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Aylesbury Vale Local Plan
Option C - Weedon Hill
Agricultural Land Classification Report
Semi-detailed Survey
April 1996.

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

AYLESBURY VALE LOCAL PLAN
OPTION C - WEEDON HILL

Introduction

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey on approximately 57 hectares of land at Weedon Hill, on the A413, to the north of Aylesbury in Buckinghamshire. The survey was carried out during April 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) from its Land Use Planning Unit, in Reading, in connection with the Aylesbury Vale District Local Plan. The results of this survey supersede any previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey all of the agricultural land on this site was in arable use comprising Oilseed Rape and Barley. The area shown as 'Other Land' comprised an Electricity Sub Station.

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 below.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% site area	% surveyed area
2	3.8	6.6	6.7
3a	9.2	16.1	16.2
3b	43.7	76.3	77.1
Other Land	0.6	1.0	-
Total surveyed area	56.7	-	100.0
Total site area	57.3	100.0	-

7. The fieldwork was conducted at an average density of just under 1 boring per hectare. A total of 42 borings and three soil pits were described.

8. The majority of the agricultural land on this site has been classified as Subgrade 3b (moderate quality) with some Subgrade 3a land (good quality) mapped towards the centre and south east of the site. The key limitation here is soil wetness. In the south east corner a narrow strip of Grade 2 (very good quality) land has also been mapped where soil wetness and soil droughtiness are equally limiting.

9. The soil profiles are derived from Jurassic Clays and recent alluvial deposits and as such comprise moderately to poorly drained clay loams over clays. The profiles are generally slowly permeable from the upper subsoil but, occasionally, these poorly structured horizons occur at greater depth. The resultant wet soils restrict seed germination and root development as well as affecting the timing of cultivations. This land has therefore been assigned to either Subgrade 3b, 3a or Grade 2 depending on the degree of drainage impedance.

10. The Grade 2 land is also limited by a minor soil droughtiness limitation. In this locally dry climatic regime the combination of soil textures with the slight to moderate stone content acts to reduce the amount of profile available water for crops. As a result crop growth and yields may be slightly diminished.

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).

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SP 433 410
Altitude	m, AOD	145
Accumulated Temperature	day°C (Jan-June)	1334
Average Annual Rainfall	mm	705
Field Capacity Days	days	159
Moisture Deficit, Wheat	mm	98
Moisture Deficit, Potatoes	mm	87

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. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation (Climatic Grade 1). However, climatic factors can interact with soil properties to influence soil wetness and droughtiness. At this location, field capacity day values are relatively low, thus decreasing the likelihood of soil wetness. Correspondingly the crop adjusted soil moisture deficits are slightly high, thus increasing the likelihood of soil droughtiness.

16. Local climatic factors such as frost risk and exposure are not thought likely to adversely affect agricultural land use on this site.

Site

17. The land on this site slopes gently from 80m AOD in the north west corner to 74m AOD in the south east. Gradient and microrelief do not affect agricultural land quality.

18. Flooding does not appear to be limiting on this site as the River Thame is not immediately adjacent as the River Thame is not immediately adjacent.

Geology and soils

19. The relevant geological sheet (BGS, 1972) maps the majority of the site as the Kimmeridge Clay and Portland Beds with a small area of alluvium adjacent to the River Thame.

20. The most recently published soils information for this area (SSEW, 1983) maps the Denchworth soil association across the most of the site and the Thame association adjacent to the river. The former are described as 'Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils. Some fine loamy over clayey with only slight seasonal waterlogging and some slowly permeable calcareous clayey soils. Landslips and associated irregular terrain locally' (SSEW, 1983). The latter are 'stoneless mainly calcareous clayey soils affected by groundwater. Flat land. Risk of flooding.' (SSEW, 1983).

21. Detailed field examination revealed soils similar to those described in paragraph 20.

Agricultural Land Classification

22. 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.

