A1
PROPOSED GOLF COURSE
(VALE OF WHITE HORSE LOCAL PLAN)
GROVE, NR WANTAGE, OXFORDSHIRE
AGRICULTURAL LAND CLASSIFICATION
ALC MAP & REPORT
MARCH 1994

PROPOSED GOLF COURSE AT GROVE, NEAR WANTAGE, OXFORDSHIRE. AGRICULTURAL LAND CLASSIFICATION REPORT

1.0 Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on an area of land near Grove in Oxfordshire, designated for possible future development as a golf course. This work forms part of MAFF's statutory input into the Vale of White Horse Local Plan.

1.2 Approximately 90 hectares of land north-west of Grove, near Wantage in Oxfordshire was surveyed in March 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 81 borings and three 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.

1.4 At the time of the survey the majority of the land on the site was under permanent grassland, with a small area of grass ley in the east of the site.

1.5 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 1:10,000. It is accurate at this scale, but any enlargement would be misleading. This map supersedes a previous survey carried out on this site in 1984, prior to the revision of the Agricultural Land Classification system.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Area
3b	64.1	71.9	75.4
4	20.4	22.9	24.0
5	0.5	0.6	0.6
Urban	2.4	2.7	100.0 (85.0 ha.)
Non-agricultural	1.4	1.5	
Woodland	0.4	0.4	
Total area of site	89.2	100.0	

1.6 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.

1.7 The agricultural land on the site has been classified as Subgrade 3b and Grades 4 and 5, with soil wetness and the occurrence of disturbed land being the main limitations. The majority of the land is classified as Subgrade 3b due to the presence of poorly structured clay subsoils that cause a significant drainage impedance, thereby leading to associated soil wetness problems. Some areas of land mapped as Grade 4 were waterlogged at the time of survey, the presence of hydrophilic plant species suggesting that this occurs for long periods throughout the year. Therefore it was considered appropriate to classify this land as Grade 4. Wet soils restrict plant and root development, and the opportunities for cultivations and grazing by livestock is limited due to the susceptibility of these soils to structural damage. Most of the agricultural land classified as Grades 4 and 5 is judged to be disturbed. This can be attributed to the previous use of the site as an airfield. Large tracts of land show disturbed soil profiles containing significant amounts of concrete rubble, particularly in the topsoil. Therefore

agricultural operations (especially mechanised cultivations) are severely restricted by these soil conditions. As a result, this land is only suitable for permanent grazing (Grade 4) and in areas of severe disturbance, rough grazing (Grade 5).

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.

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.

Table 2 : Climatic Interpolation

Grid Reference :	SU 391 906
Altitude (m) :	75
Accumulated Temperature (days) :	1437
Average Annual Rainfall (mm) :	649
Field Capacity (days) :	139
Moisture Deficit, Wheat (mm) :	107
Moisture Deficit, Potatoes (mm) :	100
Overall Climatic Grade :	1

3.0 Relief

3.1 The site rises gently from north to south lying at an altitude ranging between 75-85 metres. On no part of the site do gradient or relief pose any limitation to agricultural use.

4.0 Geology and Soils

4.1 The published geological sheet for the site (BGS Sheet 253 (Drift): Abingdon 1971) shows the underlying geology mapped as three types. The majority of the site is shown as being underlain by second terrace drift, with a band of Gault Clay and alluvium running from north-east to south-east across the site.

4.2 The published soils information for the area (SSEW Sheet 6: Soils of South East England 1983) shows the soils on the site to be of the Grove association. These are described as 'moderately permeable fine loamy calcareous soils over chalky gravel affected by groundwater. Some fine loamy over clayey soils with slowly permeable subsoils' (SSEW, 1983). Detailed field examination shows that the soils are best described as non-calcareous loamy soils with slowly permeable subsoils. Furthermore, it should be noted that soils showed signs of severe disturbance in some areas of the site.

