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Oxfordshire Structure Plan Wantage Road Didcot Agricultural Land Classification Reconnaissance Survey ALC Map & Report December 1996

Resource Planning Team Guildford Statutory Group ADAS Reading ADAS Reference3303/168/96MAFF ReferenceEL 33/00127LUPU Commission02820

AGRICULTURAL LAND CLASSIFICATION REPORT

OXFORDSHIRE STRUCTURE PLAN WANTAGE ROAD DIDCOT

INTRODUCTION

1 This report presents the findings of a reconnaissance Agricultural Land Classification (ALC) survey on approximately 163 hectares of land to the south west of Didcot between the dismantled railway the A34 and Wantage/Didcot Road in Oxfordshire The survey was carried out during December 1996

2 The survey was commissioned by the Ministry of Agriculture Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading in connection with the Oxfordshire Structure Plan The results of this survey supersede any previous ALC information for this land Land to the north of the site was the subject of a reconnaissance ALC survey (ADAS Ref 3304/001/96) carried out earlier in 1996 Information from this survey and three smaller detailed surveys (ADAS Refs 3303/169/93 3303/149/94 & 3303/221/94) has been used in the grading of the current site

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 agricultural land on this site was either under permanent grassland or in arable use (winter wheat oil seed rape and maize) The area mapped as Other Land comprises farm and residential buildings a park a road and a track

SUMMARY

5 The findings of the survey are shown on the enclosed ALC map The map has been drawn at a scale of 1 15 000 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

Grade/Other Land	Area (hectares)	/ Total Site Area	% Surveyed Area
2	77 1	47 4	49 3
31	79 3	48 7	50 7
Other Land	63	39	
Total Surveyed Area	156 4	96 1	100 0
Total Site Area	162 7	100 0	

Table 1 Area of grades and other land

7 The current fieldwork was conducted at an average density of less than 1 boring every 3 hectares A total of 50 boring and 4 soil pits were described

8 All of the agricultural land on this site has been classified as best and most versatile quality Subgrade 3a (good quality) and Grade 2 (very good quality) The key limitations are soil droughtiness and/or soil wetness

9 The majority of soils comprise well drained very slightly stony to very stony medium and heavy clay loams or occasionally clays over weathered sandstone bedrock at variable depths The sandstone was shown to be medium grained and soft thus allowing roots to penetrate it Despite the rooting depth however the amount of moisture held in sandstone is markedly less than in a soil medium. In this locally dry climatic regime the combination of stony upper subsoils over sandstone bedrock acts to reduce the amount of profile available water for crops. As a result this land is limited to either Subgrade 3a or Grade 2 due to soil droughtiness

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)

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

Factor	Units	Values	Values
Grid reference	N/A	SU 514 887	SU 506 896
Altitude	m AOD	70	80
Accumulated Temperature	day°C (Jan June)	1441	1429
Average Annual Rainfall	mm	590	587
Field Capacity Days	days	125	124
Moisture Deficit Wheat	mm	114	114
Moisture Deficit Potatoes	mm	109	108

Table 2 Climatic and altitude data

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 (AT0 January to June) as a measure of the relative warmth of a locality

14 The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. However climatic factors can interact with soil properties to influence soil

wetness and droughtiness At this locality the crop adjusted soil moisture deficits are relatively high thus increasing the likelihood of soil droughtiness restrictions Conversely the field capacity day values are relatively low thus decreasing the likelihood of soil wetness

15 Local climatic factors such as frost risk and exposure are unlikely to adversely affect agricultural land use on this site. The site is climatically Grade 1

Site

16 The land on this site slopes very gently from approximately 80m AOD in the north west to just under 65m AOD in the south east

17 Gradient microrelief and flooding do not affect land quality in this area

Geology and soils

18 The relevant geological sheet (BGS 1971) maps the entire site as Upper Green Sand over Gault Clay

19 The most recently published soils information for this area (SSEW 1983) maps the Harwell soil association across all of the site These soils are described as Well drained loamy soils over sandstone and some similar soils with slight seasonal waterlogging Shallow stony soils locally Some slowly permeable seasonally waterlogged fine loamy or fine silty over clayey soils mainly on scarp slopes Risk of water erosion. (SSEW 1983)

20 Detailed field examination broadly confirmed the existence of soils similar to those described above as the Harwell soil association

