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Hampshire Minerals and
Waste Disposal Plan
Omission site 10 : Hound Farm,
Hound
Agricultural Land Classification Report
June 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

HAMPSHIRE MINERALS AND WASTE DISPOSAL PLAN
OMISSION SITE 10 : HOUND FARM, HOUND

1. Summary

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

1.2 Omission site 10 comprises 19 hectares of land at Hound Farm, Hound near Hamble, Hampshire. An Agricultural Land Classification (ALC) survey was carried out during June 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 20 borings and two soil inspection pits were described 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 a long term limitation on its use for agriculture.

1.3 At the time of the survey the agricultural land was under either permanent grass, used for grazing horses, market garden horticulture, or was bare soil with volunteer potatoes from a previous crop. The urban area shown consists of farm buildings which have been converted for light industrial use.

1.4 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent are given in the table below. The map has been drawn at a scale of 1:5,000. It is accurate at this scale, but any enlargement would be misleading.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
2	8.5	44.8	48.0
3a	6.2	32.6	35.0
3b	3.0	15.8	17.0
Urban	1.3	6.8	100% (17.7 ha)
Total area of site	19.0 ha	100%	

1.5 Appendix I 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.

1.6 Agricultural land at this site has been classified as Grade 2 (very good quality), Subgrade 3a (good quality), and Subgrade 3b (moderate quality). Limitations include soil wetness, soil droughtiness and slope gradient. The areas limited by soil wetness occur where gleying is evident over slowly permeable clayey horizons which cause drainage to be impeded. Grading is based on the differing depths at which these horizons occur within the profile and leads to Grade 2 and Subgrade 3a being applied. Areas affected by soil droughtiness occur where stone contents in the soil profile restrict available water to plants to the extent that Subgrades 3a and 3b are appropriate within local climatic parameters. A small area towards the south west of the site is limited by slope gradient, causing the safe and efficient use of certain types of farm machinery to be restricted such that Subgrade 3b has been applied.

2. 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, 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 and soil factors interact to influence soil wetness and droughtiness limitations.

Table 2 : Climatic Interpolation

Grid Reference	SU472090
Altitude (m)	25
Accumulated Temperature (degree days, Jan-June)	1529
Average Annual Rainfall (mm)	791
Field Capacity (days)	162
Moisture Deficit, Wheat (mm)	114
Moisture Deficit, Potatoes (mm)	109
Overall Climatic Grade	1

3. Relief

3.1 The site lies between approximately 20 and 30 m AOD. Much of the area is flat. However, in the north east there is a slight rise, and in the south west an area

where a slope of 8°, as shown by an optical reading clinometer, was recorded. This is sufficient to place a restriction on land quality, as certain types of farm machinery are limited by safety and efficiency on slopes of this degree.

4. Geology and Soil

4.1 The published geology map for the area (BGS Sheet 315, 1987) shows the majority of the site to be underlain by River Terrace 4 deposits, which are mainly flinty gravels, with a considerable sand content. The remaining parts of the site are shown as being underlain by the Marsh Farm formation from the Bracklesham group of laminated sands and clays.

4.2 The published soils information for the area (SSEW 1983, Sheet 6, 1:250,000) shows the site to comprise the Hamble 2 association, described as, 'deep stoneless well drained silty soils and similar soils affected by groundwater; over gravel locally. Usually on flat land'. Soils at this site were found to be slightly more stony than suggested and were commonly found over gravel. They fall into three main groups. The most common comprises slightly stony silty and clayey textures over a very stony horizon at moderate depths. The second comprises very slightly stony silty and clayey textures which are affected by a drainage impedance at shallow and moderate depths. The third, least common soil type comprises very stony profiles, initially clayey, becoming sandier with depth.

5. Agricultural Land Classification

5.1 The ALC classification of the site is shown on the attached ALC map.

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

Grade 2

5.3 Very good quality land has been mapped over nearly half of the agricultural area at this site in a single central unit. Principal limitations include soil droughtiness and soil wetness. Profiles affected by soil droughtiness typically comprise a very slightly to slightly stony (c.3-10% v/v flints) medium silty clay loam topsoil passing to a similarly or slightly more stony (up to 15% v/v flints) medium silty clay loam upper subsoil. This commonly passes to a very slightly to moderately stony (c.2-20% v/v flints) medium silty clay loam or medium clay loam over an impenetrable, to the soil auger, stony horizon of similar texture between 60 and 80 cm. This was found in the pit observation, 1P, from the adjacent site 4 (Ref: 1503/110/94, surveyed June 1994) to contain approximately 50% v/v flints. Occasionally the upper subsoil passes to a moderately stony (c.30% v/v flints) clay horizon which becomes impenetrable to the soil auger around 75 cm. The hard stone contents within these relatively moisture retentive soils serve to slightly restrict water availability to plants, such that given the local moisture deficits, these profiles are assigned to Grade 2.

