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**BUCKINGHAMSHIRE STRUCTURE PLAN
REVIEW**

Land at Maids Moreton, Buckingham

**Agricultural Land Classification
ALC Map and Report**

July 1999

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT

BUCKINGHAMSHIRE STRUCTURE PLAN REVIEW LAND AT MAIDS MORETON

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 25 ha of land at Maids Moreton, north-east of Buckingham. 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 review of the Buckinghamshire Structure Plan. This survey supersedes any previous ALC information for this land.
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 land use on the site was predominantly permanent grass and rough grassland, although some areas were under ley. The areas mapped as 'Other land' include farm buildings, a private house and garden, and company offices with a metalled driveway.

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.
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
3a	15.3	67.1	60.5
3b	7.5	32.9	29.6
Other land	2.5	N/A	9.9
Total surveyed area	22.8	100.0	90.1
Total site area	25.3	-	100.0

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. In total, 23 borings and 2 soil pits were described.

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

8. The land at this site has been predominantly classified as Subgrade 3a (good quality agricultural land), although an area of Subgrade 3b (moderate quality) has also been mapped in the north and west. On the Subgrade 3a land, the limitation is mainly soil droughtiness, with some profiles limited by soil wetness. On the Subgrade 3b land, the principal limitation is soil wetness.
9. The land classified as Subgrade 3a occupies the majority of the site. Typical soil profiles in this unit comprise well drained, slightly stony, medium clay loam or heavy clay loam topsoils over slightly to moderately stony heavy clay loam upper subsoils, sometimes passing to a clay lower subsoil. However, many of the borings were impenetrable to the auger at depths of between 30 and 60 cm. Evidence from an inspection pit indicated that the lower subsoils contain a significant volume of stones, which restrict the amount of available water for plant growth. In the local climate, this acts to impart a soil droughtiness limitation, which may lower the level and consistency of crop yields. Although the majority of profiles in the Subgrade 3a unit were limited by soil droughtiness, some also showed signs of wetness. These profiles indicated that movement of soil water was impeded due to heavy-textured, clay horizons which were probably slowly permeable. The wetness limitation in such profiles was sufficient to impose an equal limitation with soil droughtiness.
10. Soils classified as Subgrade 3b have been identified in the north and west of the site and are restricted by soil wetness. Typical soil profiles comprise very slightly stony, medium clay loam or heavy clay loam topsoils over clay upper and lower subsoils. Evidence from an inspection pit indicated that the clay lower subsoils were slowly permeable and would restrict the downward movement of water through the profile, therefore, in the local climate, these soils are poorly drained. Soil wetness reduces both the range of crops which can be grown and the overall versatility of the land in terms of access by machinery (e.g. for cultivations or harvesting) and grazing by livestock if damage to the soil is to be avoided. Soil wetness will also adversely affect seed germination and root growth and will therefore reduce the level and consistency of yields.

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).
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 (AT0, 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. In addition, the site does not suffer from significant exposure or frost risk. As such, the site may be considered as being climatically Grade 1. Climatic factors do, however, interact with soil properties to influence soil wetness and soil droughtiness.

Table 2: Climatic and altitude data

Factor	Units	Values			
		SP 703 360	SP 705 359	SP 707 358	SP 708 355
Grid reference	N/A	124	120	113	110
Altitude	m, AOD	1355	1359	1367	1371
Accumulated Temperature	day°C (Jan-June)	689	688	686	686
Average Annual Rainfall	mm	147	147	146	146
Field Capacity Days	days	100	101	101	102
Moisture Deficit, Wheat	mm	90	90	91	92
Moisture Deficit, Potatoes	mm				
Overall climatic grade	N/A	Grade 1	Grade 1	Grade 1	Grade 1

Site

16. The site lies between 110 and 124 m AOD. The majority of the site is flat lying, while in the south, the land dips gently in a northwest-southeast direction. Nowhere on the site do gradient, flooding or microrelief present a limitation to agricultural land quality.

Geology and soils

17. The most detailed published geological information (BGS, 1983) shows the area to be underlain by Boulder clay drift deposits. Additionally, an earlier publication (BGS, 1864) shows the area to be underlain by solid deposits of Cornbrash.
18. The most recent published soils information (SSEW, 1983) shows the area to be underlain by soils from the Ashley Association. These soils 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). Detailed field survey work found soils similar to those described here, although in addition, some more droughty, stony soils were found across parts of the site.

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 II.

Subgrade 3a

21. Good quality agricultural land occurs across much of the site, extending from the south to the northeast. The principal limitation is soil droughtiness, although some of the profiles are equally limited by soil wetness.
22. Typical soil profiles in this unit comprise non-calcareous, slightly stony or moderately stony (8-30% hard rock by volume), medium clay loam or heavy clay loam topsoils. These overlie slightly stony heavy clay loam or clay upper subsoils. However, many of the borings in this unit were impenetrable to the auger at depths between 25 and 60 cm. Pit 1 is typical of these soils with a moderately stony (30% hard rock) heavy clay loam topsoil overlying similarly stony (26% hard rock) clay subsoils. These subsoils are assessed as having a moderate structure and gleyed from 33cm in pit 1. These stony soils reduce the amount of profile available water leading to slightly droughty soils and classified Subgrade 3a. The resulting drought stress may affect crop consistency and level of yield. Where these soils are gleyed within 40cm this is sufficient to place these into Wetness Class II. This combination of soil properties, in the local climate (147 FC Days), results in the land being appropriately classified as Subgrade 3a.