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 Subgrade 3b. The majority of agricultural land on the site has been classified as Subgrade 3b, moderate quality land, with soil wetness as the main limitation. Soil profiles typically comprise heavy clay loam and clay topsoils overlying clay subsoils. The profiles show evidence of a wetness imperfection, with gleying occurring in the topsoils across much of the site and in the upper subsoils across all of the site. Three soil inspection pits were dug to assess the nature of the wetness problem. It is evident from these pits that the clay subsoils on the site have a poor substructural condition (strongly developed coarse angular blocky) and therefore act as a slowly permeable layer. The depth to the slowly permeable horizon varies across the site, ranging from 27 to 35 cm. It will severely impede soil drainage and these soils are therefore assigned to Wetness Class IV. When considered along with the topsoil texture and the field capacity days for the site, these soils can be classified as no better than Subgrade 3b. The slowly permeable layer causes a significant drainage impedance, resulting in problems associated with soil wetness. Wet soils restrict plant development (particularly rooting) and are also more susceptible to damage by cultivations and grazing livestock, the opportunities for which will be restricted.

5.4 Grade 4. Approximately 20 hectares of land on the site has been classified as Grade 4, poor quality land, with soil wetness and the presence of disturbed soils being the main limitations. An area of land in the west of the site was waterlogged at the time of survey. The presence of hydrophilic plant species such as Juncus spp. rush on this part of the site, suggests that these soils are waterlogged for long periods throughout the year. They are unlikely to benefit significantly from artificial drainage and Wetness Class V, Grade 4 is therefore appropriate.
During the course of the field inspection it became clear that large areas of land on the site showed signs of severe soil disturbance. This was evident from irregular soil horizons and textures, and the presence of brick and concrete rubble throughout the profile, particularly in the topsoil. The presence of disturbed soils can be directly attributed to the previous use of the site as an airfield. The degree of soil disturbance, particularly the rubble content of the topsoil, restricts both plant growth and any agricultural cultivations on this land. Therefore this land is restricted to use for permanent grazing, with an appropriate classification of Grade 4.

5.5 Grade 5. A small area of land in the south-east of the site has been classified as Grade 5, very poor quality land. This is due to the fact that soil disturbance on this land is very severe, and restricts it for use as rough grazing only.

5.6 Urban. Areas on the site mapped as urban include a disused rifle range, remnants of the old runway system and a silage clamp.

5.7 Non-agricultural land. Areas mapped as non-agricultural include scrub and two areas of woodland.

Resource Planning Team
Guildford Statutory Group
ADAS Reading

ADAS Ref : 3304/040/94
MAFF Ref : EL 02/00297

APPENDIX I

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 on 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. When more demanding crops are grown yields are generally lower or more variable than on land in grades 1 and 2.

Sub-grade 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.

Sub-grade 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 (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.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture : 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.

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, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for 31-90 days in most years.

Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not wet within 40cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40cm depth for more than 335 days in most years.

(The number of days is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.)

REFERENCES

* British Geological Survey (1971), Sheet No.253 (Drift), Abingdon, 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.

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 : 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

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 : GROVE OXON-GOLF COURSE Pit Number : 1P

Grid Reference: SU39109040
Average Annual Rainfall : 649 mm
Accumulated Temperature : 1437 degree days
Field Capacity Level : 138 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 33	C	25Y 41 00	0	2		
33- 70	C	25Y 52 53	0	2	M	STCAB

Wetness Grade : 3B
Wetness Class : IV
Gleying :033 cm
SPL :033 cm

Drought Grade :
APW : mm MBW : 0 mm
APP : mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : GROVE OXON-GOLF COURSE Pit Number : 2P

Grid Reference: SU38909080 Average Annual Rainfall : 649 mm
Accumulated Temperature : 1437 degree days
Field Capacity Level : 138 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 20	HCL	25Y 41 00	0	0	F	
20- 28	C	05Y 51 00	0	0	C	MDCSAB
28- 60	C	05Y 53 00	0	0	M	STCAB

Wetness Grade : 3B Wetness Class : IV
Gleying :020 cm
SPL :028 cm

Drought Grade : APW : mm MBW : 0 mm
APP : mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : GROVE OXON-GOLF COURSE Pit Number : 3P

Grid Reference: SU39309030
Average Annual Rainfall : 649 mm
Accumulated Temperature : 1437 degree days
Field Capacity Level : 138 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 35	C	25Y 42-00	0	0	F	
33- 65	C	25Y 53-	0	0	M	STCAB

Wetness Grade : 3B
Wetness Class : IV
Gleying :035 cm
SPL :035 cm

Drought Grade :
APW : mm MBW : 0 mm
APP : mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

