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WEST SUSSEX MINERALS PLAN
SITE 32: RIDLINGTON FARM
AGRICULTURAL LAND CLASSIFICATION
ALC MAP & REPORT
NOVEMBER 1993

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1.0 Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on a number of sites in West Sussex. The work forms part of MAFF's statutory input to the preparation of the West Sussex Minerals Plan.

1.2 Approximately 60 hectares of land relating to Site 32 around Ridlington Farm near Duncton was surveyed during November 1993. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 58 soil auger borings and 3 soil inspection pits were assessed in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on its use for agriculture.

1.3 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.5 At the time of the survey the landuse on the site was a mixture of cereals, permanent grassland and field vegetables.

1.6 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:5000. It is accurate at this scale, but any enlargement would be misleading. This map supersedes any previous survey information for this site.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Total Site	% of Agricultural Area
2	48.4	80.4	83.3
3a	8.2	13.6	14.1
4	1.5	2.5	2.6
Non agricultural land	1.1	1.8	100% (58.1 ha.)
Woodland	0.2	0.4	
Urban	0.8	1.3	
Total area of site	60.2 ha	100%	

1.7 Appendix 1 gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.8 The site has been classified as Grade 2, Subgrade 3a and Grade 4, with the key limitations of workability, wetness and droughtiness. The majority of the site is Grade 2, very good quality land. These soils comprise medium clay loam topsoils which become heavier and occasionally sandy with depth. These soils are stoneless and well drained, but are downgraded to Grade 2 due to a slight workability limitation related to the topsoil texture. The area of Subgrade 3a land experiences a moderate droughtiness limitation. These soils have a higher sand content throughout the profile, and the combination of soil textures and structures and the local climatic regime means that they have limited reserves of available water within the profile for extraction by crops. The small area of Grade 4 land shows a severe drainage imperfection due to the presence of a poorly structured clay subsoil at a shallow depth.

2.0 Climate

2.1 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.

2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (degree days Jan-June), as a measure of the relative warmth of a locality.

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site. However, climatic factors do interact to influence soil wetness and droughtiness limitations.

2.4 No local climatic factors such as exposure or frost risk affect the site. However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. In the locality of this particular site, field capacity days are relatively high, with correspondingly low moisture deficits. In a regional context, this is likely to exacerbate any soil wetness limitations, whilst decreasing the likelihood of soil droughtiness limitations.

Table 2 : Climatic Interpolation

Grid Reference :	SU 956 180
Altitude (m) :	30
Accumulated Temperature (days) :	1508
Average Annual Rainfall (mm) :	914
Field Capacity (days) :	193
Moisture Deficit, Wheat (mm) :	100
Moisture Deficit, Potatoes (mm) :	92
Overall Climatic Grade :	1

3.0 Relief

3.1 The site is gently undulating, lying at an altitude in the range of 25-35 metres. On no part of the site do altitude or relief pose any limitation to agricultural land quality.

4.0 Geology and Soil

4.1 The relevant geological sheet for the site (BGS Sheet 317, Chichester 1957) shows the underlying geology for the majority of the area to be Folkestone Beds. There is a small area of Sandgate Beds mapped in the north of the site.

4.2 The published soils information for the area (SSEW Sheet 6, Soils of South East England 1983) maps the soils on the site as the Frilford association. These are described as 'deep, well drained sandy and coarse loamy soils. Some ferruginous sandy and some coarse loamy soils affected by groundwater' (SSEW, 1983). Detailed field examination broadly confirmed this, although the majority of soils were not of a coarse textured nature.