AGRICULTURAL LAND CLASSIFICATION

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

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

Approximately half of the agricultural land on this site has been classified as Grade 2 due to either a minor soil droughtiness or soil wetness and droughtiness limitation. The soil profiles typically comprise stoneless to slightly stony (0 15% medium grained soft sandstone by v/v) medium clay loam topsoils over similarly stony medium or heavy clay loam upper subsoils. At between 50 70cm depth slightly to moderately stony (10 30% MSST) heavy clay loam and clay lower subsoils occur. In general, the profiles become impenetrable to the soil auger between 70 95cm depth. However, information from soil inspection Pit 3 shows that the soil resource does continue to depth. The lower subsoils are generally comparable in texture and stone content to those horizons above, but they tend to be poorly structured and occasionally slowly permeable at depth (the soils still fall into Wetness Class II) see Appendix II) In this locally dry climatic regime the combination of soil textures structures and stone contents slightly depletes the amount of profile available water for crops leading to a minor soil droughtiness limitation. As a result the level and consistency of crop yields will be slightly reduced

Some profiles within the Grade 2 mapping unit were found to be deeper and less stony than those described above These are also limited by soil droughtiness but here the mottled poorly structured slowly permeable subsoils occur at slightly shallower depths (e g from 45 75cm depth) This results in a slight drainage impedance consistent with Wetness Class II (Appendix II) as wet soils such as these will slightly inhibit seed germination and growth This degree of soil wetness in combination with the medium textured topsoils may also lead to slight structural damage through over trafficking by agricultural machinery and grazing livestock As a result the timing and flexibility of cultivations is slightly restricted This land is therefore equally limited by soil wetness and soil droughtiness restrictions to Grade 2

25 Occasional borings of either slightly higher or lower quality were also included in this mapping unit where they were too limited in number and extent to map separately

Subgrade 3a

The remaining agricultural land has been classified as Subgrade 3a mostly due to soil droughtiness. These profiles tend to be similar to the Grade 2 soils described in paragraph 23 above but they are generally more stony (15 25% medium grained soft sandstone by v/v) from 27 60cm depth and subsequently become impenetrable at 40 65cm depth. Soil inspection Pits 1 and 2 showed that the stone content increases to 50% for approximately 10cm before the underlying sandstone bedrock begins. The pits also showed that crop roots are able to penetrate this soft sandstone substrate and extract water for an additional 35 55cm depth. However, the amount of available water for crops is distinctly less in sandstone than in a soil medium so these profiles are more drought prone.

Some of the Subgrade 3a profiles also include poorly structured slowly permeable subsoils from between 38 55cm depth In this local climatic regime the resultant drainage impedance leads to a soil wetness limitation consistent with Wetness Class III Subgrade 3a (Appendix III) These profiles are therefore equally limited by soil wetness and soil droughtiness restrictions However where the sandstone is not encountered until lower in the profile soil wetness is the most limiting factor

Occasional profiles also contained between 10 15% large sandstone fragments in the topsoil These large fragments increase the likelihood of damage to farm machinery and crops as well as disrupting the consistency of crop growth This land is therefore also limited to Subgrade 3a by a topsoil stoniness limitation

Again some of the profiles within this mapping unit are of either slightly better or worse quality but they have not been mapped separately as they are too limited in number and extent

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SOURCES OF REFERENCE

British Geological Survey (1971) Sheet No 253 Abingdon 1 63360 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 SSEW Harpenden.

Soil Survey of England and Wales (1984) Soils and their Use in South East England SSEW Harpenden

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

Sample location map Soil abbreviations Explanatory Note Soil Pit Descriptions Soil boring descriptions (boring and horizon levels) Database Printout Horizon Level Information

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
РОТ	Potatoes	SBT	Sugar Beet	FCD	Fodder Crops
LIN	Linseed	FRT	Soft and Top Fruit	FLW	Fallow
PGR	Permanent Pastur	eLEY	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 Crop	os			

- 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

MRELMicrorelief limitationFLOODFlood riskEROSNSoil erosion riskEXPExposure limitationFROSTFrost proneDISTDisturbed landCHEMChemical 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	ΤX	Topsoil Texture	DP	Soil Depth
CH	Chemical	WE	Wetness	WK	Workability
DR	Drought	ER	Erosion Risk	WD	Soil Wetness/Droughtiness
ST	Topsoil Stonine	SS			