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

Grade 2

24. Very good quality agricultural land (Grade 2) has been mapped towards the south east of the site. The soil profiles are generally deep and moderately well drained. Soil inspection Pits 2 & 3 typify these soils, comprising very slightly stony (2-3% total flint) medium clay loam topsoils over moderately structured, very slightly or slightly stony (1-10% total flint), heavy clay loam upper subsoils. Slight evidence of mottling occurs in the topsoils and upper subsoils but true gleying is not present until 50-66cm depth in the lower subsoil. This horizon comprises a poorly structured, slowly permeable clay which restricts drainage through the profile causing slight seasonal waterlogging. Wetness Class II (Appendix III), Grade 2 has therefore been assigned to this land, as wet soils can inhibit seed germination and growth. The medium textured topsoils can also limit the timing of cultivations, as trafficking by agricultural machinery and grazing livestock can damage the soil structure.

25. In this locally dry climatic regime the combination of soil textures, structures and stone contents acts to slightly reduce the amount of profile available water for plants. This land has therefore been assigned to Grade 2 on the basis of a minor soil droughtiness limitation, as well as a soil wetness and workability limitations.

Subgrade 3a

26. The Subgrade 3a (good quality land) is very similar to that which has been classified as Grade 2, but this has a slightly more significant soil wetness limitation. The soil profiles comprise very slightly stony (2-3% total flint) medium clay loam topsoils over moderately structured, heavy clay loam upper subsoils, with a similar stone content (0-5% total flint). The profiles are generally gleyed from between 30-50cm depth and slowly permeable, from 40-65 cm depth, where poorly structured clay lower subsoils occur. These horizons impede drainage causing more significant waterlogging (Wetness Class III). As a result, crop establishment and growth will be reduced. This land has therefore been classified as Subgrade 3a due to soil wetness. The medium textured topsoils will also limit the flexibility of cropping and stocking, as over trafficking of the land may lead to structural damage.

Subgrade 3b

27. The majority of the site has been classified as Subgrade 3b (moderate quality land) due to significant soil wetness restrictions. Soil inspection Pit 1 typifies these profiles, which comprise a very slightly stony (2-3% flints), medium or heavy clay loam topsoil with distinct mottling. Generally the upper subsoils are gleyed and slowly permeable, comprising moderately structured heavy clay loams over poorly structured clays. Occasionally, however, the poorly structured clay occurs from the upper subsoil. Shallow slowly permeable horizons, such as these, severely impede drainage through the profile, causing prolonged waterlogging. Despite the locally dry climatic regime, this land has been classified as Subgrade 3b. Workability limitations also apply where the combination of wet soils and heavy topsoils limit the timing of cultivations.

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SOURCES OF REFERENCE

British Geological Survey (1972) *Sheet No. 283, Aylesbury.* 1:63,360 Series. Drift.
BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.*
MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.*
Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South East England.*
SSEW: Harpenden.

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

DESCRIPTIONS OF THE GRADES AND SUBGRADES

Grade 1: Excellent Quality Agricultural Land

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

Grade 2: Very Good Quality Agricultural Land

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

Grade 3: Good to Moderate Quality Land

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

Subgrade 3a: Good Quality Agricultural Land

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

Subgrade 3b: Moderate Quality Agricultural Land

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

Grade 4: Poor Quality Agricultural Land

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

Grade 5: Very Poor Quality Agricultural Land

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

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Wetness Class	Duration of waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years.[2]
II	The soil profile is wet within 70 cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

[1] The number of days is not necessarily a continuous period.
[2] 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL DATA

Contents:

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

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

Boring Header Information

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

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

ARA:	Arable	**WHT:**	Wheat	**BAR**:	Barley
CER:	Cereals	**OAT**:	Oats	**MZE**:	Maize
OSR:	Oilseed rape	**BEN**:	Field Beans	**BRA**:	Brassicae
POT:	Potatoes	**SBT**:	Sugar Beet	**FCD**:	Fodder Crops
LIN:	Linseed	**FRT**:	Soft and Top Fruit	**FLW**:	Fallow
PGR:	Permanent Pasture	**LEY**:	Ley Grass	**RGR**:	Rough Grazing
SCR:	Scrub	**CFW**:	Coniferous Woodland	**DCW**:	Deciduous Wood
HTH:	Heathland	**BOG**:	Bog or Marsh	**FLW**:	Fallow
PLO:	Ploughed	**SAS**:	Set aside	**OTH**:	Other
HRT:	Horticultural Crops				

