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Swale Borough Local Plan
Thistle Hill, Isle of Sheppey
Agricultural Land Classification
ALC Map and Report
April 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

SWALE BOROUGH LOCAL PLAN THISTLE HILL, ISLE OF SHEPPEY

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 the Swale District of Kent. The work forms part of MAFF's statutory input to the preparation of the Swale Borough Local Plan.
- 1.2 Approximately 59 hectares of land around Thistle Hill to the south of Minister on the Isle of Sheppey was surveyed in March 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 56 soil auger 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 agricultural land was under a combination of winter cereals, permanent pasture and set aside.
- 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 1:5,000. It is accurate at this scale, but any enlargement would be misleading. This map supersedes any previous survey information.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Area
3b	58.6	99.5	100
Urban	<u>0.3</u>	<u>0.5</u>	
Total area of site	58.9 ha	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 The area under agricultural use has been classified Subgrade 3b (moderate quality). The principal limitation is soil wetness. Typically the soils comprise heavy clay

loam or clay topsoils overlying slowly permeable clay at shallow depth. This causes drainage to be severely impeded and restricts opportunities for cultivation and/or livestock grazing, without the risk of structural damage to the soil. Crop growth and development may also be affected by prolonged soil wetness.

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 According to unpublished Met. Office data (1979), the site is at risk from exposure. However, climatic and soil factors interact to influence soil wetness and droughtiness limitations, which are of greater significance to land quality than exposure, such that this does not affect the final classification. At this locality the climate is relatively warm and very dry in regional terms with consequent high moisture deficits and low field capacity days.

Table 2 :Climatic Interpolations

Grid Reference	TQ951721	TQ945719
Altitude, (m, AOD)	10	20
Accumulated Temperature (°days, Jan.-June)	1484	1473
Average Annual Rainfall (mm)	545	551
Field Capacity Days	98	99
Moisture deficit, wheat (mm)	130	129
Moisture deficit, potatoes (mm)	129	127
Overall Climatic Grade	1	1

3. Relief

- 3.1 The site lies between approximately 10 m and 20 m AOD. The north of the area is very gently sloping, rising gently southwards to the summit of Thistle Hill, which then falls away in all directions, rising again to the west (Rape Hill) and south east (Forty Acres Hill). Nowhere on the site is gradient or relief overriding in terms of land quality.

4. **Geology and Soils**

- 4.1 The published British Geological Survey map, Sheet 272, Chatham (1977, 1:50,000 scale), shows the area to be underlain entirely by Eocene London Clay.
- 4.2 The published Soil Survey of England and Wales map, Sheet 6, Soils of South-East England (1983, 1:250,000 scale), shows the site to be underlain by soils of the Windsor Association. These are described as, "Slowly permeable seasonally waterlogged clayey soils mostly with brown subsoils. Some fine loamy over clayey and fine silty over clayey soils and, locally on slopes, clayey soils with only slight waterlogging". (SSEW 1983). The slightly more detailed Soils of Kent publication (SSEW 1980), gives the principal soil series as Windsor and Wickham, which are given an essentially similar description to that above. Soils of this broad nature were encountered during survey work on the site.

5. **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**

Land of moderate quality is mapped for the whole of the agricultural area at this site. The principal limitation is soil wetness caused by stoneless slowly permeable clay horizons at shallow (< 38 cm) depths in the profile. Profiles typically comprise stoneless or very slightly stony, non-calcareous heavy clay loam, heavy silty clay loam or clay topsoils which are often gleyed. These overlie a gleyed and slowly permeable clay subsoil. Due to the dry climate at this location, these heavy soils are allocated to Wetness Class III (see Appendix II), but because of the low workability status of the heavy topsoils, Subgrade 3b is appropriate due to restrictions in the flexibility of cultivations, cropping and stocking.

- 5.4 The areas shown as Urban are domestic dwellings and associated grounds within the survey area.

ADAS Ref: 0211/044/94
MAFF Ref: EL20/0245

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1977), Sheet 272, Chatham, 1:50,000. Drift Edition.

