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WEST OXFORDSHIRE LOCAL PLAN
Land At Chipping Norton
Oxfordshire
Semi-Detailed Survey

Agricultural Land Classification
ALC Map and Report

August 1998

Resource Planning Team
Eastern Region
FRCA Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

WEST OXFORDSHIRE LOCAL PLAN
LAND AT CHIPPING NORTON
OXFORDSHIRE

SEMI-DETAILED SURVEY

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 210.2 hectares of land to the south and east of Chipping Norton, West Oxfordshire. The survey was carried out during August 1998.

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 West Oxfordshire Local Plan. Land around Tank Farm in the north-east of the survey area was surveyed previously in 1993 (FRCA Ref: 3305/139/93, Site 230 Chipping Norton). The results of this previous investigation are incorporated into the current survey which therefore supersedes it.

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 was in winter cereals, oilseed rape, and grassland production (both permanent and ley). Parts of the land had recently been ploughed. The areas mapped as 'Other land' include allotment gardens, recreation grounds, farm buildings and tracks, school playing fields and factories.

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.

7. The fieldwork was conducted at an average density of approximately 1.5 borings per hectare of agricultural land. A total of 118 borings and 9 soil pits was described.

8. Just over half of the land surveyed has been classified as Grade 2 (very good quality) and Subgrade 3a (good quality), with Subgrade 3b (moderate quality) making up the remainder of the land. The main limitation over much of the survey area is soil droughtiness; with soil wetness, topsoil stoniness, gradient and microrelief being restricting on occasions.

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

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	12.2	6.7	5.8
3a	93.4	51.4	44.4
3b	76.1	41.9	36.2
Other land	28.5	N/A	13.6
Total surveyed area	181.7	100	
Total site area	210.2	-	100

9. The majority of the area comprises soils developed over limestone deposits. Land which is assigned to Grade 2 is limited in extent and occupies the valley bottoms in the south-east part of the site. The soils typically comprise deep, usually well drained, loamy profiles. The combination of these soil properties and the prevailing climate results in a minor soil droughtiness limitation. As a result, yield potential may be affected to a limited extent. Occasional profiles within this mapping unit experience a slight soil wetness limitation due to slowly permeable lower subsoils. A wetness limitation may adversely affect crop growth or impose restrictions on cultivations or grazing by livestock.

10. Most of the land to the south and east of Chipping Norton is classified as Subgrade 3a and Subgrade 3b on the basis of a soil droughtiness limitation caused by the presence of very high volumes of hard limestone in the subsoil. The difference in grade mainly reflecting the depth at which limestone is encountered; shallow in the case of the Subgrade 3b and deeper in the case of Subgrade 3a. Such high stone volumes severely restrict profile available water for plant growth as well as reduce the potential rooting depth for crops. In addition to soil droughtiness, localised areas of land are also limited to Subgrade 3b on the basis of topsoil stoniness. Up to 16% flints > 2cm were measured, the volume of stones determining the severity of the limitation, with the stoniest areas assigned to Subgrade 3b. The presence of stones in the topsoil has the effect of increasing production costs caused by extra wear and tear to equipment and reducing crop quality and establishment.

11. The lower lying land on the valley sides to the west of Chipping Norton is dissected with a number of small, often incised valleys, containing springs, streams and ponds, making the land difficult to farm. The soils are very variable and consist mainly of clayey profiles (derived from Lias Clays) which are limited to different extents by soil wetness. As a result of the above, the land quality in this area is limited to Subgrade 3b due to a combination of microrelief, gradient and soil wetness limitations. Very occasional borings in this area have been downgraded because they have been disturbed and are thought to comprise waste material from construction of the nearby dismantled railway.

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 climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

14. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (ATO, January to June), as a measure of the relative warmth of a locality.

15. A detailed assessment of the prevailing climate was made by interpolation from the published 5km grid point datasets (Met. Office, 1989). Due to the range in altitude within the survey area, (i.e. 140m-226m) interpolations were performed at 5m altitude increments in two transects (a total of 41 interpolations) to assess the degree of climatic variation. Four climate zones were used which are represented by the interpolations given in Table 2.

16. The combination of rainfall and temperature within the survey area means that there is no overall climatic limitation. Other local climatic factors such as exposure and frost risk are not believed to have a significant adverse effect on the site. The site is climatically Grade 1.

Table 2: Climatic and altitude data

Factor	Units	Values			
Grid reference	N/A	SP 320 268	SP 307 259	SP 305 263	SP 303 265
Altitude	m, AOD	220	200	170	145
Accumulated Temperature	day°C (Jan-June)	1258	1282	1316	1344
Average Annual Rainfall	mm	732	730	726	723
Field Capacity Days	days	164	164	163	163
Moisture Deficit, Wheat	mm	83	86	89	92
Moisture Deficit, Potatoes	mm	67	71	75	79
Overall climatic grade	N/A	Grade 1	Grade 1	Grade 1	Grade 1

Site

17. The majority of the survey area is gently undulating. The highest land occurs above 220m to the east and south of Chipping Norton. The most notable valley feature runs in an east-west direction to the west of Chipping Norton (around Westend Farm). Here, the altitude of the land varies considerably with the highest land lying at about 180m to 215m (south of Churchill Road) and the lowest land lying adjacent to the dismantled railway at about 140m. Streams and springs dissect this valley area causing an undulating landscape, with small parcels of land on the lower valley slopes which are limited to Subgrade 3b quality on the basis of gradient (with slopes measuring between 7.5-11°). Nowhere does flooding restrictions affect land quality.

Geology and soils

18. The most detailed published geological information (BGS, 1968) shows the majority of the site (to the east and south of Chipping Norton) to lie over solid Chipping Norton and Oolite limestone deposits. There is a change of geology to the west of Chipping Norton (around

Westfield Farm and Westend Farm) where softer deposits of interbedded clays, silts and marls occur.

19. The most recently published soils information for the site shows that in areas where hard limestone deposits occur (to the east and south of Chipping Norton) four different soil associations are mapped. The first of these is the Aberford Association and is mapped in the far north-east of the site around London Road. This is described as 'Shallow, locally brashy, well drained calcareous fine loamy soils over limestone. Some deeper calcareous fine loamy soils over colluvium.' (SSEW, 1983). Elsewhere, over the limestone deposits, the remaining three soil associations are mapped. These comprise the Elmton 1, Elmton 2 and Sherborne Associations. Elmton 1 Association is described as 'Shallow well drained brashy calcareous fine loamy soils over limestone. Some deeper soils and some calcareous and non-calcareous clayey soils'. (SSEW, 1983). Elmton 2 Association is described as 'Shallow well drained brashy calcareous fine loamy soils over limestone. Some deeper fine loamy or fine silty over clayey soils. (SSEW, 1983). Sherborne Association is described as 'Shallow well drained brashy clayey soils over limestone, associated with slowly permeable calcareous soils. (SSEW, 1983).