Soil Pits and Auger Borings

1

S SZL	Sand Sandy Sılt Loam	LS CL	Loamy Sand	SL ZCI	Sandy Loam
ZL	Silt Loam	SCL	Clay Loam Sandy Clay Loam		Silty Clay Loam Clay
SC	Sandy Clay	ZC	Silty Clay	ÕL	Organic Loam
Р	Peat	SP	Sandy Peat	LP	Loamy Peat
PL	Peaty Loam	PS	Peaty Sand	MZ	Marine Light Silts

TEXTURE soil texture classes are denoted by the following abbreviations

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
СН	chalk	FSST	soft fine grained sandstone
ZR	soft argillaceous or silty rocks	5 GH	gravel with non porous (hard) stones
MSST	soft medium grained sandstone	eGS	gravel with porous (soft) stones
SI	soft weathered igneous/metamo	orphic ro	ck

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
<u>ped shape</u>	 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

Site	Name	OXON S	IP WANTAGI	ERDO	DIDCT	Pit N mbe	1	P				
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MAIN LIMITATION Droughtiness

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63- 82	MCL	057 53 00		10	MSST	MCSAB	VM	M	
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MAIN LIM	ITATION (Droughtines	s						

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22 37 MCL	10YR53 0	0 0	45	MSST				м	
37 43 HCL	25 Y52 O	0 0	45	MSST	С			м	
43-55 C	25 Y52 0	0 0	10	MSST	С	STCOAB	FM	Р	
55–100 C	25 Y62 O	0 0	10	MSST	С	STCOAB	FM	Р	
100-110 HCL	25 Y62 0	0 0	10	MSST	С			Ρ	
Wetness Grade	34	Wetness Clas Gleying SPL	s III 037 043	cm					
Drought Grade	34	APW 103mm APP 88mm		2 mm 1 mm					
FINAL ALC GRADE MAIN LIMITATION	3A Soil Wetne	ss/Droughtine	55						

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page 1

NO GRID REF USE GRDNT GLEY SPL CLASS GRADE AP HB AP HB DRT FLOOD EXP DIST LINIT COMMENTS 1 1 5051006970 3A 025 038 3 AA 115 0 16 3 3A 10 5 102 7 3A DR 3A PH BB DR	SAMP	LE	AS	PECT			-WET	NESS	WHE	AT	PO	TS	•	M REL	EROSN	FROST	CHEM	ALC				
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36 SU51608860 PGR 1 1 137 22 114 5 2 DR 2	36							1														
37 SU51808860 PGR S 01 1 1 86 29 88 21 38 DR 3A 155 See 1	37	SU51808860	PGR 3	S 01			1	1	86	29	88	21	38				DR	3A	I55 (See 1	Ρ	
38 SU51508870 OSR 1 1 110 5 113 4 3A DR 2 I80 See 3	38	SU51508870	OSR				1	1	110	5	113	4	3A				DR	2	180 3	See 3	3P	

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LIST OF BORINGS HEADERS 01/04/97 OXON SP WANTAGE RD DIDCT

SAMP	LE	AS	PECT				WET	NESS	WHE	EAT	PO	TS	м	REL	EROSN	FROST	CHEM	ALC	
NO	GRID REF	USE		GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EX	(P DIST	LIMIT		COMMENTS
39	SU52208860	050					1	1	105	10	114	5	3A				DR	2	175 See 3P
40	SU52388862				050	050	2	2	114		107		34					2	
40		· · ·					-	-				_					WD	4	I90 See 3P
41	SU50828840	PGR			045	045	2	2	103	12	107	2	3A				WD	2	180 See 3P
42	SU51008840	PGR					1	1	112	3	114	5	3A				DR	2	180 See 3P
43	SU51208840	PGR					1	1	147	32	116	7	2				DR	2	
44	SU51408840	CER	S	01			1	1	72	43	72	37	3B				DR	3A	145 QSee 2P
45	SU51608840	PGR					1	1	99	16	108	1	3A				DR	3A	165 See 2P
46	SU51808840	PGR	S	01			1	1	80	35	80	29	38				DR	3A	150 See 2P
47	SU52008840	OSR			030	030	3	3A	88	27	97	12	38				WD	3A	168 See 2P
48	SU52208840	OSR					1	1	99	16	108	1	3A				DR	3A	165 See 2P
49	SU50858828	PGR					1	1	99	16	107	2	3A				DR	3A	165 See 2P
50	SU51218828	CER	S	01	030	030	3	3A	119	4	117	8	3A				WD	34	Imp 90 MSST