5.0 Agricultural Land Classification

5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

5.2 The location of the soil observation points are shown on the attached sample point map.

5.3 Grade 2 The majority of the agricultural land on the site has been classified as Grade 2, very good quality land, with soil workability as the main limitation. Soil profiles within this mapping unit typically comprise medium clay loam, sandy clay loam or medium sandy loam topsoils which become heavier or occasionally sandy with depth. A soil inspection pit (Pit 2) was dug to assess these soils, which showed the existence of a medium clay loam topsoil overlying a heavy clay loam upper subsoil over clay, which showed evidence of gleying from a depth of 50cm. The pit is representative of much of the soils which make up the Grade 2 mapping unit, although there was no evidence of gleying in the majority of soil augerings. Overall, these soils are assigned to Wetness Class I, but the topsoil texture in combination with the field capacity days for the site (which are high in a regional context) produce a Grade 2 workability limitation. This means that there is a slight restriction on the frequency with which mechanical operations may be carried out, and the grazing density of livestock, both of which may contribute to soil structural damage. Within the Grade 2 land at the east of the site, soils were found to have subsoils of a coarse textured sandy nature. These profiles experience a slight restriction on the amount of profile available water for crop growth which results in reduced yields. This land shows both a slight soil droughtiness and a workability limitation.

5.4 Subgrade 3a Approximately 8 hectares of agricultural land on the site has been classified as Subgrade 3a, good quality land, with soil droughtiness and wetness as the main limitations. Soils in the south east of the site tend to be more sandy than elsewhere, profiles typically comprising medium sandy loam topsoils overlying loamy sand upper subsoils over sand.The depths at which the sandy subsoils are encountered does vary within this mapping unit, and this is reflected by the presence of slightly better quality land. A soil investigation pit (Pit1) was dug within this mapping unit to assess subsoil structures and textures for the purpose of calculating the profile available water for these soils. It is evident that there is a moderate droughtiness restriction arising from the combination of subsoil textures, moderate subsoil structural conditions and the local climatic regime. The restriction on profile available water affects plant growth and may cause a yield reduction, allowing this land to be classified as no greater than Subgrade 3a.
In the north of the site the soils show a moderate wetness limitation. Profiles typically comprise a medium clay loam topsoil overlying heavier, and occasionally sandy subsoils. Pit 3 was dug within this mapping unit to assess the nature of the wetness problem. Observations from the pit show the profile to comprise of a medium clay loam topsoil overlying a medium sandy loam upper subsoil, which in turn overlies clay. Beneath the clay there is a medium loamy sand subsoil. It was evident that the clay subsoil was not of a poorly structured nature and therefore does not satisfy the criteria for classification as a slowly permeable layer. As there was no evidence of gleying above a depth of 40 cm, this profile was assigned to Wetness Class I which means that technically this soil inspection pit has a classification of Grade 2. However, soil augerings in the immediate area generally showed profiles that were gleyed above a depth of 40 cm, these soil are assigned to Wetness Class II and classified as Subgrade 3a, due to the evidence of a moderate drainage imperfection. Although the pit is classified as Grade 2, it is more appropriate to give an overall classification for soils within this mapping unit of Subgrade 3a.

5.5 Grade 4 A small area of land (1.5 ha.) in the north east of the site has been classified as Grade 4, poor quality land, with soil wetness as the main limitation. Profiles typically comprise heavy clay loam topsoils overlying clay subsoils. The soils within this mapping unit show evidence of a severe wetness limitation, being gleyed below the topsoil. The drainage impedance suffered by these soils can be attributed to the poorly structured nature of the clay subsoil, which acts as a slowly permeable layer. The relatively shallow depth of this layer

places these soils in Wetness Class IV, which in conjunction with the topsoil texture and the moist climatic regime for the site, limits the land to Grade 4. Soils with severe drainage problems can restrict root penetration and development, and increase the likelihood of structural damage by cultivations and poaching damage by grazing livestock.

5.6 The areas marked as urban include a private dwelling and a tarmac road. The areas marked as non agricultural include tracks across the site and some woodland in the north.

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Resource Planning Team
Guildford Statutory Group
ADAS Reading

APPENDIX I

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 and horticultural crops can usually be grown but on some land in the 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.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where 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 level of yields. It is mainly suited to grass with occasional arable crops (eg. 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 very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

Definition of Soil Wetness Classes

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 not wet within 40 cm depth for more than 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 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 and 90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years *or*, if there is no slowly permeable layer 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.

[1] The number of days specified is not necessarily a continuous period.

[2] 'In most years' is defined as more than 10 out of 20 years.

