Land at Mercers Farm, Nutfield, Surrey

Statement of Physical Characteristics
April 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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STATEMENT OF PHYSICAL CHARACTERISTICS

LAND AT MERCERS FARM, NUTFIELD, SURREY

Introduction

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 26.3 ha of land to the east of Mercers Farm at Nutfield, Surrey. The survey was carried out during April 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading. This land is currently the subject of a planning application for minerals extraction and, consequently, a statement of physical characteristics has been prepared. This survey supersedes previous ALC surveys on this land. The distribution of ALC grades was found to broadly concur with a survey carried out by Dr. Stuart McRae.

3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. 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 was mainly winter barley, with a small area of permanent grass near the 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. A map at a scale of 1:10,000 illustrates the soil resources found on the site.

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)	% Total Site Area
2	7.4	28.1
3a	15.2	57.8
3b	3.7	14.1
Total Site Area	26.3	100.0

7. The fieldwork was conducted at an average density of one boring every two hectares. A total of 11 borings and one soil pit were described. Additional information, namely auger boring and soil pit information from Dr McRae's survey, has been used in order to delineate the ALC boundaries on this site and to prepare the statement of physical characteristics.

8. The majority of land on the site has been classified as Subgrade 3a, good quality. A relatively large area of Grade 2 land, good quality, occurs in the south of the site. Smaller areas of Subgrade 3b land, moderate quality, occur on the slightly lower lying land in the north and west of the site.

9. Grade 2 land is limited by slight soil droughtiness. Medium sandy loam topsoils overlie similarly textured upper subsoils and sandier lower subsoils. These profiles are well drained and tend to be virtually stoneless. The combination of the light soil textures and prevailing climate reduces the amount of water available for crops. Consequently, this land will suffer from slightly lower and less consistent crop yields.

10. Subgrade 3a land is subject to soil wetness and workability limitations. Medium textured topsoils overlie permeable similarly textured upper subsoils. These pass into heavy silty clay loam lower subsoils which either extend to depth or become lighter with depth. The heavy silty clay loam horizons are slowly permeable. The interaction between the imperfect drainage conditions and topsoil textures at this locality will result in some restrictions to the flexibility of cropping, stocking and cultivations. Where slowly permeable horizons occur directly below the topsoil the drainage is poorer, and the wetness/workability limitations more severe. This land is thus assigned to Subgrade 3b.

Factors Influencing ALC Grade

Climate

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

12. 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).

Factor	Units	Values	Values
Grid reference	N/A	TQ 304 517	TQ 306 516
Altitude	m, AOD	85	90
Accumulated Temperature	day°C	1422	1417
Average Annual Rainfall	mm	767	767
Field Capacity Days	days	163	163
Moisture Deficit, Wheat	mm	105	105
Moisture Deficit, Potatoes	mm	97	97

13. 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.

14. 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.

15. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Local climatic factors such as exposure and frost risk are not believed to adversely affect the site. The site is climatically Grade 1. However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations.

Site

16. Most of the site is flat and lies at approximately 85-90 m AOD. In the north and centre of the site the land is slightly lower, lying at approximately 80 m AOD. Nowhere on the site does gradient or relief result in any limitation to land quality.

Geology and soils

17. The published geological information for the site (BGS, 1978) shows all of the site to be underlain by Folkestone Beds. These are overlain by drift deposits of brickearth in the west of the site and, to a lesser extent, by alluvium where the land is lower lying.

18. The published soils information for the site (SSEW, 1983) maps the entire site as soils of the Fyfield 2 Association. These soils are described as 'well drained coarse loamy and sandy soils over sands and sandstones. Some very acid sandy soils with bleached subsurface horizons on heather and in woodlands. Risk of water erosion.' (SSEW, 1983). Detailed field examination found the soils on this site to differ from this description. Well drained sandy soils occur in the south of the site; however, elsewhere imperfectly or poorly drained heavier textured soils prevail.

Agricultural Land Classification

19. 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.

20. 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 III.

