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**BUCKINGHAMSHIRE STRUCTURE PLAN
REVIEW**

Land north of Winslow

**Agricultural Land Classification
ALC Map and Report**

June 1999

**Resource Planning Team
Eastern Region
FRCA Reading**

**RPT Job Number: 0301/045/99
MAFF Reference: EL 03/02036**

AGRICULTURAL LAND CLASSIFICATION REPORT
BUCKINGHAMSHIRE STRUCTURE PLAN REVIEW
LAND NORTH OF WINSLOW, BUCKINGHAMSHIRE
SEMI-DETAILED SURVEY

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of approximately 63 ha of land north of Winslow, in Buckinghamshire. The survey was carried out during June 1999.
2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)¹ on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF). The survey was carried out in connection with MAFF's statutory input to the Buckinghamshire Structure Plan Review. This survey supersedes any previous ALC information for this land; however, adjacent survey information (FRCA ref: 0301/044/96 and 0301/132/96) has been used to help classify the land on this site.
3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey the agricultural land on the site consisted of ley grassland, permanent grassland, rough grassland, Set-aside land, and soft fruit. The areas mapped as 'Other land' include residential dwellings, farm buildings, a nursery, metalled trackways and a pond.

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.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	37.8	67.2	59.9
3a	5.1	9.1	8.1
3b	13.3	23.7	21.1
Other land	6.9	N/A	10.9
Total surveyed area	56.2	100	89.1
Total site area	63.1	-	100

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

7. The fieldwork was conducted at an average density of 1.5 borings per hectare of agricultural land. In total, 43 borings and 3 soil pits were described.
8. The agricultural land on this site has been classified as Grade 2 (very good quality), Subgrade 3a (good quality) and Subgrade 3b (moderate quality). The principal limitations to land quality are soil wetness, soil droughtiness or a combination of both restrictions.
9. Grade 2 land is mapped over most of the survey area and suffers from minor soil wetness and/or soil droughtiness limitations. Over the central area of the site, the soils are variably calcareous and comprise fine loamy topsoils passing to similarly textured or clayey subsoils. These subsoils are moderately to imperfectly drained resulting in a minor soil wetness limitation. In the east and west, the soils are non-calcareous and well drained. They typically comprise stony sandy profiles which, in the prevailing climate, results in a minor soil droughtiness limitation. These minor limitations may affect the choice of crops grown and the level and consistency of yields.
10. Subgrade 3a land is mapped on the western boundary of the site and suffers from a soil wetness limitation. These soils are non-calcareous and typically comprise fine loamy topsoils over clayey subsoils. The clayey lower subsoils impede the movement of water resulting in imperfect drainage and a slight soil wetness limitation. This will affect the range and yield of crops that can be grown as well as restricting the number of days when the land is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock.
11. There are four discrete areas where Subgrade 3b land is mapped. Soil wetness is the principal limitation. These soils are similar to those described for Subgrade 3a; however, the clayey subsoils are poorly drained resulting in a significant soil wetness limitation. This degree of soil wetness will act to reduce the flexibility of the land, particularly in wetter years.

FACTORS INFLUENCING ALC GRADE

Climate

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

Table 2: Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SP 774 289	SP 764 286
Altitude	m, AOD	105	110
Accumulated Temperature	day°C (Jan-June)	1378	1373
Average Annual Rainfall	mm	672	677
Field Capacity Days	days	141	142
Moisture Deficit, Wheat	mm	104	103
Moisture Deficit, Potatoes	mm	94	93
Overall climatic grade	N/A	Grade 1	Grade 1

16. 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 do not affect land quality at this location. The site is climatically Grade 1. However, climatic factors do interact with soil properties to influence soil wetness and soil droughtiness. At this locality the climate is cool with average rainfall, in regional terms.

Site

17. The site lies at altitudes in the range 100–115m AOD. The lowest lying land occurs in the extreme west of the site and the highest ground is found in the extreme east. Between the two extremes, the land is gently undulating with low lying land also occurring either-side of a stream in the east. The site is not affected by any site restrictions (i.e., gradient, microrelief or flooding).