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

Meteorological Office (1979), Unpublished Climate Data relating to 1:63,360 Sheet 172.

Meteorological Office (1989), Climatic datasets for Agricultural Land Classification.

Soil Survey of England and Wales (1980), Soils of Kent, Bulletin No.9.

Soil Survey of England and Wales (1983), Sheet No. 6, Soils of South-East England, 1:250,000, and Accompanying Legend.

Soil Survey of England and Wales (1984), Soils and their use in South-East England. Bulletin No.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, 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. 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.

¹The 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. **GLEYSPL** : 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. **GLEYS** : 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 **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

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 appropriate 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 : SWALE LP THISTLE HILL Pit Number : 1P

Grid Reference: TQ95107220 Average Annual Rainfall : 546 mm
 Accumulated Temperature : 1484 degree days
 Field Capacity Level : 98 days
 Land Use : Permanent Grass
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 38	C	10YR42 00	0	2	F	
38- 78	C	25Y 53 00	0	2	M	MDMAB

Wetness Grade : 3B Wetness Class : III
 Gleying : 038 cm
 SPL : 038 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 : SWALE LP THISTLE HILL Pit Number : 2P

Grid Reference: TQ94507190 Average Annual Rainfall : 546 mm
 Accumulated Temperature : 1484 degree days
 Field Capacity Level : 98 days
 Land Use : Permanent Grass
 Slope and Aspect : 04 degrees SE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 22	C	10YR42 00	0	0	F	
22- 65	C	10YR53 00	0	0	C	MDCAB
65- 80	C	10YR53 00	0	0	C	MDCAB

Wetness Grade : 3B Wetness Class : III
 Gleying : 022 cm
 SPL : 022 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 : SWALE LP THISTLE HILL Pit Number : 3P

Grid Reference: TQ94607170 Average Annual Rainfall : 546 mm
Accumulated Temperature : 1484 degree days
Field Capacity Level : 98 days
Land Use : Permanent Grass
Slope and Aspect : 02 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	C	10YR42 00	0	2	F	
28- 65	C	25Y 53 00	0	0	M	MDCAB