Grade 2

21. Grade 2 land, very good quality, has been mapped in the south of the site, where minor soil droughtiness limitations exist. Topsoils comprise non-calcareous medium sandy loams having 0-5% total flints, (0-1% >2cm in diameter). These overlie similarly textured and, occasionally, sandy clay loam upper subsoils. At approximately 70-90 cm depth these pass into loamy medium sand, medium and fine sand lower subsoils. Subsoils are also slightly stony, typically having 0-5% total flints. These profiles are well drained, and are assigned to

Wetness Class I (see appendix III). Although no pit was dug by ADAS in this mapping unit Dr. McRae found these sandier subsoils to be moderately structured. The interaction between these soil properties and the prevailing climate causes these soils to have slightly restricted reserves of soil moisture. Consequently, this land will suffer from slightly lower and less consistent crop yields.

Subgrade 3a

22. Subgrade 3a land, good quality, has been mapped across most of the site where soil wetness and workability limitations occur. Topsoils comprise non-calcareous medium silty clay loams and silt loams. These overlie permeable medium silty clay loam upper subsoils. These pass into heavy silty clay loam lower subsoils at approximately 45-60 cm depth. The silty textured subsoils usually extend to depth, but towards the south of this mapping unit become sandier at approximately 80-100 cm depth. These profiles are virtually stoneless. Pit 1, which typifies such soils, found the heavy silty clay loams to be slowly permeable. Given the local climate Wetness Class III is appropriate. The interaction between these soil properties (medium textured topsoils and imperfect soil drainage) at this locality results in soil wetness and workability limitations. This land will be subject to some restrictions on the flexibility of cropping, stocking and cultivations.

Subgrade 3b

23. Subgrade 3b land, moderate quality, has been mapped on the slightly lower lying land on the site. Topsoils comprise non-calcareous medium clay loams and, according to Dr. McRae's survey, heavy silty clay and heavy clay loams. Upper subsoils typically comprise clays which are poorly structured and slowly permeable. Lower subsoils tend to be varied in texture, including chalk marl, sandy clay, clay, loamy sand and sand. The presence of slowly permeable clay directly below the topsoil means that these profiles are poorly drained. Consequently, these profiles are assigned to Wetness Class IV. The interaction between the drainage status and topsoil textures with the local climate means that this land is classified as Subgrade 3b. This land is likely to have reduced flexibility of cropping, stocking and cultivations.

Soil Resources

Soil Units : Consideration for Restoration

24. The following section and the accompanying soil resources map describe the pattern of topsoil and subsoil resources on the site. The subsoil structures for Unit I have been taken from Dr. McRae's survey work. Table 3 gives the depths and volumes of the two soil units on this site. It should be emphasised that the map is not a soil stripping map, but merely an illustration of the soil resources available for restoration on the site. When considering these details it is important to remember that soils were sampled to a maximum depth of 120 cm during survey work. In some cases soil resources will extend below this depth. The depths and volumes quoted should be treated with caution due to soil variability.

Unit I

25. This unit comprises an average 30 cm of dark greyish brown or brown (10YR 4/2 or 4/3) non-calcareous medium sandy loam topsoil. This topsoil is virtually stoneless containing 0-5% total flints by volume, (0-1% >2cm in diameter).

26. These topsoils overlie an average 40-60 cm of brown, yellowish brown, dark yellowish brown or light yellowish brown (10YR 5/3, 5/4, 4/4, 6/3) medium sandy loam typically having 0-5% total flints by volume. Most of the upper horizons show no evidence of drainage imperfections and are well aerated and rooted. At depth some of the horizons have common ochreous mottles (yellowish brown or strong brown, 10YR 5/8 or 75YR 4/6). These upper subsoils have moderate structure comprising weakly developed medium angular blocky peds of very friable consistence.

27. Lower subsoil horizons comprise a further 30-50 cm of pale yellow, occasionally dark brown (25Y 7/3, 7/4, occasionally 75YR 3/4) medium and fine sand. These lower subsoils show no evidence of drainage imperfections, and contain approximately 0-2% total flints by volume. These subsoil horizons are moderately structured, comprising single grain structure of very friable consistence.