Profiles limited by soil wetness commonly comprise a very slightly stony (c.2-3% v/v flints) medium silty clay loam topsoil, overlying a very slightly stony medium silty clay loam upper subsoil. This passes to a stoneless medium clay loam horizon with a few mottles overlying gleyed and slowly permeable stoneless heavy clay loam and slightly stony gleyed and slowly permeable clay lower subsoil horizons. The depths at which the slowly permeable horizons occur are such that, within local climatic parmeters Wetness Class II is appropriate, which within this topsoil workability class leads to Grade 2 being applied.

Subgrade 3a

5.4 Good quality land has been mapped over approximately one third of the site in two units towards the east and north west. Principal limitations include soil wetness and soil droughtiness. Where soil wetness is the principal limitation profiles typically comprise a very slightly stony (c.2-3% v/v flints) medium silty clay loam topsoil, overlying a stoneless occasionally slightly gleyed and slowly permeable (from the pit observation, 2P, see Appendix III) medium silty clay loam or medium clay loam upper subsoil. This passes to a similarly stony commonly slightly gleyed or gleyed slowly permeable medium or heavy silty clay loam horizon. Underlying this is a commonly stoneless or very slightly stony (0-5% v/v flints) gleyed and slowly permeable medium clay loam, medium silty clay loam or clay horizon, passing between 75 and 110 cm to a very slightly or slightly stony (c.1-10% v/v flints) gleyed and slowly permeable clay lower subsoil horizon. The drainage impedance that the slowly permeable horizons cause, within the prevailing local climate, lead to a moderate restriction in the flexibility of cultivations, cropping and stocking.

Profiles limited principally by soil droughtiness within this Subgrade are either, essentially similar to those described above (para 5.3), except that the very stony horizon (c.50% v/v flints) occurs at a shallower depth (c.60 cm). This leads to a slightly greater reduction in plant available water such that Subgrade 3a is appropriate. Or the soil profile comprises a slightly stony (15% v/v flints, 4-6% > 2cm) medium silty clay loam topsoil, overlying a moderately stony (c.30% v/v flints) medium silty clay loam upper subsoil, becoming impenetrable to the soil auger between 35 and 40 cm. Below this it has been assumed that the soil horizons were similar to those found in 1P, (see appendix III), as described fully below (para 5.5), ie very stony medium sandy loam, over very stony loamy medium sand to depth. The stones in the profile, in combination with the free draining nature of the sandy subsoils, leads to a reduction in the available water within the soil, such that in most years there is a moderate risk of drought stress occurring.

Subgrade 3b

5.5 Moderate quality land is mapped over the remaining 20% of the agricultural land at this site. Principal limitations include soil droughtiness and slope. Where soil droughtiness is limiting profiles comprise a moderately stony (20-31% v/v flints, 4-

7% > 2cm) medium silty clay loam topsoil, passing to a moderately to very stony (30-48% v/v flints) medium silty clay loam or medium clay loam upper subsoil. This overlies an impenetrable (to the soil auger 35 - 45 cm) moderately or very stony (c.30-50% v/v flints) medium silty clay loam or medium clay loam horizon. In the pit observation 1P, see Appendix III, the profile was found to become sandier (medium sandy loam to loamy medium sand), stonier (up to 56% v/v flints, max 15% > 2 cm) and gleyed beyond these depths to 120 cm. The gleying being indicative of high groundwater levels rather than a drainage impedance. The stones in the profile, in combination with the sandy lower horizons severely restrict available water to plants such that given the local moisture deficits, there is a significant risk of drought stress to plants in most years.

A small area of the site to the south west is limited by slope. Gradients measured at 8° using an optical reading clinometer, mean that there is a restriction on the safe and efficient use of some farm machinery for the purposes of cultivation, such that this area is shown as Subgrade 3b.

ADAS Ref: 1503/127/94
MAFF Ref: EL15/107

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1987) Sheet No. 315, Southampton, Solid and Drift Edition.

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 (1983), Sheet No. 6, Soils of South East England, 1:250,000.