REFERENCES

* British Geological Survey (1957), Sheet No.317, Chichester, 1:50,000

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

* Meteorological Office (1989), Climatological Data for Agricultural Land Classification.

* Soil Survey of England and Wales (1982), Sheet No.6, Soils of South East England, 1:250,000, and accompanying legend.

APPENDIX IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

* Soil Abbreviations : Explanatory Note
* Soil Pit Descriptions
* Database Printout : Boring Level Information
* Database Printout : Horizon Level Information

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

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

Boring Header Information

1. GRID REF : national 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 HRT : Horticultural Crops PGR : Permanent Pasture LEY : Ley Grass RGR : Rough Grazing
SCR : Scrub CFW : Coniferous Woodland DCW : Deciduous Woodland HTH : Heathland BOG : Bog or Marsh
FLW : Fallow PLO : Ploughed SAS : Set aside OTH : Other

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

4. GLEY/SPL : Depth in cm to gleying or slowly permeable layers.

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

6. MB (WHEAT/POTS) : Moisture Balance.

7. DRT : Best grade according to soil droughtiness.

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

MREL : Microrelief limitation FLOOD : Flood risk EROSN : Soil erosion risk EXP : Exposure limitation FROST : Frost
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 : Soil Erosion Risk WD : Combined 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
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 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 : Moule colour

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 : Moule 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

6. STONE LITH : One of the following is used.

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

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

7. 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 VC : very coarse

- ped shape S : single grain M : massive GR : granular AB : angular blocky SAB : sub-angular blocky PR : prismatic
PL : platy

8. 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

9. SUBS STR : Subsoil structural condition recorded for the purpose of calculating profile droughtiness.

G : good M : moderate P : poor

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

11. IMP : If the profile is impenetrable a 'Y' will appear in this column at the appropiate horizon.

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

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

14. 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 : WSUSSEX MINS SITE 32 Pit Number : 1P

Grid Reference: SU95651770 Average Annual Rainfall : 914 mm
Accumulated Temperature : 1508 degree days
Field Capacity Level : 193 days
Land Use : Cereals
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 32	MSL	10YR33 00	0	2		MDCSAB
32- 60	LMS	10YR64 00	0	2		WKCSAB
60-120	MS	10YR73 00	0	2		WKCSAB

Wetness Grade : 1 Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 3A APW : 94 mm MBW : -6 mm
APP : 79 mm MBP : -13 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : WSUSSEX MINS SITE 32 Pit Number : 2P

Grid Reference: SU95601816
Average Annual Rainfall : 914 mm
Accumulated Temperature : 1508 degree days
Field Capacity Level : 193 days
Land Use : Cereals
Slope and Aspect : 01 degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	MCL	10YR43 00	0	1		MDCSAB
25- 50	HCL	10YR44 00	0	0		MDCAB
50- 82	C	10YR53 00	0	0	C	MDCSAB
82-120	C	10YR53 00	0	10	C	MDCSAB

Wetness Grade : 2
Wetness Class : I
Gleying :050 cm
SPL : No SPL

Drought Grade : 1
APW : 138mm MBW : 38 mm
APP : 117mm MBP : 25 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Workability

SOIL PIT DESCRIPTION

Site Name : WSUSSEX MINS SITE 32 Pit Number : 3P

Grid Reference: SU95631835 Average Annual Rainfall : 914 mm
Accumulated Temperature : 1508 degree days
Field Capacity Level : 193 days
Land Use : Permanent Grass
Slope and Aspect : 01 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	MCL	10YR43 00	0	2		MDCSAB
30- 60	MSL	10YR44 00	0	2		WKCSAB
60- 90	C	25Y 63 00	0	1	C	MDCSAB
90-120	LMS	10YR58 00	0	0		WKCSAB

Wetness Grade : 2 Wetness Class : I
Gleying :060 cm
SPL : No SPL

Drought Grade : 1 APW : 131mm MBW : 31 mm
APP : 113mm MBP : 21 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Workability