Unit II

28. This unit comprises an average 25 cm of dark greyish brown or brown (10YR 4/2 or 4/3) non-calcareous medium silty clay loam or silt loam topsoil. This topsoil is virtually stoneless containing 0-1% total flints by volume

29. These topsoils overlie upper subsoils of medium silty clay loam which extend about 20-35 cm. These are brown and pale brown (10YR 5/3 or 6/3) with yellowish brown, brownish yellow, strong brown or reddish yellow mottles (10YR 5/8, 6/8 or 75YR 5/8). These upper subsoils are permeable and moderately structured, having moderately developed coarse sub-angular blocky peds of friable consistence.

30. Lower subsoil horizons comprise a further 60-75 cm of heavy silty clay loam which sometimes passes into sandier textures (sandy clay loam or medium sand) at approximately 90 cm depth. These subsoils are stoneless and are brown, pale brown or light brownish grey (10YR 5/3, 6/3 or 6/2) with yellowish brown, brownish yellow, strong brown, reddish yellow and light grey mottles (10YR 5/8, 6/8, 75YR 5/8 and 10YR 7/1, 7/2). These subsoils are moderately structured being composed of weakly developed medium prisms of friable consistence and less than 0.5% biopores >0.5 mm in diameter. They are therefore slowly permeable and impede soil drainage. Pit 1 is typical of this soil unit. It should also be noted that this unit includes the soils on the lower lying areas of the site which cannot be delineated as a separate unit because of their limited areal extent.

Table 3: Soil Resources

Unit	Topsoil			Subsoil		
	av. depth (cm)	area (ha)	volume (m^3)	av. depth (cm)	area (ha)	volume (m^3)
I	30	7.4	22,200	90	7.4	66,600
II	25	18.9	47,250	95	18.9	179,550
Total soil resource		26.3	69,450		26.3	246,150

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SOURCES OF REFERENCE

British Geological Survey (1978) *Sheet No. 286, Reigate, 1:50,000 Series (drift edition).* BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South East England, 1:250,000* 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 WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Wetness Class	Duration of waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years.[2]
II	The soil profile is wet within 70 cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

[1] The number of days is not necessarily a continuous period.

[2] 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

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	**DCW**:	Deciduous Wood
HTH:	Heathland	**BOG**:	Bog or Marsh	**FLW**:	Fallow
PLO:	Ploughed	**SAS**:	Set aside	**OTH**:	Other
HRT:	Horticultural Crops				

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

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

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

6. **MB (WHEAT/POTS)**: Moisture Balance. (Crop adjusted AP - crop adjusted MD)

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

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

MREL:	Microrelief limitation	**FLOOD:**	Flood risk	**EROSN**:	Soil erosion risk
EXP:	Exposure limitation	**FROST**:	Frost prone	**DIST**:	Disturbed land
CHEM:	Chemical limitation				

9. **LIMIT**: The main limitation to land quality. The following abbreviations are used.

OC:	Overall Climate	**AE**:	Aspect	**EX**:	Exposure
FR:	Frost Risk	**GR**:	Gradient	**MR**:	Microrelief
FL:	Flood Risk	**TX**:	Topsoil Texture	**DP**:	Soil Depth
CH:	Chemical	**WE**:	Wetness	**WK**:	Workability
DR:	Drought	**ER**:	Erosion Risk	**WD**:	Soil Wetness/Droughtiness
ST:	Topsoil Stoniness				

Soil Pits and Auger Borings

1. **TEXTURE**: soil texture classes are denoted by the following abbreviations.

