A1
HAMPSHIRE MINERALS PLAN
SITE 1 : WELSHMAN'S ROAD,
MORTIMER WEST END
AGRICULTURAL LAND CLASSIFICATION
ALC MAP & REPORT
NOVEMBER 1993

HAMPSHIRE MINERALS PLAN
SITE 1 : WELSHMAN'S ROAD, MORTIMER WEST END
AGRICULTURAL LAND CLASSIFICATION REPORT

1.0 Introduction

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

1.2 Approximately 91 hectares of land relating to Site 1, north of Welshman's Road at Mortimer West End, in Hampshire was surveyed during November 1993. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 29 soil auger borings and 4 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 Work was conducted by members of the Resource Planning Team in the Guildford Statutory Group.

1.4 At the time of the survey, the land use on the site was permanent grass.

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 any previous ALC information for this site.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
3a	28.9	31.6
Non Agricultural	0.3	0.3
Urban	1.1	1.2
Woodland	61.1	66.9
Total area of site	91.4	100

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 All of the agricultural land surveyed has been classed as Subgrade 3a because of a moderate soil wetness limitation. Topsoils comprise medium clay loams and, occasionally, medium silty clay loams. These are underlain by similar textured subsoils which become heavier with depth. These subsoils exhibit evidence of wetness in the profile caused by a fluctuating groundwater table. Profiles are slightly stony throughout, though an area of stonier soils exists in the middle of the eastern field. This land experiences both soil wetness and soil droughtiness restrictions.

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 the overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature, 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, there is an interaction between the climatic factors and the soil characteristics which influence soil wetness and soil workability limitations.

2.4 No local climatic factors such as exposure or frost risk affect the site.

Table 2 : Climatic Interpolation

Grid Reference :	SU 627 643
Altitude (m) :	100
Accumulated Temperature : (degree days, Jan-June)	1415
Average Annual Rainfall (mm) :	735
Field Capacity (days) :	154
Moisture Deficit, Wheat (mm) :	102
Moisture Deficit, Potatoes (mm) :	93
Overall Climatic Grade :	1

3.0 Relief

3.1 The site is flat and lies at approximately 100m AOD. Nowhere on the site does gradient or relief affect agricultural land quality.

4.0 Geology and Soil

4.1 British Geological Survey (1984), Sheet 268, Reading, shows the entire site to be underlain by Plateau Gravel.

4.2 The published soils information for this site, as shown on the Soil Survey map of South-East England (SSEW, 1983, 1:250,000) shows the site to comprise soils of the Southampton Association. These soils are described as 'well drained, very acid, very flinty sandy soils with bleached subsurface horizon. Also some very acid, sandy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging' (SSEW, 1984).

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.

Subgrade 3a

5.3 All of the agricultural land surveyed has been assessed as Subgrade 3a, good quality land, with the key limitation being soil wetness. At the time of the survey (November), it was felt that across the site Wetness Class III was appropriate, even though soil drainage characteristics (soil profiles being gleyed within 40cm, but not slowly permeable within

80cm) are characteristic with Wetness Class II. This downgrading resulted from observation of high groundwater table levels (the shallowest being 35cm) in soil auger borings and inspection pits, plus the abundance of marshy species in the grassland. Based upon these findings, it was felt that the soil profiles would be wet within 70cm for more than 180 days but only wet within 40cm for between 31 and 90 days in most years. The interaction between the medium textured topsoils and duration of field capacity (154 days) means that this land can be graded no better than Subgrade 3a. Excessive soil wetness adversely affects seed germination and survival, and inhibits the development of a good root system. Soil wetness also imposes restrictions on cultivations, trafficking by machinery or grazing by livestock.

5.4 Pits 1, 2 and 4 are typical of soil profiles across the majority of the site. Profiles comprise slightly stony non-calcareous soils to depth. Topsoils consist of shallow medium clay loams and, occasionally, medium silty clay loams which generally are not gleyed. Upper subsoils mostly comprise medium clay loams, though heavier textures are found in an irregular distribution across the site. Upper subsoils are mostly gleyed and have moderately developed coarse sub-angular blocky structures. Consequently, the soils on this site are gleyed but not slowly permeable within 40cm. Lower subsoils comprise gleyed clays. It was not possible to determine the structure of the lower subsoil at Pit 1, because of a high water table. However, from observations of Pits 2 and 4 it could be seen that the structure of the lower subsoils was not characteristic of a slowly permeable layer (Pit 2 being weakly developed medium sub-angular blocky; Pit 4 being moderately developed coarse sub-angular blocky).