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	EROSN FLOOD	FROST EXP	CHEM DIST	ALC LIMIT		COMMENTS
1	SU95901850	STU	NW	01			1	2	133	33	115	23	1				WK	2	
1P	SU95651770	CER					1	1	94	-6	79	-13	3A				DR	3A	
2	SU95601840	CER			025	000	3	3A	137	37	117	25	1				WE	3A	
2P	SU95601816	CER	NW	01	050		1	2	138	38	117	25	1				WK	2	
3	SU95701840	CER			050	000	1	2	146	46	118	26	1				WE	2	
3P	SU95631835	PGR	S	01	060		1	2	131	31	113	21	1				WK	2	
4	SU95801840	HOR	NW	01			1	2	150	50	110	18	1				WK	2	
5	SU95901840	STU	NW	01			1	2	120	20	105	13	2				WK	2	
6	SU96001840	STU	E	01	080		1	2	135	35	116	24	1				WK	2	
7	SU95351830	CER					1	2	147	47	113	21	1				WK	2	
9	SU94801837	PGR			028	050	4	3B	135	35	112	20	1				WE	3B	
10	SU95601830	PGR			050		1	3A	90	-10	96	4	3A				WE	3A	
11	SU95701830	CER	NW	01			1	2	150	50	117	25	1				WK	2	
12	SU95801830	HOR	W	01			1	2	143	43	108	16	1				WK	2	
13	SU95901830	HOR	SE		095		1	2	86	-14	89	-3	3A				DR	3A	
14	SU96001830	STU	SE	01			1	2	154	54	113	21	1				WK	2	
15	SU96101830	CER			025	025	4	4	116	16	104	12	2				WE	4	
16	SU95301820	CER					1	2	151	51	111	19	1				WK	2	
17	SU95401820	CER					1	2	156	56	118	26	1				WK	2	
18	SU95501820	CER					1	2	132	32	113	21	1				WK	2	
19	SU95601820	PLO					1	2	153	53	117	25	1				WK	2	
20	SU95701820	CER	NW	01	070		1	2	144	44	116	24	1				WK	2	
21	SU95801820	CER	W		075		1	2	155	55	114	22	1				WK	2	
22	SU95901820	HOR	E	01	060		1	2	122	22	104	12	2				WK	2	
23	SU96001820	CER			030	030	4	4	115	15	106	14	2				WE	4	
24	SU96101820	CER					1	2	149	49	117	25	1				WK	2	
25	SU95301810	CER					1	2	136	36	117	25	1				WK	2	
26	SU95401810	CER					1	2	118	18	114	22	2				DR	2	
27	SU95501810	CER					1	2	154	54	117	25	1				WK	2	
28	SU95601810	CER					1	2	122	22	116	24	2				WK	2	
29	SU95701810	CER					1	2	142	42	115	23	1				WK	2	
30	SU95801810	CER					1	2	150	50	115	23	1				WK	2	
31	SU95901810	CER					1	2	159	59	118	26	1				WK	2	
32	SU96001810	CER					1	2	122	22	110	18	2				DR	2	
33	SU96101810	CER					1	2	129	29	115	23	2				WK	2	
34	SU95201800	CER			070		1	2	135	35	117	25	1				WK	2	
35	SU95301800	CER					1	2	94	-6	99	7	3A				DR	3A	
36	SU95401800	CER			040		2	3A	91	-9	103	11	3A				WE	3A	
37	SU95501800	CER					1	1	141	41	111	19	1					1	
38	SU95601800	CER					1	1	142	42	112	20	1					1	
39	SU95701800	CER					1	1	99	-1	111	19	3A				DR	3A	
40	SU95801800	CER					1	2	149	49	115	23	1				WK	2	