S:	Sand	**LS**:	Loamy Sand	**SL**:	Sandy Loam
SZL:	Sandy Silt Loam	**CL**:	Clay Loam	**ZCL**:	Silty Clay Loam
ZL:	Silt Loam	**SCL**:	Sandy Clay Loam	**C**:	Clay
SC:	Sandy Clay	**ZC**:	Silty Clay	**OL**:	Organic Loam
P:	Peat	**SP**:	Sandy Peat	**LP**:	Loamy Peat
PL:	Peaty Loam	**PS**:	Peaty Sand	**MZ**:	Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:

F: Fine (more than 66% of the sand less than 0.2mm)
M: Medium (less than 66% fine sand and less than 33% coarse sand)
C: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (<27% clay) **H**: Heavy (27-35% clay)

2. **MOTTLE COL**: Mottle colour using Munsell notation.

3. **MOTTLE ABUN**: Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2-20% **M**: many 20-40% **VM**: very many 40% +

4. **MOTTLE CONT:** Mottle contrast

F: faint - indistinct mottles, evident only on close inspection
D: distinct - mottles are readily seen
P: prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL**: Ped face colour using Munsell notation.

6. **GLEY:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH**: Stone Lithology - One of the following is used.

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

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

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

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

9. **CONSIST**: Soil consistence is described using the following notation:

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

10. **SUBS STR**: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G**: good **M**: moderate **P**: poor

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

12. **IMP**: If the profile is impenetrable to rooting a 'Y' will appear in this column at the 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 : MERCERS FARM, SURREY Pit Number : 1P

Grid Reference: TQ30605180 Average Annual Rainfall : 767 mm
Accumulated Temperature : 1417 degree days
Field Capacity Level : 163 days
Land Use : Barley
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MZCL	10YR42 00	0	0						
30- 47	MZCL	10YR53 00	0	0		C	MDCSAB	FR	M	
47- 65	HZCL	10YR53 00	0	0		M	MDCPR	FR	M	
65- 95	HZCL	10YR63 00	0	0		M	WKMPR	FR	M	
95-120	SCL	10YR62 00	0	0		M			M	

Wetness Grade : 3A Wetness Class : III
Gleying :030 cm
SPL :047 cm

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

FINAL ALC GRADE : 3A
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	TQ30735218	BAR			025	025	4	3B		0		0						WE	3B	Chalk mar150
1P	TQ30605180	BAR			030	047	3	3A		0		0						WE	3A	
2	TQ30405200	BAR			025	060	3	3A		0		0						WE	3A	
3	TQ30605200	BAR			025	050	3	3A		0		0						WE	3A	
4	TQ30505190	BAR			037	050	3	3A		0		0						WE	3A	
5	TQ30405180	BAR			030	040	4	3B		0		0						WE	3B	
6	TQ30605180	BAR			035	045	3	3A		0		0						WE	3A	Just WC III
7	TQ30385167	BAR			025	025	4	3B		0		0						WE	3B	
8	TQ30505170	BAR			030	045	3	3A		0		0						WE	3A	
9	TQ30305160	BAR			055		1	1	107	2	111	14	3A					DR	2	Imp85 stone
10	TQ30505164	BAR			055		1	1	131	26	109	12	2					DR	2	H4 Q fine sand
11	TQ30705160	BAR					1	1	147	42	102	5	2					DR	2	H5 Q med. sand