20. In the lower lying land of the valley to the west of Chipping Norton (around Westfield Farm and Westend Farm where deposits of clays, silts and marls occur) the Oxpasture Association is mapped. This is described as 'Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some slowly permeable seasonally waterlogged clayey soils.' (SSEW,1983).

AGRICULTURAL LAND CLASSIFICATION

21. 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.

22. 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.

23. Just over half of the agricultural land surveyed has been classified as Grade 2 (very good quality) and Subgrade 3a (good quality), with Subgrade 3b (moderate quality) making up the remainder of the land. The main limitation over much of the survey area is soil droughtiness; with soil wetness, topsoil stoniness, gradient and microrelief being restricting on occasions.

Grade 2

24. A small proportion of the survey area (totalling 12.2 hectares) is mapped as Grade 2 agricultural land (very good quality) and occurs on the colluvial footslopes of the dry valleys in the south-west part of the site. Here, the soils are deep and tend to limited to a minor extent by a combination of soil droughtiness and occasionally soil wetness.

25. The soil profiles generally comprise calcareous medium clay loam or silty clay loam topsoils, which are very slightly to slightly stony (containing up to 8% total hard limestone). These overlie heavy clay loam or silty clay loam (and occasionally clay) upper subsoils which contain up to 15% total hard limestone. Lower subsoils are similar but are variably stony (containing between 0-50% total hard limestone) Most of the profiles in the Grade 2 mapping unit are

impenetrable to the soil auger at depths between 60cm and 100cm.. Soil Pits 2 and 9 are representative of these soils types (see Appendix II).

26. Where soil droughtiness is limiting, the soils are well drained and a Wetness Class of I is ascribed. The combination of soil texture and amount of hard rock in the profile restricts the water available to crops such that there is a slight risk of drought stress to the plants in most years. As a result, the level and consistency of crop growth and yields may be reduced.

27. In occasional locations where soil wetness is limiting, profiles tend to show either evidence of impeded drainage (in the form of gleying) and/or have poorly structured, slowly permeable, clay horizons which occur at depths between 45cm and 65cm. In this climatic regime, the occurrence of such waterlogging in the profile results in a minor soil wetness limitation such that the soils are placed in Wetness Class II and the land is classified as Grade 2. Crop germination and growth may therefore be adversely affected and cultivations may also be restricted.

28. Very occasional borings of better quality occur within the Grade 2 mapping unit but were too few and far between to be mapped separately at this scale.

Subgrade 3a

29. Approximately half (51.4%) of the surveyed area has been classified as Subgrade 3a (good quality agricultural land) on the basis of a soil droughtiness limitation.

30. The profiles within this unit comprise calcareous medium clay loam and medium silty clay loam (with very occasional heavy clay loam or heavy silty clay loam) topsoils which are very slightly or slightly stony (containing up to 10% total hard limestone and/or occasionally soft limestone fragments). The subsoils are very similar to the topsoils in character but they become increasingly stony with depth (the upper subsoil usually contain up to 30% total hard limestone and the lower subsoils contain as much as 65% total). The profiles are impenetrable to the soil auger at depths between 30cm and 55cm. Overall, the soils within this unit are permeable and well drained (Wetness Class I). Soil Pits 4 and 5 (Appendix II) are representative of the soils within this unit. The combination of soil texture and hard stone restricts the water available to crops such that there is a risk of drought stress to the plants in most years. However, given the local climate, which has relatively low moisture deficits in a regional context (due to the high altitudes), droughtiness is less marked than in other parts of Oxfordshire on similar soils. Land of Subgrade 3a quality could be expected to produce moderate yields of a wide range of crops and moderate to high yields of a narrow range of crops, principally cereals and grass.

Subgrade 3b

31. The remainder of the site (76.1 hectares) has been classified as Subgrade 3b (moderate quality agricultural land) mainly on the basis of a significant soil droughtiness and soil wetness problem. Topsoil stoniness, gradient and microrelief is also limiting on occasions.

32. Parts of the survey area (to the east and south of Chipping Norton) are limited to Subgrade 3b on the basis of a soil droughtiness limitation where the soils are relatively stony and shallow. Within these areas the soil profiles generally comprise calcareous medium clay loam (with occasional

medium silty clay loam or heavy clay loam) topsoils which are variably stony (containing up to 40% total hard limestone fragments). Where penetrable, these overlie similarly, or slightly heavier, textured upper subsoils which are calcareous and contain up to 80% total limestone. The soil profiles are impenetrable to the auger at depths between 23cm and 35cm. They are permeable and well drained (Wetness Class I). Soil Pits 1, 6 and 7 (Appendix II) are representative of the soils within this unit. Such high stone volumes severely restrict profile available water for plant growth as well as reduce the potential rooting depth for crops to the extent that Subgrade 3b is appropriate. The hard, flaggy nature of the solid limestone deposits in the area meant that the potential rooting depth was restricted as the roots were unable to sufficiently penetrate the bedrock. Drought calculations were cut-off as appropriate (depending on the 'observed rooting depth') into the limestone.

33. Within the Subgrade 3b areas affected by soil droughtiness, localised patches of land are also limited by topsoil stoniness. Around 16% flints > 2cm were measured, the volume of stones determining the severity of the limitation, with the stoniest areas assigned to Subgrade 3b. The presence of stones in the topsoil has the effect of increasing production costs caused by extra wear and tear to equipment and reducing crop quality and establishment.

34. In addition to soil droughtiness and topsoil stone content, occasional profiles are limited to Subgrade 3b on the basis of soil depth. Topsoils are very shallow over 'solid' limestone bedrock (see pits 1P and 7P, Appendix II). Shallow soils restrict the range of cultivations which can take place and limit the nutrient supply to crops.

35. The majority of land to the west of Chipping Norton (on the lower lying land in the valley around Westfield Farm and Westend Farm) is limited to Subgrade 3b on the basis of soil wetness, micro-relief and gradient limitations.

36. Where soil wetness is limiting the profiles generally comprise medium clay loam or medium silty clay loam (occasionally heavy clay loam or heavy silty clay loam) topsoils which tend to be stoneless or very slightly stony (0-2% total hard rock). These sometimes overlie virtually stoneless, shallow, upper subsoils which are slightly heavier in texture and show evidence of wetness in the form of gleying. At shallow depths within the profile (20cm to 44cm), clay or silty clay subsoils are encountered which impede soil drainage. Soil inspection pit 8 (see Appendix II) reveal these shallow clay lower subsoils to be poorly structured and slowly permeable. Wetness Class IV, Subgrade 3b is therefore considered appropriate for this land. Occasional borings in this area are of better quality but were not mapped as such because the landscape is, in places, limited by a micro-relief restriction which is overriding. The valley side is dissected by springs and streams causing changes of slopes and localised areas of steep gradients. This somewhat broken landscape is considered difficult to cultivate intensively using normal agricultural equipment. Consequently, the whole area is limited to Subgrade 3b on the basis of a soil wetness and/or microrelief limitation.

