate depths. Topsoils are very slightly stony containing 0-3% total flints (all of which are smaller than 2cm). Subsoils were mostly stone free although occasionally up to 2% flints and/or 2% chalk fragments were observed. Although some profiles were observed to be gleyed at moderate depths (50cm+) this slight restriction is insufficient to restrict the land quality and the profiles are assessed as being well drained (Wetness Class I). All the subsoils are moderately structured and permeable they are typified by Pit 2 (see Appendix II).
- 25 The combination of light loamy topsoil textures and the prevailing climate means that this land has no or very minor restrictions on the flexibility of cropping, stocking and cultivations. In addition the silt content of the soils means that these profiles have high reserves of soil available water to support a very wide range of agricultural or horticultural crops throughout the growing season in most years. Consequently Grade 1 is appropriate.

Grade 2

- 26 Land classified as Grade 2 very good quality has minor soil droughtiness and wetness limitations. The profiles are represented by soil pit 1 (see Appendix II) and typically comprise non calcareous medium clay loam and medium silty clay loam topsoils. Upper subsoils are of similar texture generally becoming heavier with greater depth (heavy clay loam and clay). The topsoils are very slightly stony containing up to 4% total flints by volume with 1% larger than 2cm. Subsoils have a similar or smaller stone content. The higher clay sand and stone content of these soils means that the available water content of these soils is slightly lower than those classified as Grade 1 and as such leads this area to be classified as Grade 2 on the basis of soil droughtiness. This limitation is likely to adversely affect crop growth as water supply may not match demand especially in drier years.
- 27 Some of the profiles examined also exhibit indications of soil wetness. This was in the form of gleying in most cases usually within 40cm depth. Where clay was present this was assessed as being slowly permeable in common with the clay lower subsoil at soil pit 3 (see Appendix II). The shallow depth to gleying and slowly permeable horizons (where present) lead to Wetness Class II being applied given the local climatic parameters. When combined with the medium topsoils Grade 2 is appropriate. This slight soil wetness limitation restricts the number of days when either cultivations or grazing should occur without damaging the soil. It

can also adversely affect crop quality and yield. Nevertheless such land is suitable for a wide range of agricultural and horticultural uses.

Subgrade 3a

- 28 Land of good quality has been mapped in three separate areas within the site to the north and east. The principal limitation is soil wetness and the profiles are typified by soil pit 3 (see Appendix II)
- 29 Soil profiles in this area typically comprise a non-calcareous medium silty clay loam or clay loam topsoil overlying clayey upper subsoils with occasionally medium silty clay loam or medium clay loam lower subsoils. Stone contents are typically slight throughout the profile to a maximum of 2% flints by volume. The presence of ochreous mottles in pale coloured matrices indicate that wetness is present in these soils. These occur in the upper subsoil ie within 40cm of the surface. The pit confirms that some of the clay horizons are slowly permeable and as such these cause drainage to be impeded. In the dry local climate this places these profiles in Wetness Class III and when combined with the medium topsoils leads to Subgrade 3a being appropriate. The drainage impedance is sufficient to give some restriction on access to the land for cultivations and/or grazing if soil damage is to be avoided. The imperfect drainage is also likely to cause crop yields to be less consistent than on land of higher quality.

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SOURCES OF REFERENCE

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Soil Survey of England and Wales (1980) *Soils of Kent Soil Survey Bulletin No 9*
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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

Sample location map

Soil abbreviations - explanatory note

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 **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 **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	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