Geology and soils

18. The most detailed published geological information for the site (BGS, 1896) shows most of it to be underlain by Oxford Clay. The remainder is mapped as chalky boulder clay in the extreme west and east, with glacial sands outcropping between the Oxford Clay and chalky boulder clay in the east.
19. The most detailed published soils information covering the site (SSEW, 1983) shows it to comprise mostly soils of the Wickham 2 association. These soils are described as ‘slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils. Small areas of slowly permeable calcareous soils on steeper slopes’ (SSEW, 1983). In the west, soils of the Ashley association are shown. These are described as ‘fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging, associated with similar but wetter soils. Some calcareous and non-calcareous slowly permeable clayey soils’ (SSEW, 1983). In the extreme east, soils of the Hanslope association are mapped. These are described as ‘slowly permeable calcareous clayey soils. Some slowly permeable non-calcareous clayey soils. Slight risk of soil erosion’ (SSEW, 1983).

AGRICULTURAL LAND CLASSIFICATION

20. 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.

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

Grade 2

22. Very good quality land occurs over most of the site. It is limited by soil wetness and/or soil droughtiness and includes better quality land which could not be distinguished separately.
23. Grade 2 land is variable and includes two soil types. Most of the land is affected by a minor soil wetness limitation, combined with soil droughtiness in places. Soils in this mapping unit comprise very slightly stony medium or heavy clay loam or medium silty clay loam topsoils. These pass to gleyed slightly stony heavy clay loam or clay upper subsoils. These overlie a slowly permeable clay lower subsoil or pass through a similarly textured thin horizon to the clay beneath. Pit 2 (see Appendix II) is typical of these soils and confirmed the upper subsoil was gleyed within 40cm (of the surface), and the clayey lower subsoil poorly structured from 50cm. It is the duration of field capacity (141 FCD), depth to gleying and to the slowly permeable layer which assigns the majority of these soils to Wetness Class II, or Wetness Class III in the absence of calcareous topsoils. This, combined with the topsoil texture, results in a minor soil wetness limitation with land classified Grade 2. A minor soil wetness limitation may affect crop growth and development and limit the flexibility of the land.
24. Grade 2 land with a minor soil droughtiness limitation is found on the higher land and mid-slopes in the east, and individual auger borings in the west. The soils are associated with the mapped underlying glacial sands which are similar to those found on adjacent surveys (FRCA ref: 0301/044/96 and 0301/132/96). The soils in the east typically comprise medium clay loam or sandy clay loam or medium sandy loam topsoils which contain up to 5% total hard rock by volume. These overlie similarly textured upper subsoils which contain up to 20% hard rock. These pass to medium sandy loam and loamy medium sand with up to 25% hard rock. These soil properties limit the amount of available water that the soil profile can hold and result in a minor soil droughtiness limitation, which is confirmed by moisture balance calculations. A minor soil droughtiness limitation may adversely affect the level and consistency of crop yields. There are a few auger borings where the soils are less stony, indicating better quality land but this area was too small to map separately.

Subgrade 3a

25. Land of good quality occurs in one isolated area in the west and is restricted by a soil wetness limitation.
26. Soils in this mapping unit typically comprise a non-calcareous medium clay loam topsoil which contains up to 5% total hard rock. This passes to a similarly stony heavy clay loam upper subsoil which overlies a slowly permeable clay lower subsoil. Pit 4 (see Appendix II) is representative of these soils and proves the existence of these slowly permeable layers (SPLs) which are poorly structured. In these soils the depth to gleying is in the region 35–55cm, and the depth to SPL 41–60cm. This assigns these soils to Wetness Class III, and this combination of imperfect drainage, topsoil texture and prevailing field capacity level (141 FCD) results in land classified Subgrade 3a. A slight soil wetness limitation such as this can

adversely affect plant growth or impose significant restrictions on cultivations or grazing by livestock, particularly in wet years.