37. As indicated above, numerous small areas of land are limited to Subgrade 3b on the basis of a gradient limitation. The gradients were measured (with an optical reading clinometer) between 7° and 10°. Slopes in this gradient range are sufficient to compromise the safe and efficient operation of farm machinery.

38. Very occasional borings in this area have been downgraded because they have been disturbed and are thought to comprise waste material from construction of the nearby dismantled railway. Such profiles were too limited in extent to investigate further (by digging a soil pit) and have been incorporated into the Subgrade 3b mapping unit.

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SOURCES OF REFERENCE

British Geological Survey (1968) *Sheet No. 218, Chipping Norton.*
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

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. 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	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).

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:

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	USE	ASPECT	GRDNT	GLEY	SPL	WETNESS CLASS	WETNESS GRADE	WHEAT AP	WHEAT MB	POTS AP	POTS MB	M.REL DRT	EROSN FLOOD	FROST EXP	CHEM DIST	ALC LIMIT	COMMENTS
1	SP32242782	LEY					1	1	85	1	86	17	3A				DR 3A	IMP 55 SEE 5P
2	SP32202770	LEY					1	1	64	-20	63	-6	3A				DR 3A	IMP 40 SEE 5P
3	SP32402770	CER					1	1	78	-6	78	9	3A				DR 3A	IMP 52 SEE 5P
4	SP32102760	LEY					1	1	69	-15	68	-1	3A				DR 3A	IMP 47 SEE 5P
5	SP32302760	CER					1	1	70	-14	69	0	3A				DR 3A	IMP 50 SEE 5P
6	SP32502760	CER					1	1	88	4	89	20	3A				DR 3A	IMP 55 SEE 5P
7	SP32102750	LEY					1	1	46	-38	45	-24	3B				DR 3A	I30 2P 139/93
8	SP32202750	CER					1	1	51	-33	50	-19	3B				DR 3A	I35 2P 139/93
9	SP32402750	CER					1	1	46	-38	45	-24	3B				DR 3A	I30 2P 139/93
10	SP32562744	RGR					1	1	60	-24	59	-10	3B				DR 3A	I40 2P 139/93
11	SP32002710	BAR					1	1	42	-42	41	-28	3B				DR 3A	IMP 38 SEE 4P
12	SP32102716	LEY			40	S	1	1	117	33	110	41	1				1	IMP 87
13	SP32202710	LEY					1	1	82	-2	84	15	3A				DR 3A	IMP 55
14	SP31902700	BAR					1	1	37	-47	36	-29	3B				DR 3B	I30 2P 139/93
15	SP32002700	BAR					1	1	40	-44	39	-26	3B				DR 3B	I30 2P 139/93
16	SP32102700	OPH					1	2	82	-2	84	15	3A				DR 3A	IMP 55 SEE 5P
17	SP32102690	PGR					1	1	41	-43	40	-29	3B				DR 3B	IMP 30
18	SP32202690	LEY	E	1			1	1	49	-35	48	-21	3B				DR 3A	IMP 40 SEE 5P
19	SP31702680	PGR					1	1	48	-36	47	-18	3B				DR 3B	IMP 32
20	SP32102682	LEY					1	1	27	-57	26	-39	4				DR 3B	IMP 30
21	SP32202680	LEY					1	1	43	-41	42	-27	3B				DR 3B	IMP 30
22	SP30552667	PGR	NW	3	20	20	4	3B	80	-11	89	11	3A				WE 3B	
23	SP30712671	LEY	NW	3	30	30	4	3B	128	37	105	27	1				WE 3B	SEE 8P
24	SP31602670	PGR					1	1	71	-13	70	1	3A				DR 3A	IMP 50 SEE 3P
25	SP32202670	BAR	E	2			1	1	60	-24	59	-10	3B				DR 3A	IMP 40 SEE 4P
26	SP32302670	STB	S	2			1	1	113	29	103	34	2				DR 2	IMP 100 SEE 2P
27	SP32402670	BAR	SW	2			1	1	47	-37	46	-23	3B				DR 3A	IMP 40 SEE 4P
28	SP30342656	PGR	NW	6	35	43	4	3B	112	21	110	32	2				WE 3B	SEE 8P
29	SP30502660	PGR	NW	3			1	1	62	-29	62	-16	3B			Y	DR 3B	DISTURBED
30	SP30602660	PGR	NW	3	39	95	2	2	143	52	113	35	1				WE 2	
31	SP30702660	RGR	NW	3	0	35	4	3B	129	38	106	28	1				WE 3B	SEE 8P
32	SP30802660	PGR	NW	3	35	35	4	3B	130	39	106	28	1				WE 3B	SEE 8P
33	SP32302660	BAR	S	2			1	1	99	15	105	36	2				DR 2	SEE 2P
34	SP30202650	PGR	NW	3	25	25	3	3B	107	16	104	26	2				WE 3B	SEE 8P
35	SP30402650	PGR	SW	5	25	42	4	3B	132	41	116	38	1				WE 3B	SEE 8P
36	SP30502650	PGR	NW	3	20	20	4	3B	98	7	93	15	2				WE 3B	SEE 8P
37	SP30602650	PGR	NW	4			1	1	75	-16	74	-4	3A				DR 3A	IMP 50
38	SP31602650	HRT					1	1	59	-25	58	-11	3B				DR 3B	IMP 35 SEE 4P
39	SP31802650	HRT					1	1	50	-34	49	-20	3B				DR 3B	IMP 30 SEE 4P
40	SP32202650	BAR	W	2	45		1	1	90	6	97	29	2				DR 2	IMP 80 SEE 2P
41	SP32302650	STB	W	2			1	1	75	-9	77	8	3A				DR 3A	IMP 55 QGR2
42	SP32402650	BAR	W	3			1	1	51	-33	51	-18	3B				DR 3A	IMP 40