SAMPLE NO	GRID REF	ASPECT USE	--WETNESS--				WHEAT-		-POTS-		M REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	ORT					
5	TQ84706450	WHT				1	1	160	45	124	15	1			1		
6	TQ85416417	WHT NW	4	28	28	3	3A	102	-13	118	9	3A		WE	3B	3PI70 DR-120 2	
7	TQ85336403	WHT	3	29	50	3	3A	154	39	121	12	1		WE	3A		
9	TQ84606440	WHT				1	1	160	45	124	15	1			1	SL GLEY 60	
10	TQ84706440	WHT				1	1	160	45	124	15	1			1	SL GLEY 50	
11	TQ84806440	WHT				1	1	158	43	122	13	1			1		
12	TQ84906440	WHT		50		1	1	159	44	123	14	1			1	SEE 2P	
13	TQ85006440	ORC		75	100	1	1	149	34	115	6	2		DR	2	SEE 3P	
14	TQ85106440	ORC NE	2	29	50	3	3A	145	30	121	12	1		WE	3A	3P LOCATION	
15	TQ84506430	ORC		30		2	2	158	43	120	11	1		WE	2		
16	TQ84606428	ORC W	1			1	1	160	45	124	15	1			1		
17	TQ84706430	WHT		55		1	1	160	45	124	15	1			1		
18	TQ84806430	WHT				1	1	159	44	123	14	1			1		
19	TQ85106430	WHT		26	50	3	3A	141	26	117	8	2		WE	3A	PIT 3	
20	TQ85206430	WHT SE	2			1	1	158	43	122	13	1			1		
21	TQ85306430	WHT SW	3			1	1	162	47	126	17	1			1		
22	TQ85406430	WHT SW	3	46	46	2	2	145	30	119	10	1		WE	2		
23	TQ84406420	ORC		60		1	1	153	38	123	14	1			1		
24	TQ84506420	ORC N	1	65		1	1	159	44	123	14	1			1		
25	TQ84606420	ORC N	1	65		1	1	160	45	124	15	1			1		
26	TQ84706420	HMP N	1	45		1	1	160	45	124	15	1			1	HMP HEMP	
27	TQ84806420	HMP N	1			1	1	159	44	123	14	1			1		
28	TQ85306420	WHT N	2			1	1	196	81	148	39	1			1		
29	TQ85406420	WHT		32	50	3	3A	146	31	122	13	1		WE	3A	SEE 3P	
30	TQ84506410	HMP N	1	65		1	1	158	43	122	13	1			1		
31	TQ84616410	HMP N	1			1	1	159	44	123	14	1			1	2P LOCATION	
32	TQ84706410	HMP N	1			1	1	160	45	124	15	1			1		
33	TQ84806410	HMP N	1			1	1	160	45	124	15	1			1		
34	TQ85306410	WHT	2			1	1	162	47	126	17	1			1		
35	TQ84406400	ORC N	1	70	90	1	1	147	32	115	6	2		DR	2	SPL 90 SEE 3P	
36	TQ84506400	ORC N	1	0		2	2	151	36	114	5	2		WD	2		
37	TQ84606400	HMP N	2	50	95	1	1	152	37	122	13	1			1		
38	TQ84706400	HMP N	2	28		2	2	158	43	122	13	1		WE	2		
39	TQ84806400	HMP N	1	75		1	1	171	56	135	26	1			1		
40	TQ84406390	ORC NW	2	30		2	2	152	37	114	5	2		WD	2		
41	TQ84506390	ORC		50	70	2	2	138	23	113	4	2		WD	2	SPL 70 SEE 3P	
42	TQ84606390	ORC		25		2	2	152	37	116	7	2		WD	2	1P LOCATION	
43	TQ84706390	ORC		90		1	1	158	43	122	13	1			1		
44	TQ84806390	ORC				1	1	159	44	123	14	1			1	CALC45+ SLGL65	
45	TQ84906390	ORC				1	1	159	44	123	14	1			1	CALC 50+	
46	TQ84506380	ORC NW	1	30		2	2	151	36	114	5	2		WD	2		
47	TQ84606380	ORC		22	50	3	3A	147	32	114	5	2		WE	3A	SPL 50 SEE 3P	