Subgrade 3b

27. Land of moderate quality is mapped in four discrete areas with soil wetness the principle limitation to land quality.
28. Soils in this mapping unit typically comprise non-calcareous medium clay loam or heavy clay loam topsoils, these are generally stoneless but may contain up to 5% total hard rock. These overlie slowly permeable clay subsoils which are mostly stoneless but may contain up to 12% total flints by volume. Pit 1 (see Appendix II) is typical of these soils and confirms the existence of these slowly permeable layers (SPLs) which are poorly structured. The clay horizons act to impede soil drainage, and it is the depth to these SPLs which is one of the factors which determines the final ALC grade. The depth to SPLs in these soils occur in the range 25–40cm and extend for another 15cm or to a depth of at least 50cm, this results in soils being assigned to Wetness Class IV. This combination of poor soil drainage, topsoil texture and the prevailing field capacity level (141 FCD), gives rise to a land classification of Subgrade 3b. A significant soil wetness limitation such as this can adversely affect plant growth or impose significant restrictions on cultivations or grazing by livestock.

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SOURCES OF REFERENCE

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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

APPENDIX I

DESCRIPTIONS OF THE GRADES AND SUBGRADES

Grade 1: Excellent Quality Agricultural Land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2: Very Good Quality Agricultural Land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural or horticultural crops can usually be grown but on some land of this grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1 land.

Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When more demanding crops are grown, yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a: Good Quality Agricultural Land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b: Moderate Quality Agricultural Land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4: Poor Quality Agricultural Land

Land with severe limitations which significantly restrict the range of crops and/or the level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5: Very Poor Quality Agricultural Land

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

APPENDIX II

SOIL DATA

Contents:

Sample location map

Soil abbreviations - explanatory note

Soil pit and soil boring descriptions (boring and horizon levels)

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

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

Boring Header Information

1. **GRID REF:** national 100 km grid square and 8 figure grid reference.

2. **USE:** Land use at the time of survey. The following abbreviations are used:

ARA: Arable	WHT: Wheat	BAR: Barley
CER: Cereals	OAT: Oats	MZE: Maize
OSR: Oilseed rape	BEN: Field beans	BRA: Brassicae
POT: Potatoes	SBT: Sugar beet	FCD: Fodder crops
LIN: Linseed	FRT: Soft and top fruit	FLW: Fallow
PGR: Permanent pasture	LEY: Ley grass	RGR: Rough grazing
SCR: Scrub	CFW: Coniferous woodland	OTH: Other
DCW: Deciduous woodland	BOG: Bog or marsh	SAS: Set-Aside
HTH: Heathland	HRT: Horticultural crops	PLO: Ploughed

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

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

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

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

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

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

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

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

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

Soil Pits and Auger Borings

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

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

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

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

The clay loam and silty clay loam classes will be sub-divided according to the clay content:

M: Medium (<27% clay) H: Heavy (27-35% clay)

2. **MOTTLE COL:** Mottle colour using Munsell notation.
3. **MOTTLE ABUN:** Mottle abundance, expressed as a percentage of the matrix or surface described:
F: few <2% C: common 2-20% M: many 20-40% VM: very many 40% +
4. **MOTTLE CONT:** Mottle contrast:
F: faint - indistinct mottles, evident only on close inspection
D: distinct - mottles are readily seen
P: prominent - mottling is conspicuous and one of the outstanding features of the horizon
5. **PED. COL:** Ped face colour using Munsell notation.
6. **GLEYS:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.
7. **STONE LITH:** Stone Lithology - one of the following is used:

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

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

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

Degree of development	WK: weakly developed	MD: moderately developed
	ST: strongly developed	
Ped size	F: fine	M: medium
	C: coarse	
Ped shape	S: single grain	M: massive
	GR: granular	AB: angular blocky
	SAB: sub-angular blocky	PR: prismatic
	PL: platy	
9. **CONSIST:** Soil consistence is described using the following notation:

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

10. **SUBS STR:** Subsoil structural condition recorded for the purpose of calculating profile droughtiness:
G: good M: moderate P: poor
11. **POR:** Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.
12. **IMP:** If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.
13. **SPL:** Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.
14. **CALC:** If the soil horizon is calcareous, a 'Y' will appear in this column.
15. Other notations:

APW: available water capacity (in mm) adjusted for wheat
APP: available water capacity (in mm) adjusted for potatoes
MBW: moisture balance, wheat
MBP: moisture balance, potatoes

