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WEST SUSSEX MINERALS PLAN
SITE 3: BRICK KILN FARM,
CHICHESTER
AGRICULTURAL LAND CLASSIFICATION
ALC MAP & REPORT
NOVEMBER 1993

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SITE 3: BRICK KILN FARM, CHICHESTER
AGRICULTURAL LAND CLASSIFICATION REPORT

1.0 Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on a number of sites in West Sussex. The work forms part of MAFF's statutory input to the preparation of the West Sussex Minerals Plan.

1.2 Approximately 49 hectares of land relating to Site 3 around Brick Kiln Farm close to Chichester was surveyed during November 1993. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 45 soil auger borings and 2 soil inspection pits were assessed in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on its use for agriculture.

1.3 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of the survey the landuse on the site was a mixture of cereals, field vegetables and permanent grassland.

1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:5000. It is accurate at this scale, but any enlargement would be misleading. This map supercedes any previous survey information for this site.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	%of Site	% of Agricultural Area
2	35.6	71.6	78.9
3a	3.3	6.7	7.3
3b	6.2	12.5	13.8
Non agricultural land	1.1	2.2	100.0 (45.1 ha)
Urban	3.2	6.4	
Agricultural buildings	0.3	0.6	
Total area of site	49.7	100.0	

1.6 Appendix 1 gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.7 The site has been classified as Grade 2 and Subgrades 3a and 3b with soil droughtiness as the main limitation to agricultural use. Most of the land surveyed has been classified as Grade 2. Although soils have inadequate reserves of available water in the profile to qualify for a higher grade due to subsoil textural and structural characteristics the land is only slightly limited by soil droughtiness. Subsoils in the Subgrade 3a mapping unit are more stony and thereby cause a moderate restriction to profile available water. The area shown as Subgrade 3b is more severely limited due to the presence of a very stony subsoil. The high stone volumes significantly restrict profile available water for plant growth and restrict the range of crops that can tolerate such conditions.

2.0 Climate

2.1 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.

2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (degree days Jan-June), as a measure of the relative warmth of a locality.

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site.

2.4 No local climatic factors such as exposure or frost risk affect the site. However, climatic factors and soil factors do interact to influence soil wetness and droughtiness limitations.

Table 2 : Climatic Interpolation

Grid Reference :	SU 883 036
Altitude (m) :	10
Accumulated Temperature (days) :	1539
Average Annual Rainfall (mm) :	768
Field Capacity (days) :	157
Moisture Deficit, Wheat (mm) :	118
Moisture Deficit, Potatoes (mm) :	114
Overall Climatic Grade :	1

3.0 Relief

3.1 The site lies at an altitude of 10 metres and is level.

4.0 Geology and Soil

4.1 The relevant geological sheet for the site (BGS Sheet 317, Chichester 1957) shows the underlying geology to be Valley Gravel.

4.2 The published soils information for the area (SSEW Sheet 6, Soils of South East England 1983) shows that the main soil type which occurs on the site is of the Hamble 2 association. These are described as deep stoneless well drained silty soils and similar soils affected by groundwater; over gravel locally (SSEW, 1983). Detailed field examination broadly confirms this, in particular the soils on some parts of the site were found to have very stony subsoils over gravel.

5.0 Agricultural Land Classification

5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

5.2 The location of the soil observation points are shown on the attached sample point map.

5.3 Grade 2: The majority of the agricultural land on the site has been classified as Grade 2, very good quality land, with soil droughtiness as the main limitation. Profiles typically comprise medium silty clay loams which become heavier and occasionally less silty with depth. A soil inspection pit (pit 2) was dug within this mapping unit, confirming that the soils tend to be stoneless with no evidence of a wetness limitation, Wetness Class I, being generally typical of the Grade 2 soils on the site. However, these soils are limited by a slight soil droughtiness imperfection due to the combination of soil textures and moderate substructural conditions with the local climatic regime.

5.4. Subgrade 3a: A small area of land (3.3 ha.) in the north-east of the site has been classified as Subgrade 3a, good quality land, with soil droughtiness as the main limitation. Soil profiles typically comprise medium silty clay loam topsoils which become heavier with depth. Topsoils and subsoils tend to be very slightly or slightly stony, becoming impenetrable to the auger at a depth of approximately 70 cm. The restricted soil depths, textures and slight stone contents in these profiles means that there is a moderate restriction on the amount of profile available water and the range of crops that can tolerate such conditions. There were a small number of soil augerings across the site which had a resultant classification of Subgrade 3a, these were not regarded as sufficiently extensive to warrant mapping as a separate unit.