SAMPLE NO	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		POTS-		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
48	TQ84726379	ORC W	2	80	1	1	183	68	148	39	1			1	
49	TQ84806380	WHT NE	2		1	1	194	79	156	47	1			1	
50	TQ84906380	ORC N	2	48	1	1	159	44	123	14	1			1	
51	TQ85006380	ORC NE	2		1	1	182	67	146	37	1			1	
52	TQ84606370	ORC NE	3	43	55	2	2	108	-7	115	6	3A		WD	2 IMP80 DR 120-
53	TQ84706370	WHT NE	3		1	1	204	89	148	39	1			1	
54	TQ84806370	ORC NE	1		1	1	187	72	152	43	1			1	
55	TQ84906370	ORC N	2		1	1	185	70	151	42	1			1	CHALKY 60+
56	TQ85006370	HMP NE	1		1	1	167	52	131	22	1			1	
57	TQ85106370	HMP NW	2	28	28	4	3B	152	37	116	7	2		WE	3B SPL 28 SEE 3P
58	TQ84706360	WHT NE	1	55		1	1	147	32	107	-2	2		DR	2 IMP45X2 NEARBY
59	TQ84806360	ORC NE	2		1	1	187	72	153	44	1			1	
60	TQ84906360	WHT NE	2	90		1	1	182	67	146	37	1		1	
61	TQ85006360	WHT NE	1	70		1	1	159	44	123	14	1		1	SL GLEY 60
62	TQ84806350	ORC NE	2	70		1	1	152	37	115	6	2		DR	2
1P	TQ84606390	ORC		37		2	2	150	35	112	3	2		WD	2 PIT 120
2P	TQ84616410	HMP N	1	56		1	1	170	55	134	25	1		1	PIT 120
3P	TQ85106440	ORC NE	2	28	48	3	3A	144	29	120	11	2		WE	3A PIT 90 AUG 120

SAMPLE	DEPTH	TEXTURE	COLOUR	-MOTTLES -			PED	- STONES----			STRUCT/	SUBS	STR	POR	IMP	SPL	CALC	
				COL	ABUN	CONT		COL	GLE	2								6
5	0 30	MZCL	10YR42							0	0	HR	2					
	30 45	MZCL	10YR43							0	0		0		M			
	45 60	MZCL	10YR54							0	0		0		M			
	60 120	MZCL	10YR54					FEW MN		0	0	CH	1		M		Y	
6	0 28	HCL	10YR42							0	0		0				Y	SEE 3P WCIII
	28 70	C	25Y 63	10YR56		C	F		Y	0	0		0		M		Y	Y
7	0 29	MZCL	10YR42							0	0		0					SEE 3P
	29 50	C	25Y 64	10YR66		C	D		Y	0	0		0		M			
	50 76	C	25Y 64	10YR66		C	D		Y	0	0		0		M		Y	
	76-120	MZCL	25Y 63	10YR66		C	D		Y	0	0		0		M			
9	0 30	MZCL	10YR42							0	0	HR	2					
	30 60	MZCL	10YR54	10YR56		F	F	FEW MN		0	0		0		M			
	60 120	MZCL	10YR54	10YR56		C	F	FEW MN	S	0	0		0		M			SLIGHTLY GLEYED
10	0 30	MZCL	10YR42							0	0	HR	2					
	30 50	MZCL	10YR54							0	0	CH	2		M		Y	
	50 80	MZCL	10YR54	10YR56		C	F		S	0	0		0		M		Y	SLIGHTLY GLEYED
	80 120	MZCL	10YR54	10YR56		C	F		S	0	0		0		M		N	SLIGHTLY GLEYED
11	0 30	MZCL	10YR42							0	0	HR	3					
	30 55	MZCL	25Y 54							0	0	HR	2		M			
	55 120	MZCL	10YR54					FEW MN		0	0	CH	2		M		Y	
12	0 30	MZCL	10YR42							0	0	HR	2					
	30 50	MZCL	10YR44 54							0	0	HR	2		M			
	50 120	HZCL	10YR53 52	10YR56		C	F	FEW MN	Y	0	0		0		M			
13	0 25	MCL	10YR42 41							0	0	HR	2					
	25 75	MCL	10YR53 54							0	0	HR	2		M			SLIGHTLY SANDY
	75 100	HCL	25Y 52 53	10YR56 58		C	D		Y	0	0		0		M			SLIGHTLY SANDY
	100 120	C	05Y 52 53	10YR58		M	D		Y	0	0		0		M		Y	SEE 3P
14	0-29	MZCL	25Y 42							0	0		0					3P LOCATION
	29 50	C	25Y 54	10YR66		C	D		Y	0	0		0		M		N	
	50 120	C	25Y 53	10YR66		M	D		Y	0	0		0		M		Y	
15	0 30	MZCL	10YR42							1	0	HR	4				Y	LIMED TOPSOIL
	30 60	MZCL	10YR53 54	10YR56		C	F	FEW MN	Y	0	0	HR	3		M			
	60 75	MCL	10YR53	10YR56		C	D	COM MN	Y	0	0		0		M			SLIGHTLY SANDY
	75 120	MZCL	10YR53 54	10YR56		C	D	COM MN	Y	0	0		0		M			
16	0-28	MZCL	10YR43 42							0	0	HR	2					LIMED TS BDR ZL
	28-120	MZCL	10YR54					FEW MN		0	0		0		M			
17	0 28	MZCL	10YR42							0	0	HR	2					
	28 55	MZCL	10YR54	10YR56		F	F			0	0		0		M			
	55 120	HZCL	10YR54 53	10YR56		C	F	FEW MN	Y	0	0		0		M			