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
43	SP30102640	PGR	NW	3	25	50	3	3A	108	17	113	35	2				WE	3A	V MANY MN
44	SP30302640	PGR	NW	3	60	60	2	2	139	48	117	39	1				WE	2	ROOT MOTTS
45	SP30502640	PGR	W	5	22	44	4	3B	113	22	110	32	2				WE	3B	SEE 8P
46	SP31702640	HOR					1	1	84	0	83	14	3A				DR	3A	IMP50 SEE 3P
47	SP31902640	HOR					1	2	63	-21	62	-7	3B				DR	3A	IMP 38 SEE 4P
48	SP32102640	WHT	S	2			1	1	46	-38	46	-23	3B				DR	3A	IMP 30 SEE 4P
49	SP32302642	BAR	W	1			1	1	66	-18	66	-3	3A				DR	3A	IMP 45 SEE 3P
50	SP30202630	PGR	NE	6	45	45	3	3A	115	24	113	35	2				WE	3A	SEE 8P
51	SP30402633	PGR	NW	4	25		2	2	88	-3	96	18	3A				DR	3A	IMP 60
52	SP30602630	PGR	NW	5			1	1	35	-56	34	-44	3B				DR	3B	IMP 25 SEE 6P
53	SP31602630	CER	SE	4	47	47	3	3B	105	21	113	44	2				WE	3B	
54	SP31802630	HOR					1	1	56	-28	56	-13	3B				DR	3B	IMP 35 SEE 4P
55	SP32002630	BAR	S	3			1	2	84	0	89	20	3A				DR	3A	IMP 60 SEE 3P
56	SP32172635	RGR	SE	1	0		2	2	66	-18	66	-3	3A				DR	3A	I40 NR DITCH
57	SP30142623	PGR	N	5	25	25	4	3B	114	23	105	27	2				WE	3B	SEE 8P
58	SP30302620	PGR	N	3			1	1	98	14	106	37	2				DR	2	IMP 70
59	SP30502620	LEY	N	6			1	1	56	-35	55	-23	3B				DR	3B	SEE 6P
60	SP31202620	BAR	NW	1			1	1	46	-38	45	-24	3B				DR	3B	IMP 28 SEE 7P
61	SP31302620	BAR	SW	2			1	1	64	-20	63	-6	3A				DR	3A	IMP 40 SEE 4P
62	SP31502620	BAR	SE	3	28		2	2	62	-22	62	-7	3B				DR	3A	IMP 40 SEE 4P
63	SP31602620	STB	S	1			1	1	77	-7	77	8	3A				DR	3A	IMP 48 SEE 4P
64	SP31702620	STB	S	1			1	1	62	-22	62	-7	3B				DR	3A	IMP 40 LST
65	SP31942620	BAR	S	1			1	2	49	-35	49	-20	3B				DR	3B	IMP 35 SEE 1P
66	SP32102620	BAR	S	2	20	20	4	3B	101	17	86	17	2				WE	3B	
67	SP32302620	LEY	S	2			1	1	63	-21	63	-6	3B				DR	3A	IMP 40 SEE 4P
68	SP30202610	PGR	N	4			1	1	36	-48	35	-34	3B				DR	3B	IMP 23 SEE 6P
69	SP30402610	PGR	NW	3			1	1	39	-45	38	-31	3B				DR	3B	IMP 25 SEE 6P
70	SP30602610	STB	NW	2			1	1	52	-32	51	-18	3B				TS	3B	SEE 7P+ 8P
71	SP31102610	BAR	NW	1			1	1	40	-44	40	-29	3B				DR	3B	IMP 25 SEE 6P
72	SP31202610	BAR					1	1	31	-60	31	-47	4				DR	3B	IMP 20 SEE 6P
73	SP31302610	STB	NE	1			1	1	44	-40	44	-25	3B				DR	3B	IMP 30 SEE 7P
74	SP31402610	BAR					1	2	89	5	97	28	2				DR	2	IMP 60 SEE 9P
75	SP31502610	STB			65	65	2	2	130	46	110	42	1				WE	2	SEE 9P
76	SP31602610	BAR					1	2	137	53	113	44	1				WK	2	SEE 9P
77	SP31802610	STB	S	1			1	1	74	-10	74	5	3A				DR	3A	IMP 50 LST
78	SP32002610	PGR	S	1			1	1	91	7	105	36	2				DR	2	SEE 9P
79	SP32112612	SAS	SE	2	65	24	3	3B	105	21	100	31	2				WE	3B	SEE 2P
80	SP32222612	LEY	S	1			1	1	45	-39	45	-24	3B				DR	3B	IMP 30 SEE 1P
81	SP32302610	SAS	S	2			1	1	44	-40	44	-25	3B				DR	3B	IMP 30 SEE 1P
82	SP30302600	STB	NE	1			1	1	44	-40	43	-26	3B				DR	3B	IMP 35 SEE 7P
82A	SP30502600	STB	NW	2			1	1	43	-46	43	-32	3B				DR	3B	IMP 25 SEE 7P
83	SP30702600	WHT	N	2			1	1	49	-35	49	-20	3B				DR	3B	IMP 35 SEE 7P

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	DRT	M.REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
84	SP30922596	WHT	N	3			1	2	96	12	107	38	2				WD	2	IMP 70
85	SP31102600	BAR					1	2	57	-34	57	-21	3B				DR	3B	IMP 35 SEE 7P
86	SP31302600	BAR					1	1	66	-18	66	-3	3A				DR	3A	IMP 40 SEE 4P
87	SP31402600	STB	NE	3			1	1	47	-37	47	-22	3B				DR	3B	IMP 30 SEE 7P
88	SP31502600	WHT					1	2	39	-45	39	-30	3B				DR	3B	IMP 25 SEE 7P
89	SP31602600	CER	E	2			1	1	47	-37	47	-22	3B				DR	3B	IMP 30 SEE 7P
90	SP31802600	STB					1	1	141	57	112	43	1					1	SEE 9P
91	SP31902600	PGR	NE	1			1	1	133	49	110	41	1					1	SEE 9P
92	SP32102600	PGR	N	2			1	1	59	-25	59	-10	3B				DR	3A	IMP 40 SEE 4P
93	SP32302600	LEY			65	65	2	2	102	18	109	40	2				WD	2	SEE 2P
94	SP30402590	STB	N	1			1	1	69	-15	68	-1	3A				DR	3A	IMP 45 SEE 3P
95	SP30582590	WHT	N	2			1	1	72	-12	72	3	3A				DR	3A	IMP 50 SEE 5P
96	SP30802590	WHT	N	2			1	1	52	-32	52	-17	3B				DR	3A	IMP 40 SEE 4P
97	SP31002590	WHT	NE	2			1	2	48	-36	47	-22	3B				DR	3B	IMP 30 SEE 7P
98	SP31202590	BAR	NE	2			1	2	83	-1	83	14	3A				DR	2	IMP 50 SEE 3P
99	SP31302590	WHT	NE	1			1	2	53	-31	53	-12	3B				DR	3B	IMP 28 SEE 7P
100	SP31402590	WHT	NE	2			1	2	37	-47	37	-32	3B				DR	3B	IMP 25 SEE 7P
101	SP31502590	CER	NE	2			1	1	62	-22	60	-9	3B				DR	3A	IMP 40 SEE 7P
102	SP31592588	WHT					1	2	95	11	106	37	2				WD	2	IMP 70
103	SP32002590	STB					1	1	42	-42	42	-27	3B				DR	3B	ST I30 SEE 1P
104	SP32202590	STB	SE	1			1	1	39	-45	39	-30	3B				DR	3B	I30 ALSO ST
105	SP30302580	STB	NW	3			1	1	50	-34	49	-20	3B				DR	3B	IMP 33 SEE 7P
106	SP30402580	STB	NW	3			1	1	57	-27	57	-12	3B				DR	3B	IMP 35 SEE 7P
107	SP30512585	STB	NW	3			1	1	57	-27	57	-12	3B				DR	3B	IMP 35 SEE 7P
108	SP30702580	WHT	N	3			1	1	50	-34	50	-19	3B				DR	3B	IMP 30 SEE 7P
109	SP30902580	WHT	NE	3			1	2	57	-27	56	-13	3B				DR	3A	IMP 40 Q3B
110	SP31302580	WHT	NE	3			1	2	83	-1	86	17	3A				DR	3A	IMP 60 Q2
111	SP31502580	WHT					1	1	95	12	102	33	2				DR	2	IMP 60
112	SP31902580	STB	N	2			1	1	39	-45	39	-30	3B				DR	3B	ST
113	SP32102580	STB	E	3			1	1	67	-17	67	-2	3A				DR	3A	VALLEY
114	SP30202570	STB	NE	2			1	1	46	-38	46	-23	3B				DR	3B	IMP 33 SEE 7P
115	SP30612572	WHT	N	2			1	1	62	-22	62	-7	3B				DR	3A	IMP 40 SEE 4P
116	SP31202570	WHT	NE	3			1	1	57	-27	56	-13	3B				DR	3B	IMP 35 SEE 4P
117	SP32202570	STB	N	2			1	1	60	-18	64	-5	3A				DR	3A	IMP 40 SEE 4P
P1	SP32222612	LEY	S	1			1	1	38	-46	38	-31	3B				DR	3B	+ SOIL DEPTH
P2	SP32202650	BAR	E	2			1	1	90	6	97	28	2				DR	2	PT 90 ROOT 85
P3	SP31702640	HOR	S	2			1	1	85	4	90	21	3A				DR	2	PT 80 ROOT 57
P4	SP31902640	RGR	S	2			1	1	76	-8	77	7	3A				DR	3A	PT 82 ROOT 78
P5	SP32302760	WHT					1	1	69	-15	72	3	3A				DR	3A	PT 82 ROOT 72
P6	SP30202610	PGR	N	5			1	1	52	-36	55	-23	3B				DR	3B	PT 60 ROOT 55
P7	SP30302580	STB	N	4			1	1	33	-51	32	-37	4				DR	3B	+ SOIL DEPTH
P8	SP30402650	PGR	SW	6	23	42	4	3B	105	14	108	30	2				WE	3B	PIT 80