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
1	SU38909100	PGR			0	027	4	3B	0		0						WE	3B		
1P	SU39109040	PGR			033	033	4	3B	0		0						WE	3B		
2	SU39009100	PGR			045	025	3	3B	0		0						WE	3B		
2P	SU38909080	PGR			020	028	4	3B	0		0						WE	3B		
3	SU39109100	PGR			0	025	4	3B	0		0						WE	3B		
3P	SU39309030	PGR			035	035	4	3B	0		0						WE	3B		
4	SU39209100	PGR			0	025	4	3B	0		0						WE	3B		
5	SU39309100	PGR			0	025	4	3B	0		0					Y	DS	4		DISTURBED
6	SU38609090	PGR			025		2	3A	0		0						WE	3A		
7	SU38709090	PGR			030	030	4	3B	0		0						WE	3B		
8	SU38809090	PGR			0	025	4	3B	0		0						WE	3B		
9	SU38909090	PGR			038	027	4	3B	0		0						WE	3B		
10	SU39009090	PGR			0	024	4	3B	0		0						WE	3B		
11	SU39109090	PGR			0	024	4	3B	0		0						WE	3B		
12	SU39209090	PGR			0	024	4	3B	0		0						WE	3B		
13	SU39309090	PGR			030	055	3	3B	0		0					Y	DS	4		DISTURBED
14	SU39409090	PGR			0	050	3	3B	0		0					Y	DS	4		DISTURBED
15	SU39509090	PGR			0	024	4	3B	0		0						WE	3B		
16	SU38609080	PGR			0	035	4	3B	0		0						WE	3B		
17	SU38709080	PGR			025	025	4	3B	0		0						WE	3B		
18	SU38809080	PGR			0	019	4	3B	0		0						WE	3B		
19	SU38909080	PGR			0	025	4	3B	0		0						WE	3B		
20	SU39009080	PGR			0	024	4	3B	0		0						WE	3B		
21	SU39109080	PGR			0	050	3	3B	0		0						WE	3B		
22	SU39209080	PGR	E	03	035	035	4	3B	0		0						WE	3B		
23	SU39309080	PGR	E	03	0	020	4	3B	0		0					Y	DS	4		DISTURBED
24	SU39409080	PGR	E	03	035	035	4	3B	0		0					Y	DS	4		DISTURBED
25	SU39509080	PGR			053	053	2	3A	0		0						WE	3A		
26	SU39609080	PGR			024	024	4	3B	0		0						WE	3B		
28	SU38709070	PGR			025	025	4	3B	0		0						WE	3B		
29	SU38809070	PGR			0	030	4	3B	0		0						WE	3B		
30	SU38909070	PGR			0	025	4	3B	0		0						WE	3B		
31	SU39009070	LEY	E	02	0	025	4	3B	0		0						WE	3B		
32	SU39109070	LEY	E	02	035	035	4	3B	0		0						WE	3B		
33	SU39209070	PGR			0	027	4	3B	0		0						WE	3B		
34	SU39309070	PGR			0		2	3B	0		0					Y	DS	4		DISTURBED
35	SU39409070	PGR			0		2	3B	0		0					Y	DS	4		DISTURBED
36	SU39509070	PGR			0	055	3	3B	0		0					Y	DS	4		DISTURBED
37	SU38609060	PGR			025	025	4	3B	0		0						WE	3B		
38	SU38709060	PGR			0	035	4	3B	0		0						WE	3B		
39	SU38809060	PGR	S	03	0	030	4	3B	0		0						WE	3B		
40	SU38909060	PGR	S	03	0	025	5	4	0		0						WE	4		WATERLOGGED