Soil Survey of England and Wales (1984), Soils and their Use in South East England, Bulletin Number 15.

APPENDIX I

DESCRIPTION OF THE GRADES AND SUBGRADES

Grade 1 : Excellent Quality Agricultural Land

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

Grade 2 : Very Good Quality Agricultural Land

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

Grade 3 : Good to Moderate Quality Land

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

Subgrade 3a : Good Quality Agricultural Land

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

Subgrade 3b : Moderate Quality Agricultural Land

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

Grade 4 : Poor Quality Agricultural Land

Land with severe limitations which significantly restrict the range of crops and/or the level of yields. It is mainly suited to grass with occasional arable crops (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 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 including: housing, industry, commerce, education, transport, religous buildings, cemetries. 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. 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, 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

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

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

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

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

[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.

APPENDIX III

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 computer database. This uses notations and abbreviations as set out below.

Boring Header Information

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

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

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

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

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

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

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

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

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

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

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

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

Soil Pits and Auger Borings

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

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

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

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

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

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

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

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

4. **MOTTLE CONT** : Mottle contrast

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SOIL PIT DESCRIPTION

Site Name : HANTS MINS OM SITE 10 Pit Number : 1P

Grid Reference: SU47100900 Average Annual Rainfall : 791 mm
Accumulated Temperature : 1529 degree days
Field Capacity Level : 162 days
Land Use : Ploughed
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 33	MZCL	10YR42 00	4	31	HR		WKCSAB	FR		
33- 48	MCL	10YR56 46	15	48	HR			FR	M	
48- 63	MSL	10YR53 00	15	56	HR	M		FR	M	
63- 71	MSL	25Y 64 00	7	55	HR	M		FR	M	
71- 90	MSL	10YR52 00	8	52	HR	M		FR	M	
90-120	LMS	10YR52 00	0	55	HR	M		FR	M	

Wetness Grade : 1 Wetness Class : I
Gleying : 48 cm
SPL : No SPL

Drought Grade : 3B APW : 80mm MBW : -34 mm
APP : 73mm MBP : -36 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : HANTS MINS OM SITE 10 Pit Number : 2P

Grid Reference: SU47400900
Average Annual Rainfall : 791 mm
Accumulated Temperature : 1529 degree days
Field Capacity Level : 162 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	MZCL	10YR42 00	0	2	HR	F	MDCSAB	FR		
29- 48	MCL	25Y 44 54	0	0		C	MDCAB	FR	M	
48- 78	MZCL	10YR53 00	0	0		M	WKCSAB	FR	M	
78- 90	MCL	10YR52 00	0	5	HR	M	WKCSAB	FR	M	
90-120	C	25Y 61 00	0	8	HR	M	WKCSAB	FM	P	

Wetness Grade : 3A
Wetness Class : III
Gleying :S29 cm
SPL : ~~28~~ cm 48

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

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SAMPLE 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
1	SU47100920	PLO					1	1		0		0					DR	3A	IMP 60 1P S4
1P	SU47100900	PLO			48		1	1	80	-34	73	-36	3B				DR	3B	PIT 95 DR 120
2	SU47200920	PLO			40	40	3	3A		0		0					WD	3A	SPL 40 SEE 2P
2P	SU47400900	PGR			S29	~~29~~ 48	3	3A		0		0					WE	3A	PIT100 AUG120
3	SU47300920	HOR			60	60	2	2		0		0					WE	2	SPL 60 SEE 2P
4	SU47400920	PGR					1	1		0		0					DR	3A	IMP 35 SEE 1P
5	SU47100910	PLO	S	01			1	1		0		0					DR	2	IMP 75 1P S4
6	SU47200910	PLO					1	1		0		0					DR	2	IMP 80 1P S4
7	SU47300910	HOR			S50	50	3	3A		0		0					WE	3A	SL GLEY 50-70
8	SU47400910	PGR	S	02			1	1		0		0					DR	3A	IMP 40 SEE 1P
9	SU47000900	PLO	S	01			1	1		0		0					DR	3B	IMP 45 SEE 1P
10	SU47100900	PLO					1	1		0		0					DR	3B	IMP 40 SEE 1P
11	SU47200900	PGR					1	1		0		0					DR	2	IMP 80 1P S4
12	SU47300900	PGR			60	60	2	2	142	28	122	13	2				WD	2	SPL 60 SEE 2P
13	SU47400900	PGR			S30	30	3	3A		0		0					WE	3A	SL GLEY 30-45
14	SU47000890	PGR					1	1		0		0					DR	3B	IMP 42 SEE 1P
15	SU47100890	PGR			65		1	1		0		0					DR	2	IMP 70 1P S4
16	SU47200890	PGR			S50		1	1		0		0					DR	2	IMP 72 1P S4
17	SU47300890	PGR			55	55	3	3A		0		0					WE	3A	SPL 55 SEE 2P
18	SU47000880	PGR	S	08			1	1		0		0					DR	3B	IMP 35 SEE 1P
19	SU47100880	PGR			45	55	3	3A		0		0					WE	3A	SPL 55 SEE 2P
21	SU47300880	PGR					1	1		0		0					DR	2	IMP 60 1P S4