SAMPLE NO.	GRID REF	ASPECT USE	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	EROSN FLOOD	FROST EXP	CHEM DIST	ALC LIMIT	COMMENTS
41	SU95901800	STB				1	2	141	41	116	24	1				WK 2	
42	SU96001800	STB				1	2	136	36	116	24	1				WK 2	
43	SU96101800	CER				1	2	135	35	115	23	1				WK 2	
44	SU95201790	CER				1	2	123	23	113	21	2				WK 2	
45	SU95301790	CER				1	2	100	0	91	-1	3A				DR 3A	
46	SU95401790	CER				1	2	133	33	115	23	1				WK 2	
47	SU95501790	CER				1	2	136	36	118	26	1				WK 2	
48	SU95601790	CER				1	2	134	34	114	22	1				WK 2	
49	SU95701790	CER				1	2	136	36	118	26	1				WK 2	
50	SU95801790	CER				1	1	123	23	111	19	2				DR 2	
51	SU95901790	CER				1	1	99	-1	90	-2	3A				DR 3A	
52	SU95401780	CER				1	2	135	35	116	24	1				WK 2	
53	SU95501780	CER				1	2	114	14	114	22	2				WK 2	
54	SU95601780	CER				1	2	136	36	116	24	1				WK 2	
55	SU95701780	CER				1	1	122	22	108	16	2				DR 2	
56	SU95801780	CER				1	1	90	-10	82	-10	3A				DR 3A	
57	SU95501770	PGR				1	2	137	37	118	26	1				WK 2	
58	SU95601770	CER				1	1	97	-3	88	-4	3A				DR 3A	
59	SU95701770	CER				1	1	114	14	99	7	2				DR 2	