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES - PED			-- STONES----			STRUCT/	SUBS	SPL	CALC				
				COL	ABUN	CONT	COL	GLEYS	>2					>6	LITH	TOT	CONSIST
18	0-30	MZCL	10YR42						0	0	HR	2					
	30-45	MZCL	10YR43						0	0	HR	2		M			
	45-65	MZCL	10YR54						0	0		0		M			
	65-120	MZCL	10YR64	10YR56	F	F	FEW MN		0	0	CH	2		M			Y
19	0-26	MCL	10YR32						0	0		0					SEE 3P
	26-50	C	10YR64	10YR68	M	D		Y	0	0		0		M			
	50-120	C	25Y 53 51	10YR66	C	D		Y	0	0		0		M		Y	
20	0-32	MCL	10YR42						0	0		0					
	32-120	MZCL	10YR66						0	0		0		M			
21	0-36	MZCL	10YR53						0	0		0					BORDER ZL
	36-120	MZCL	25Y 54						0	0		0		M			
22	0-26	MZCL	10YR42						0	0		0					
	26-46	MZCL	10YR53						0	0		0		M			
	46-120	ZC	25Y 64	10YR68	M	D		Y	0	0		0		M		Y	SEE 3P
23	0-27	MZCL	10YR42						0	0	HR	2					
	27-60	MZCL	10YR44						0	0		0		M			
	60-90	HZCL	10YR52 54	10YR56	C	F	FEW MN	Y	0	0		0		M			
	90-120	ZC	10YR52 54	10YR56	C	F		Y	0	0		0		M		Y	SEE 3P
24	0-30	MZCL	10YR42						0	0	HR	3					
	30-65	MZCL	10YR44						0	0		0		M			
	65-120	MZCL	10YR54	10YR56	C	F	FEW MN	Y	0	0		0		M			
25	0-28	MZCL	10YR42						0	0	HR	2					
	28-65	MZCL	10YR54	10YR56	F	F			0	0		0		M			
	65-120	MZCL	10YR54 53	10YR56	C	F	FEW MN	Y	0	0		0		M			
26	0-28	MZCL	10YR42						0	0	HR	2					
	28-45	MZCL	10YR54	10YR56	F	F			0	0		0		M			
	45-120	MZCL	10YR54 52	10YR56 66	C	D	FEW MN	Y	0	0		0		M			
27	0-30	MZCL	10YR42						0	0	HR	2					BORDER ZL
	30-80	MZCL	10YR54 44						0	0	HR	2		M			
	80-120	MZCL	10YR54	10YR52	C	D	COM MN		0	0		0		M			MOTS NOT OCHRE
28	0-25	FSZL	10YR42	75YR56	C	F			0	0	HR	1					ROOT MOTTLES
	25-90	FSZL	10YR43						0	0	HR	1		M			
	90-120	MCL	10YR43						0	0	HR	1		M			
29	0-32	MZCL	10YR42						0	0		0					
	32-50	C	25Y 64	10YR66	C			Y	0	0		0		M			
	50-80	C	25Y 64	10YR66	C			Y	0	0		0		M		Y	
	80-120	C	25Y 63	10YR66	C			Y	0	0		0		M		Y	