5.4 Subgrade 3b The remainder of the site is classified as Subgrade 3b, moderate quality land, with soil droughtiness as the main limitation. The majority of soil inspections in this unit proved impenetrable below the topsoil. A subsequent soil inspection pit (pit 1) revealed the presence of a very stony subsoil which proved impenetrable to digging at 75 cm. Above this, the topsoil consists of a medium silty clay loam containing approximately 10% total flints by volume. A very stony upper subsoil comprising a medium silty clay loam contains approximately 60% total flints by volume. Below this there is a lower subsoil of similar texture with a similar stone content, but with a poor substructural condition. Rooting within the profile was observed to a depth of 70cm. Although the profile is well drained, Wetness Class I, these soils suffer significant droughtiness problems as a result of the high profile stone contents and soil conditions in combination with local climatic factors, which will severely restrict available water for crop growth.

ADAS REFERENCE :4203/240/93
MAFF REFERENCE : EL 42/228

Resource Planning Team
Guildford Statutory Group
ADAS Reading

APPENDIX I

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 on the 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.

Grade 3 : Good To Moderate Quality Agricultural Land

Land with moderate limitations which affect the choice of crops, 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.

Sub-grade 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.

Sub-grade 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 (eg. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. the grade also includes very droughty arable land.

Grade 5 : Very Poor Quality Agricultural Land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture : housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including : private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland.

Agricultural Buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

Open Water

Includes lakes, ponds and rivers as map scale permits.

Land Not Surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

REFERENCES

* British Geological Survey (1957), Sheet No.317, Chichester, 1:50,000

* MAFF (1988), Agricultural Land Classification of England And Wales : revised guidelines and criteria for grading the quality of agricultural land.

* Meteorological Office (1989), Climatological Data for Agricultural Land Classification.

* Soil Survey of England and Wales (1983), Sheet No.6, Soils of South East England, 1:250,000. And accompanying legend.

APPENDIX III

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for 31-90 days in most years.

Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not wet within 40cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40cm depth for more than 335 days in most years.

(The number of days is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.)

APPENDIX IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

2. MOTTLE COL : Mottle colour

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

6. STONE LITH : One of the following is used.

HR : all hard rocks and stones MSST : soft, medium or coarse grained sandstone
SI : soft weathered igneous or metamorphic SLST : soft oolitic or dolimitic limestone
FSST : soft, fine grained sandstone ZR : soft, argillaceous, or silty rocks CH : chalk
GH : gravel with non-porous (hard) stones GS :gravel with porous (soft) stones

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

7. STRUCT : the degree of development, size and shape of soil peds are described using the following notation:

- degree of development WK : weakly developed MD : moderately developed ST : strongly developed

- ped size F : *fine* M : *medium* C : *coarse* VC : *very coarse*

- ped shape S : single grain M : massive GR : granular AB : angular blocky SAB : sub-angular blocky PR : prismatic PL : platy

8. 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

9. SUBS STR : Subsoil structural condition recorded for the purpose of calculating profile droughtiness.

G : good M : moderate P : poor

10. POR : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

11. IMP : If the profile is impenetrable a 'Y' will appear in this column at the appropiate horizon.

12. SPL : Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

13. CALC : If the soil horizon is calcareous, a 'Y' will appear in this column.

14. 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 PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a database. This has commonly used notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF** : national 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 **HRT** : Horticultural Crops **PGR** : Permanent Pasture **LEY** : Ley Grass **RGR** : Rough Grazing
SCR : Scrub **CFW** : Coniferous Woodland **DCW** : Deciduous Woodland **HTH** : Heathland **BOG** : Bog or Marsh
FLW : Fallow **PLO** : Ploughed **SAS** : Set aside **OTH** : Other

3. **GRDNT** : Gradient as measured by a hand-held optical clinometer.

4. **GLEY/SPL** : Depth in cm to gleying or slowly permeable layers.

5. **AP (WHEAT/POTS)** : Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)** : Moisture Balance.

7. **DRT** : Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, an entry of 'Y' will be entered in the relevant column.