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
41	SU39009060	LEY	NW	02	025	025	4	3B		0		0					WE	3B	
42	SU39109060	PGR			025		2	3A		0		0				Y	DS	4	DISTURBED
43	SU39209060	PGR			0		2	3A		0		0				Y	DS	4	DISTURBED
44	SU39309060	PGR			027	027	4	3B		0		0				Y	DS	4	DISTURBED
45	SU39409060	PGR					1	2		0		0				Y	DS	4	DISTURBED
46	SU38609050	PGR			0	020	5	4		0		0					WE	4	WATERLOGGED
48	SU38809050	PGR			0	020	5	4		0		0					WE	4	WATERLOGGED
49	SU38909050	PGR			0	030	5	4		0		0					WE	4	WATERLOGGED
51	SU39109050	PGR			028	028	3	3B		0		0					WE	3B	
52	SU39209050	PGR			028	028	4	3B		0		0					WE	3B	
53	SU39309050	PGR			038	038	3	3B		0		0					WE	3B	
54	SU39409050	PGR			027	027	4	3B		0		0					WE	3B	
55	SU38609040	PGR			0	025	4	3B		0		0					WE	3B	
60	SU39109040	PGR			028	028	4	3B		0		0					WE	3B	
61	SU39209040	PGR			028	028	4	3B		0		0					WE	3B	
62	SU39309040	PGR			025	025	4	3B		0		0					WE	3B	
63	SU39409040	PGR			036	036	4	3B		0		0					WE	3B	
64	SU38609030	PGR			0	035	4	3B		0		0					WE	3B	
65	SU38709030	PGR			030	030	4	3B		0		0					WE	3B	
67	SU38909030	PGR			0	030	4	3B		0		0					WE	3B	
68	SU39009030	PGR			0	030	4	3B		0		0					WE	3B	
69	SU39109030	PGR			050	050	2	3A		0		0					WE	3A	
70	SU39209030	PGR			020	020	4	3B		0		0					WE	3B	
71	SU39309030	PGR			025	025	4	3B		0		0					WE	3B	
72	SU39409030	PGR			035	035	4	3B		0		0					WE	3B	
73	SU38609020	PGR			0		2	3A		0		0					WE	3A	
75	SU38809020	PGR			0	020	4	3B		0		0					WE	3B	
77	SU39009020	PGR			025	025	4	3B		0		0					WE	3B	
78	SU39109020	PGR			0	035	4	3B		0		0					WE	3B	
79	SU39209020	PGR			035	035	4	3B		0		0					WE	3B	
80	SU39309020	PGR			025	025	4	3B		0		0					WE	3B	
81	SU39409020	PGR			0	030	4	3B		0		0					WE	3B	
83	SU38709010	PGR			0	025	4	3B		0		0					WE	3B	
84	SU38809010	PGR			0	020	4	3B		0		0					WE	3B	
85	SU38909010	PGR			0	030	4	3B		0		0					WE	3B	
86	SU39009010	PGR			0	035	4	3B		0		0					WE	3B	
87	SU39109010	PGR			060	060	2	3A		0		0					WE	3A	
88	SU39209010	PGR			0	035	4	3B		0		0					WE	3B	
89	SU39309010	PGR			0	025	4	3B		0		0					WE	3B	
90	SU38709000	PGR			0	030	4	3B		0		0					WE	3B	
92	SU38909000	PGR			0	020	4	3B		0		0					WE	3B	
93	SU39009000	PGR			0	030	4	3B		0		0					WE	3B	