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

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

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

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

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

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

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

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

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

Soil Pits and Auger Borings

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

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

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

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

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (<27% clay) **H**: Heavy (27-35% clay)

2. **MOTTLE COL**: Mottle colour using Munsell notation.

3. **MOTTLE ABUN**: Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2-20% **M**: many 20-40% **VM**: very many 40% +

4. **MOTTLE CONT:** Mottle contrast

F: faint - indistinct mottles, evident only on close inspection
D: distinct - mottles are readily seen
P: prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL**: Ped face colour using Munsell notation.

6. **GLEY:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH**: Stone Lithology - One of the following is used.

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

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

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

degree of development	**WK**: weakly developed **ST**: strongly developed	**MD**: moderately developed
ped size	**F**: fine **C**: coarse	**M**: medium **VC**: very coarse
ped shape	**S** : single grain **GR**: granular **SAB**: sub-angular blocky **PL**: platy	**M**: massive **AB**: angular blocky **PR**: prismatic

9. **CONSIST**: Soil consistence is described using the following notation:

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

10. **SUBS STR**: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G**: good **M**: moderate **P**: poor

11. **POR**: Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP**: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropiate horizon.

13. **SPL**: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC**: If the soil horizon is calcareous, a 'Y' will appear in this column.

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

SOIL PIT DESCRIPTION

Site Name : AYLESBURY VALE,OPTION C Pit Number : 1P

Grid Reference: SP81001600 Average Annual Rainfall : 640 mm
Accumulated Temperature : 1417 degree days
Field Capacity Level : 135 days
Land Use : Oilseed Rape
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	MCL	10YR42 00	2	4	HR					
29- 45	HCL	10YR52 00	0	10	HR	M	WKCSAB	FR	M	
45- 90	C	25Y 52 00	0	5	HR	M	WKCAB	FM	P	

Wetness Grade : 3B Wetness Class : IV
Gleying :029 cm
SPL :029 cm

Drought Grade : 3A APW : 106mm MBW : -5 mm
APP : 104mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : AYLESBURY VALE,OPTION C Pit Number : 2P

Grid Reference: SP81601580
Average Annual Rainfall : 640 mm
Accumulated Temperature : 1417 degree days
Field Capacity Level : 135 days
Land Use : Barley
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 32	MCL	10YR42 00	1	5	HR					
32- 48	HCL	10YR53 00	0	5	HR		MDCAB	FR	M	
48- 90	C	10YR62 00	0	10	HR	M	WKCSAB	FM	P	

Wetness Grade : 2
Wetness Class : II
Gleying :048 cm
SPL :048 cm

Drought Grade : 3A
APW : 107mm MBW : -4 mm
APP : 105mm MBP : 1 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : AYLESBURY VALE,OPTION C Pit Number : 3P

Grid Reference: SP81401550 Average Annual Rainfall : 640 mm
Accumulated Temperature : 1417 degree days
Field Capacity Level : 135 days
Land Use : Barley
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 35	MCL	10YR42 00	0	2	HR					
35- 68	HCL	10YR53 00	0	2	HR	F	MDCSAB	FM	M	
68-120	C	10YR63 00	0	2	HR	M	WKCSAB	FM	P	

Wetness Grade : 2 Wetness Class : II
Gleying :068 cm
SPL :068 cm

Drought Grade : 2 APW : 139mm MBW : 28 mm
APP : 116mm MBP : 12 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Soil Wetness/Droughtiness