MREL : Microrelief limitation **FLOOD** : Flood risk **EROSN** : Soil erosion risk **EXP** : Exposure limitation **FROST** : Frost
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** : Soil Erosion Risk **WD** : Combined 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
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 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)

SOIL PIT DESCRIPTION

Site Name : WSUSSEX MINS SITE 3 Pit Number : 1P

Grid Reference: SU87980383 Average Annual Rainfall : 768 mm
Accumulated Temperature : 1539 degree days
Field Capacity Level : 157 days
Land Use : Cereals
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	MZCL	10YR42 00	0	10		
30- 42	MZCL	10YR32 00	0	60		
42- 70	MZCL	10YR32 00	0	60		

Wetness Grade : 1 Wetness Class : I
Gleying :000 cm
SPL : No SPL

Drought Grade : 3B APW : 70 mm MBW : -48 mm
APP : 76 mm MBP : -38 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : WSUSSEX MINS SITE 3 Pit Number : 2P

Grid Reference: SU88350374 Average Annual Rainfall : 768 mm
Accumulated Temperature : 1539 degree days
Field Capacity Level : 157 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	MZCL	10YR43 00	0	1		
28- 46	MZCL	10YR54 00	0	1		MDCOAB
46-120	HZCL	75YR54 00	0	1		MDCSAB

Wetness Grade : 1 Wetness Class : I
Gleying :000 cm
SPL : No SPL

Drought Grade : 2 APW : 159mm MBW : 41 mm
APP : 123mm MBP : 9 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Droughtiness

SAMPLE NO.	GRID REF	USE	ASPECT		--WETNESS--		-WHEAT-		-POTS-		M.REL	EROSN	FROST	CHEM	ALC	
			GRDNT	GLEY SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	COMMENTS
1	SU87900410	CER			1	1	101	-17	113	-1	3A				DR 3A	IMPEN 75
1P	SU87980383	CER			1	1	70	-48	76	-38	3B				DR 3B	
2	SU88000410	CER			1	1	126	8	118	4	2				DR 2	
2P	SU88350374	PGR			1	1	159	41	123	9	2				DR 2	
3	SU88100410	CER	040		1	1	108	-10	114	0	3A				DR 3A	
4	SU88200410	CER	045		1	1	104	-14	109	-5	3A				DR 3A	IMPEN 75
6	SU88400410	PGR			1	1	84	-34	84	-30	3B				DR 3B	IMP50SEE1P
7	SU87900400	CER			1	1	118	0	118	4	3A				DR 3A	IMPEN 90
9	SU88100400	CER			1	1	123	5	115	1	2				DR 2	IMPEN 100
10	SU88000400	CER			1	1	130	12	119	5	2				DR 2	
12	SU88400400	CER			1	1	96	-22	101	-13	3B				DR 3B	IMPEN 60
13	SU88500400	CER			1	1	104	-14	117	3	3A				DR 3A	IMPEN 70
14	SU88600400	CER			1	1	62	-56	62	-52	4				DR 4	IMP35SEE1P
15	SU87900390	CER			1	1	84	-34	87	-27	3B				DR 3B	IMPEN 55
16	SU88000390	CER			1	1	117	-1	117	3	3A				DR 3A	IMPEN 85
17	SU88100390	CER			1	1	135	17	117	3	2				DR 2	
18	SU88190388	VEG			1	1	122	4	119	5	3A				DR 3A	
19	SU88300390	CAB	060		1	1	128	10	120	6	2				DR 2	
20	SU88400390	CER			1	1	123	5	120	6	2				DR 2	
21	SU88500390	PGR			1	1	113	-5	120	6	3A				DR 3A	IMPEN 75
22	SU88600390	PGR			1	1	99	-19	105	-9	3A				DR 3A	IMPEN 60
23	SU87900380	PGR			1	1	62	-56	62	-52	4				DR 4	IMPEN 35
24	SU88000380	CER			1	1	66	-50	68	-46	3B				DR 4	IMPEN 40
25	SU88100380	HOR	075		1	1	155	37	121	7	2				DR 2	
26	SU88200380	HOR			1	1	160	42	124	10	1				1	
27	SU88300380	PGR			1	1	134	16	120	6	2				DR 2	
28	SU88400380	PGR	050		1	1	129	11	121	7	2				DR 2	
29	SU88500380	PGR			1	1	139	21	121	7	2				DR 2	
30	SU88600380	PGR	045		1	1	119	1	119	5	3A				DR 3A	IMPEN 90
31	SU88700380	VEG			1	1	126	8	118	4	2				DR 2	
32	SU88000370	PGR			1	1	71	-47	71	-43	3B				DR 3B	IMPEN 40
33	SU88100370	PGR			1	1	129	11	119	5	2				DR 2	
34	SU88200370	PGR			1	1	154	36	125	11	1				1	
35	SU88300370	PGR			1	1	161	43	125	11	1				1	
36	SU88370369	PGR			1	1	160	42	124	10	1				1	
37	SU88500370	PGR			1	1	131	13	123	9	2				DR 2	
38	SU88600370	PGR	070		1	1	141	23	123	9	2				DR 2	
39	SU88700370	MZE	035	055	3	3A	125	7	128	14	2				WE 3A	
40	SU88000360	PGR			1	1	67	-51	67	-47	4				DR 4	IMPEN 40
41	SU88100360	PGR			1	1	131	13	123	9	2				DR 2	
42	SU88200360	PGR			1	1	137	19	126	12	2				DR 2	
43	SU88300360	PGR			1	1	160	42	124	10	1				DR 2	