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
1	0-30	scl	10YR43 00						0	0		0						
	30-45	mcl	10YR44 54						0	0		0		M				
	45-75	mcl	10YR56 00						0	0		0		M				
	75-85	hcl	10YR56 00						0	0		0		M				
	85-100	scl	75YR56 00						0	0		0		M				
1P	0-32	msl	10YR33 00						0	0	HR	2	MDCSAB	VF				
	32-60	lms	10YR64 00						0	0	HR	2	WKCSAB	VF	M			
	60-120	ms	10YR73 00						0	0	HR	2	WKCSAB	VF	M			
2	0-25	mcl	10YR32 00						0	0		0						
	25-50	hcl	10YR53 00	000C00 00	M			Y	0	0		0		M				
	50-75	c	25Y 63 00	000C00 00	M			Y	0	0		0		M				
	75-120	c	25Y 63 00	000C00 00	M			Y	0	0		0		P		Y		
2P	0-25	mcl	10YR43 00						0	0	HR	1	MDCSAB	FR				
	25-50	hcl	10YR44 00						0	0		0	MDCAB	FR	M		Y	
	50-82	c	10YR53 00	10YR56 00	C			Y	0	0		0	MDCSAB	FM	M		Y	
	82-120	c	10YR53 00	10YR56 00	C			Y	0	0	HR	10	MDCSAB	FM	M		Y	
3	0-30	mcl	10YR42 00						0	0		0						
	30-50	mcl	10YR54 00						0	0		0		M				
	50-85	hcl	10YR63 00	000C00 00	C			Y	0	0		0		M				
	85-120	c	25Y 62 00	000C00 00	M			Y	0	0		0		P		Y		
3P	0-30	mcl	10YR43 00						0	0	HR	2	MDCSAB	FR			Y	
	30-60	msl	10YR44 00						0	0	HR	2	WKCSAB	VF	M		Y	
	60-90	c	25Y 63 00	25Y 73 00	C			Y	0	0	HR	1	MDCSAB	FR	M		Y	
	90-120	lms	10YR58 00					Y	0	0		0	WKCSAB	FR	M		Y	
4	0-35	scl	10YR43 00						0	0	HR	2						
	35-60	scl	10YR44 00						0	0	HR	2		M				
	60-120	scl	10YR56 00						0	0		0		M				
5	0-28	scl	10YR43 00						0	0		0						
	28-65	scl	10YR44 00						0	0	HR	3		M				
	65-100	lms	10YR56 00						0	0	HR	3		M				
	100-120	lms	75YR58 00						0	0		0		M				
6	0-30	mcl	10YR43 00						0	0		0						
	30-50	mcl	10YR44 00						0	0		0		M				
	50-65	scl	75YR46 00						0	0		0		M				
	65-80	scl	10YR56 00						0	0	HR	2		M				
	80-120	lms	10YR73 00	75YR66 00	C			Y	0	0		0		M				
7	0-30	mcl	10YR42 00						0	0	HR	1						
	30-60	scl	10YR43 00						0	0		0		M				
	60-100	msl	10YR56 00						0	0		0		M				
	100-120	lms	10YR58 00						0	0		0		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
9	0-28	mcl	10YR32 00						0	0		0						
	28-50	c	10YR62 00	000C00 00	M			Y	0	0		0		M				
	50-120	c	25Y 62 00	000C00 00	M			Y	0	0		0		P			Y	
10	0-38	hcl	10YR22 00						0	0	HR	15						
	38-50	scl	10YR32 00						0	0	HR	20		M				
	50-70	msl	10YR52 00	75YR46 00	C			Y	0	0	HR	25		M				
11	0-35	mcl	10YR43 00						0	0	HR	3						
	35-45	hcl	10YR52 00						0	0	HR	1		M				
	45-80	hcl	10YR52 00	75YR56 00	F				0	0	HR	1		M				
	80-100	mcl	10YR52 00						0	0	HR	1		M				
	100-110	mszl	10YR62 00						0	0		0		M				
	110-120	lms	10YR61 00						0	0		0		M				
12	0-30	mcl	10YR43 00						0	0		0						
	30-55	scl	10YR44 00						0	0	HR	3		M				
	55-65	msl	10YR46 00						0	0	HR	5		M				
	65-85	lms	10YR56 00						0	0		0		M				
	85-120	sc	75YR58 00						0	0		0		M				
13	0-30	scl	10YR43 00						0	0		0						
	30-55	scl	10YR44 00						0	0	HR	3		M				
	55-95	lms	10YR56 00						0	0		0		M				
	95-115	sc	75YR56 00	10YR63 00	C			Y	0	0	HR	3		M				
	115-120	c	75YR56 00	10YR63 00	C			Y	0	0	HR	3		M				
14	0-28	mcl	10YR43 00						0	0		0						
	28-60	scl	10YR44 00						0	0		0		M				
	60-85	scl	75YR56 00						0	0		0		M				
	85-95	msl	75YR65 00						0	0		0		M				
	95-120	mcl	75YR56 00						0	0		0		M				
15	0-25	hcl	10YR43 00						0	0		0						
	25-45	c	10YR52 00	10YR58 61	C			Y	0	0		0		P			Y	
	45-65	c	10YR51 00	10YR58 00	M			Y	0	0		0		P			Y	
	65-100	sc	10YR52 00	10YR58 00	C			Y	0	0		0		P			Y	
16	0-28	scl	10YR42 00						0	0		0						
	28-60	scl	10YR43 00						0	0		0		M				
	60-120	scl	10YR54 00						0	0		0		M				
17	0-32	mcl	10YR42 00						0	0	HR	1						
	32-60	hcl	10YR43 00						0	0		0		M				
	60-120	hcl	10YR54 00						0	0		0		M				
18	0-32	mcl	10YR44 00						0	0	HR	1						
	32-65	hcl	10YR44 00						0	0	HR	1		M				
	65-90	lms	10YR64 00						0	0	HR	3		M				
	90-110	scl	75YR56 00						0	0	HR	3		M				