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
1	0-25	mzcl	10YR42 00						7	0	HR	20							
	25-35	mzcl	10YR42 00						0	0	HR	30		M					
	35-60	mzcl	10YR56 00						0	0	HR	30		M					IMP STONES 60
1P	0-33	mzcl	10YR42 00						4	0	HR	31	WKCSAB	FR					
	33-48	mcl	10YR56 46						15	0	HR	48		FR	M				
	48-63	msl	10YR53 00	10YR58 00	M			Y	15	0	HR	56		FR	M				
	63-71	msl	25Y 64 00	10YR58 00	M			Y	7	0	HR	55		FR	M				
	71-90	msl	10YR52 00	75YR58 00	M			Y	8	0	HR	52		FR	M				
	90-120	lms	10YR52 00	75YR58 00	M			Y	0	0	HR	55		FR	M				PIT IMP STONES 95
2	0-32	mzcl	10YR43 00						6	0	HR	20							
	32-40	c	10YR58 00	10YR52 00	F				0	0	HR	15		M					
	40-60	c	10YR53 00	10YR58 00	M			Y	0	0	HR	20		P		Y			
	60-82	c	10YR52 00	05YR56 58	M			Y	0	0	HR	15		P		Y			IMP STONES 82
2P	0-29	mzcl	10YR42 00	10YR46 00	F				0	0	HR	2	MDCSAB	FR					
	29-48	mcl	25Y 44 54	10YR56 00	C		10YR54 00	S	0	0		0	MDCAB	FR	M	Y		Y	SLIGHTLY GLEYED
	48-78	mzcl	10YR53 00	10YR58 00	M		00MN00 00	Y	0	0		0	WKCSAB	FR	M	Y		Y	
	78-90	mcl	10YR52 00	10YR58 00	M			Y	0	0	HR	5	WKCSAB	FR	M	Y		Y	
	90-120	c	25Y 61 00	05YR58 00	M			Y	0	0	HR	8	WKCSAB	FM	P	Y		Y	PIT 100 AUG 120
3	0-30	mzcl	10YR42 00						0	0	HR	3							
	30-45	mzcl	10YR44 54						0	0	HR	2		M					
	45-60	mcl	10YR53 52	10YR56 00	F				0	0		0		M					
	60-85	hcl	10YR53 52	10YR58 00	M		00MN00 00	Y	0	0		0		M			Y		
	85-120	c	10YR53 00	10YR58 00	M			Y	0	0	HR	10		P		Y			
4	0-30	mzcl	10YR42 00						6	0	HR	15							
	30-35	mzcl	10YR42 00						0	0	HR	35		M					IMP STONES 35
5	0-27	mzcl	10YR43 00						6	0	HR	10							
	27-58	mzcl	10YR44 00						0	0	HR	5		M					
	58-75	c	75YR56 00						0	0	HR	30		P					IMP STONES 75
6	0-30	mzcl	10YR43 00						2	0	HR	10							
	30-50	mzcl	10YR44 00						0	0	HR	5		M					
	50-60	mzcl	10YR44 00	10YR56 00	F				0	0	HR	2		M					
	60-80	mcl	10YR54 00						0	0	HR	10		M					IMP STONES 80
7	0-35	mzcl	10YR42 00						0	0	HR	3							
	35-50	mzcl	10YR43 44						0	0		0		M					
	50-70	hzcl	10YR54 53	10YR56 00	C			S	0	0		0		M			Y		SLIGHTLY GLEYED
	70-110	c	10YR53 52	10YR58 00	M			Y	0	0		0		P		Y			
	110-120	c	10YR53 52	10YR58 00	M			Y	0	0	HR	10		P		Y			
8	0-30	mzcl	10YR42 00						4	0	HR	15							
	30-40	mzcl	10YR42 43						0	0	HR	30		M					IMP STONES 40