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	DRT	M.REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
44	SU88400360	PGR			080		1	1	135	17	121	7	2				DR	2	
45	SU88500360	PGR					1	1	159	41	123	9	2				DR	2	
46	SU88600360	PGR			028	053	3	3A	138	20	114	0	2				WE	3A	
47	SU88500350	PGR			067	072	2	2	149	31	127	13	1				WE	2	
48	SU88600350	PGR			058	075	2	2	147	29	124	10	2				WK	2	

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	0-25	mzcl	10YR43 00						0	0	HR	8						
	25-40	hcl	10YR53 00						0	0	HR	5		M				
	40-75	c	10YR56 00						0	0	HR	5		M				
1P	0-30	mzcl	10YR42 00						0	0	HR	10						
	30-42	mzcl	10YR32 00						0	0	HR	60		M				
	42-70	mzcl	10YR32 00						0	0	HR	60		P				
2	0-30	mzcl	10YR54 00						0	0	HR	4						
	30-55	hcl	10YR44 00						0	0	HR	2		M				
	55-100	c	10YR56 00						0	0	HR	2		M				
2P	0-28	mzcl	10YR43 00						0	0	HR	1						
	28-46	mzcl	10YR54 00						0	0	HR	1	MDCOAB FR	M				
	46-120	hzcl	75YR54 00						0	0	HR	1	MDCSAB FR	M				
3	0-25	mzcl	10YR44 00						0	0	HR	5						
	25-40	hcl	10YR54 00						0	0	HR	2		M				
	40-55	hcl	10YR52 00	10YR58	61	C		Y	0	0	HR	2		M				
	55-80	c	10YR54 00						0	0	HR	10		M				
4	0-30	mzcl	10YR43 00						0	0	HR	5						
	30-45	hcl	10YR54 00						0	0	HR	2		M				
	45-55	c	10YR52 00	10YR58	00	C		Y	0	0		0		M				
	55-75	ch	10YR71 00					Y	0	0		0		M				
6	0-30	mzcl	10YR43 00						0	0	HR	1						
	30-50	hcl	10YR56 00				00MN00	00	0	0	HR	15		M				
7	0-35	mzcl	10YR53 00						0	0	HR	5						
	35-50	hcl	10YR54 00						0	0	HR	2		M				
	50-90	c	10YR56 00	00MN00	00	C			0	0	HR	4		M				
9	0-25	mzcl	10YR43 00						0	0	HR	5						
	25-50	hcl	10YR54 00						0	0	HR	2		M				
	50-85	c	10YR52 00						0	0	HR	6		M				
	85-100	c	10YR56 00	00MN00	00	F			0	0	HR	2		M				
10	0-35	mzcl	10YR43 00						0	0	HR	4						
	35-65	hcl	10YR54 00						0	0	HR	2		M				
	65-100	c	10YR56 00						0	0	HR	2		M				
12	0-35	mzcl	10YR43 00						0	0	HR	3						
	35-48	mzcl	10YR54 00						0	0	HR	5		M				
	48-58	hcl	10YR54 00				00MN00	00	0	0	HR	20		M				
	58-60	c	10YR56 00						0	0	HR	20		M				
13	0-30	mzcl	10YR43 00						0	0	HR	2						
	30-47	mzcl	10YR54 00						0	0	HR	3		M				
	47-55	hcl	10YR54 00						0	0	HR	3		M				
	55-70	c	10YR54 56	75YR56	00	C	00MN00	00	0	0	HR	15		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
14	0-35	mzcl	10YR42 00						0	0	HR	7						
15	0-30	mzcl	10YR42 00						8	0	HR	12						
	30-50	hcl	10YR54 00						0	0	HR	10		M				