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	0-27	hcl	25Y 41 00	10YR56 00	C			Y	0	0	HR	1							
	27-45	c	25Y 53 00	05Y 51 00	M			S	0	0		0		P			Y		
	45-120	c	25Y 52 51	75YR56 00	C			Y	0	0	HR	1		P			Y		
1P	0-33	c	25Y 41 00						0	0	HR	2							
	33-70	c	25Y 52 53	75YR78 00	M			Y	0	0	SLST	2	STCAB VM	P	Y		Y		
2	0-25	hcl	25Y 41 00						0	0	HR	1							
	25-45	c	25Y 53 00	25Y 52 00	C			S	0	0	HR	1		P			Y		
	45-70	c	05Y 63 00	75YR56 00	C			Y	0	0	HR	5		P			Y		
2P	0-20	hcl	25Y 41 00	10YR56 00	F				0	0		0							
	20-28	c	05Y 51 00	10YR56 00	C			Y	0	0		0	MDCSAB FM	M					
	28-60	c	05Y 53 00	10YR56 00	M			Y	0	0		0	STCAB FM	P	Y		Y		
3	0-25	c	25Y 41 00	75YR56 00	C			Y	0	0	HR	1							
	25-60	c	05Y 63 62	75YR56 00	M			Y	0	0	HR	2		P			Y		
3P	0-35	c	25Y 42-00	10YR58-	F				0	0		0							
	35-65	c	25Y 53-	75YR58 00	M			Y	0	0		0	STCAB FM	P	Y		Y		
4	0-25	hcl	25Y 41 00	75YR56 00	M			Y	0	0	HR	1							
	25-60	c	05Y 51 00	75YR56 00	M			Y	0	0	HR	1		P			Y		
5	0-25	c	25Y 42 00	10YR56 00	C			Y	0	0	HR	3							disturbed
	25-60	c	25Y 42 52	10YR56 00	C			Y	0	0	HR	5		P			Y		profile
6	0-25	hcl	25Y 42 00						0	0	HR	3							
	25-35	c	25Y 52 00	10YR58 00	C			Y	0	0		0		M					
	35-80	hcl	05Y 62 00	10YR58-	C			Y	0	0	CH	30		M					
7	0-30	hcl	25Y 42 00						0	0		0							
	30-65	c	25Y 62 00	10YR58 61	C			Y	0	0		0		P			Y		
8	0-25	hcl	25Y 42 32	10YR56 00	C			Y	0	0		0							
	25-38	c	05Y 53 00	10YR56 00	C			Y	0	0		0		P			Y		
	38-60	c	05Y 53 00	75YR56 00	C			Y	0	0		0		P			Y		
9	0-27	c	25Y 41 00	10YR56 00	F				0	0		0							
	27-38	c	25Y 53 00	25Y 52 00	C			S	0	0		0		P			Y		
	38-60	c	25Y 52 53	75YR56 00	C			Y	0	0		0		P			Y		
10	0-24	hcl	25Y 41 00	75YR56 00	C			Y	0	0		0							
	24-45	c	05Y 52 00	10YR56 00	C			Y	0	0		0		P			Y		
	45-60	c	25Y 53 00	75YR58 00	M			Y	0	0		0		P			Y		
11	0-24	c	25Y 41 00	75YR56 00	C			Y	0	0		0							
	24-70	c	05Y 62 00	10YR56 66	C			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	
12	0-24	c	25Y 41 00	75YR56 00	M			Y	0	0	HR	1							
	24-38	c	25Y 53 00	75YR58 00	C			Y	0	0		0		P		Y			
	38-60	c	25Y 52 00	75YR58 00	M			Y	0	0		0		P		Y			
13	0-20	c	25Y 42 00	10YR56 00	F				0	0	HR	3							
	20-30	c	25Y 42 00	10YR56 00	F		25Y 32 00		0	0	HR	5		M					disturbed
	30-55	c	25Y 42 00	10YR56 00	C			Y	0	0	HR	10		M					profile
	55-120	c	05Y 42 00	75YR56 00	C		25Y 63 00	Y	0	0	HR	5		P		Y			
14	0-20	c	25Y 42 00	75YR56 00	C		05Y 52 00	Y	0	0	HR	5							
	20-40	c	25Y 42 00	75YR56 00	C		25Y 32 00	Y	0	0	HR	5		M					disturbed
	40-50	hcl	25Y 41 00	75YR56 00	M			Y	0	0		0		M					profile
	50-80	c	05Y 62 63	75YR56 00	M			Y	0	0		0		P		Y			
15	0-24	hcl	25Y 42 00	75YR56 00	C			Y	0	0		0							
	24-60	c	25Y 63 64	75YR58 00	M			Y	0	0		0		P		Y			
16	0-35	c	10YR52 00	10YR58 00	C			Y	0	0		0							
	35-60	c	10YR51 00	10YR58 00	M			Y	0	0	CH	20		P		Y			
17	0-25	hcl	10YR41 51						0	0		0							
	25-65	c	25Y 52 00	10YR58 61	M			Y	0	0	HR	5		P		Y			
18	0-19	hcl	25Y 41 00	75YR56 00	C			Y	0	0		0							
	19-60	c	25Y 63 00	75YR56 58	M			Y	0	0		0		P		Y			
19	0-25	c	25Y 41 00	75YR56 00	C			Y	0	0		0							
	25-46	c	25Y 53 00	75YR56 00	C			Y	0	0		0		P		Y			
	46-60	c	05Y 53 00	75YR58 00	M			Y	0	0		0		P		Y			
20	0-24	c	25Y 42 00	75YR56 00	C			Y	0	0		0							
	24-60	c	25Y 53 00	75YR56 58	M			Y	0	0		0		P		Y			
21	0-25	c	10YR42 00	75YR56 00	C			Y	0	0		0							
	25-50	c	25Y 42 00	10YR56 00	F			Y	0	0		0		M					
	50-70	c	25Y 42 00	75YR56 00	M			Y	0	0	HR	5		P		Y			
22	0-25	c	25Y 42 00	10YR56 00	F				0	0		0							
	25-35	c	25Y 53 00	10YR56 00	F				0	0		0		M					
	35-60	c	25Y 53 00	75YR56 58	M			Y	0	0		0		P		Y			
23	0-20	c	25Y 52 00	75YR58 00	C			Y	0	0	HR	2							disturbed
	20-50	c	25Y 42 62	75YR56 00	C		05Y 63 00	Y	0	0	HR	3		P		Y			profile
24	0-20	c	25Y 41 00	10YR56 00	F				0	0	HR	1							
	20-35	c	05Y 41 00	10YR56 00	F				0	0		0		M					disturbed
	35-120	c	05Y 41 00	75YR56 00	C		25Y 41 00	Y	0	0		0		P		Y			profile