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	mcl	10YR42 00						0	0		0							
	25-50	c	05Y 51 00	75YR46 58	M			Y	0	0		0		P			Y		
	50-120	mcl	10YR71 00	10YR58 00	M			Y	0	0		0		M				Y	Chalk marl
1P	0-30	mzcl	10YR42 00						0	0		0							
	30-47	mzcl	10YR53 00	75YR58 00	C			Y	0	0		0	MDCSAB	FR M					Borderline hzcl
	47-65	hzcl	10YR53 00	75YR58 00	M			Y	0	0		0	MDCPR	FR M	Y		Y		
	65-95	hzcl	10YR63 00	75YR58 00	M		10YR63 00	Y	0	0		0	WKMPR	FR M	Y		Y		
	95-120	scl	10YR62 00	10YR58 00	M			Y	0	0		0		M	Y		Y		
2	0-25	zl	10YR43 00						0	0	HR	1							
	25-45	mzcl	10YR53 00	10YR58 00	C			Y	0	0		0		M					
	45-60	hzcl	10YR63 00	10YR58 52	M		00MN00 00	Y	0	0		0		M					Borderline mzcl
	60-120	hzcl	10YR61 62	75YR58 00	M		00MN00 00	Y	0	0		0		M			Y		
3	0-25	zl	10YR43 00						0	0		0							
	25-38	mzcl	10YR53 00	10YR58 00	C			Y	0	0		0		M					
	38-50	mzcl	10YR62 00	10YR58 00	M		00MN00 00	Y	0	0		0		M					
	50-120	c	10YR61 00	75YR58 00	M			Y	0	0		0		P			Y		
4	0-25	mzcl	10YR43 00						0	0		0							Borderline zl
	25-37	mzcl	10YR54 00						0	0		0		M					
	37-50	mzcl	10YR53 00	10YR58 00	M			Y	0	0		0		M					
	50-120	hzcl	10YR62 00	75YR58 00	M			Y	0	0		0		M			Y		
5	0-30	mzcl	10YR43 00						0	0		0							
	30-40	mzcl	10YR53 00	10YR68 00	C			Y	0	0		0		M					
	40-65	hzcl	10YR63 00	75YR68 00	M			Y	0	0		0		M			Y		
	65-100	hcl	10YR63 00	10YR71 68	M			Y	0	0		0		M			Y		
	100-120	scl	10YR62 00	10YR68 00	M			Y	0	0		0		M			Y		
6	0-35	mzcl	10YR43 00						0	0		0							
	35-40	mzcl	10YR53 00	10YR58 00	C			Y	0	0		0		M					
	40-45	mzcl	10YR63 00	10YR58 00	M			Y	0	0		0		M					
	45-80	hzcl	10YR63 00	10YR58 72	M			Y	0	0		0		M			Y		
	80-110	hcl	10YR63 00	10YR58 72	M		00MN00 00	Y	0	0	HR	1		M			Y		
	110-120	scl	10YR63 00	10YR68 71	M			Y	0	0	HR	1		M			Y		
7	0-25	mcl	10YR43 00						0	0		0							
	25-45	c	10YR52 00	75YR58 00	M			Y	0	0		0		M			Y		
	45-60	c	10YR52 00	05YR58 00	M			Y	0	0		0		P			Y		
	60-85	ms	10YR53 00	10YR56 00	C			Y	0	0		0		M					
8	0-30	mzcl	10YR53 00						0	0		0							
	30-45	mzcl	10YR63 53	10YR58 00	C			Y	0	0		0		M					
	45-60	hzcl	10YR63 00	10YR58 00	C			Y	0	0		0		M			Y		
	60-80	c	10YR63 00	10YR58 00	M			Y	0	0		0		M			Y		
	80-90	sc	10YR62 00	75YR46 00	M			Y	0	0	HR	3		M			Y		
	90-120	ms	10YR68 00						0	0		0		M					

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	POR	IMP	SPL	CALC	
9	0-30	msl	10YR42 00						0	0		0							
	30-55	msl	10YR54 00						0	0		0		M					
	55-70	msl	10YR53 00	75YR46 00	C			Y	0	0		0		M					
	70-85	ms	75YR34 00						0	0		0		M					Impen 85 stone
10	0-30	msl	10YR42 00						0	0	HR	1							
	30-55	msl	10YR53 00	00MN00 00	C				0	0	HR	5		M					
	55-90	scl	10YR63 00	10YR58 00	C			Y	0	0		0		M					
	90-120	ms	25Y 74 73						0	0		0		M					Borderline fs
11	0-30	msl	10YR43 00						1	0	HR	5							
	30-50	msl	10YR44 00						0	0	HR	20		M					
	50-75	msl	10YR54 00						0	0	HR	2		M					
	75-85	lms	10YR64 00						0	0	HR	2		M					
	85-120	fs	25Y 74 00						0	0		0		M					Borderline ms