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
P9	SP31802600	STB		80			1	1	142	58	113	44	1					1	VALLEY

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	IMP	SPL	CALC	
1	0-27	MCL	10YR42						0	0	SLST	2					Y		
	27-50	HCL	10YR46						0	0	SLST	2			M		Y		
	50-55	HCL	10YR46						0	0	SLST	30			M		Y		IMP LIMESTONE
2	0-27	MCL	10YR43						0	0	HR	2					Y		
	27-37	HCL	10YR44 46						0	0	SLST	5			M		Y		
	37-40	HCL	10YR44 46						0	0	HR	50			M		Y		IMP LIMESTONE
3	0-30	MCL	10YR42 43						0	0	HR	5					Y		
	30-40	MCL	10YR44 46						0	0	SLST	2			M		Y		
	40-52	MCL	10YR44 46						0	0	SLST	20			M		Y		IMP LIMESTONE
4	0-25	MCL	10YR42 43						0	0	HR	2					Y		
	25-30	MCL	10YR43 44						0	0	SLST	20			M		Y		
	30-47	HCL	10YR44 46						0	0	HR	20			M		Y		IMP LIMESTONE
5	0-25	MCL	10YR42 43						0	0	HR	5					Y		
	25-50	MCL	10YR43 44						0	0	HR	20			M		Y		IMP LIMESTONE
6	0-30	MCL	10YR43						0	0	SLST	2							
	30-50	HCL	10YR43 44						0	0	SLST	2			M		Y		
	50-55	HCL	10YR44 46						0	0	SLST	20			M		Y		IMP LIMESTONE
7	0-20	MCL	10YR42 43						0	0	SLST	2					Y		
	20-30	MCL	10YR44						0	0	HR	20			M		Y		IMP STONY
8	0-22	MCL	10YR42 43						0	0	HR	5					Y		
	22-35	MCL	10YR43 44						0	0	HR	20			M		Y		IMP STONY
9	0-30	MCL	10YR42 43						0	0	HR	10					Y		IMP HARD/DRY
10	0-30	MCL	10YR42						0	0	SLST	5					Y		
	30-40	MCL	10YR43 44						0	0	HR	30			M		Y		IMP LIMESTONE
11	0-25	MCL	10YR42						12	8	HR	25					Y		
	25-38	HCL	75YR46						0	0	HR	60			M		Y		IMP LIMESTONE
12	0-25	MCL	10YR43						0	0	HR	5							
	25-40	C	10YR44	10YR68	F	D			0	0	HR	3			M				
	40-55	C	10YR54	10YR58	M	D		S	0	0	HR	3			M				
	55-87	SCL	25Y 56	10YR58	M	D		S	0	0		0			M		Y		IMP LIMESTONE
13	0-28	MCL	10YR43						1	0	HR	5					Y		
	28-45	HCL	10YR44						0	0	HR	10			M		Y		
	45-55	HCL	10YR46						0	0	HR	20			M		Y		IMP LIMESTONE
14	0-23	MCL	10YR42						9	4	HR	20					Y		
	23-30	HCL	75YR46						0	0	HR	60			M		Y		IMP LIMESTONE

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
15	0-24	MCL	10YR43						3	0	HR	20						Y	
	24-30	HCL	10YR46						0	0	HR	40		M				Y	IMP LIMESTONE
16	0-28	HCL	10YR42						0	0	HR	5							
	28-45	C	10YR44						0	0	HR	3		M					
	45-55	C	10YR66						0	0	HR	30		M					IMP LIMESTONE
17	0-22	MCL	10YR44						3	0	HR	15							
	22-30	MCL	10YR46						0	0	HR	40		M				Y	IMP LIMESTONE
18	0-22	MCL	10YR43						0	0	HR	5						Y	
	22-40	HCL	75YR44						0	0	HR	60		M				Y	IMP LIMESTONE
19	0-25	MCL	10YR42						2	0	HR	12						Y	
	25-32	HCL	75YR46						0	0	HR	20		M				Y	IMP LIMESTONE
20	0-22	MCL	10YR44						3	0	HR	40						Y	
	22-30	SCL	10YR46						0	0	HR	80		M				Y	IMP LIMESTONE
21	0-25	MCL	10YR43						3	0	HR	15						Y	
	25-30	MCL	10YR44						0	0	HR	40		M				Y	IMP LIMESTONE
22	0-20	HCL	05Y 31	10YR46	56 M	D		Y	0	0	ZR	10							
	20-70	ZC	05Y 61	10YR46	58 M	D		Y	0	0	ZR	10		P		Y			WEATHERED ZR
23	0-30	MCL	10YR41 31	10YR46	C	D		Y	0	0		0							
	30-120	C	05Y 61 62	75YR58	M	D		Y	0	0		0		P		Y			DENSE, PLASTIC
24	0-25	MCL	10YR42						2	0	HR	8						Y	
	25-47	HCL	75YR46						0	0	HR	20		M				Y	
	47-50	HCL	75YR46						0	0	HR	60		M				Y	IMP LIMESTONE
25	0-25	MCL	10YR33						1	0	HR	5						Y	
	25-38	HCL	10YR44						0	0	HR	20		M				Y	
	38-40	HCL	10YR44						0	0	HR	60		M				Y	IMP LIMESTONE
26	0-25	MZCL	10YR42						2	0	HR	8						Y	
	25-60	HCL	75YR46						0	0	HR	15		M				Y	
	60-80	HCL	75YR46						0	0	HR	20		M				Y	
	80-100	HCL	10YR56						0	0	HR	50		M				Y	IMP LIMESTONE
27	0-23	MCL	10YR43						3	2	HR	20						Y	
	23-40	HCL	10YR44						0	0	HR	50		M				Y	IMP LIMESTONE
28	0-35	MCL	10YR42						0	0		0							
	35-43	C	05Y 63	10YR46	58 M	D		Y	0	0	HR	2		M					
	43-90	C	05Y 51 52	75YR58	M	D		Y	0	0		0		P		Y			DENSE, FIRM

