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Aylesbury District Local Plan
Land at Billingsfield, Bicester Road, Aylesbury, Buckinghamshire
Agricultural Land Classification
ALC map and Report
December 1995

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

AYLESBURY DISTRICT LOCAL PLAN
LAND AT BILLINGSFIELD, BICESTER ROAD, AYLESBURY, BUCKINGHAMSHIRE.

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 28.3 hectares of land to the north west of Aylesbury in Buckinghamshire. The survey was carried out during December 1995.

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 Aylesbury District Local Plan. The results of this survey supersede any previous ALC information for this land.

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 agricultural land uses included permanent grass and winter cereals.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10000. It is accurate at this scale, but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1 below.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% Surveyed area
3a	1.2	4.2
3b	27.1	95.8
Total Site area	28.3	100.0

7. The fieldwork was conducted at an average density of approximately 1 boring per hectare. A total of 28 borings and two soil pits were described.

8. The agricultural land at this site has been classified as Subgrade 3a (good quality) and Subgrade 3b (moderate quality). The principal limitation to land quality is soil wetness. Medium and heavy clay loam, occasionally silty clay loam topsoils overlie slowly permeable clays at shallow and moderate depths in the profile. The slowly permeable horizons cause drainage to be impeded such that land utilisation is restricted. The depth at which these horizons occur determines the severity of the soil wetness restrictions and therefore the ALC grade.

Climate

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

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values	Values
Grid reference	N/A	SP 790 151	SP 788 154
Altitude	m, AOD	75	80
Accumulated Temperature	day°C	1417	1411
Average Annual Rainfall	mm	637	640
Field Capacity Days	days	134	134
Moisture Deficit, Wheat	mm	111	110
Moisture Deficit, Potatoes	mm	104	103

11. 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.

12. 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.

13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. In regional terms, this area is relatively dry and warm, with a moderate accumulated temperature, a low average rainfall and subsequently relatively low number of field capacity days. These factors combine to create moderate to high moisture deficits for the two reference crops used in the classification. In terms of grading, these factors are likely to reduce the likelihood of soil wetness being a limitation and conversely increase the likelihood of soil droughtiness. Other local climatic factors such as exposure and frost risk are also believed not to affect the site. The site is climatically Grade 1.

Site

14. The site lies at an altitude in the range of 73-83 m AOD. The River Thame forms the south eastern border to the site. To the west of this, there is a relatively narrow floodplain, before the land rises onto a small hill, which then falls to the north western boundary of the site. Nowhere on the site does gradient or microrelief affect the agricultural land quality. There was no information available at the time of survey regarding the flooding risk from the River Thame, which forms the south eastern boundary to the site. However, this was not felt to be a greater limitation to land quality than the soil wetness (see paras. 21 & 22) limitations already present in this area.

Geology and soils

15. The published geological information for the site (GS of GB, 1865), shows the majority of the site to the west to be underlain by Kimmeridge Clay. To the east of this an area of valley gravel is shown as a drift deposit. Along the south eastern boundary of the site, next to the River Thame, the remaining area comprising approximately 10% of the site is shown as alluvium.

16. The most detailed published soils information for the site (SSEW, 1983 and 1984) shows the site to comprise soils of the Denchworth and Fladbury 1 Associations. Denchworth soils are described as, 'slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils. Some fine loamy over clayey soils with only slight seasonal waterlogging and some slowly permeable calcareous clayey soils. Landslips and associated irregular terrain locally.' (SSEW, 1983). Soils of this broad type were found across the majority of the site to the west. Fladbury 1 soils are described as, 'stoneless clayey soils, in places calcareous, variably affected by groundwater. Flat land. Risk of flooding.' (SSEW, 1983). Soils of this broad type were found across the east of the site.

Agricultural Land Classification

17. 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.

18. The location of the auger borings and pits is shown on the attached sample location map and details of the soils data are presented in Appendix III.

Subgrade 3a

19. Land of good quality has been mapped in a small area towards the south east of the site, on the lower slopes rising from the River Thame. The principal limitation is soil wetness and/or workability.