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
25	0-25	hcl	25Y 42 00						0	0		0							
	25-53	c	25Y 53 00	10YR56 00	F				0	0		0		M					
	53-80	c	05Y 52 00	75YR56 00	C			Y	0	0		0		P			Y		
26	0-24	hcl	25Y 42 00						0	0		0							
	24-60	c	25Y 53 00	75YR56 00	C			Y	0	0		0		P			Y		
28	0-25	hcl	25Y 42 00						0	0		0							
	25-60	c	05Y 62 00	25Y 66 00	C		05Y 71 00	Y	0	0		0		P			Y		
	60-85	c	05GY71 00					Y	0	0	CH	25		M			Y	Y	
29	0-30	hcl	25Y 42 00	10YR58 00	C			Y	0	0		0							
	30-65	c	25Y 62 00	10YR78 61	M			Y	0	0		0		P			Y		
30	0-25	hcl	25Y 42 00	75YR56 00	C			Y	0	0		0							
	25-60	c	25Y 53 00	75YR56 58	M			Y	0	0	HR	1		P			Y		
31	0-25	hcl	25Y 42 00	10YR56 00	C			Y	0	0	HR	1							
	25-60	c	25Y 53 00	75YR56 00	C			Y	0	0		0		P			Y		
32	0-25	hcl	10YR42 00						0	0	HR	2							
	25-35	c	25Y 54 00	75YR56 00	C			S	0	0		0		M					
	35-60	c	25Y 53 00	75YR56 00	M			Y	0	0		0		P			Y		
33	0-27	c	25Y 41 00	75YR56 00	C			Y	0	0		0							
	27-48	c	25Y 52 00	75YR56 00	C			Y	0	0		0		P			Y		
	48-60	c	25Y 53 00	75YR58 00	C			Y	0	0		0		P			Y		
34	0-15	c	25Y 53 00	75YR56 00	C			Y	0	0	HR	30							disturbed
35	0-25	c	25Y 42 00	10YR56 00	F				0	0	HR	2							
	25-35	c	25Y 62 53	75YR58 00	M			Y	0	0		0		P					disturbed
	35-50	c	25Y 41 00	75YR56 00	C			Y	0	0	HR	5		M					profile
36	0-20	c	05Y 41 00	75YR58 00	C			Y	0	0	HR	3							
	20-45	c	25Y 41 53	10YR56 00	C			Y	0	0	HR	4		M					disturbed
	45-55	c	25Y 42 00					Y	0	0	MSST	20		M					profile
	55-120	c	25Y 42 00	75YR56 00	C			Y	0	0	HR	5		P			Y		
37	0-25	hcl	25Y 42 00						0	0		0							
	25-60	c	05Y 52 00	10YR58 00	C			Y	0	0		0		P			Y		
	60-75	c	05GY71 00					Y	0	0	CH	10		M			Y		
38	0-35	hcl	25Y 42 00	10YR58 00	M			Y	0	0		0							
	35-50	c	25Y 52 00	10YR58 61	M			Y	0	0		0		P			Y		
	50-70	c	10YR51 00	10YR58 00	M		05GY71 00	Y	0	0		0		P			Y		
39	0-30	hcl	25Y 42 00	10YR58 00	C			Y	0	0		0							
	30-45	c	10YR52 00	10YR58 61	M			Y	0	0		0		P			Y		
	45-60	c	25Y 52 00	10YR78 61	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	
40	0-25	hcl	25Y 42 00	10YR58 00	C			Y	0	0		0							
	25-60	c	25Y 62 00	10YR58 61	M			Y	0	0		0		P			Y		
41	0-25	hcl	10YR42 00						0	0	HR	1							
	25-38	c	25Y 53 00	75YR56 00	M			Y	0	0		0		P			Y		
	38-60	c	25Y 53 00	75YR58 00	M			Y	0	0		0		P			Y		