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	--WETNESS-- GLEY	SPL	CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SP81401630	CER	S	02	025	025	4	3B		0		0					WE	3B	V Plastic C
1P	SP81001600	OSR			029	029	4	3B	106	-5	104	0	3A				WE	3B	Near Boring 1
2	SP81491630	CER	S	02	018	018	4	3B		0		0					WE	3B	V Plastic C
2P	SP81601580	BAR			048	048	2	2	107	-4	105	1	3A				DR	2	At Boring 36
3	SP81401620	CER	S	01	040	040	3	3A		0		0					WE	3A	
3P	SP81401550	BAR			068	068	2	2	139	28	116	12	2				WD	2	At Boring 54
4	SP81501620	CER	S	01	050	050	2	2	136	25	113	9	2				WD	2	
5	SP81101610	OSR	N	01	0	030	4	3B	117	6	097	-7	2				WE	3B	
6	SP81301610	BAR			030	030	4	3B		0		0					WE	3B	
7	SP81401610	BAR			025	025	4	3B		0		0					WE	3B	
8	SP81501610	CER			025	025	4	3B		0		0					WE	3B	
9	SP81601610	CER	S	01	0	028	4	3B		0		0					WE	3B	
10	SP81001600	OSR			0	030	4	3B	100	-11	105	1	3A				WE	3B	See 1P
11	SP81201600	OSR			0	030	4	3B		0		0					WE	3B	
12	SP81401600	BAR	SE	02	0	028	4	3B		0		0					WE	3B	
13	SP81501600	BAR	SE	02	035	035	4	3B		0		0					WE	3B	
14	SP80731589	ORS	NW	03	0	030	4	3B	102	-9	110	6	3A				WE	3B	
15	SP80901590	ORS			0	030	4	3B		0		0					WE	3B	
16	SP81101590	OSR	NW	03	0	030	4	3B		0		0					WE	3B	
17	SP81201590	BAR	SE	01	0	030	4	3B		0		0					WE	3B	
18	SP81301590	BAR	SE	02	0	020	4	3B		0		0					WE	3B	
19	SP81401590	BAR	SE	02	030	050	3	3A		0		0					WE	3A	
20	SP81501590	BAR	SE	01	030	030	4	3B		0		0					WE	3B	
21	SP81601590	BAR			050	050	2	2	130	19	108	4	2				WD	2	
22	SP80801580	ORS	W	01	0	028	4	3B		0		0					WE	3B	
23	SP81001580	BAR			0	028	4	3B		0		0					WE	3B	
24	SP81101580	BAR	SE	02	0	025	4	3B		0		0					WE	3B	
25	SP81201580	BAR	SE	01	030	045	3	3A		0		0					WE	3A	
26	SP81301580	BAR			0	030	4	3B		0		0					WE	3B	
27	SP81401580	BAR			030	030	4	3B		0		0					WE	3B	
28	SP81601580	BAR			050	050	2	2		0		0					DR	3A	See 2P
29	SP80901570	BAR	SE	03	0	030	4	3B		0		0					WE	3B	
30	SP81001570	BAR	SE	03	0	025	4	3B		0		0					WE	3B	
31	SP81101570	BAR	SE	02	030	030	4	3B		0		0					WE	3B	
32	SP81301570	BAR			0	030	4	3B		0		0					WE	3B	
33	SP81501570	BAR			030	030	4	3B		0		0					WE	3B	
34	SP81601570	BAR			060	060	2	2	131	20	110	6	2				WD	2	
35	SP80901555	BAR	SE	05	0	025	4	3B		0		0					WE	3B	
36	SP81001560	BAR	SE	03	030	030	4	3B		0		0					WE	3B	
37	SP81201560	BAR			030	030	4	3B		0		0					WE	3B	
38	SP81401560	BAR	SE	01	030	030	4	3B		0		0					WE	3B	
39	SP81601560	BAR	SE	01	030	040	3	3A		0		0					WE	3A	