20. Soils in this area commonly comprise a stoneless to very slightly stony (up to 2% v/v total flints) heavy clay loam, occasionally medium clay loam topsoil, passing to a similarly stony, occasionally slightly gleyed, heavy clay loam upper subsoil. This passes to a stoneless, gleyed and slowly permeable clay to depth as seen in the pit observation, 1p which is representative of this soil type. The slowly permeable horizons have the effect of restricting water flow through the soil profile thus causing drainage to be impeded. The depth at which

these horizons occur in combination with the local climate leads to Wetness Class II being appropriately applied and subsequently Subgrade 3a given the workability status of the topsoil. Soil wetness affects plant growth and yield as well as restricting land utilisation in terms of the number of days when machinery cultivations and grazing by livestock can occur without causing structural damage to the soil.

Subgrade 3b

21. Land of moderate quality has been mapped over the majority of the site. The principal limitation to land quality is soil wetness.

22. Soils in this area comprise a stoneless to very slightly stony (up to 5% v/v total flints), occasionally gleyed medium / heavy clay loam or silty clay loam topsoil. Commonly this passes to a similarly stony, commonly gleyed thin heavy clay loam or clay upper subsoil, which overlies stoneless, slowly permeable clay. The pit observation, 2p, is representative of this soil type. Towards the east of the site the topsoil lies directly over the gleyed and slowly permeable clay. Occasionally, the slowly permeable clay gave way to an impenetrable (to the soil auger), gravelly, gleyed heavy clay loam or clay lower subsoil. The slowly permeable clay horizons restrict water flow through the soil profile so causing drainage to be impeded to the extent that Wetness Class IV and Subgrade 3b has been appropriately applied to this land given the local climate and the workability status of the topsoils. Soil wetness affects plant growth and yield as well as restricting land utilisation in terms of the number of days when machinery cultivations and grazing by livestock can occur without causing structural damage to the soil. Occasional observations in this area were of a slightly better quality, but these were of too scattered a distribution to be shown as separate mapping units.

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SOURCES OF REFERENCE

Geological Survey of Great Britain (1865) *Sheet 46 SW, (Old Series) Woburn. Solid Edition. 1:63 360. Scale.* GS of GB: 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) *Soils of South East England. 1:250 000 Scale.* SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils of South East England. Bulletin No. 15.* 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 : AYLESBURY LP:BICESTER RD Pit Number : 1P

Grid Reference: SP79101510
Average Annual Rainfall : 637 mm
Accumulated Temperature : 1417 degree days
Field Capacity Level : 134 days
Land Use : Cereals
Slope and Aspect : 2 degrees E

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	HCL	10YR43 00	2	2	HR					
30- 60	MCL	10YR54 00	0	0			MDCSAB	FR	M	
60-120	C	10YR64 00	0	0		C	MDCAB	FM	P	

Wetness Grade : 3A
Wetness Class : II
Gleying : 60 cm
SPL : 60 cm

Drought Grade : 2
APW : 137mm MBW : 26 mm
APP : 114mm MBP : 10 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : AYLESBURY LP:BICESTER RD Pit Number : 2P

Grid Reference: SP79001530
Average Annual Rainfall : 637 mm
Accumulated Temperature : 1417 degree days
Field Capacity Level : 134 days
Land Use : Cereals
Slope and Aspect : 2 degrees NE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 26	HCL	10YR43 00	0	2	HR					
26- 38	C	25Y 41 00	0	5	HR	M	WKCSAB	FR	M	
38- 60	C	25Y 52 00	0	0		M	MDCAB	FM	P	