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--			-WHEAT-		-POTS-		M. REL		EROSN	FROST	CHEM	ALC	COMMENTS	
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST		LIMIT
1	SP77502910	LIN			26	75	2	2	109	5	109	15	2		WD	2	SEE 2P
3	SP77702910	LIN	S	1			1	1	144	40	106	12	1			1	
5	SP77902910	LEY			25	25	4	3B	82	-22	88	-6	3B		WE	3B	SEE 1P
7	SP77602900	LIN	E	1			1	1	107	3	102	8	3A		DR	2	2P-/132/96
9	SP77802900	LEY	W	1			1	1	117	13	97	3	2		DR	2	2P-/132/96
12	SP77502890	LEY			42	85	1	1	144	40	114	20	1			1	
14	SP77702890	LEY	W	2	30	30	4	3B	85	-19	91	-3	3A		WE	3B	AT 1P
17	SP77002880	PGR	M	1	28	57	3	2	111	7	109	15	2		WE	2	AT 2P
19	SP77202880	PGR	S	1	0	64	3	2	115	11	116	22	2		WD	2	SEE 2P
20	SP77302880	LEY	S	1	25	75	2	2	121	17	105	11	2		WD	2	SEE 2P
23	SP77602880	LEY	S	1	0	25	4	3B	92	-12	104	10	3A		WE	3B	SEE 1P
23A	SP77552875	LEY			28	28	4	3B	80	-24	82	-12	3B		WE	3B	SEE 1P
25	SP76302870	PGR			60		1	1	154	50	116	22	1			1	
26	SP76402870	PGR	W	2	50		1	1	130	26	114	20	2		DR	2	1P-/044/96
26A	SP76502870	PGR			65		2	2	120	16	118	24	2		WD	2	SEE 3P
27	SP76902870	PGR	N	2	0	25	4	3B	87	-17	93	-1	3A		WE	3B	SEE 1P
29	SP77102870	PGR	N	1	27	45	3	2	110	6	108	14	2		WD	2	SEE 2P
31	SP77302870	PGR			0	45	3	3A	133	29	110	16	2		WE	3A	SEE 2P
33	SP77502870	PGR			0	27	4	3B	129	25	103	9	2		WE	3B	SEE 1P
34	SP76202860	PGR			35	55	3	3A	110	6	108	14	2		WE	3A	SEE 4P
35	SP76302860	PGR			30	30	4	3B	128	24	106	12	2		WE	3B	DIST'D DRAIN
36	SP76402860	PGR			35		2	2	131	27	114	20	2		WD	2	1P-/044/96
37	SP76502860	FRT			35		2	2	119	15	110	16	2		WD	2	SEE 3P
38	SP76602860	LEY			55		1	1	137	33	116	22	1			1	
39	SP76702860	LEY	W	2	30		2	2	153	49	117	23	1		WE	2	AT 3P
40	SP76802860	PGR			60		1	1	111	7	105	11	2		DR	2	IMP900M
42	SP77002860	PGR	N	1	38	49	3	3A	112	8	110	16	2		WE	3A	SEE 2P
44	SP77202860	PGR			46	65	2	2	117	13	113	19	2		WE	2	SEE 2P
45	SP76102850	SAS			35	60	3	3A	106	2	111	17	3A		WE	3A	SEE 4P
46	SP76202850	SAS			40	40	3	3A	101	-3	106	12	3A		WE	3A	SEE 4P
47	SP76302850	SAS			30		2	2	89	-15	94	0	3A		WD	2	SEE 3P/160
48	SP76502850	FRT			45		1	1	102	-2	107	13	3A		DR	2	SEE 3P
49	SP76602850	LEY			55		1	1	113	9	112	18	2		DR	2	SEE 3P
50	SP76702850	LEY					1	1	95	-9	101	7	3A		DR	2	SEE 3P/160
50A	SP76752850	PGR	W	3			1	1	144	40	102	8	2		DR	2	1P-/044/96
51	SP76802850	PGR			25		2	2	64	-40	64	-30	3B		DR	3B	V. DRY/140
52	SP76902850	PGR			40	40	3	3B	109	5	103	9	2		WE	3B	H3 PLASTIC
53	SP76102840	SAS			35	45	3	3A	100	-4	105	11	3A		WE	3A	SEE 4P
54	SP76202840	SAS			45	45	3	3A	130	26	109	15	2		WE	3A	SEE 4P
56	SP76102830	PGR			35	35	4	3B	96	-8	100	6	3A		WE	3B	H2 PLASTIC
57	SP76202830	PGR					1	1	119	15	100	6	2		DR	2	1P-/044/96
58	SP76102820	PGR	SW	4	32	32	4	3B	97	-7	101	7	3A		WE	3B	H2 PLASTIC