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
29	0-37	MCL	10YR21						0	0	HR	5							IMP LIMESTONE
30	0-25	MCL	25Y 42						0	0		0							
	25-39	MCL	25Y 53 54						0	0	HR	2		M					
	39-95	HCL	25Y 53 62	10YR46 58	M	D		Y	0	0	HR	5		M					
	95-120	C	05Y 51 52	10YR58	M	D		Y	0	0		0		P		Y			DENSE, FIRM
31	0-35	MCL	10YR42	10YR46	C	F		Y	0	0	HR	2							
	35-120	C	05Y 52	75YR58 46	M	D		Y	0	0		0		P		Y			DENSE, FIRM
32	0-35	MCL	10YR42						0	0		0							
	35-55	C	25Y 52 53	10YR58	M	F		Y	0	0		0		P		Y			DENSE
	55-120	C	05Y 62	10YR58	M	D		Y	0	0		0		P		Y			FIRM
33	0-28	MCL	10YR44						1	0	HR	5					Y		
	28-65	C	75YR46						0	0	HR	10		M			Y		
	65-80	HCL	75YR44 54						0	0	HR	35		M			Y		IMP LIMESTONE
34	0-25	MZCL	25Y 52	10YR58	C	D		Y	0	0		0							
	25-43	C	25Y 62 63	10YR58	C	D		Y	0	0		0		P		Y			DENSE
	43-90	ZC	05Y 61	10YR58	M	D		Y	0	0		0		P		Y			FIRM
35	0-25	MZCL	10YR43						0	0		0							
	25-42	MZCL	10YR54						0	0	SLST	1		M					
	42-80	C	25Y 53 62	10YR58	M	D		Y	0	0	SLST	1		P		Y			DENSE
	80-110	C	05Y 61	10YR58	M	D		Y	0	0		0		P		Y			FIRM
36	0-20	MCL	10YR42						0	0		0							
	20-90	ZC	05Y 51 52	75YR58	M	D		Y	0	0		0		P		Y			DENSE
37	0-28	MCL	10YR42						0	0	HR	5					Y		
	28-40	MCL	10YR43						0	0	SLST	10		M			Y		
	40-50	C	25Y 53 54						0	0	SLST	10		M			Y		IMP ZR
38	0-25	MZCL	10YR42						2	0	HR	6					Y		
	25-35	HZCL	10YR46						0	0	HR	10		M			Y		IMP LIMESTONE
39	0-28	MCL	10YR42						1	0	HR	5					Y		
	28-30	MCL	10YR54						0	0	HR	5		M			Y		IMP LIMESTONE
40	0-30	MCL	10YR32						4	2	HR	8					Y		
	30-45	HCL	10YR43						0	0	HR	10		M			Y		
	45-78	C	25YR53	10YR56	C	F		Y	0	0	HR	10		M			Y		
	78-80	SLST	10YR78						0	0		0		M			Y		IMP LIMESTONE
41	0-25	MCL	10YR42						2	0	HR	10							
	25-50	HCL	10YR46						0	0	HR	20		M			Y		
	50-55	HCL	10YR46 66						0	0	HR	35		M			Y		IMP LIMESTONE

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	IMP	SPL	CALC	
42	0-25	MCL	10YR43						4	1	SLST	25						Y	
	25-40	SCL	10YR66 76						0	0	SLST	35		M				Y	IMP LIMESTONE
43	0-25	MZCL	10YR53	10YR58	F				0	0		0							
	25-50	MCL	25Y 53	10YR58	C			Y	0	0		0		M					
	50-80	C	05Y 51	10YR58	M			Y	0	0		0		P		Y			DENSE, FIRM
44	0-25	MZCL	10YR43						0	0	SLST	2							
	25-60	MZCL	10YR54						0	0	SLST	2		M					
	60-120	C	25Y 62 54	10YR58	M			Y	0	0	SLST	1		P		Y			DENSE
45	0-22	MZCL	10YR43						0	0		0							
	22-44	HZCL	10YR54	10YR56	C				0	0	SLST	1		P		Y			
	44-90	C	05Y 51 54	10YR58	M			Y	0	0	SLST	1		P		Y			FIRM
46	0-26	MZCL	10YR42						1	0	HR	5						Y	
	26-50	HZCL	10YR56						0	0	HR	8		M				Y	IMP LIMESTONE
47	0-26	HZCL	10YR42						0	0	HR	5						Y	
	26-38	C	10YR56						0	0	HR	7		M				Y	IMP LIMESTONE
48	0-30	MCL	10YR32						5	2	SLST	15						Y	IMP LIMESTONE
49	0-20	MCL	10YR43						3	3	SLST	15						Y	
	20-40	C	10YR46						0	0	SLST	5		M				Y	
	40-45	SCL	10YR67 76						0	0	SLST	35		M				Y	IMP LIMESTONE
50	0-25	MZCL	10YR43						0	0		0							
	25-45	MZCL	10YR54						0	0		0		M					
	45-60	C	25Y 62 53	10YR58	C			Y	0	0		0		P		Y			DENSE
	60-90	C	05Y 61	10YR58	M			Y	0	0		0		P		Y			FIRM
51	0-25	MZCL	10YR32						0	0		0						Y	
	25-40	C	25Y 52	10YR58	C	D		Y	0	0		0		P					
	40-60	C	25Y 52	10YR58	C	D		Y	0	0	SLST	10		M				Y	IMP LIMESTONE
52	0-25	MCL	10YR43						8	4	HR	20						Y	IMP LIMESTONE
53	0-28	HCL	10YR43						0	0	HR	5						Y	
	28-47	C	10YR56						0	0		0		M					
	47-80	C	10YR64	10YR56	C	F		Y	0	0		0		M		Y			
54	0-25	MCL	10YR42						1	0	HR	5						Y	
	25-35	HZCL	10YR44						0	0	HR	5		M				Y	IMP LIMESTONE
55	0-30	HCL	10YR43						2	0	SLST	10						Y	
	30-40	C	10YR56						0	0	SLST	5		M				Y	
	40-60	HCL	10YR64						0	0	SLST	25		M				Y	IMP LIMESTONE