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	--WETNESS-- GLEY	SPL	CLASS	-WHEAT- GRADE	AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT		ALC	COMMENTS
40	SP81401550	BAR			066	066	2	2	126	15	117	13	2				WD	2		See 3P
41	SP81501550	BAR			035	065	3	3A		0		0					WE	3A		
42	SP81701550	BAR	SE	01	035	050	3	3A		0		0					WE	3A		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
1	0-25	hcl	10YR32 00						0	0	HR	2							
	25-55	c	10YR52 00	10YR58 00	C			Y	0	0	HR	2		P			Y		
	55-70	c	10YR52 00	10YR58 00	M			Y	0	0	HR	5		P			Y		
1P	0-29	mcl	10YR42 00						2	0	HR	4							
	29-45	hcl	10YR52 00	05YR46 58	M		10YR62 00	Y	0	0	HR	10	WKCSAB	FR M	Y		Y		
	45-90	c	25Y 52 00	75YR68 00	M		25Y 61 00	Y	0	0	HR	5	WKCAB	FM P	Y		Y		
2	0-18	hcl	10YR32 00						0	0	HR	2							
	18-55	c	25Y 53 00	25Y 56 00	M			Y	0	0		0		P			Y		
	55-70	c	25Y 51 00	25Y 56 00	M			Y	0	0		0		P			Y		
2P	0-32	mcl	10YR42 00						1	0	HR	5							
	32-48	hcl	10YR53 00				10YR52 00		0	0	HR	5	MDCAB	FR M					
	48-90	c	10YR62 00	75YR46 58	M		10YR61 00	Y	0	0	HR	10	WKCSAB	FM P	Y		Y		Imp Gravelly
3	0-28	mcl	10YR42 00						0	0	HR	2							
	28-40	hcl	10YR54 00						0	0	HR	2		M					
	40-50	hcl	10YR53 00	10YR58 52	C			Y	0	0	HR	2		M			Y		
	50-70	c	10YR51 00	75YR58 00	M			Y	0	0	HR	2		P			Y		
3P	0-35	mcl	10YR42 00						0	0	HR	2							
	35-68	hcl	10YR53 00	10YR58 00	F				0	0	HR	2	MDCSAB	FM M					
	68-120	c	10YR63 00	75YR58 00	M		10YR53 00	Y	0	0	HR	2	WKCSAB	FM P	Y		Y		
4	0-30	mcl	10YR42 00						0	0	HR	2							
	30-50	c	10YR43 00						0	0	HR	5		M					
	50-65	hcl	10YR53 00	05YR46 00	C			Y	0	0	HR	2		M			Y		
	65-90	c	10YR52 00	10YR58 61	M			Y	0	0	HR	2		P			Y		
	90-120	c	10YR61 00	10YR58 00	M			Y	0	0		0		P			Y		
5	0-30	mcl	10YR42 00	75YR58 00	C			Y	0	0	HR	5							
	30-50	c	10YR61 62	75YR58 00	M			Y	0	0	HR	10		P			Y		
	50-120	c	25Y 71 72	75YR68 00	M		00MN00 00	Y	0	0	HR	15		P			Y		
6	0-30	mcl	10YR42 00						0	0	HR	3							
	30-50	c	10YR61 62	10YR58 00	C			Y	0	0	HR	2		P			Y		
	50-65	c	25Y 61 62	10YR66 00	M			Y	0	0		0		P			Y		
7	0-25	mcl	10YR42 00	75YR68 00	C		00	Y	0	0	HR	3							
	25-60	c	25Y 61 00	10YR66 00	Y			Y	0	0		0		P			Y		
8	0-25	hcl	10YR42 00						0	0	HR	3							
	25-70	c	10YR53 62	75YR58 00	M		00MN00 00	Y	0	0	HR	3		P			Y		
9	0-28	mcl	10YR32 00	10YR56 00	C			Y	0	0	HR	2							
	28-40	c	10YR53 00	10YR46 00	M			Y	0	0	HR	2		P			Y		
	40-70	c	10YR51 53	75YR56 00	M		00MN00 00	Y	0	0	HR	2		P			Y		