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SAMPLE	DEPTH	TEXTURE	COLOUR	COL ABUN	CONT		GLEY	2						P SPL CALC	
	VEFIN	ICATORE	COLOOK					~				Q.I.			
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	25-38	mcl	10YR58 00	10YR58 00 C			Y	0	0 MSST	5		м			Soft
	38-110	c	25Y 62 61	10YR66 00 C			Y	0	0 MSST			Р		Ŷ	Imp MSST
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	25-52	mzcl	10YR54 00					0	0 MSST	2	MCSAB	FRM			Colouration from
	52 65	mzc1	10YR54 00					0	0 MSST	50		M			weathered S t
	65-120	msst	25Y 72 00					0	0	0		M			75% MSST Sieved
2	0 28	mzcl	10YR41 00					1	0 MSST	3					Firm
	28 75	hzcl	25Y 53 00	10YR66 00 C			Y	0	0 MSST	2		Ρ		Y	FR/Imp_MSST
	75-100	c	25Y 62 72					0	0 MSST	15		м			
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	40 52	с	25Y 52 00					0	0 MSST	2	MCSAB	FM M			H4 is from the
	52 66	с	25Y 52 00					0	0 MSST	50		M			weathered Sst
	66 100	msst	25Y 72 00					0	0	0		M			
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	28 60	fszl	10YR52 62					0	0 MSST	1		M			
	60 110	mc]	25Y 72 00	10YR68 00 C			Y	0	0 MSST	1		M			Soft/Imp Stony
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	63-82	mcl	05Y 53 00					0	0 MSST			VMM			weathered Sst
	82 100	mcl	05Y 63 00					0	0 MSST		MVCPL	VM P			V Dry/Hard
	100 120	hc1	05Y 63 00	10YR58 00 C			Y	0	0 MSST	10		Ρ		Y	
								-		•					
4	0 25	mcl	10YR43 00					0	0 MSST						
	25-48	hc1	10YR53 00					0	0 MSST			M			
-	48 75		25Y 63 00						0 MSST			M			Friable
	75-120	С	254 62 00	10YR66 00 C			Y	υ	0 MSST	1		Р		Y	Firm
			104040.00					11	0 MCCT	15					At 0- 4 10
4 P	0 22	mc]	10YR42 00						0 MSST			м			At Bo ing 18
	22 37	mcl	10YR53 00				v		0 MSST			M			Colou at on in H2 3 i from the
	37 43	hcl		10YR68 00 C			Y Y		0 MSST		STCOAB		Y	Y	weathered Sst
	43 55	c		10YR66 00 C	2	5 Y61 (STCOAB		Y	Ŷ	Weathered Sat
	55-100 100 110	C bol		10YR66 00 C			Ŷ		0 MSST		OTOOND	P	•	Ŷ	Imp MSST 110
	100 110	nci	23 102 00				•	Ŭ	0 1.001			•		•	
5	0 25	mcl	10YR43 00					0	0 MSST	2					
5	25-50	mcl	10YR53 00						0 MSST			м			
	20-00 50 55	ຫວ່ໄ	25Y 52 00					ō	0 MSST			M			Imp MSST
	~~ ~~	-1962						-		-		••			τ
6	0 30	mcl	10YR41 00					8	0 MSST	10					
	30 70	hc1	25Y 53 00					0	0 MSST			м			F iable
	70-80	c	25Y 62 72					0	0 MSST			м			Imp MSST
		-													