5.5 As represented by Pit 3, an area of stonier soils exists in the middle of the eastern field. Soil droughtiness and soil wetness are the key limitations. Very stony (9% hard rock > 2cm by volume; 36% total hard rock by volume) shallow medium clay loam topsoils (approximately 22cm) are underlain by very stony (50% total hard rock by volume) shallow medium clay loam upper subsoils. At approximately 28cm, these pass into moderately stony (25% total hard rock by volume) clay lower subsoils. This clay extends to depth, but becomes much stonier (57% total hard rock by volume) at approximately 75cm. Due to the stony nature of this clay layer and the stony upper subsoil, subsoil structural conditions within these horizons were assumed to be moderate. The structure of the horizon from approximately 28-75 cm was weakly developed coarse sub-angular blocky. The interaction of soil textures, profile stone contents and subsoil structural conditions with the local climatic regime means that this land can be graded no higher than Subgrade 3a because of a moderate soil droughtiness limitation. This reduces the available water for crops in the profile, which reduces the range of crops which can be grown. This gives rise to a moderate risk of drought stress for those crops which are grown. All stone contents were measured using volumetric displacement in water. These soils experience a fluctuating groundwater table similar to that prevailing elsewhere on the site. Consequently, this land is also classed as Subgrade 3a because of a moderate soil wetness limitation.

5.6 The Woodland marked on the map comprises mature deciduous trees.

5.7 The Urban shown on the map consists of a road.

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

REFERENCES

* British Geological Survey (1984), Sheet No 268, Reading, 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 Sets for Agricultural Land Classification.

* Soil Survey of England and Wales (1983), Sheet 6, Soils of South East England, 1:250,000.

* Soil Survey of England and Wales (1984), Soils and their Use in South East England.

APPENDIX III

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.)

APPENDIX IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

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** : Mottle 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 : HANTS MINS-MORTIMER WEST Pit Number : 1P

Grid Reference: SU62276426

Average Annual Rainfall : 735 mm
Accumulated Temperature : 1415 degree days
Field Capacity Level : 154 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 22	MZCL	10YR31 00	2	33	C	MCSAB
22- 40	MZCL	10YR62 00	0	2	M	MCSAB
40- 80	C	25Y 61 00	0	20	M	

Wetness Grade : 3A

Wetness Class : III
Gleying : 0 cm
SPL : No SPL

Drought Grade : 3A

APW : 91 mm MBW : -11 mm
APP : 98 mm MBP : 5 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : HANTS MINS-MORTIMER WEST Pit Number : 2P

Grid Reference: SU62576439
Average Annual Rainfall : 735 mm
Accumulated Temperature : 1415 degree days
Field Capacity Level : 154 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 20	MCL	10YR32 00	0	1	C	MDCSAB
20- 52	MCL	10YR62 00	0	0	M	MCSAB
52-110	C	10YR61 00	0	3	M	WMSAB

Wetness Grade : 3A
Wetness Class : III
Gleying : 0 cm
SPL : No SPL

Drought Grade : 2
APW : 131mm MBW : 29 mm
APP : 115mm MBP : 22 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : HANTS MINS-MORTIMER WEST Pit Number : 3P

Grid Reference: SU62476431 Average Annual Rainfall : 735 mm
Accumulated Temperature : 1415 degree days
Field Capacity Level : 154 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 22	MCL	10YR22 00	9	36		WCSAB
22- 28	MCL	10YR63 00	20	50	C	
28- 75	C	10YR71 00	0	25	M	WCSAB
75-120	C	10YR61 00	0	57	M	

Wetness Grade : 3A Wetness Class : III
Gleying : 22 cm
SPL : No SPL

Drought Grade : 3A APW : 90 mm MBW : -12 mm
APP : 83 mm MBP : -10 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION :

SOIL PIT DESCRIPTION

Site Name : HANTS MINS-MORTIMER WEST Pit Number : 4P

Grid Reference: SU61986427 Average Annual Rainfall : 735 mm
Accumulated Temperature : 1415 degree days
Field Capacity Level : 154 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2.	TOT.STONE	MOTTLES	STRUCTURE
0- 22	MCL	10YR32 00	0	1	F	MCSAB
22- 61	MCL	10YR62 00	0	3	M	MCSAB
61- 90	C	10YR71 00	0	10	M	MCSAB

Wetness Grade : 3A Wetness Class : III
Gleying : 22 cm
SPL : No SPL

Drought Grade : 2 APW : 114mm MBW : 12 mm
APP : 113mm MBP : 20 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