42	0-25	hcl	25Y 52 00	10YR56 00	F				0	0	HR	2							
	25-38	hcl	05Y 53 00	10YR58 00	C			Y	0	0	HR	2		M					disturbed
	38-45	c	05Y 41 52	10YR56 00	F			Y	0	0	HR	3		M					profile
43	0-25	hcl	25Y 62 00	10YR56 00	C			Y	0	0		0							disturbed
44	0-27	c	05Y 51 00	10YR56 00	F				0	0		0							disturbed
	27-60	c	05Y 53 00	75YR56 00	M			Y	0	0		0		P			Y		profile
45	0-30	hcl	25Y 62 42	10YR56 00	F				0	0	HR	3							disturbed
46	0-20	hcl	25Y 42 00	10YR58 00	M			Y	0	0		0							
	20-60	c	25Y 52 00	10YR58 61	M			Y	0	0		0		P			Y		
48	0-20	hcl	25Y 42 00	10YR58 61	M			Y	0	0		0							
	20-60	c	25Y 52 00	10YR58 61	M			Y	0	0		0		P			Y		
49	0-30	hcl	25Y 42 00	10YR58 00	M			Y	0	0		0							
	30-60	c	25Y 52 00	10YR58 61	M			Y	0	0		0		P			Y		
51	0-28	c	25Y 41 00						0	0		0							
	28-60	c	25Y 52 51				10YR46 00	S	0	0		0		P			Y		
52	0-28	c	05Y 41 00	10YR56 00	F				0	0		0							
	28-60	c	05Y 52 62	10YR56 46	C			Y	0	0		0		P			Y		
53	0-38	hcl	25Y 42 62	10YR56 00	F				0	0	HR	2							
	38-90	c	05Y 53 00	75YR56 00	M			Y	0	0		0		P			Y		
54	0-27	c	25Y 41 00	10YR56 00	F				0	0		0							
	27-60	c	25Y 53 00	75YR56 00	M			Y	0	0		0		P			Y		
55	0-25	hcl	25Y 42 00	10YR58 00	M			Y	0	0		0							
	25-60	c	25Y 52 00	10YR58 61	M			Y	0	0		0		P			Y		
60	0-28	c	25Y 41 00						0	0		0							
	28-60	c	25Y 42 00	75YR56 00	C			Y	0	0		0		P			Y		
61	0-28	c	25Y 41 00						0	0		0							
	28-60	c	25Y 53 00	75YR56 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
62	0-25	c	25Y 41 00						0	0		0						
	25-60	c	05Y 53 00	75YR56 00	M			Y	0	0		0		P			Y	
63	0-36	c	25Y 41 00						0	0		0						
	36-60	c	25Y 52 53	75YR56 00	C			Y	0	0	HR	1		P			Y	
64	0-25	hcl	25Y 42 00	10YR58 00	M			Y	0	0		0						
	25-35	hcl	10YR52 00	10YR58 61	M			Y	0	0		0		M				
	35-60	c	25Y 52 00	10YR58 61	M			Y	0	0		0		P			Y	
65	0-30	hcl	25Y 42 00						0	0		0						
	30-60	c	25Y 52 00	10YR58 61	M			Y	0	0		0		P			Y	
67	0-30	hcl	10YR52 00	10YR58 61	C			Y	0	0		0						
	30-60	c	10YR62 00	10YR58 61	M			Y	0	0		0		P			Y	
68	0-30	hcl	25Y 42 00	10YR58 61	C			Y	0	0		0						
	30-60	c	10YR62 00	10YR78 61	M			Y	0	0		0		P			Y	
69	0-30	hcl	10YR41 00	10					0	0		0						
	30-50	c	10YR52 00						0	0		0		M				
	50-80	c	10YR52 00	10YR58 61	M			Y	0	0	CH	10		P			Y	Y