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	
9	0-25	mzcl	10YR42 00						7	0	HR	25							
	25-35	mzcl	10YR42 00						0	0	HR	30		M					
	35-45	mcl	10YR56 00						0	0	HR	35		M					IMP STONES 45
10	0-30	mzcl	10YR42 00						6	0	HR	20							
	30-40	mzcl	10YR44 00						0	0	HR	30		M					IMP STONES 40
11	0-35	mzcl	10YR42 00						0	0	HR	3							
	35-65	mzcl	10YR43 44						0	0	HR	3		M					
	65-75	mcl	10YR54 52	10YR56 00	F				0	0	HR	5		M					
	75-80	mcl	10YR53 54	10YR56 00	F				0	0	HR	30		M					IMP STONES 80
12	0-33	mcl	10YR42 00						0	0	HR	1							
	33-45	mzcl	10YR43 00						0	0		0		M					
	45-60	mzcl	10YR44 54	10YR56 00	F				0	0		0		M					
	60-70	hzcl	10YR53 54	10YR56 00	C			Y	0	0		0		M		Y			
	70-105	c	10YR53 00	10YR56 00	C		00MN00 00	Y	0	0		0		P		Y			
	105-120	c	10YR53 61	10YR58 00	M			Y	0	0	HR	10		P		Y			
13	0-30	mzcl	10YR43 00	10YR52 56	F				1	0	HR	5							
	30-45	hcl	10YR54 00	10YR56 00	M			S	0	0		0		M		Y			SLIGHTLY GLEYED
	45-75	c	10YR53 00	10YR68 64	M			Y	0	0		0		P		Y			
	75-97	hcl	10YR54 00	10YR56 00	C			S	0	0	HR	5		M		Y			SLIGHTLY GLEYED
	97-120	c	10YR63 00	05YR56 00	M			Y	0	0	HR	1		P		Y			
14	0-30	mzcl	10YR42 00						6	0	HR	25							
	30-40	mzcl	10YR42 00						0	0	HR	35		M					
	40-42	mzcl	10YR43 00						0	0	HR	50		M					IMP STONES 42
15	0-30	mzcl	10YR31 00						0	0	HR	10							
	30-50	mzcl	10YR44 00						0	0	HR	15		M					
	50-65	mzcl	10YR56 00						0	0	HR	20		M					
	65-70	mzcl	10YR53 00	10YR56 00	C			Y	0	0	HR	30		M					IMP STONES 70
16	0-30	mzcl	10YR42 52	10YR46 00	F				0	0	HR	5							
	30-50	mzcl	10YR44 00						0	0	HR	10		M					
	50-70	mzcl	10YR54 53	10YR66 00	M			S	0	0	HR	10		M					SLIGHTLY GLEYED
	70-72	mzcl	10YR53 54	10YR58 66	M			Y	0	0	HR	30		M					IMP STONES 72
17	0-30	mzcl	10YR42 00						0	0	HR	1							
	30-45	mzcl	10YR44 00						0	0		0		M					
	45-55	mzcl	10YR43 00	10YR56 00	F				0	0	HR	1		M					
	55-75	mzcl	10YR53 54	10YR58 00	C			Y	0	0		0		M		Y			
	75-120	c	10YR53 61	10YR58 00	M			Y	0	0	HR	1		P		Y			
18	0-25	mzcl	10YR42 00						6	0	HR	20							
	25-35	mzcl	10YR42 00						0	0	HR	30		M					IMP STONES 35

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
19	0-33	mzcl	10YR41 00	10YR46 00	F				0	0	HR	3							
	33-45	mzcl	10YR43 42	10YR46 00	F				0	0		0		M					
	45-55	mzcl	10YR52 00	10YR46 00	C		00MN00 00	Y	0	0		0		M		Y			
	55-70	hcl	10YR53 00	10YR58 00	M			Y	0	0	HR	2		M		Y			
	70-105	c	25Y 62 00	10YR58 00	M			Y	0	0	HR	2		P		Y			IMP STONES 110
	105-110	c	25Y 62 00	10YR58 00	M			Y	0	0	HR	25		P		Y			
21	0-25	mzcl	10YR42 00						0	0	HR	3							
	25-50	mzcl	10YR43 00						0	0	HR	3		M					
	50-58	mzcl	10YR43 53						0	0	HR	10		M					
	58-60	mzcl	10YR43 53						0	0	HR	30		M					IMP STONES 60