MPLE NO.	GRID REF	ASPECT USE	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1P	SU62276426	PGR	0			3	3A	91	-11	98	5	3A				WE	3A	WATR TABLE 48
2P	SU62576439	PGR	0			3	3A	131	29	115	22	2				WE	3A	PIT DUG TO 90
3P	SU62476431	PGR	22			3	3A	90	-12	83	-10	3A				WD	3A	3A WE/DR
4P	SU61986427	PGR	22			3	3A	114	12	113	20	2				WE	3A	PIT DUG TO 90
1	SU62626473	PGR	20			3	3A	137	35	113	20	1				WE	3A	
2A	SU62706479	PGR	30			3	3A	136	34	113	20	1				WE	3A	
3	SU62506450	PGR	20			3	3A	000	0	000	0					WE	3A	IMPEN 70
34	SU62606450	PGR	0			3	3A	148	46	115	22	1				WE	3A	
4	SU61906440	PGR	25			3	3A	000	0	000	0					WE	3A	IMPEN 75
5	SU62306440	PGR	19			3	3A	105	3	110	17	3A				WE	3A	IMPEN 82
46	SU62406440	PGR	18			3	3A	124	22	117	24	2				WE	3A	IMPEN 100
7	SU62506440	PGR	28			3	3A	92	-10	104	11	3A				WE	3A	IMPEN 70
8a	SU62606440	PGR	25			3	3A	109	7	113	20	2				WE	3A	
59	SU61906430	PGR	30			3	3A	000	0	000	0					WE	3A	IMPEN 100
0	SU62006430	PGR	35			3	3A	000	0	000	0					WE	3A	IMPEN 80
61	SU62106430	PGR	19			3	3A	102	0	104	11	3A				WE	3A	IMPEN 82
62	SU62206430	PGR	29			3	3A	126	24	119	26	2				WE	3A	
3	SU62306430	PGR	0			3	3A	109	7	113	20	2				WE	3A	IMPEN 85
64	SU62406430	PGR	25			3	3A	000	0	000	0					WE	3A	
65	SU62506430	PGR				3	3A	51	-51	51	-42	4				WE	3B	IMPEN 40
6	SU62606430	PGR	22			3	3A	108	6	116	23	2				WE	3A	
77	SU61806420	PGR	35			3	3A	000	0	000	0					WE	3A	IMPEN 95
78	SU61906420	PGR	25			3	3A	114	12	118	25	2				WE	3A	IMPEN 85
9	SU62006420	PGR	20			3	3A	135	33	115	22	1				WE	3A	
80	SU62106420	PGR	45			3	3A	101	-1	107	14	3A				WE	3A	WATR TABLE 35
1	SU62206420	PGR	29			3	3A	94	-8	106	13	3A				WE	3A	
2	SU62406420	PGR	25			3	3A	000	0	000	0					WE	3A	
83	SU62506420	PGR	20			3	3A	87	-15	90	-3	3A				WE	3A	
84	SU62606420	PGR	20			3	3A	106	4	113	20	3A				WE	3A	IMPEN 80
5	SU61806410	PGR	30			3	3A	000	0	000	0					WE	3A	IMPEN 70
87	SU61906410	PGR	20			3	3A	105	3	117	24	3A				WE	3A	IMPEN 70
8	SU62006410	PGR	20			3	3A	113	11	125	32	2				WE	3A	IMPEN 75
89	SU62106410	PGR	30			3	3A	92	-10	100	7	3A				WE	3A	IMPEN 65