Subgrade 3b

23. Moderate quality agricultural land occurs along the northern boundary of the site, either-side of Maids Moreton House and adjacent to the junction of the A413 and Bycell Road. Soil wetness is the principal limitation to land quality.
24. Typically, soil profiles in this unit comprise non-calcareous very slightly stony heavy clay loam or medium clay loam topsoils. These pass to a very slightly stony poorly structured clay upper subsoil, or slightly stony clay, or heavy clay loam which is not slowly permeable overlying the less permeable clay beneath. Pit 2 (see Appendix II) is typical of the latter description and confirmed the porous upper subsoil and poorly drained lower subsoil. These poor drainage characteristics are sufficient to place these soils into Wetness Class IV, or III where the slowly permeable clays are found deeper down the profile. This combination of soil properties, in the local climate (147 FC Days), results in the land being appropriately classified as Subgrade 3b. Excessive soil wetness adversely affects seed germination and survival, partly by a reduction in soil temperature and partly because of anaerobism. It also inhibits the development of a good root system, all of which can affect the range of crops that can be grown and the level of yield. Soil wetness also influences the sensitivity of the soil to structural damage and is, therefore, a major factor in determining the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock.

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SOURCES OF REFERENCE

British Geological Survey (1983) *Technical Report (Mineral Resources Series)*.
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, 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. **GLEYSPL:** 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	GRDNT	GLEYS	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
					SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
1	SP70303610	PGR		0	30	4	3B	102	1	107	16	3A					WE 3B SPL/2P
2	SP70403610	LEY		25	25	4	3B	80	-21	83	-8	3B					WE 3B SPL/2P
3	SP70503610	PGR		30	30	4	3B	106	5	104	13	2					WE 3B SPL/2P
4	SP70303600	PGR				1	1	49	-52	49	-42	4					DR 3A IMP30/1P
5	SP70403600	PGR				1	1	80	-21	80	-11	3B					DR 3A IMP50 POSS2
6	SP70503600	LEY		25	25	4	3B	78	-23	79	-12	3B					WE 3B SPL/2P
7	SP70603600	PGR		25	25	4	3B	97	-4	101	10	3A					WE 3B SPL/2P
8	SP70303590	PGR		50	50	3	3B	116	15	107	16	2					WE 3B SPL/2P
9	SP70403590	PGR				1	1	41	-60	41	-50	4					DR 3A IMP25/1P
10	SP70503590	PGR		35	50	3	3B	110	9	108	17	2					WE 3B SPL/2P
12	SP70703590	RGR		20	20	4	3B	75	-26	75	-16	3B					WE 3B IMP50 POSS2
13	SP70303580	LEY		25	50	3	3B	97	-4	112	21	3A					WE 3B SPL/2P
14	SP70403580	PGR				1	1	79	-22	79	-12	3B					DR 3A IMP50 POSS2
16	SP70603580	RGR		25	40	3	3A	83	-18	88	-3	3A					WD 3A IMP60 POSS2
17	SP70703580	LEY	NE	4	62	62	2	3A	100	-1	106	15	3A				WE 3A IMP80 POSS2
18	SP70803580	LEY	N	2	25	50	3	3A	110	9	108	17	2				WE 3A
19	SP70503570	RGR				1	1	65	-36	65	-26	3B					DR 3A IMP50 POSS2
21	SP70703570	PGR		30	55	3	3B	108	7	107	16	2					WE 3B SPL/2P
22	SP70803570	LEY				1	2	90	-11	98	7	3A					DR 3A IMP60 POSS2
23	SP70703560	PGR				1	1	57	-44	57	-34	3B					DR 3A IMP35/1P
24	SP70803560	PGR	SE	3			1	1	46	-55	46	-45	4				DR 3A IMP30/1P
25	SP70903560	PGR	SE	3			1	1	78	-23	78	-13	3B				DR 3A IMP50 POSS2
26	SP70803550	PGR	SE	3			1	1	50	-51	50	-41	4				DR 3A IMP30/1P
1P	SP70803560	PGR	SE	2	33		2	3A	87	-14	81	-10	3A				WD 3A MANY ROOTS 75
2P	SP70433605	LEY			15	27	4	3B	77	-24	80	-11	3B				WE 3B AT AB