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
19	0-30	mcl	10YR43 00						0	0	HR	1						
	30-70	hcl	10YR43 00	00					0	0		0		M				
	70-80	c	10YR54 00						0	0		0		M				
	80-120	scl	10YR54 00	000C00	00	C			0	0		0		M				
20	0-28	mcl	10YR43 00						0	0	HR	1						
	28-40	hcl	10YR53 00						0	0	HR	1		M				
	40-70	hcl	10YR53 00	10YR58 00	F				0	0	HR	1		M				
	70-120	c	10YR53 00	75YR46 00	C			Y	0	0	HR	1		M				
21	0-33	mcl	10YR43 00						0	0		0						
	33-50	scl	10YR44 00						0	0		0		M				
	50-65	scl	75YR56 00						0	0	HR	3		M				
	65-75	msl	75YR54 00						0	0		0		M				
	75-120	scl	75YR63 00	75YR66 00	C			Y	0	0		0		M				
22	0-35	scl	10YR43 00						0	0		0						
	35-60	msl	10YR46 00						0	0		0		M				
	60-120	lms	75YR68 00	10YR73 00	C			Y	0	0		0		M				
23	0-30	hcl	10YR42 00						0	0		0						
	30-100	c	10YR52 00	10YR58 61	M			Y	0	0		0		P			Y	
24	0-30	mcl	10YR43 00						0	0		0						
	30-55	mcl	10YR44 00						0	0		0		M				
	55-80	scl	10YR56 00						0	0		0		M				
	80-110	msl	10YR58 00						0	0		0		M				
25	0-30	mcl	10YR43 00						0	0	HR	1						
	30-75	hcl	10YR44 00						0	0	HR	1		M				
	75-85	scl	10YR54 00						0	0	HR	5		M				
	85-120	lms	10YR64 00						0	0	HR	5		M				
26	0-38	scl	10YR43 00						0	0	HR	1						
	38-65	mcl	10YR44 00						0	0	HR	1		M				
	65-70	scl	10YR54 00						0	0	HR	1		M				
	70-85	sc	10YR54 00						0	0	HR	2		M				
27	0-28	mcl	10YR43 00						0	0	HR	1						
	28-42	c	75YR44 00						0	0		0		M				
	42-70	c	10YR54 00	000C00	00	C			0	0		0		M				
	70-90	sc	10YR54 00						0	0		0		M				
	90-120	msl	10YR56 00						0	0		0		M				
28	0-30	mcl	10YR42 00						0	0	HR	1						
	30-60	hcl	10YR43 00						0	0	HR	2		M				
	60-95	c	10YR54 00						0	0	HR	2		M				