SAMPLE	DEPTH	TEXTURE	COLOUR	-- MOTTLES		--- PED		----STONES----			STRUCT/ CONSIST	SUBS			CALC			
				COL	ABUN	CONT	COL	GLE	>2	>6		LITH	TOT	STR		POR	IMP	SPL
30	0-30	MZCL	10YR41 42						1	0	HR	5					SL MIXED TS/SS	
	30-65	MZCL	10YR54						0	0		0			M			
	65-120	HZCL	10YR54 52	10YR56	C	F	FEW MN	Y	0	0		0			M			
31	0-25	MZCL	10YR42						0	0	HR	2					BORDER ZL	
	25-70	MZCL	10YR44 54						0	0		0			M			
	70-120	HZCL	10YR44 54	10YR56	F	F	FEW MN		0	0		0			M			
32	0-30	MZCL	10YR42						0	0	HR	2						
	30-75	MZCL	10YR44 54						0	0		0			M			
	75-120	MZCL	10YR44 54	10YR52	C	D	COM MN		0	0		0			M		MOTS NOT OCHRE	
33	0-30	MZCL	10YR42						0	0	HR	2						
	30-80	MZCL	10YR44 54	10YR56	F	F			0	0		0			M			
	80-120	MZCL	10YR54	10YR52	C	D			0	0		0			M			
34	0-37	MZCL	10YR42						0	0		0						
	37-120	MZCL	10YR53						0	0		0			M			
35	0-30	MCL	10YR42						0	0	HR	3					WITH FINE SAND	
	30-70	MCL	10YR44						0	0	HR	2			M		WITH MED SAND	
	70-90	HCL	25Y 53	10YR56	C	F	FEW MN	Y	0	0	HR	2			M		Y	
	90-120	C	25Y 52 53	10YR56 58	M	D	FEW MN	Y	0	0	HR	2			M		Y	Y
36	0-30	MCL	10YR32 42	10YR46 56	C	D	FEW MN	Y	0	0	HR	3						
	30-60	HCL	10YR53	10YR58	M	D			Y	0	0	HR	5		M			
	60-120	HCL	10YR53	10YR58	M	D	FEW MN	Y	0	0	HR	3			M			
37	0-29	MZCL	10YR42				FEW MN		0	0	HR	3						
	29-50	MZCL	10YR44	10YR56	F	F	FEW MN		0	0	HR	3			M			
	50-95	HZCL	10YR53 63	10YR56	C	F	FEW MN	Y	0	0	HR	2			M			
	95-120	ZC	10YR52 53	10YR46 58	M	D	COM MN	Y	0	0		0			P		Y	SEE 3P
38	0-28	MZCL	10YR32 42						0	0	HR	3						
	28-48	MZCL	10YR53	10YR56	C	F	FEW MN	Y	0	0	HR	2			M			
	48-120	HZCL	10YR53 63	10YR56 58	C	F	FEW MN	Y	0	0		0			M			
39	0-27	ZL	10YR42						0	0		0						
	27-75	MZCL	10YR44				FEW MN		0	0		0			M			
	75-120	MZCL	10YR52 53	10YR46 56	C	D	FEW MN	Y	0	0		0			M			
40	0-30	MCL	10YR42	10YR46	C	F			0	0	HR	5						
	30-48	MCL	10YR53	10YR56	C	F			Y	0	0	HR	5		M			
	48-70	HCL	25Y 53	10YR56	C	F			Y	0	0		0		M		SLIGHTLY SANDY	
	70-120	HCL	25Y 52 53	10YR56 46	M	D			Y	0	0		0		M		SLIGHTLY SANDY	
41	0-20	MCL	10YR42						0	0	HR	3						
	20-50	MCL	10YR53	10YR56	F	F	FEW MN		0	0	HR	5			M			
	50-70	HZCL	25Y 52 53	10YR46 58	M	D	COM MN	Y	0	0	HR	5			M			
	70-120	C	25Y 52 62	75YR58	M	D	COM MN	Y	0	0	HR	5			M		Y	SEE 3P