Wetness Grade : 3B
Wetness Class : IV
Gleying : 26 cm
SPL : 26 cm

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

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	--WETNESS-- GLEY	SPL	CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SP78601550	CER			35	35	4	3B		0		0					WE	3B	IMP GRAVEL 55
1P	SP79101510	CER	E	2	60	60	2	3A	137	26	114	10	2				WE	3A	PIT 80 AUG 120
2	SP78701550	CER			33	33	4	3B		0		0					WE	3B	
2P	SP79001530	CER	NE	2	26	26	4	3B		0		0					WE	3B	PIT 60
3	SP78801549	CER			30	30	4	3B		0		0					WE	3B	
4	SP78701540	CER			28	55	3	3B		0		0					WE	3B	
5	SP78801540	CER	W	2	30	30	4	3B		0		0					WE	3B	
6	SP78901540	CER			25	25	4	3B		0		0					WE	3B	
7	SP79001540	CER			28	28	4	3B		0		0					WE	3B	PLASTIC 50
8	SP79101540	CER	SE	3	28	28	4	3B		0		0					WE	3B	
9	SP79201539	CER	E	1	28	28	4	3B		0		0					WE	3B	
10	SP78801530	CER	NW	2	25	25	4	3B		0		0					WE	3B	
11	SP78901530	CER	NE	2	30	30	4	3B		0		0					WE	3B	
12	SP79001530	CER	N	2	30	30	4	3B		0		0					WE	3B	SEE 2P
13	SP79101530	CER	SE	1	58	58	2	2	134	23	112	8	2				WD	2	
14	SP79201530	CER			28	28	4	3B		0		0					WE	3B	IMP GRAVEL 60
15	SP79301530	PGR			0	35	4	3B		0		0					WE	3B	STICKY
16	SP78901520	CER	NE	2	28	28	4	3B		0		0					WE	3B	
17	SP79001520	CER	E	2	30	30	4	3B		0		0					WE	3B	
18	SP79101520	CER	E	2	35	35	4	3B		0		0					WE	3B	
19	SP79201520	CER	E	1	25	25	4	3B		0		0					WE	3B	
20	SP79301520	PGR			20	20	4	3B		0		0					WE	3B	
21	SP79401520	PGR			20	20	4	3B		0		0					WE	3B	
22	SP79501520	PGR			25	25	4	3B		0		0					WE	3B	
23	SP79001510	CER	NE	3	28	28	4	3B		0		0					WE	3B	
24	SP79101510	CER	NE	2	70	70	2	3A	141	30	118	14	1				WE	3A	SEE 1P
25	SP79201510	CER			25	25	4	3B		0		0					WE	3B	IMP GRAVEL 75
26	SP79301510	PGR			0	20	4	3B		0		0					WE	3B	
27	SP79101500	CER			60	60	2	3A	124	13	115	11	2				WE	3A	SL GLEY 30
28	SP79201500	PGR			0	20	4	3B		0		0					WE	3B	

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	mcl	10YR43 00						0	0	HR	5						
	25-35	hcl	10YR54 44						0	0	HR	5		M				
	35-55	c	10YR53 00	10YR56 00	M		00MN00 00	Y	0	0	HR	10		P			Y	IMP GRAVEL 55
1P	0-30	hcl	10YR43 00						2	0	HR	2						
	30-60	mcl	10YR54 00						0	0		0	MDCSAB FR	M				
	60-120	c	10YR64 00	10YR68 61	C			Y	0	0		0	MDCAB FM	P			Y	
2	0-25	mcl	10YR43 00						0	0	HR	3						
	25-33	hcl	10YR54 44						0	0	HR	5		M				
	33-70	c	25Y 53 00	75YR68 61	M			Y	0	0	HR	2		P			Y	
2P	0-26	hcl	10YR43 00						0	0	HR	2						
	26-38	c	25Y 41 00	10YR46 00	M		00MN00 00	Y	0	0	HR	5	WKCSAB FR	M	Y		Y	
	38-60	c	25Y 52 00	10YR58 68	M		25Y 51 00	Y	0	0		0	MDCAB FM	P	Y		Y	
3	0-30	mcl	10YR43 00						2	1	HR	2						
	30-70	c	25Y 54 00	10YR58 00	C			Y	0	0		0		P			Y	
4	0-28	hcl	10YR43 00						0	0		0						
	28-55	hcl	10YR44 54	10YR56 00	C			S	0	0	HR	2		M				
	55-90	c	25Y 51 00	10YR58 00	M			Y	0	0		0		P			Y	
5	0-30	mcl	10YR43 00						2	1	HR	2						
	30-70	c	10YR64 00	10YR51 68	C		05 Y53 00	Y	0	0		0		P			Y	
6	0-25	mcl	10YR43 00						0	0	HR	2						
	25-35	c	10YR53 00	75YR58 51	M			Y	0	0		0		P			Y	
	35-60	c	05Y 53 00	10YR56 51	M			Y	0	0		0		P			Y	
7	0-28	mcl	10YR43 00						0	0		0						
	28-50	c	10YR53 00	10YR51 58	M		00MN00 00	Y	0	0		0		P			Y	
	50-70	c	05Y 53 00	10YR56 51	M			Y	0	0		0		P			Y	
8	0-28	mcl	10YR43 00						0	0	HR	2						
	28-70	c	25Y 52 00	75YR68 61	M			Y	0	0		0		P			Y	
9	0-28	hcl	10YR41 00						0	0	HR	3						
	28-70	c	25Y 53 00	75YR56 52	M		00MN00 00	Y	0	0		0		P			Y	
10	0-25	hcl	10YR43 00						0	0		0						
	25-35	c	25Y 41 51	10YR58 00	M			Y	0	0		0		P			Y	
	35-70	c	25Y 51 52	10YR58 00	M			Y	0	0		0		P			Y	
11	0-30	hcl	10YR43 00						0	0		0						
	30-70	c	25Y 52 00	10YR58 00	M			Y	0	0		0		P			Y	
12	0-30	hcl	10YR43 00						2	1	HR	2						
	30-70	c	25Y 64 00	10YR66 61	C			Y	0	0	HR	5		P			Y	
	70-90	c	25Y 64 00	10YR66 61	C			Y	0	0	HR	5		P			Y	