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	0-30	mcl	10YR44 00						0	0	HR	3						
	30-80	hcl	10YR46 00						0	0	HR	3		M				
	80-120	c	10YR58 00						0	0	HR	10		M				
30	0-30	mcl	10YR34 00						0	0	HR	3						
	30-90	hcl	10YR46 00						0	0	HR	2		M				
	90-120	scl	10YR58 00						0	0	HR	10		M				
31	0-30	mcl	10YR33 00						0	0		0						
	30-90	hcl	10YR46 00						0	0		0		M				
	90-120	msl	10YR44 00						0	0		0		M				
32	0-30	mcl	10YR43 00						0	0		0						
	30-65	msl	10YR54 00						0	0		0		M				
	65-110	lms	10YR56 00						0	0		0		M				
33	0-25	mcl	10YR43 00						0	0		0						
	25-45	mcl	10YR44 00						0	0		0		M				
	45-75	msl	10YR54 00						0	0		0		M				
	75-110	lms	10YR63 00						0	0		0		M				
34	0-30	mcl	10YR43 00						0	0	HR	2						
	30-70	mcl	10YR54 00						0	0		0		M				
	70-100	mcl	10YR52 00	10YR58 00	C			Y	0	0		0		M				
35	0-35	mcl	10YR43 00						0	0	HR	2						
	35-60	scl	10YR56 00						0	0	HR	2		M				IMPEN 60+
36	0-3	scl	10YR42 00						0	0	HR	1						
	3-40	c	10YR54 00						0	0	HR	1		M				
	40-60	c	10YR56 00	000C00 00	C			Y	0	0	HR	1		M				
	60-65	c	10YR56 00	000C00 00	C			Y	0	0	HR	5		M				IMPEN 65+
37	0-35	msl	10YR33 00						0	0	HR	2						
	35-65	msl	10YR34 00						0	0	HR	2		M				
	65-100	mcl	10YR34 00						0	0		0		M				
	100-120	lms	10YR58 00						0	0		0		M				
38	0-30	msl	10YR33 00						0	0	HR	3						
	30-60	mcl	10YR46 00						0	0	HR	3		M				
	60-90	hcl	10YR46 00						0	0	HR	3		M				
	90-120	c	75YR58 00						0	0	HR	5		M				
39	0-30	msl	10YR33 00						0	0	HR	3						
	30-70	mcl	10YR46 00						0	0	HR	5		M				IMPEN 70+
40	0-40	mcl	10YR43 00						0	0	HR	2						
	40-45	hcl	10YR44 00						0	0	HR	2		M				
	45-80	scl	10YR56 00						0	0	HR	2		M				
	80-110	msl	10YR42 00						0	0		0		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
41	0-30	mcl	10YR43 00						0	0		0						
	30-45	mcl	10YR44 00						0	0		0		M				
	45-80	msl	10YR54 00						0	0		0		M				
	80-100	msl	10YR56 00						0	0		0		M				
42	0-35	mcl	10YR43 00						0	0		0						
	35-75	scl	10YR56 00						0	0		0		M				
	75-100	sc	10YR58 00						0	0		0		M				
43	0-30	mcl	10YR43 00						0	0	HR	2						
	30-55	mcl	10YR54 00						0	0		0		M				
	55-85	msl	10YR56 00						0	0		0		M				
	85-110	lms	10YR64 00						0	0		0		M				
44	0-30	mcl	10YR43 00						0	0	HR	2						
	30-45	mcl	10YR44 00						0	0	HR	2		M				
	45-90	scl	10YR56 00						0	0	HR	2		M				
45	0-20	mcl	10YR43 00						0	0	HR	2						
	20-45	msl	10YR54 00						0	0		0		M				
	45-100	lms	10YR56 00						0	0		0		M				
46	0-30	mcl	10YR43 00						0	0	HR	2						
	30-50	msl	10YR54 00						0	0		0		M				
	50-100	mcl	10YR53 00						0	0		0		M				
47	0-30	mcl	10YR43 00						0	0		0						
	30-65	mcl	10YR44 00						0	0		0		M				
	65-100	sc	10YR58 00	05YR58 00	F				0	0		0		M				
48	0-30	mcl	10YR43 00						0	0	HR	2						
	30-45	mcl	10YR44 00						0	0		0		M				
	45-100	scl	10YR54 00						0	0		0		M				
49	0-35	mcl	10YR43 00						0	0	HR	2						
	35-50	mcl	10YR44 00						0	0		0		M				
	50-100	hcl	10YR56 00						0	0		0		M				
50	0-35	msl	10YR42 00						0	0	HR	2						
	35-80	msl	10YR54 00						0	0		0		M				
	80-100	lms	10YR64 00						0	0		0		M				
51	0-40	msl	10YR42 00						0	0		0						
	40-100	lms	10YR71 00						0	0		0		M				
52	0-30	mcl	10YR42 00						0	0	HR	2						
	30-60	mcl	10YR44 00						0	0		0		M				
	60-100	scl	10YR56 00						0	0		0		M				

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
53	0-30	mcl	10YR43 00						0	0		0						
	30-65	scl	10YR56 00						0	0		0		M				
	65-80	sc	10YR58 00	05YR56 00	F				0	0		0		M				
54	0-30	mcl	10YR43 00						0	0		0						
	30-45	mcl	10YR54 00						0	0		0		M				
	45-100	scl	10YR56 00						0	0		0		M				
55	0-40	msl	10YR42 00						0	0		0						
	40-65	msl	10YR43 00						0	0		0		M				
	65-120	ms	10YR53 00						0	0		0		M				
56	0-35	msl	10YR42 00						0	0		0						
	35-50	lms	10YR43 00						0	0		0		M				
	50-100	ms	10YR54 00						0	0		0		M				
57	0-40	mcl	10YR43 00						0	0	HR	2						
	40-60	mcl	10YR44 00						0	0		0		M				
	60-100	scl	10YR56 00						0	0		0		M				
58	0-30	msl	10YR42 00						0	0		0						
	30-40	msl	10YR54 00						0	0		0		M				
	40-100	lms	10YR73 00						0	0		0		M				
59	0-50	msl	10YR42 00						0	0		0						
	50-65	lms	10YR54 00						0	0		0		M				
	65-120	ms	10YR72 00						0	0		0		M				