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--				-WHEAT-		-POTS-		M. REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
59	SP76702840	PGR		35	35	4	3B	89	-15	95	1	3A			WE	3B	SEE 1P
1P	SP77702890	LEY W	1	32	32	4	3B	96	-8	107	13	3A			WE	3B	AT AB14
2P	SP77002880	PGR N	1	35	50	3	2	92	-12	104	10	3A			WD	2	PIT70 AUG120
3P	SP76702860	LEY W	2	43	80	1	1	136	32	112	18	1			DR	1	AT AB39
4P	SP76102840	PGR		46	46	3	3A	99	-5	108	14	3A			WE	3A	AT AB53

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---		PED		---STONES---			STRUCT/	SUBS	STR	POR	IMP	SPL	CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6							
1	0-26	HCL	10YR43						0	0	HR	3					Y
	26-75	C	25Y 53	10YR58	C	D		Y	0	0	HR	10		M			Y
	75-90	C	10Y 51	10YR58	C	D		Y	0	0		0		P		Y	Y
3	0-30	MCL	10YR42						0	0	HR	5					Y
	30-70	SCL	10YR44						0	0	HR	10		M			
	70-90	MSL	10YR44						0	0	HR	20		M			
	90-120	MSL	75YR44			COM	MN		0	0	HR	10		M			
5	0-25	HCL	10YR42						0	0	HR	5					
	25-35	C	25Y 62	10YR66	C	D	FEW	MN	Y	0	0	0		P		Y	
	35-60	C	05Y 62	10YR66	C	D	FEW	MN	Y	0	0	0		P		Y	
7	0-30	SCL	75YR43						0	0		0					
	30-46	MSL	75YR43						0	0	HR	10		M			
	46-76	MSL	75YR44	10YR56	C	D		S	0	0	HR	20		M			Y
	76-90	LMS	75YR44	10YR56	C	D		S	0	0	HR	25		M			Y
9	0-35	MSL	10YR32						0	0	HR	5					
	35-65	MSL	10YR44						0	0	HR	20		M			
	65-95	LMS	10YR46						0	0	HR	10		M			
	95-120	LMS	10YR46			MANY	MN		0	0	HR	20		M			
12	0-30	MCL	10YR32						0	0	HR	1					
	30-42	MCL	10YR32						0	0	HR	1		M			
	42-75	SCL	25Y 52	10YR56	C	D		Y	0	0	HR	1		M			
	75-85	MSL	10YR54						0	0	HR	5		M			
	85-120	C	05Y 31	10YR56	C	D		Y	0	0		0		P		Y	
14	0-30	HCL	10YR32	75YR46	F	D	FEW	MN		0	0	HR	1				Y
	30-50	C	05Y 62	10YR58	C	D	FEW	MN	Y	0	0	HR	5		M		Y
	50-70	C	05Y 61	10YR68	C	D			Y	0	0	0		P		Y	Y
17	0-28	MZCL	10YR42						0	0		0					Y
	28-38	HCL	25Y 53	10YR46	C	D		Y	0	0	SLST	5		M			Y
	38-57	C	25Y 52	53 10YR58	M	D		Y	0	0	HR	5		M			Y
	57-90	C	10Y 51	10YR68	M	D		Y	0	0		0		P		Y	Y
19	0-27	MZCL	10YR42	10YR46	C	D		Y	0	0		0					Y
	27-42	HCL	25Y 53	10YR56	C	D		Y	0	0	SLST	5		M			Y
	42-64	C	25Y 61	10YR58	M	D		Y	0	0	HR	5		M			Y
	64-90	C	10Y 51	10YR56	C	D		Y	0	0		0		P		Y	Y
20	0-25	MCL	10YR42						0	0		0					Y
	25-48	HCL	25Y 53	10YR56	C	D		Y	0	0	HR	10		M			Y
	48-75	MSL	25Y 63	10YR56	C	D		Y	0	0	HR	20		M			Y
	75-100	C	10Y 51	10YR68	M	D		Y	0	0		0		P		Y	Y