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES----			PED COL	---STONES ---			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR		FOR
53	0 25	ZL	10YR42						2	0	HR	3				
	25 90	FSZL	10YR44						0	0	HR	3		M		
	90 120	FSL	10YR54						0	0		0		M		
54	0-35	ZL	10YR42						0	0	HR	1				
	35 60	ZL	10YR43						0	0		0		M		
	60-80	MZCL	10YR43						0	0		0		M		
	80 120	MZCL	10YR44	10YR56	F	F			0	0		0		M		
55	0-25	ZL	10YR42						0	0	HR	1				
	25-60	ZL	10YR43						0	0		0		M		
	60-120	MZCL	10YR43						0	0	CH	5		M		Y
56	0 25	ZL	10YR42						0	0	HR	2				
	25 120	MZCL	10YR54 44				FEW MN		0	0	HR	2		M		
57	0 28	HZCL	10YR42						0	0	HR	2				
	28 65	ZC	10YR53	10YR66	M	D		Y	0	0		0		M		Y
	65-75	HZCL	25Y 53	10YR68	M	D		Y	0	0		0		M		SEE 3P
	75 95	MCL	25Y 53	10YR58	M	D		Y	0	0		0		M		SLIGHTLY SANDY
	95-120	MCL	25Y 61	10YR68	M	D		Y	0	0		0		M		WITH FINE SAND
58	0-30	MCL	10YR42						0	0	HR	5				WITH FINE SAND
	30 45	MSL	10YR53	10YR56	F	D			0	0	HR	20		M		HR SANDST HERE
	45 55	MSL	25Y 54	10YR56	F	D			0	0	HR	5		M		
	55-70	SCL	25Y 54	10YR56	C	F		Y	0	0		0		M		WITH FINE SAND
	70 120	HZCL	25Y 54	10YR56	C	F		Y	0	0		0		M		
59	0 27	FSZL	10YR32						1	0	HR	2				
	27 70	ZL	10YR43						0	0		0		M		
	70 120	MZCL	10YR54						0	0		0		M		
60	0 40	ZL	10YR32						1	0	HR	2				
	40 50	ZL	10YR54						0	0	HR	1		M		
	50 90	MZCL	10YR54						0	0		0		M		
	90-120	MZCL	10YR53 54	10YR58	C	D		Y	0	0		0		M		
61	0-30	MZCL	10YR42						0	0	HR	3				
	30-60	MZCL	10YR44	10YR56	F	F	FEW MN		0	0		0		M		
	60-70	HZCL	10YR44 54	10YR56	C	F		S	0	0		0		M		SLIGHTLY GLEYED
	70-120	HZCL	10YR54 52	10YR56	C	F		Y	0	0		0		M		
62	0-25	MCL	10YR42						0	0	HR	3				
	25-60	MCL	25Y 44						0	0	HR	3		M		WITH FINE SAND
	60-70	MZCL	10YR44 54						0	0		0		M		
	70-120	HZCL	10YR53 54	10YR56 66	C	D		Y	0	0		0		M		
1P	0-26	MCL	10YR42 41						2	1	HR	5				
	26 37	MCL	10YR54	10YR56 58	F	F	10YR54 44		0	0	HR	5	MDCSAB	FR	M	
	37 73	MCL	10YR53 63	10YR56 58	C	D		Y	0	0	HR	5	MDCSAB	FR	M	
	73-120	HCL	25Y 63	10YR58	M	D		Y	0	0		0	MDCSAB	FR	M	PIT 120