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
56	0-30	MZCL	10YR32	10YR46	C	D		Y	0	0	HR	5						Y	
	30-40	MZCL	10YR42						0	0	SLST	20		M				Y	IMP LIMESTONE
57	0-25	HZCL	10YR43	10YR58	C	D		S	0	0		0							
	25-50	C	10YR53	10YR58	C	D		Y	0	0		0		P		Y			FIRM
	50-100	C	25Y 62 53	10YR58	M	D		Y	0	0		0		P		Y			DENSE
58	0-25	MZCL	10YR43						0	0	HR	5						Y	
	25-50	HCL	10YR44						0	0	HR	5		M				Y	
	50-70	HCL	10YR44						0	0	HR	20		M				Y	IMP LIMESTONE
59	0-25	MCL	10YR43						0	0	HR	2						Y	
	25-35	MCL	10YR44						0	0	SLST	15		M				Y	IMP LIMESTONE
60	0-28	MCL	10YR42						4	1	HR	8						Y	IMP LIMESTONE
61	0-28	MCL	10YR42						3	1	HR	9						Y	
	28-40	C	10YR54						0	0		0		M				Y	IMP LIMESTONE
62	0-28	MCL	10YR42						2	0	HR	7						Y	
	28-40	HCL	10YR64	10YR66	C	D		Y	0	0	HR	15		M				Y	IMP LIMESTONE
63	0-30	MCL	10YR43						0	0	HR	5						Y	
	30-48	HCL	10YR44						0	0	HR	5		M				Y	IMP LIMESTONE
64	0-30	MCL	10YR43						3	0	HR	8							
	30-40	HCL	10YR44						0	0	HR	10		M					IMP LIMESTONE
65	0-24	HCL	10YR43						3	0	SLST	10						Y	
	24-35	HCL	10YR44						0	0	SLST	50		M				Y	IMP LIMESTONE
66	0-20	HCL	10YR32						4	1	HR	10						Y	
	20-60	C	25Y 52 53	10YR56	M	D		Y	0	0	SLST	20		P		Y			DENSE
	60-75	C	10YR53	10YR58	M	D		Y	0	0	SLST	30		P		Y	Y		FIRM
	75-120	C	25Y 63	10YR58	M	D		Y	0	0	SLST	40		P		Y			PLASTIC
67	0-30	MZCL	10YR42 43						3	1	SLST	5						Y	
	30-40	HCL	10YR43 44						0	0	SLST	20		M				Y	IMP LIMESTONE
68	0-23	MCL	10YR32						4	1	HR	8						Y	IMP LIMESTONE
69	0-25	MCL	10YR42						6	2	HR	9						Y	IMP LIMESTONE
70	0-23	MCL	10YR42						16	6	HR	20						Y	3B T/S ST
	23-30	HCL	25YR54						0	0	HR	3		M				Y	
	30-38	C	25YR53						0	0	HR	5		M				Y	IMP LIMESTONE
71	0-25	MZCL	10YR42						7	3	HR	12						Y	IMP LIMESTONE

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
72	0-20	MCL	10YR42						5	0	HR	10						Y	IMP LIMESTONE
73	0-30	MCL	10YR43						5	2	HR	15						Y	IMP LIMESTONE
74	0-28	HCL	10YR42						1	0	HR	3						Y	
	28-60	C	10YR44						0	0	HR	2		M				Y	IMP LIMESTONE
75	0-28	MCL	25Y 4243						0	0	HR	5						Y	
	28-65	C	10YR4446						0	0	HR	2		M				Y	
	65-120	C	05Y 6153	10YR58	C	D		Y	0	0	HR	2		P		Y			PLASTIC, DENSE
76	0-30	HCL	10YR42						0	0	HR	3						Y	
	30-50	C	10YR54						0	0	HR	5		M				Y	
	50-120	C	10YR53						0	0		0		M					
77	0-25	MCL	10YR43						5	3	HR	12						Y	
	25-50	C	10YR44						0	0	HR	10		M				Y	IMP LIMESTONE
78	0-27	MCL	10YR43						0	0	HR	5						Y	
	27-68	C	10YR44 46						0	0	HR	5		M					IMP LIMESTONE
79	0-24	HCL	10YR42						0	0		0							
	24-65	C	10YR54	10YR58	C	D		S	0	0	SLST	2		P		Y			FIRM, DENSE
	65-90	C	10YR53 54	10YR58	C	D		Y	0	0	SLST	2		P		Y			PLASTIC
	90-95	C	10YR54 66						0	0	SLST	40		P				Y	IMP LIMESTONE
80	0-30	MCL	10YR42 43						2	0	HR	10						Y	IMP LIMESTONE
81	0-28	MCL	10YR43						2	0	HR	12						Y	
	28-30	MCL	10YR44						0	0	HR	50		M				Y	IMP LIMESTONE
82	0-30	MCL	10YR42						7	4	HR	10						Y	IMP LIMESTONE
82A	0-25	MZCL	10YR42						6	1	HR	10						Y	IMP LIMESTONE
83	0-25	MCL	10YR43						2	1	HR	5						Y	
	25-35	HCL	10YR54						0	0	HR	50		M				Y	IMP LIMESTONE
84	0-25	HCL	10YR43						2	1	HR	5						Y	
	25-70	HCL	10YR54						0	0	SLST	10		M				Y	IMP LIMESTONE
85	0-28	HCL	10YR42						0	0	HR	5						Y	
	28-35	C	10YR54						0	0		0		M				Y	IMP LIMESTONE
86	0-28	HCL	10YR42						0	0	HR	3						Y	
	28-40	C	10YR54						0	0		0		M				Y	IMP LIMESTONE
87	0-30	MCL	10YR43						0	0	HR	10						Y	IMP LIMESTONE