	50-55	hcl	10YR56 00						0	0	HR	12		M				
16	0-30	mzcl	10YR43 00						0	0	HR	5						
	30-70	hcl	10YR54 00						0	0	HR	2		M				
	70-85	c	10YR56 00						0	0	HR	2		M				
17	0-30	mzcl	10YR43 00						0	0	HR	5						
	30-100	hcl	10YR54 00						0	0	HR	2		M				
18	0-35	mzcl	10YR43 00						0	0	HR	5						
	35-45	mcl	10YR53 00						0	0		0		M				
	45-85	hcl	10YR54 00						0	0	HR	2		M				
19	0-35	mzcl	10YR43 00						0	0	HR	3						
	35-45	mcl	10YR56 00						0	0	HR	2		M				
	45-60	hcl	10YR56 00						0	0	HR	1		M				
	60-90	hcl	25Y 64 00	10YR56 00	C			Y	0	0	HR	2		M				
20	0-35	mzcl	10YR43 00						0	0	HR	2						
	35-45	mcl	10YR44 00	10YR56 00	F				0	0	HR	2		M				
	45-55	hcl	10YR56 00				00MN00	00	0	0	HR	2		M				
	55-80	c	10YR56 00	10YR58 00	C		00MN00	00	0	0	HR	2		M				
	80-90	hcl	10YR56 00						0	0	HR	3		M				
21	0-36	mzcl	10YR43 00						0	0	HR	2						
	36-44	mcl	10YR54 00						0	0	HR	2		M				
	44-75	hcl	10YR56 00	75YR56 00	F				0	0	HR	4		M				
22	0-35	mzcl	10YR42 00						0	0	HR	2						
	35-50	mzcl	10YR53 00						0	0	HR	3		M				
	50-60	mcl	10YR53 00	10YR56 00	F				0	0	HR	10		M				
23	0-30	mzcl	10YR42 00						0	0	HR	5						
	30-35	mzcl	10YR53 00						0	0	HR	10		M				
24	0-35	mzcl	10YR32 00						0	0	HR	10						
	35-40	mzcl	10YR42 00						0	0	HR	10		M				
25	0-35	mzcl	10YR43 00						0	0	HR	2						
	35-40	hcl	10YR44 00						0	0	HR	2		M				
	40-60	hcl	10YR56 00				00MN00	00	0	0	HR	1		M				
	60-75	c	10YR56 00				00MN00	00	0	0	HR	1		M				
	75-120	hcl	10YR53 56	10YR58 00	C		00MN00	00 Y	0	0	HR	1		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
26	0-35	mzcl	10YR43 00						0	0	HR	2						
	35-50	mzcl	10YR54 00						0	0	HR	1		M				
	50-120	hzcl	10YR54 56				00MN00	00	0	0	HR	1		M				
27	0-30	mzcl	10YR44 00						0	0	HR	2						
	30-80	hcl	10YR56 00						0	0		0		M				
	80-100	c	10YR58 00						0	0		0		M				
28	0-30	mzcl	10YR44 00						0	0		0						
	30-50	hcl	10YR53 00						0	0		0		M				
	50-100	c	10YR52 00	10YR58 61	C		00MN00	00 Y	0	0		0		M				
29	0-30	mzcl	10YR44 00						0	0		0						
	30-50	mcl	10YR54 00						0	0		0		M				
	50-100	hcl	10YR56 00	00MN00	00 F				0	0		0		M				
30	0-30	mzcl	10YR43 00						0	0	HR	2						
	30-45	hcl	10YR54 00						0	0	HR	2		M				
	45-90	c	10YR52 00	10YR58 61	C		00MN00	00 Y	0	0	HR	2		M				
31	0-30	mzcl	10YR43 00						0	0	HR	5						
	30-55	mcl	10YR44 00						0	0	HR	2		M				
	55-90	hcl	10YR62 00						0	0		0		M				
32	0-35	mzcl	10YR42 00						0	0	HR	5						
	35-40	mzcl	10YR32 00						0	0	HR	10		M				