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				-MOTTLES	PED			STONES	STRUCT/	SUBS		
SAMPLE	DEPTH	TEXTURE	COLOUR	COL ABUN CONT		GLEY	2			STR POR IMP	SPL CALC	
7	028	mcl	10YR53 00				0	0 MSST				
	28 55	hcl	25Y 62 00				0	0 MSST		м		V Fri ble
	55-75	hcl	25Y 72 00				0	0 MSST	15	м		VF/Imp MSST
0	0.00	- 1	100040 00						2			
8	030 3060	mcl hcl	10YR42 00 25Y 52 00				1 0	0 MSST 0 MSST		м		Soft
	50 00 60 75	hc1		10YR68 00 C		Y	0	0 MSST		M M		FR/Imp_MSST
	00 / 5	16.1				r	Ŭ	01001	.5			
9	0 28	mcl	10YR42 00				1	0 MSST	3			
	28-40	hc1	25Y 52 00				0	0 MSST	20	м		Friable
	40 70	zc	25Y 62 00	10YR68 00 C		Y	0	0 MSST	10	P	Y	Imp MSST
10	028	mcl	10YR42 00				0	0 MSST	2			
	28-55	hcl	25Y 52 72				0	0 MSST	2	M		
	55-80	с		10YR68 00 C		Y	0	0	0	M		Friable
	80 90	с		10YR68 00 C		Y	0	0	0	P	Ŷ	Firm
	90 120	с	25Y 73 00	10YR68 00 C		Y	0	0	0	Р	Ŷ	Firm
11	0 30	mcl	10VR43 00	10YR56 00 F			٥	0 MSST	2			
	30-48	mcl		10YR56 00 F					2	м		
	48 78	hcl		10YR58 00 C		Y		0 MSST		M		FR Not SPL
	78 90	mcl	25Y 62 00					0 MSST		M		Imp MSST
12	0 30	mcl	10YR42 00				0	0 MSST	2			
	30 50	hc1	10YR53 00				0	0 MSST	2	м		Soft
	50 80	с	25Y 62 00				0	0 MSST	2	Ρ	Y	Imp MSST
_							_	_	_			
13	0 28	mc]	10YR42 00					0 MSST				
	28 70 70 90	hc)	10YR53 00 25Y 62 72					0 MSST 0 MSST		M M		FR/Imp MSST
	70 90	c	231 02 12				Ů	0 1651	30	ri -		
14	0 30	mcl	10YR41 00				0	0 MSST	1			
	30-40	mcl	10YR53 00					0 MSST		м		
	40-60	mc]		10YR58 00 C				0 MSST		м		Imp MSST
15	028	mcl	10YR42 00				0	0 MSST	2			
	28 40	mc]	25Y 63 00					0 MSST		M		Friable
	40 85	c		10YR68 00 C				0 MSST		P	Y	Firm
	85–120	c	25Y 73 00	10YR68 00 C		Y	0	0 MSST	10	Р	Y	
16	0.20	1	100052 00				^	0 MSST	F			
16	0 30 3040	mcl mcl	10YR52 00 10YR52 62					0 MSST		м		
	40 50	mc1	10YR62 00					0 MSST		M		Imp MSST
		and t	TOTAL VV				*					Turbe (pare)
17	0 30	mcl	10YR42 00				0	0 MSST	2			
	30 60	hcl	25Y 53 00					0 MSST		м		Soft
	60 70	c	25Y 62 00	10YR66 00 C				0 MSST		Ρ		
	70 85	c	25Y 62 72			Y	0	0 MSST	20	М		VF/Imp MSST