NOT SPL/2P

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----			PED		-----STONES-----			STRUCT/	SUBS	SPL	CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH					TOT
23	0-25	HCL	10YR42	10YR46	C	F			Y	0	0	0				
	25-48	C	25Y 52 53	10YR56	C	D	FEW MN		Y	0	0	0	P		Y	
	48-70	C	25Y 61	10YR68	M	D	COM MN		Y	0	0	0	P		Y	
23A	0-28	MCL	10YR43							0	0	0				
	28-52	C	25Y 53	10YR56	C	D			Y	0	0	0	P		Y	
25	0-30	MCL	10YR43							0	0	HR 2				
	30-60	HCL	10YR53							0	0	HR 2	M			
	60-95	HCL	25Y 53 63	10YR58	C	D	MANY MN		Y	0	0	HR 2	M		FRIABLE	
	95-120	SCL	25Y 53	10YR58	C	D			Y	0	0	0	M		FRIABLE	
26	0-28	MCL	10YR43							0	0	0				
	28-50	HCL	25Y 63 53							0	0	HR 5	M			
	50-70	SCL	25Y 63	10YR58	C	F			Y	0	0	0	M			
	70-85	LMS	10YR53							0	0	0	M			
	85-120	MS	10YR53							0	0	0	M			
26A	0-35	MCL	10YR43							0	0	0				
	35-65	HCL	10YR53							0	0	0	M			
	65-90	C	25Y 53	10YR58	C	D			Y	0	0	0	P	Y	Y	PLASTIC
27	0-25	HZCL	10YR42	75YR56	C	D	FEW MN		Y	0	0	HR 1				
	25-40	C	25Y 61	10YR66	C	D			Y	0	0	0	P		Y	
	40-60	C	05Y 52	10YR66	C	D	FEW MN		Y	0	0	0	P		Y	Y
29	0-27	MCL	10YR42							0	0	0			Y	
	27-45	HCL	25Y 53	10YR56	C	D			Y	0	0	SLST 5	M		Y	
	45-52	C	25Y 53	10YR68	M	D			Y	0	0	HR 5	P	N	Y	POROUS/2P
	52-90	C	10Y 51	10YR68	M	D			Y	0	0	0	P		Y	Y
31	0-20	MZCL	10YR42	10YR46	C	D			Y	0	0	0				
	20-37	HZCL	25Y 42	10YR56	C	D			Y	0	0	0	M			
	37-45	C	25Y 53	10YR56	C	D			Y	0	0	SLST 5	M		Y	
	45-95	C	25Y 52	10YR58	M	D			Y	0	0	HR 5	P		Y	Y
	95-120	C	10Y 51	10YR58	M	D			Y	0	0	0	P		Y	Y
33	0-27	HCL	10YR42	10YR46	C	D			Y	0	0	0				
	27-58	C	10YR51	10YR56	M	D	COM MN		Y	0	0	0	P		Y	
	58-76	C	25Y 52	10YR66	M	D			Y	0	0	HR 10	P		Y	
	76-98	SCL	25Y 64	10YR56	M	D			Y	0	0	HR 20	M			
	98-120	C	10Y 51	10YR58	M	D			Y	0	0	0	P		Y	Y
34	0-35	MCL	10YR43							0	0	HR 5				
	35-55	HCL	10YR53	10YR58	C	D	FEW MN		Y	0	0	HR 12	M			
	55-90	C	25Y 53	10YR58	C	D			Y	0	0	HR 2	P		Y	SEE 4P
35	0-30	MCL	10YR32							0	0	0				
	30-65	C	25Y 53	10YR58	C	D			Y	0	0	0	P		Y	DIST DRAIN
	65-90	C	05Y 61	10YR58	C	D	MANY MN		Y	0	0	0	P		Y	
	90-120	HCL	25Y 53	10YR58	C	D			Y	0	0	HR 5	P		Y	Y