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES----- PED			-----STONES-----			STRUCT/ SUBS		SPL	CALC		
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH			TOT	CONSIST
1	0-30	MCL	10YR43	10YR58	C	D		Y	0	0	HR	4			
	30-45	C	25Y 63	10YR58	C	D		Y	0	0	HR	4	P	Y	PLASTIC
	45-80	C	25Y 62	10YR58	C	D		Y	0	0	HR	2	P	Y	SEE 2P
2	0-25	HCL	10YR42						0	0	HR	2			
	25-55	C	25Y 53	10YR56	C			Y	0	0	HR	1	P	Y	SEE 2P
3	0-30	HCL	10YR43	10YR58	C	D		Y	0	0	HR	2			
	30-50	C	25Y 53	10YR58	C	D		Y	0	0	HR	2	P	Y	PLASTIC
	50-90	C	25Y 63 53	10YR58	C	D		Y	0	0	HR	2	P	Y	Y
4	0-30	MCL	10YR43						0	0	HR	10			IMP30
5	0-30	MCL	10YR43						0	0	HR	8			
	30-50	C	10YR53						0	0	HR	8	M		IMP50
6	0-25	HCL	10YR42						0	0	HR	1			
	25-52	C	25Y 53	10YR56	M			Y	0	0	HR	1	P	Y	SEE 2P
7	0-25	HCL	10YR43						0	0	HR	2			
	25-80	C	25Y 63 64	10YR58	C	D		Y	0	0	HR	2	P	Y	Y
8	0-35	HCL	10YR43						0	0	HR	5			
	35-50	C	10YR53						0	0	HR	10	M		
	50-100	C	25Y 64 63	10YR58	C	D		Y	0	0	HR	2	P	Y	SEE 2P
9	0-25	MCL	10YR43						0	0	HR	10			IMP25
10	0-35	HCL	10YR43						0	0	HR	5			
	35-50	C	10YR53	10YR58	C	D		Y	0	0	HR	10	M		
	50-90	C	10YR53	10YR58	C	F		Y	0	0		0	P	Y	SEE 2P
12	0-20	HZCL	10YR42						0	0	HR	2			
	20-50	C	25Y 53	10YR58	C	D		Y	0	0	HR	2	P	Y	Y
13	0-25	MCL	10YR43						0	0	HR	5			POSS HCL
	25-50	HCL	10YR53	10YR56	C			Y	0	0	HR	5	M		
	50-70	C	25Y 53	10YR56	M			Y	0	0	HR	2	P	Y	SEE 2P
14	0-35	MCL	10YR43						0	0	HR	8			
	35-50	HCL	10YR53						0	0	HR	15	M		IMP50
16	0-25	MCL	10YR43						0	0	HR	5			
	25-40	HCL	10YR53	10YR58	68	C	D		Y	0	0	HR	10	M	
	40-60	C	10YR63 53	10YR58	C	D		Y	0	0	HR	10	P	Y	PLASTIC
17	0-25	HCL	10YR43						0	0	HR	10			
	25-55	HCL	10YR42						0	0	HR	7	M		
	55-62	C	10YR54	10YR56	C			Y	0	0	HR	7	M	N	
	62-80	C	10YR54	10YR56	M			Y	0	0	HR	8	P	Y	IMP80

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS						
				COL	ABUN	CONT		GLY	>2	>6		LITH	TOT	STR	POR	IMP	SPL	CALC
18	0-25	MCL	10YR53	10YR58	C	D		Y	0	0	HR	2						
	25-50	HCL	25Y 53	10YR58	C	D		Y	0	0	HR	2		M				
	50-90	C	25Y 53	10YR58	C	D		Y	0	0	HR	5		P		Y		
19	0-30	MCL	10YR43						0	0	HR	5						
	30-40	HCL	10YR53						0	0	HR	15		M				IMP40
21	0-30	HCL	10YR54						0	0	HR	5						
	30-55	C	10YR53	10YR58	C	D		Y	0	0	HR	8		M				
	55-90	C	10YR53	10YR58	C	D		Y	0	0	HR	5		P		Y		PLASTIC
22	0-25	HCL	10YR43						0	0	HR	2						
	25-50	C	10YR54						0	0	HR	5		M				
	50-60	C	10YR56						0	0	HR	5		M				IMP60
23	0-30	HCL	10YR4353						0	0	HR	8						
	30-35	HCL	10YR5343						0	0	HR	15		M				IMP60
24	0-30	HCL	10YR43						0	0	HR	15						IMP30 1P LOC
25	0-30	HCL	10YR42						0	0	HR	8						
	30-50	C	25Y 53						0	0	HR	13		M		Y		IMP80
26	0-30	MCL	10YR43						0	0	HR	8						IMP30
1P	0-23	HCL	10YR43						14	2	HR	30						STONE SAMPLE
	23-33	C	10YR54						0	0	HR	26		M				STONE SAMPLE
	33-85	C	10YR53	10YR58	C	D		Y	0	0	HR	26		M				PIT 55 AUG85
2P	0-15	MCL	10YR43						0	0	HR	5						
	15-27	C	25Y 53	10YR58	C			Y	0	0	HR	5		M				POROUS
	27-55	C	25Y 53	10YR58	C			Y	0	0	HR	2	MDCPR	VM	P	Y	Y	Y