70	0-20	hcl	25Y 42 00						0	0		0						
	20-60	c	10YR52 00	10YR78 61	M			Y	0	0		0		P			Y	
71	0-25	hcl	25Y 42 00						0	0		0						
	25-60	c	10YR52 00	10YR78 61	M			Y	0	0		0		P			Y	
72	0-25	hcl	25Y 42 00						0	0		0						
	25-35	c	05Y 52 00	10YR78 00	C			Y	0	0	CH	5		M				
	35-60	c	05Y 52 00	10YR78 00	M			Y	0	0	CH	20		P			Y	
73	0-30	hcl	10YR53 00	10YR58 00	M			Y	0	0	HR	5						
	30-45	c	10YR52 00	10YR58 61	M			Y	0	0		0		M				
	45-80	hcl	25Y 42 00					Y	0	0		0		M				
75	0-20	c	10YR52 00	10YR58 61	M			Y	0	0		0						
	20-60	c	10YR51 00	10YR78 00	M			Y	0	0		0		P			Y	
77	0-25	c	10YR41 00						0	0		0						
	25-55	c	10YR52 00	10YR78 00	M			Y	0	0		0		P			Y	
	55-70	c	10YR42 00	10YR58 61	M			Y	0	0		0		P			Y	
78	0-35	c	25Y 42 00	10YR58 00	M			Y	0	0		0						
	35-60	c	10YR52 00	10YR58 00	C			Y	0	0	CH	15		M			Y	
	60-90	c	10YR41 00	10YR78 00	M			Y	0	0		0		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
79	0-35	c	25Y 42 00						0	0		0						
	35-60	c	10YR52 00	10YR58 61	M			Y	0	0		0		P			Y	
80	0-25	c	10YR41 00						0	0		0						
	25-60	c	10YR62 00	10YR78 51	M			Y	0	0		0		P			Y	
81	0-30	c	25Y 42 00	10YR58 00	C			Y	0	0		0						
	30-60	c	10YR62 00	10YR78 61	M			Y	0	0		0		P			Y	
83	0-25	c	25Y 42 00	10YR58 00	C			Y	0	0		0						
	25-60	c	10YR62 00	10YR58 61	M			Y	0	0		0		P			Y	
84	0-20	c	25Y 42 00	10YR58 61	C			Y	0	0		0						
	20-60	c	10YR52 00	10YR78 61	M			Y	0	0		0		P			Y	
85	0-30	c	10YR41 00	10YR58 00	C			Y	0	0		0						
	30-60	c	10YR51 00	10YR78 00	M			Y	0	0		0		P			Y	
86	0-35	c	10YR41 00	10YR58 00	C			Y	0	0		0						
	35-60	c	10YR52 00	10YR58 61	M			Y	0	0		0		P			Y	
87	0-30	hcl	25Y 42 00						0	0		0						
	30-60	hcl	10YR41 00						0	0		0		M				
	60-90	c	10YR52 00	10YR58 61	M			Y	0	0		0		P			Y	
88	0-35	c	25Y 42 00	10YR58 00	C			Y	0	0		0						
	35-60	c	10YR51 00	10YR78 00	M			Y	0	0		0		P			Y	
89	0-25	c	25Y 42 00	10YR58 61	C			Y	0	0		0						
	25-60	c	10YR52 00	10YR58 61	M			Y	0	0		0		P			Y	
90	0-30	c	25Y 42 00	10YR58 00	C			Y	0	0		0						
	30-90	c	05GY71 00	10YR78 00	C			Y	0	0	CH	20		P			Y	Y
92	0-20	c	25Y 42 00	10YR58 00	C			Y	0	0		0						
	20-60	c	10YR52 00	10YR58 61	M			Y	0	0	Z	0		P			Y	
93	0-30	c	25Y 42 00	10YR58 61	C			Y	0	0		0						
	30-60	c	10YR51 00	10YR78 00	M			Y	0	0		0		P			Y	