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	IMP	SPL	CALC	
88	0-25	HCL	10YR43						8	2	HR	10						Y	IMP LIMESTONE
89	0-30	MCL	10YR42						3	2	HR	10						Y	IMP LIMESTONE
90	0-26	MCL	10YR4243						0	0	HR	5						Y	
	26-80	HCL	10YR4446						0	0	HR	2		M				Y	LOOSE
	80-120	C	10YR4446	10YR58	F	D			0	0	HR	2		M				Y	FIRM, DENSE
91	0-28	MCL	10YR42 43						0	0	HR	2						Y	
	28-45	HCL	10YR43 44						0	0	HR	5		M				Y	
	45-120	C	10YR44 46						0	0	SLST	2		M				Y	
92	0-21	MCL	10YR42 43						0	0	HR	2						Y	
	21-40	MCL	10YR43 44						0	0	SLST	5		M				Y	IMP LIMESTONE
93	0-30	MCL	10YR42 43						0	0	HR	2						Y	
	30-40	HCL	10YR43						0	0		0		M				Y	
	40-65	C	10YR44 46						0	0		0		M					
	65-80	C	25Y 52	10YR46 58	C	D		Y	0	0		0		P			Y		IMP LIMESTONE
94	0-28	MCL	10YR43						4	2	HR	5						Y	
	28-45	HCL	75YR44						0	0	HR	5		M				Y	IMP LIMESTONE
95	0-30	MCL	10YR43						4	2	HR	14						Y	
	30-50	HCL	10YR54						0	0	SLST	20		M				Y	IMP LIMESTONE
96	0-25	MCL	10YR43						4	2	HR	8						Y	
	25-40	HCL	10YR54						0	0	HR	50		M				Y	IMP LIMESTONE
97	0-25	HCL	10YR43						3	1	HR	6						Y	
	25-30	HCL	10YR54						0	0	HR	20		M				Y	IMP LIMESTONE
98	0-28	HZCL	10YR43						0	0	HR	1						Y	
	28-40	C	10YR44						0	0	HR	1		M				Y	
	40-50	C	10YR56						0	0	SLST	25		M				Y	IMP LIMESTONE
99	0-28	HCL	10YR42						5	1	HR	8						Y	IMP LIMESTONE
100	0-25	HCL	10YR43						11	2	HR	13						Y	IMP LIMESTONE
101	0-37	MCL	10YR4243						5	2	HR	12						Y	IMP LIMESTONE
102	0-28	HCL	10YR42						2	1	HR	3						Y	
	28-70	HCL	10YR54						0	0	HR	10		M				Y	IMP LIMESTONE
103	0-30	MCL	10YR4243						16	3	HR	20						Y	IMP LIMESTONE
104	0-30	MCL	10YR42						16	6	HR	25						Y	IMP LIMESTONE

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	IMP	SPL	CALC	
105	0-25	MZCL	10YR43						6	2	HR	9						Y	
	25-33	HCL	75YR54						0	0	HR	10			M			Y	IMP LIMESTONE
106	0-25	MCL	10YR43						2	1	HR	4						Y	
	25-35	HCL	10YR44						0	0	HR	5			M			Y	IMP LIMESTONE
107	0-25	MCL	10YR43						3	1	HR	5						Y	
	25-35	HCL	10YR44						0	0	HR	5			M			Y	IMP LIMESTONE
108	0-30	MZCL	10YR43						5	2	HR	10						Y	IMP LIMESTONE
109	0-25	HCL	10YR43						3	1	HR	5						Y	
	25-40	HCL	10YR63 64						0	0	SLST	50			M			Y	IMP LIMESTONE
110	0-25	HCL	10YR42						0	0	HR	2						Y	
	25-40	HCL	10YR44						0	0	HR	2			M			Y	
	40-60	HCL	10YR44						0	0	SLST	50			M			Y	IMP LIMESTONE
111	0-28	MZCL	10YR43						0	0	HR	3						Y	
	28-40	HZCL	10YR54						0	0	HR	5			M			Y	
	40-50	HZCL	10YR44						0	0	HR	5			M			Y	
	50-60	HZCL	75YR54	10YR58	F	F			0	0	HR	5			M			Y	IMP LIMESTONE
112	0-30	MCL	10YR4243						16	6	HR	25						Y	IMP LIMESTONE
113	0-28	MCL	10YR43						1	4	HR	10						Y	
	28-45	HCL	10YR44						0	0	HR	15			M			Y	IMP LIMESTONE
114	0-25	MCL	10YR43						7	4	HR	10						Y	
	25-33	HCL	75YR54						0	0	HR	50			M			Y	IMP LIMESTONE
115	0-30	HCL	10YR43						4	2	HR	6						Y	
	30-40	HCL	10YR54						0	0	HR	20			M			Y	IMP LIMESTONE
116	0-25	MCL	10YR43						0	0	HR	3						Y	
	25-35	HCL	10YR43						0	0	HR	10			M			Y	IMP LIMESTONE
117	0-30	MCL	10YR4243						4	0	HR	10						Y	
	30-40	HCL	10YR44						0	0	HR	10			M			Y	IMP LIMESTONE
P1	0-27	MCL	10YR42 43						13	5	HR	20						Y	OVER SOLID LST
	27-34	HR							0	0		0			P			Y	ROOTS TO 34CM
P2	0-28	MCL	10YR32						4	1	HR	10						Y	
	28-48	HCL	10YR43 44						0	0	HR	35		FR	M			Y	HARD, DRY
	48-61	C	25Y 53						0	0	HR	5	MDMPR	VM	P			Y	
	61-77	C	10YR54						0	0	HR	5	MDCSAB	FM	M			Y	
	77-85	HR	10YR76						0	0		0			M			Y	LST,ROOTS TO 85CM

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
P3	0-25	MCL	10YR43 42						0	0	HR	2						Y	
	25-57	HCL	10YR46						0	0	HR	6	MDCSAB	FR	M			Y	HRD PLATED LST
	57-80	HCL	10YR44 46						0	0	HR	43			M			Y	ROOTS TO 57CM
P4	0-21	MCL	10YR44						0	0	HR	7						Y	
	21-27	HCL	10YR46						0	0	HR	25	MDCSAB	FR	M			Y	
	27-44	HCL	10YR56 66						0	0	HR	35		FR	M			Y	DRY, HARD
	44-82	HCL	10YR66						0	0	HR	60		FR	M			Y	ROOTS TO 78CM
P5	0-21	MCL	10YR42						0	0	HR	8						Y	
	21-38	MCL	10YR44						0	0	HR	15	MDCSAB	FR	M			Y	
	38-82	MCL	10YR46						0	0	HR	65			P			Y	ROOTS TO 72CM
P6	0-23	MCL	10YR42 43						2	0	HR	16						Y	
	23-44	HCL	10YR44						0	0	HR	60	M		M			Y	DRY, HARD, STONY
	44-55	MCL	10YR66						0	0	HR	57	M		M			Y	DRY, HARD, STONY
	55-60	HCL	10YR66						0	0	HR	64	M		M			Y	ROOTS TO 55CM
P7	0-22	MCL	10YR44						6	0	HR	10						Y	
	22-47	HR							0	0		0			P			Y	CLAY MATRIX
P8	0-23	MZCL	10YR43						0	0		0	MDCSAB	FR					
	23-42	HZCL	25Y 53	10YR56	C	F		Y	0	0	HR	2	MDCSAB	FR	M				
	42-80	ZC	05Y 52	75YR58	M	D		Y	0	0		0	MDCPR	FM	P	Y		Y	
P9	0-28	MCL	10YR43						0	0	HR	3						Y	
	28-80	HCL	10YR46						0	0	HR	2	MDCSAB	FR	M			Y	
	80-120	C	10YR5453	10YR56	F	D		Y	0	0	HR	2	MDCSAB	FM	M			Y	