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
10	0-30	mcl	10YR42 00 05Y 58 71 C					Y	0	0	HR	5							
	30-50	hcl	10YR61 62 05Y 58 00 M				00MN00 00	Y	0	0	HR	15		M			Y		
	50-80	c	25Y 61 62 75YR68 00 M					Y	0	0		0		P			Y		
11	0-30	mcl	10YR42 00 75YR58 00 C					Y	0	0	HR	2							
	30-50	c	10YR61 62 75YR58 00 M					Y	0	0	HR	5		P			Y		
	50-80	c	25Y 71 72 75YR68 00 M				00MN00 00	Y	0	0	HR	10		P			Y		
12	0-28	mcl	10YR42 00 10YR58 00 C					Y	0	0	HR	2							
	28-60	c	25Y 61 62 10YR66 00 M					Y	0	0		0		P			Y		
13	0-35	mcl	10YR42 00 10YR58 00 F						0	0	HR	2							
	35-60	c	25Y 61 62 10YR66 00 M					Y	0	0		0		P			Y		
14	0-30	mcl	10YR42 00 10YR58 00 C					Y	0	0	HR	2							
	30-55	hcl	10YR53 63 75YR58 00 C					Y	0	0	HR	5		M			Y		
	55-75	c	10YR63 62 75YR58 00 C					Y	0	0	HR	5		P			Y		
15	0-30	mcl	10YR42 00 75YR58 00 C					Y	0	0	HR	5							
	30-70	c	25Y 61 62 75YR68 00 M				00MN00 00	Y	0	0	HR	10		P			Y		
16	0-30	mcl	10YR42 00 75YR58 00 C					Y	0	0	HR	5							
	30-60	c	25Y 61 62 75YR58 00 M				00MN00 00	Y	0	0	HR	10		P			Y		
17	0-30	mcl	10YR42 00 10YR58 00 C					Y	1	0	HR	4							
	30-60	c	10YR61 62 75YR58 00 C					Y	0	0	HR	1		P			Y		
18	0-20	c	25Y 42 00 10YR66 00 C					Y	0	0	HR	2							
	20-60	c	25Y 62 61 10YR66 00 M					Y	0	0		0		P			Y		
19	0-30	mcl	10YR42 00 10YR58 00 F						0	0	HR	2							
	30-50	hcl	10YR53 52 10YR66 00 C					Y	0	0		0		M					Friable/Soft
	50-70	c	25Y 61 62 10YR66 00 M					Y	0	0		0		P			Y		
20	0-30	mcl	10YR42 00 10YR58 00 F						0	0	HR	2							
	30-60	c	25Y 52 00 75YR58 00 M				00MN00 00	Y	0	0	HR	2		P			Y		
21	0-35	mcl	10YR42 00						1	0	HR	3							
	35-50	hcl	10YR53 00						0	0	HR	10		M					
	50-120	c	10YR62 00 75YR58 00 M					Y	0	0	HR	5		P			Y		
22	0-28	mcl	10YR42 00 75YR58 00 C					Y	0	0	HR	2							
	28-60	c	25Y 61 62 10YR68 00 M					Y	0	0	HR	5		P			Y		
23	0-28	mcl	10YR42 00 75YR68 00 C					Y	2	0	HR	6							
	28-55	hcl	10YR52 53 75YR58 61 C					Y	0	0	HR	5		M			Y		
	55-70	c	25Y 62 61 10YR66 00 C					Y	0	0	HR	5		P			Y		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
24	0-25	hcl	10YR42 00	10YR58 00	C			Y	0	0	HR	1							
	25-60	c	25Y 61 62	10YR66 00	M			Y	0	0		0		P			Y		
25	0-30	mcl	10YR42 00	10YR58 00	F		00MN00 00		0	0	HR	3							
	30-45	hcl	10YR53 52	75YR58 00	C			Y	0	0	HR	3		M					Friable/Soft
	45-70	c	25Y 61 62	10YR66 00	M			Y	0	0		0		P			Y		