33	0-35	mzcl	10YR43 00						0	0	HR	2						
	35-45	hzcl	10YR54 00						0	0	HR	1		M				
	45-100	zc	10YR56 00						0	0	HR	2		M				
34	0-35	mzcl	10YR43 00						0	0	HR	1						
	35-75	hzcl	10YR54 00						0	0		0		M				
	75-85	hzcl	10YR54 56				00MN00	00	0	0		0		M				
	85-120	c	10YR56 00				00MN00	00	0	0	HR	1		M				
35	0-35	mzcl	10YR54 00						0	0	HR	1						
	35-60	mzcl	10YR54 00						0	0	HR	1		M				
	60-120	hzcl	10YR54 56						0	0		0		M				
36	0-32	mzcl	10YR43 00						0	0	HR	1						
	32-120	mzcl	10YR53 00						0	0	HR	1		M				
37	0-35	mzcl	10YR42 00						0	0		0						
	35-50	hcl	10YR54 00						0	0		0		M				
	50-100	c	10YR56 00	00MN00	00 C				0	0		0		M				
38	0-35	mzcl	10YR52 00						0	0		0						
	35-50	mcl	10YR53 00						0	0		0		M				
	50-70	hcl	10YR54 00						0	0		0		M				
	70-100	hcl	10YR52 00	10YR58 61	C			Y	0	0		0		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
39	0-35	zl	10YR42 32						0	0	HR	3						
	35-55	hzcl	25Y 52 00	75YR46 00	C			Y	0	0	HR	3		M				
	55-80	zc	25Y 62 63	75YR46 00	C			Y	0	0	HR	5		P	Y		Y	
40	0-30	mzcl	10YR42 00						0	0	HR	10						
	30-40	mzcl	10YR44 00						0	0	HR	12		M				
41	0-30	mzcl	10YR43 00						0	0		0						
	30-50	mzcl	10YR52 00						0	0		0		M				
	50-100	c	10YR56 00	00MN00 00	F				0	0		0		M				
42	0-35	mzcl	10YR54 00						0	0		0						
	35-75	hzcl	10YR54 00						0	0		0		M				
	75-100	c	10YR56 00						0	0		0		M				
43	0-35	mzcl	10YR43 00						0	0	HR	2						
	35-55	mzcl	10YR44 00						0	0	HR	2		M				
	55-120	hzcl	10YR56 00				00MN00 00		0	0	HR	1		M				
44	0-30	mzcl	10YR43 00						0	0		0						
	30-80	hcl	10YR54 00						0	0		0		M				
	80-100	c	10YR58 00	00MN00 00	F			Y	0	0		0		M				
45	0-28	mzcl	10YR42 00						0	0	HR	2						
	28-55	mzcl	10YR53 00						0	0	HR	1		M				
	55-120	hzcl	10YR53 00						0	0	HR	1		M				
46	0-28	mzcl	10YR32 00						0	0	HR	2						
	28-53	mzcl	10YR52 53	75YR58 00	C			Y	0	0	HR	3		M				
	53-120	zc	10YR52 53	75YR58 68	C			Y	0	0	HR	1		P	Y		Y	
47	0-48	mzcl	10YR53 00						0	0	HR	1						
	48-58	mzcl	10YR54 00						0	0	HR	1		M				
	58-67	hzcl	10YR54 00						0	0	HR	1		M				
	67-72	hzcl	10YR63 00	75YR58 00	C		10YR72 00	Y	0	0	HR	1		M				
	72-120	zc	10YR63 00	75YR58 00	C		10YR72 00	Y	0	0	HR	1		P			Y	
48	0-32	mzcl	10YR43 00						0	0	HR	1						
	32-58	mzcl	10YR58 00						0	0	HR	1		M				
	58-75	hzcl	10YR53 00	75YR58 00	C		00MN00 00	Y	0	0	HR	1		M				
	75-120	zc	10YR53 00	75YR58 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y	