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED		----STONES----			STRUCT/		SUBS		CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT	CONSIST	STR	POR	
36	0-35	MCL	10YR43						0	0	HR	2				
	35-55	C	25Y 53	10YR58	C	D	COM MN	Y	0	0	HR	8	M		POROUS	
	55-75	SCL	25Y 63	10YR58	C	D		Y	0	0		0	M			
	75-85	LMS	25Y 64	10YR58	C	D		Y	0	0		0	M		Y	
	85-120	MS	25Y 64	10YR58	C	D		Y	0	0		0	M		Y	
37	0-35	MCL	10YR43						0	0	HR	2				
	35-60	HCL	25Y 53	10YR56	C	D	COM MN	Y	0	0	HR	10	M			
	60-100	C	25Y 53	10YR58	56	M	D	Y	0	0	HR	5	M		POROUS	
38	0-30	MCL	10YR43						0	0		0				
	30-55	HCL	10YR53						0	0	HR	2	M			
	55-75	SCL	25Y 63	10YR58	C	D		Y	0	0		0	M			
	75-120	LMS	25Y 64	10YR58	C	F		Y	0	0		0	M			
39	0-30	MCL	10YR43						0	0		0				
	30-55	HCL	25Y 53	10YR56	C	D		Y	0	0		0	M			
	55-120	HCL	25Y 63	10YR68	C	D	MANY MN	Y	0	0	HR	5	M			
40	0-35	MSL	10YR31						0	0	HR	2				
	35-60	MSL	10YR32				COM MN		0	0	HR	10	M			
	60-80	SCL	10YR53	10YR66	C	D	COM MN	Y	0	0	HR	20	M			
	80-90	C	25Y 64	10YR66	C	D	COM MN	Y	0	0	HR	10	P	N	Q SPL	
42	0-29	MCL	10YR42						0	0		0				
	29-38	MCL	10YR43						0	0		0	M			
	38-49	HCL	25Y 52	10YR68	M	D		Y	0	0	HR	10	M		Y	
	49-90	C	25Y 61	10YR68	M	D		Y	0	0		0	P	Y	Y	
44	0-29	MCL	10YR42						0	0		0			Y	
	29-46	MZCL	10YR43						0	0	SLST	3	M		Y	
	46-65	SCL	10YR52	10YR68	M	D		Y	0	0	HR	10	M		Y	
	65-90	C	10Y 51	10YR68	M	D		Y	0	0		0	P	Y	Y	
45	0-35	MCL	10YR31						0	0	HR	5			ORGANIC?	
	35-60	HCL	10YR53	10YR58	C	D		Y	0	0	HR	5	M		SEE 4P	
	60-80	C	10YR53	10YR56	C	D	COM MN	Y	0	0	HR	5	P	Y	Y	SEE 4P
46	0-40	MCL	10YR31						0	0	HR	5			ORGANIC?	
	40-80	C	25Y 53	10YR58	C	D		Y	0	0	HR	5	P	Y	Y	SEE 4P
47	0-30	MCL	10YR43						0	0	HR	2				
	30-60	HCL	10YR53	10YR58	C	F		Y	0	0	HR	15	M		Y	IMP 60CM
48	0-35	MCL	10YR42						0	0	HR	5				
	35-45	HCL	25Y 63						0	0	HR	2	M			
	45-80	C	25Y 53	10YR58	C	D		Y	0	0	HR	5	M		Y	SEE 3P