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
13	0-28	mcl	10YR43 00						0	0	HR	2						
	28-58	hcl	10YR44 54						0	0	HR	2		M				
	58-120	c	25Y 53 00	75YR58 61	M		00MN00 00	Y	0	0	HR	2		P		Y		
14	0-28	mcl	10YR43 00						0	0	HR	4						
	28-60	c	25Y 52 53	10YR56 58	M		00MN00 00	Y	0	0	HR	5		P		Y		IMP GRAVEL 60
15	0-35	hcl	10YR42 00	10YR56 00	C			Y	0	0	HR	2						
	35-70	c	25Y 51 00	75YR46 00	M			Y	0	0	HR	4		P		Y		
16	0-28	hcl	10YR41 42						0	0		0						
	28-70	c	25Y 41 42	10YR46 56	C			Y	0	0	HR	5		P		Y		
17	0-30	mcl	10YR42 00						1	0	HR	1						
	30-70	c	25Y 52 00	10YR68 00	C			Y	0	0		0		P		Y		
18	0-30	mcl	10YR43 00						2	1	HR	2						
	30-35	hcl	10YR54 00						0	0		0		M				
	35-50	c	10YR64 00	10YR58 00	C			Y	0	0		0		P		Y		
	50-120	c	10YR64 00	25Y 72 00	C		10YR58 00	Y	0	0		0		P		Y		
19	0-25	mcl	10YR42 00						3	1	HR	3						
	25-60	c	10YR64 00	10YR58 52	C			Y	0	0	HR	2		P		Y		
	60-70	c	10YR64 00	10YR68 00	C			Y	0	0	HR	15		P		Y		
20	0-20	mzcl	10YR41 00	10YR46 00	F				0	0		0						
	20-60	c	25Y 52 53	10YR58 00	M			Y	0	0		0		P		Y		
21	0-20	mzcl	10YR41 00						0	0		0						
	20-60	c	25Y 53 00	10YR58 00	M			Y	0	0		0		P		Y		
22	0-25	hcl	10YR41 00	10YR46 00	F				0	0		0						
	25-35	c	10YR53 00	10YR56 00	C			Y	0	0		0		P		Y		
	35-60	c	25Y 53 00	10YR58 00	M			Y	0	0		0		P		Y		
23	0-28	hcl	10YR41 42						0	0		0						
	28-65	c	25Y 42 00	10YR46 56	M			Y	0	0		0		P		Y		
	65-80	c	25Y 52 00	10YR58 00	M			Y	0	0		0		P		Y		
24	0-30	hcl	10YR43 00						0	0		0						
	30-70	hcl	10YR44 54	00MN00 00	F				0	0		0		M				
	70-120	c	25Y 53 00	10YR58 00	M		00MN00 00	Y	0	0		0		P		Y		
25	0-25	hcl	10YR41 00						0	0	HR	2						
	25-55	c	25Y 51 00	10YR58 00	C			Y	0	0		0		P		Y		
	55-75	hcl	25Y 62 00	10YR68 00	M			Y	0	0	HR	10		M				IMP GRAVEL 75
26	0-20	hzcl	10YR41 00	10YR58 00	C			Y	0	0		0						
	20-60	c	10YR52 00	10YR58 00	M			Y	0	0		0		P		Y		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
27	0-30	hcl	10YR43 00						0	0		0							
	30-60	hcl	10YR44 54	10YR56 00	C			S	0	0		0		M					SLIGHTLY GLEYED
	60-100	c	25Y 52 00	10YR58 00	M		00MN00 00	Y	0	0		0		P		Y			
28	0-20	hzcl	10YR41 00	10YR46 00	C			Y	0	0		0							
	20-60	c	25Y 51 00	10YR58 00	M			Y	0	0		0		P		Y			