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
1P	0-22	mzcl	10YR31 00	10YR58 00	C			Y	2	0	HR	33	MCSAB	FR				
	22-40	mzcl	10YR62 00	10YR58 00	M			Y	0	0	HR	2	MCSAB	FR	M		Y	
	40-80	c	25Y 61 00	75YR58 00	M			Y	0	0	HR	20			M			
2P	0-20	mcl	10YR32 00	75YR46 00	C			Y	0	0	HR	1	MDCSAB	FR			Y	
	20-52	mcl	10YR62 00	10YR66 00	M			Y	0	0		0	MCSAB	FR	M		Y	
	52-110	c	10YR61 00	10YR58 00	M			Y	0	0	HR	3	WMSAB	FM	M		Y	
3P	0-22	mcl	10YR22 00						9	0	HR	36	WCSAB	FR			Y	
	22-28	mcl	10YR63 00	10YR56 00	C			Y	20	0	HR	50		FR	M			
	28-75	c	10YR71 00	10YR58 00	M			Y	0	0	HR	25	WCSAB	FM	M		Y	
	75-120	c	10YR61 00	10YR58 00	M			Y	0	0	HR	57		FM	M		Y	
4P	0-22	mcl	10YR32 00	75YR46 00	F				0	0	HR	1	MCSAB	FR			Y	
	22-61	mcl	10YR62 00	10YR58 00	M			Y	0	0	HR	3	MCSAB	FR	M		Y	
	61-90	c	10YR71 00	75YR58 00	M			Y	0	0	HR	10	MCSAB	FM	M		Y	
11	0-20	mcl	10YR32 00						0	0	HR	3						
	20-50	mcl	10YR61 00	10YR68 00	M			Y	0	0	HR	3			M			
	50-120	c	10YR71 00	10YR56 00	C			Y	0	0	HR	1			M			
12A	0-30	mcl	10YR32 00						0	0	HR	4						
	30-60	c	10YR62 00	10YR66 00	C			Y	0	0	HR	5			M			
	60-120	c	10YR71 00	10YR58 00	C			Y	0	0	HR	5			M			
33	0-20	hcl	10YR32 00						0	0	HR	3						
	20-35	hcl	10YR61 00	10YR58 00	C			Y	0	0	HR	3			M			
	35-70	c	10YR61 00	10YR58 00	C			Y	0	0	HR	3			M			
34	0-20	mcl	10YR63 00	000C00 00	C			Y	0	0	HR	2						
	20-50	mcl	10YR63 00	000C00 00	M			Y	0	0		0			M			
	50-70	mcl	10YR62 00	000C00 00	M			Y	0	0	HR	1			M			
	70-120	hcl	10YR62 00	000C00 00	M			Y	0	0	HR	10			M			
44	0-25	mcl	10YR32 00						0	0	HR	2						
	25-50	mcl	10YR61 00	10YR58 00	C			Y	0	0	HR	3			M			
	50-75	c	10YR51 00	10YR58 00	C			Y	0	0	HR	3			M			
45	0-19	mcl	10YR32 00	10YR58 00	F				0	0	HR	3						
	19-50	mcl	10YR63 62	10YR56 00	M			Y	0	0		0			M			
	50-82	c	10YR51 00	10YR58 00	M			Y	0	0	HR	15			M		Y	
46	0-18	mzcl	10YR42 00	05YR58 00	C				0	0		0						
	18-50	c	10YR62 00	75YR68 00	C			Y	0	0	HR	1			M			
	50-90	c	10YR71 00	75YR68 00	C			Y	0	0	HR	1			M			
	90-100	c	10YR71 00	75YR68 00	M			Y	0	0	HR	10			M			
47	0-28	mcl	10YR32 00						0	0	HR	8						
	28-40	mcl	10YR52 53	10YR58 00	M			Y	0	0	HR	4			M			
	40-50	mcl	10YR53 00	10YR56 00	M			Y	0	0	HR	15			M			
	50-65	c	10YR52 00	10YR58 00	M			Y	0	0	HR	20			M		Y	
	65-70	hcl	10YR53 00	10YR58 00	M			Y	0	0	HR	30			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
48a	0-25	mcl	10YR32 00						0	0	HR	2						
	25-45	hcl	10YR62 00	000C00 00	M			Y	0	0	HR	10		M				
	45-70	c	10YR61 00	000C00 00	M			Y	0	0	HR	1		M				
	70-85	c	10YR71 00	000C00 00	M			Y	0	0	HR	1		M		Y		
59	0-30	mcl	10YR32 00						0	0	HR	3						
	30-65	hcl	10YR51 00	10YR58 00	C			Y	0	0	HR	2		M				
	65-100	c	10YR51 00	10YR58 00	C			Y	0	0	HR	5		M				
60	0-35	mcl	10YR32 00						0	0	HR	3						
	35-50	mcl	10YR61 00	10YR58 00	C			Y	0	0	HR	2		M				
	50-80	c	10YR51 00	10YR58 00	C			Y	0	0	HR	5		M				
61	0-19	mcl	10YR32 00						0	0	HR	3						
	19-65	mcl	10YR53 00	10YR56 00	C			Y	0	0	HR	15		M				