26	0-30	mcl	10YR52 00	10YR58 00	C			Y	0	0	HR	2							
	30-60	c	10YR61 62	75YR58 00	M		00MN00 00	Y	0	0		0		P			Y		
27	0-30	mcl	10YR42 00	10YR58 00	F				0	0	HR	2							
	30-60	c	10YR61 62	75YR58 00	M		00MN00 00	Y	0	0		0		P			Y		
28	0-35	mcl	10YR42 00	10YR58 00	F				0	0	HR	2							
	35-50	hcl	10YR52 53	75YR58 00	F				0	0	HR	2		M					
	50-65	c	10YR61 62	75YR58 00	M		00MN00 00	Y	0	0	HR	2		P			Y		
29	0-30	mcl	10YR42 00	10YR58 00	C			Y	0	0	HR	1							
	30-60	c	25Y 61 00	10YR66 00	M			Y	0	0		0		P			Y		
30	0-25	mcl	10YR42 00	75YR68 00	C			Y	0	0	HR	3							
	25-60	c	25Y 61 00	10YR66 00	M			Y	0	0		0		P			Y		
31	0-30	mcl	10YR42 00	10YR58 00	F				0	0	HR	2							
	30-60	c	10YR61 00	75YR58 00	M			Y	0	0	HR	1		P			Y		
32	0-30	hcl	25Y 42 00	10YR58 00	C			Y	0	0	HR	2							
	30-60	c	25Y 61 62	10YR58 00	C			Y	0	0	HR	1		P			Y		
33	0-30	mcl	10YR42 00	10YR58 00	F				0	0	HR	2							
	30-60	c	10YR61 62	75YR58 00	M		00MN00 00	Y	0	0		0		P			Y		
34	0-30	mcl	10YR42 00						1	0	HR	3							
	30-60	hcl	10YR53 00						0	0	HR	5		M					
	60-120	c	10YR62 00	75YR58 46	M		00MN00 00	Y	0	0	HR	10		P			Y		
35	0-25	hcl	25Y 42 00	10YR66 00	C			Y	0	0	HR	1							
	25-60	c	25Y 62 00	10YR66 00	C			Y	0	0	HR	1		P			Y		
36	0-30	mcl	10YS42 00	10YR58 00	F				0	0	HR	1							
	30-40	c	10YR53 62	75YR58 00	C			Y	0	0		0		P			Y		
	40-60	c	25Y 62 00	10YR66 00	M			Y	0	0		0		P			Y		
37	0-30	hcl	25Y 42 00						0	0	HR	2							
	30-60	c	25Y 61 62	10YR66 00	M			Y	0	0	HR	5		P			Y		
38	0-30	mcl	25Y 42 00	10YR58 00	F				0	0	HR	2							
	30-60	c	25Y 61 62	10YR66 00	M			Y	0	0		0		P			Y		

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
39	0-30	mcl	10YR42 00						0	0	HR	2						
	30-40	hcl	10YR64 00	10YR58 00	C			Y	0	0		0		M				
	40-60	c	10YR64 00	75YR58 00	C			Y	0	0		0		P			Y	
40	0-38	mcl	10YR42 00						0	0	HR	2						
	38-66	hcl	10YR53 00	10YR58 00	F				0	0	HR	1		M				
	66-100	c	10YR64 00	75YR58 00	M		00MN00 00	Y	0	0		0		P			Y	
41	0-35	mcl	10YR42 00	10YR58 00	F				0	0	HR	2						
	35-65	hcl	10YR52 53	75YR58 00	C			Y	0	0	HR	1		M				
	65-80	c	10YR63 62	75YR58 00	C		00MN00 00	Y	0	0		0		P			Y	
42	0-35	mcl	10YR42 00						0	0	HR	2						
	35-50	hcl	10YR64 00	75YR58 00	C			Y	0	0		0		M				
	50-65	c	10YR64 00	75YR58 00	C			Y	0	0	HR	2		P			Y	
	65-80	c	10YR64 00	75YR58 00	C			Y	0	0	HR	20		M			Y	