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				MOTTLES	PED			STONES		STRUCT/	SUBS		
SAMPLE	E DEPTH	TEXTURE	COLOUR	COL ABUN CO		GLEY	2	6 LITH	тот		STR POR	IMP SPL CALC	
•		_					•	0 VCCT	-				
18	0 25	mcl l	10YR42 00				0						
-	25-45	ແລງ	10YR53 00	10YR66 00 C		v	0	0 MSST 0 MSST	20		M P	Y	Firm
_	45-75	c				Y Y	0	0 MSST	1		P	Ŷ	runn V Firm
	75-95	C		10YR66 00 C		Ŷ	0	0 MSST			P	Ŷ	Soft
	95-120	hc1	25Y 62 72			,	v	0 7651	5		F	•	3010
19	0 30	mcl	10YR42 00				0	0 MSST	2				
	30 50	mcl	25Y 62 00				0	0 MSST			м		
	50 90	с		10YR66 00 C		Y	0	0 MSST	2		Р	¥	Firm
	90 95	hc]	25Y 72 00	10YR66 00 C		Y	0	0 MSST	15		м		FR/Imp MSST
20	0 28	mcl	10YR42 00				2	0 MSST	5				
	28 55	hc1	25Y 62 00	10YR58 00 C		Y	0	0 MSST	15		М		Friable
	55 105	c	25Y 62 00	10YR58 00 C		Y	0	0 MSST	1		Ρ	Y	Firm
	105 120	c	25Y 72 00			Y	0	0 MSST	1		м		F iable
- 21	0 35	1	10YR42 00				0	0 MSST	2				
	35 58	mcl hcl	25Y 53 00				0	0 MSST			м		Soft
	58 80	hci	257 53 00 257 52 00				õ	0 MSST			M		Friable
-	80 95	c	25Y 52 00				ō	0 MSST			M		VF/Imp_MSST
	00 75	2					-						
22	0 30	mcl	10YR42 00				0	0 HR	2				
	30 55	hc1	25Y 52 00				0	0 MSST	2		м		Soft
	55 70	c	25Y 62 72	10YR68 00 C		Y	0	0 MSST	20		м		FR/Imp MSST
23	0 30	mcl	10YR42 00				0	0 MSST	2				
-	30 45	wcl	10YR53 00				0	0 MSST	2		M		V Soft
	45-60	hc1		10YR68 00 C		Y	0	0 MSST	5		P	Ŷ	Firm
•	60 85	c	25Y 62 72	10YR66 00 C		Y	0	0 MSST	20		м		FR/Imp MSST
2 4	0 30	mcl	10YR42 00				0	0 MSST	1				
-	30 50	mcl	25Y 52 00				Ō	0 MSST	1		м		
	50 60	hcl	25Y 52 00				0	0 MSST	5		м		Soft
_	60 90	с	25Y 62 00				0	0 MSST	10		м		Friable
	90 120	с		10YR66 00 C		Y		0 MSST			Р	Y	Firm
25	0 32	mcl	10YR42 00				0	0 MSST	5				
	32 55	hc1	25Y 62 00				0				м		
	55-60	hc1	25Y 62 00				0	0 MSST	35		Р		FR/Imp MSST
		_					_		•				
26	0 27	mcl	10YR43 00					0 MSST					
	27 40	mcl	25 Y63 00				U	0 MSST	25		М		Imp MSST
27	0 35		10YR42 00				0	0 MSST	2				
	35 45	mcl hcl	25Y 53 00					0 MSST			м		Imp MSST
	45 4 4		20, 00 00				*		-				
28	0 30	mcl	10YR42 00				0	0 MSST	2				
	30 45	mcl	25 Y52 00				0				м		
	45-120		25 Y53 00				0	O MSST	5		м		

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				_	MOTTLES		PED			9	STONES		STRUCT/	SUBS		
SAMPLE	DEPTH	TEXTURE	COLOUR		ABUN	CONT		GL	EY 2						IMP SPL CALC	
								_	-						-	
29	0 25	mcl	10YR42 00						C) (0 MSST	1				
	25-55	mcl	10YR53 00						0) (0 MSST	1		M		V Soft
	55 60	hc1	25Y 62 00						0) (d MSST	15		м		Imp MSST
30	0 30	mcl	10YR43 00						C) (o msst	2				
	30-48	hcl	25Y 53 00						C) (o msst	2		M		V Soft
	48-65	c	25Y 62 00	10YR5	8 00 C	C	DOMINOO	00	Y C		0 MSST	5		Р	Y	Firm
	65-90	с	25Y 62 72					1	Y C) (o msst	20		M	Y	FR/Imp MSST
31	0 30	mcl	10YR42 00						C		0 MSST					
	30 65	hc1	25Y 53 00						C		d MSST			M		Soft
	65–75	hc1	25Y 62 72						C) (o msst	20		M		FR/Imp MSST
32	030	mcl	10YR41 00								0 MSST					
	30 70	hcl	25Y 62 00						C		0 MSST			M		Friable
	70 80	С	25Y 62 72						C) (d MSST	20		М		VF/Imp MSST
		_										•				
33	0 28	mcl	10YR42 00								0 MSST					0.0
	28-50	mcl	25Y 52 00		~ ~~ ~						0 MSST			M		Soft
	50-85	hcl	25Y 62 72	1046	6 00 C				Y C) (0 MSST	15		M		Friable
34	0.35	1	10YR42 00								0 MSST	5				
34	0 35 35-45	mcl bal	25Y 62 00								D MSST			M		FR/Imp MSST
	33-43	hcl	231 02 00	TUTKJ	6 00 C				· ·	, ,		55		п		r ty thip (165)
35	0 27	mcl	25 Y42 00						ſ) (0 MSST	1				
55	27-47	mcl	25 Y52 00	10YR6	6 00 F						0 MSST			м		
	47 120	hcl	25 Y52 00			2	25 Y72	00			D MSST			P	Y	
						-				_						
36	0 30	mcl	10YR42 00						c) (o msst	2				
	30 55	hcl	25Y 52 00						c) (0 MSST	5		м		
	55-105	с	25Y 63 00						c		o msst	10		м		
	105-120		05 Y72 00						¢) (o msst	2		м		
37	0 30	mcl	10YR52 00						C)	o msst	5				
	30 55	mcl	25 Y52 00						C) (o msst	10		M		Imp MSST
38	0 30	mcl	10YR42 00						C		0 MSST					
	30 60	hc1	25Y 52 00						C		0 MSST			М		
	60-80	hcl	25Y 62 72						C		0 MSST	20		M		Imp MSST
											A 11007	~				
39	0 30	mcl	10YR42 00								0 MSST			м		0]
	30 60	hc1	10YR54 00								0 MSST			M		Gla co itic
	60 75	c	25Y 62 72						C) (0 MSST	20		M		FR/Imp MSST
40	0 20		10YR42 00						,) (0 msst	2				
40	030 3050	mcl hcl	25Y 53 00								0 MSST			M		Soft
	50 75	hc1	257 53 00 257 52 00	75789	2 00 B						0 MSST			P	Y	Firm
	75 90	hcì	257 52 00 257 62 00								0 MSST			M	Ŷ	V Soft/ImpMSST
			201 02 00	, .,						-				••		· · · · · · · · · · · · · · · · · · ·