	65-82	c	10YR52 00	10YR58 00	M			Y	0	0	HR	3		M		Y		
62	0-29	mzcl	10YR32 00	10YR58 00	F				0	0		0						
	29-40	hzcl	10YR62 00	10YR58 00	C			Y	0	0	HR	1		M				
	40-80	c	10YR62 00	75YR68 00	C			Y	0	0	HR	5		M				
	80-100	c	10YR71 00	75YR68 00	M			Y	0	0	HR	10		M				
63	0-19	mcl	25Y 32 00	10YR58 00	C			Y	0	0	HR	3						
	19-37	hcl	10YR52 00	10YR58 00	M			Y	0	0		0		M				
	37-48	c	10YR61 00	10YR58 00	M			Y	0	0		0		M				
	48-85	c	10YR51 00	10YR58 00	M			Y	0	0	HR	5		M				
64	0-25	mcl	10YR32 00						0	0	HR	2						
	25-65	mcl	10YR61 00	10YR58 00	C			Y	0	0	HR	2		M				
	65-120	c	10YR61 00	10YR58 00	C			Y	0	0	HR	2		M				
65	0-20	mcl	10YR32 00						0	0	HR	5						
	20-40	mcl	10YR32 00						0	0	HR	50		M				
66	0-22	mcl	10YR32 00						0	0	HR	2						
	22-50	c	10YR61 00	000C00 00	M			Y	0	0		0		M				
	50-80	c	25Y 07 00	000C00 00	M			Y	0	0		0		M		Y		
77	0-35	mcl	10YR32 00						0	0	HR	2						
	35-60	hcl	10YR51 00	10YR58 00	C			Y	0	0	HR	2		M				
	60-95	c	10YR51 00	10YR58 00	C			Y	0	0	HR	3		M				
78	0-25	mzcl	10YR22 00						0	0		0						
	25-50	hcl	10YR53 00	000C00 00	M			Y	0	0	HR	2		M				
	50-70	c	25Y 71 00	000C00 00	M			Y	0	0	HR	2		M				
	70-85	c	25Y 71 00	000C00 00	M			Y	0	0	HR	2		M		Y		
79	0-20	mcl	10YR32 00						0	0	HR	2						
	20-45	hcl	10YR62 00	000C00 00	M			Y	0	0	HR	1		M				
	45-85	c	10YR61 00	000C00 00	M			Y	0	0	HR	1		M		Y		
	85-120	c	25Y 62 00	000C00 00	C			Y	0	0	HR	15		M		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
80	0-29	mcl	10YR31 00						0	0	HR	4						
	29-45	mcl	10YR53 00	10YR56 00	F				0	0	HR	15		M				
	45-82	c	10YR51 00	10YR58 00	M			Y	0	0	HR	15		M		Y		
81	0-29	mzcl	10YR31 00						0	0	HR	5						
	29-40	mzcl	10YR61 00	10YR58 00	C			Y	0	0	HR	10		M				
	40-65	c	10YR61 00	10YR68 00	C			Y	0	0	HR	25		M				
	65-70	c	10YR71 00	10YR68 00	C			Y	0	0	HR	30		M				
82	0-25	mcl	10YR32 00						0	0	HR	2						
	25-40	mcl	10YR51 00	75YR56 00	C			Y	0	0	HR	3		M				
	40-65	c	10YR51 00	10YR58 00	C			Y	0	0	HR	2		M				
83	0-20	mcl	10YR22 00						0	0	HR	20						
	20-38	mzcl	10YR22 00	10YR58 53	M			Y	0	0	HR	25		M				
	38-50	mcl	10YR53 00	10YR56 00	C			Y	0	0	HR	25		M				
	50-78	hcl	10YR62 00	10YR58 00	C			Y	0	0	HR	30		M				
84	0-20	mcl	10YR32 00						0	0	HR	2						
	20-30	mzcl	10YR32 00	10YR58 00	C			Y	0	0	HR	1		M				
	30-45	hcl	10YR31 00	10YR58 00	C			Y	0	0	HR	5		M				
	45-80	c	10YR61 00	10YR58 00	M			Y	0	0	HR	5		M				
86	0-30	mcl	10YR32 00						0	0	Y	0						
	30-45	hcl	10YR51 00	10YR58 00	C			Y	0	0	HR	2		M				
	45-70	c	10YR51 00	10YR58 00	C			Y	0	0	HR	2		M				
87	0-20	mzcl	10YR22 00						0	0		0						
	20-35	mcl	25Y 62 00	000C00 00	C			Y	0	0	HR	1		M				
	35-75	c	10YR61 00	000C00 00	M		00ZZ00 00	Y	0	0	HR	1		M		Y		
88	0-20	zl	10YR22 00						0	0		0						
	20-75	c	10YR52 00	000C00 00	M			Y	0	0	HR	1		M		Y		
89	0-30	mcl	10YR31 00						0	0	HR	5						
	30-60	mcl	10YR51 00	10YR58 00	C			Y	0	0	HR	15		M				
	60-65	hcl	10YR51 00	10YR58 00	M			Y	0	0	HR	15		M				