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----			PED		-----STONES-----			STRUCT/ CONSIST	SUBS			CALC				
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR		IMP	SPL		
49	0-35	MCL	10YR42						0	0	HR	2								
	35-55	C	25Y 53						0	0	HR	2		M			Y			
	55-90	C	25Y 53	10YR58	C	D			Y	0	0	HR	5		M		Y	SEE 3P		
50	0-35	MCL	10YR43						0	0		0								
	35-60	HCL	10YR53						0	0	HR	5		M				IMP 60CM		
50A	0-25	MSL	10YR31						0	0	HR	5								
	25-50	MSL	10YR54				FEW MN		0	0	HR	10		M						
	50-120	MSL	10YR54						0	0	HR	10		M						
51	0-25	MZCL	10YR31				COM MN		0	0	HR	5								
	25-40	SCL	10YR53	10YR66	C	D			Y	0	0	HR	20		M			IMP 40CM		
52	0-25	HZCL	10YR31				FEW MN		0	0	HR	5								
	25-40	C	10YR43				COM MN		0	0	HR	10		M				Y		
	40-65	C	25Y 61	10YR68	C	D			Y	0	0	HR	10		P		Y	Y	V. PLASTIC	
	65-90	SCL	10YR53	10YR66	C	D			Y	0	0	HR	20		M			Y		
53	0-35	MCL	10YR42						0	0	HR	5								
	35-45	HCL	10YR53	10YR58	C	D			Y	0	0	HR	8		M				SEE 4P	
	45-60	C	10YR53	10YR58	C	D			Y	0	0	HR	10		P		Y		SEE 4P	
	60-80	C	10YR53	10YR58	M	D	COM MN		Y	0	0	HR	5		P		Y			
54	0-45	MCL	10YR31						0	0	HR	2						Y	ORGANIC?	
	45-120	C	25Y 53	10YR56	C	D	MANY MN		Y	0	0	HR	10		P		Y			
56	0-35	HCL	10YR43						0	0	HR	5								
	35-80	C	25Y 53	10YR58	M	D			Y	0	0	HR	12		P		Y		PLASTIC	
57	0-30	MCL	10YR43						0	0	HR	8								
	30-60	MSL	10YR43						0	0	HR	10		M						
	60-80	LMS	10YR54						0	0		0		M						
	80-120	MS	10YR56						0	0		0		M						
58	0-32	HCL	10YR43						0	0	HR	5								
	32-50	C	25Y 53	10YR58	C	D			Y	0	0	HR	8		P		Y		PLASTIC	
	50-80	C	25Y 53	10YR58	M	D			Y	0	0	HR	5		P		Y	Y	PLASTIC	
59	0-35	HZCL	10YR31				COM MN		0	0	HR	2								
	35-60	C	25Y 64	10YR66	C	D	COM MN		Y	0	0	HR	10		P		Y			
1P	0-32	HCL	10YR42						0	0		0							Y	
	32-52	C	25Y 51	10YR58	C	D	COM MN		Y	0	0		0	MDCAB	FM	P	Y	Y	Y	PLASTIC
	52-72	C	05Y 61	10YR58	C	D	COM MN		Y	0	0		0	MDCAB	FM	P	Y	Y	Y	PLASTIC
2P	0-25	MCL	10YR42						0	0	HR	1							Y	
	25-35	MCL	10YR44	10YR66	F	D			0	0		0			FR	M			Y	
	35-50	C	10YR64	10YR68	C	D	COM MN		Y	0	0	HR	10	WKCSAB	FM	P		Y	Y	POROUS
	50-70	C	05Y 61	10YR68	C	D			Y	0	0		0	MDCAB	FM	P	Y	Y	Y	PLASTIC

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----		PED COL.	-----STONES-----		STRUCT/ CONSIST	SUBS STR POR IMP SPL	CALC
				COL	ABUN		CONT	COL.			
3P	0-25	MCL	10YR42					0 0	HR 2		
	25-43	HCL	10YR43					0 0	HR 2	FR M	POROUS
	43-80	C	25Y 53	10YR56	C D			Y 0 0	HR 10	MDCSAB FR M	POROUS
	80-120	C	25Y 61	10YR58	M D			Y 0 0	HR 2	M	PIT80 AUG120
4P	0-30	MCL	10YR31					0 0	0		
	30-46	C	10YR54					0 0	HR 10	MDCSAB FR M	
	46-60	C	25Y 63	10YR58	C D	COM MN		Y 0 0	0	MDCAB FM P Y	Y PLASTIC
	60-75	C	25Y 63	10YR58	C D			Y 0 0	HR 5	MDCAB FM P Y	Y Y PLASTIC