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					-MOTTLES		PED			STONES		STRUCT/	SUBS		
SAMPLE	DEPTH	TEXTURE	COLOUR		ABUN	CONT	COL	GI FY	2			CONSIST		SPL CALC	
	VEF III	ILATORE	OULOUK		~~~	~~~		MLL I	•	U LIM		00,0101	UIK I U		
41	0 30	mcl	10YR42 0	00					0	0 MSST	2				
	30-45	hc1	25Y 52 0						0	0 MSST	2		м		Soft
	45-65	hc1	25Y 62 0		58 00 C			Y	0	0 MSST	2		Р	Y	Firm
	65-80	c	25Y 62 7					Y	0	0 MSST	20		м		Imp MSST
42	0 28	mcl	10YR42 0	ю					0	0 MSST	2				
-	28 60	mcl	25Y 52 0	ю					0	0 MSST	2		M		Soft
	60 80	hc1	25Y 62 7	2					D	0 MSST	15		м		FR/Imp MSST
43	0 28	mcl	10YR42 0	20					0	0 MSST	2				
	28-48	hc1	25Y 62 0	ю					0	0 MSST	1		M		
	48-85	hc1	25Y 62 0	ю					0	0 MSST	1		M		Soft
-	85 120	с	25Y 72 0	ю					0	0 MSST	1		M		Friable
44	0 28	mcl	25 Y42 C	0					0	0 MSST	2				
-	28 45	hc1	25 Y52 0	0					0	0 MSST	20		м		Imp MSST
_															
45	0 28	mcl	10YR42 0	0					0	0 MSST	2				
	28-47	hc1	25Y 52 0	0					0	0 MSST	2		M		
	47 65	hc1	25Y 64 0	ю					0	0 MSST	1		м		Imp MSST
46	0 30	fszl	10YR42 0	0					0	0 MSST	5				PSD
	30 45	mcl	25 Y52 0	0					0	0 MSST	10		Μ		
	45-50	hc1	25 Y52 4	2					0	0 MSST	20		м		Imp MSST
47	0 30	mcl	10YR42 0	0					2	0 MSST	5				
-	30 60	hc1	25Y 52 0	0 10YR5	800 C			Y	0	0 MSST	5		Р	Y	Firm
	60 68	hcl	25Y 62 7	2				Y	0	0 MSST	20		м	Y	Imp MSST
48	0 35	ucj	10YR42 0	0					0	0 MSST	2				
	35-50	hc1	25Y 53 0						0	0 MSST			м		
	50 60	hcl	25Y 62 0						0	0 MSST			M		
	60 65	hc1	25Y 62 7	2					0	0 MSST	20		М		V FR/Imp MSST
•															
49	0 30	mcl	10YR42 0							0 MSST					
-	30 60	hc1	25Y 52 0						0	0 MSST			м		Soft
-	60 65	hc1	25Y 62 7	2					0	0 MSST	15		M		Imp MSST
		-													
50	0 30	mcl	10YR42 0							0 MSST			_		
_	30 70	c .	25 Y53 0					Y		0 MSST			P	Y	Firm
	70-80	mcl	25 Y63 0					Y	0	0 MSST			M		Q Weathered SST
	80 90	с	25 Y54 0	U 10YR6	600C			Y	0	0 MSST	5		P	Y	Imp MSST

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