Wetness Grade : 3B Wetness Class : III
Gleying : 028 cm
SPL : 028 cm

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

FINAL ALC GRADE ; 3B
MAIN LIMITATION ; Wetness

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB					
1	TQ94707240	SAS		035 035	3	3B		0	0				WE	3B	
1P	TQ95107220	PGR		038 038	3	3B		0	0				WE	3B	PIT 78
2	TQ94607230	SAS E	02	030 030	3	3B		0	0				WE	3B	
2P	TQ94507190	PGR SE	04	022 022	3	3B		0	0				WE	3B	PIT 80
3	TQ94707230	SAS NE	01	030 030	3	3B		0	0				WE	3B	
3P	TQ94607170	PGR S	02	028 028	3	3B		0	0				WE	3B	PIT 65
4	TQ94807230	SAS		030 030	3	3B		0	0				WE	3B	
5	TQ94907230	CER		030 030	3	3B		0	0				WE	3B	
6	TQ95007230	CER		025 025	3	3B		0	0				WE	3B	
7	TQ95107230	PGR		030 030	3	3B		0	0				WE	3B	
8	TQ95207230	PGR		035 035	3	3B		0	0				WE	3B	
9	TQ94607220	SAS NE	02	038 038	3	3B		0	0				WE	3B	
10	TQ94707220	SAS NE	02	030 030	3	3B		0	0				WE	3B	
11	TQ94807220	SAS NE	01	033 033	3	3B		0	0				WE	3B	
12	TQ94907220	CER		0 030	3	3B		0	0				WE	3B	
13	TQ95007220	PGR		030 030	3	3B		0	0				WE	3B	
14	TQ95107220	PGR		0 033	3	3B		0	0				WE	3B	
15	TQ95207220	PGR		030 030	3	3B		0	0				WE	3B	
16	TQ94207210	CER SW	03	026 026	3	3B		0	0				WE	3B	
17	TQ94307210	CER SE	02	030 030	3	3B		0	0				WE	3B	
18	TQ94507210	SAS E	01	035 035	3	3B		0	0				WE	3B	
19	TQ94607210	SAS E	03	0 030	3	3B		0	0				WE	3B	
20	TQ94707210	SAS E	03	0 030	3	3B		0	0				WE	3B	
21	TQ94807210	SAS NE	02	033 033	3	3B		0	0				WE	3B	
22	TQ94907210	SAS NE	01	030 030	3	3B		0	0				WE	3B	
23	TQ95007210	CER		025 025	3	3B		0	0				WE	3B	
24	TQ95107210	CER		0 025	3	3B		0	0				WE	3B	
25	TQ94207200	CER S	01	035 035	3	3B		0	0				WE	3B	
26	TQ94307200	CER S	01	033 033	3	3B		0	0				WE	3B	
27	TQ94407200	CER W	02	035 035	3	3B		0	0				WE	3B	
28	TQ94507200	CER NE	02	030 030	3	3B		0	0				WE	3B	
29	TQ94607200	SAS N	02	030 030	3	3B		0	0				WE	3B	
30	TQ94707200	SAS NE	02	033 033	3	3B		0	0				WE	3B	
31	TQ94807200	SAS N	02	033 033	3	3B		0	0				WE	3B	
32	TQ94907200	PGR NE	02	0 028	3	3B		0	0				WE	3B	
33	TQ94107190	CER W	01	030 030	3	3B		0	0				WE	3B	
34	TQ94207190	CER S	01	028 028	3	3B		0	0				WE	3B	
35	TQ94307190	CER W	04	031 031	3	3B		0	0				WE	3B	
36	TQ94407190	CER W	04	025 025	3	3B		0	0				WE	3B	
37	TQ94507190	PGR SE	04	023 023	3	3B		0	0				WE	3B	
38	TQ94607190	PGR SE	03	021 021	3	3B		0	0				WE	3B	
39	TQ94707190	PGR N	01	026 026	3	3B		0	0				WE	3B	

SAMPLE NO.	GRID REF	ASPECT		--WETNESS--				-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
		USE	GRDNT	GLEYS	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT		
40	TQ94807190	PGR	N	01	031	031	3	3B		0	0					WE	3B	
41	TQ94907190	PGR	N	01	036	036	3	3B		0	0					WE	3B	
42	TQ94107180	CER	SW	01	028	028	3	3B		0	0					WE	3B	
43	TQ94207180	CER	SW	01	025	025	3	3B		0	0					WE	3B	
44	TQ94307180	CER	SW	01	032	032	3	3B		0	0					WE	3B	
45	TQ94407180	CER	S	03	032	032	3	3B		0	0					WE	3B	
46	TQ94507180	PGR	SE	03	020	020	3	3B		0	0					WE	3B	
47	TQ94607180	PGR	SE	02	032	032	3	3B		0	0					WE	3B	
48	TQ94707180	PGR	SE	01	024	024	3	3B		0	0					WE	3B	
49	TQ94107170	CER			035	035	3	3B		0	0					WE	3B	
50	TQ94207170	CER			032	032	3	3B		0	0					WE	3B	
51	TQ94307170	CER			035	035	3	3B		0	0					WE	3B	
52	TQ94407170	CER	SW	01	030	030	3	3B		0	0					WE	3B	
53	TQ94507170	PGR	SW	01	028	028	3	3B		0	0					WE	3B	
54	TQ94607170	PGR	SW	01	025	025	3	3B		0	0					WE	3B	
55	TQ94707170	PGR	SE	02	029	029	3	3B		0	0					WE	3B	
56	TQ94807170	PGR	SE	02	038	038	3	3B		0	0					WE	3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES-----			STRUCT/		SUBS		CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT	CONSIST	STR	POR	
1	0-35	hc1	10YR42 00 00MN00 00 F						0	0	0					
	35-70	c	25Y 53 00 10YR58 00 M					Y	0	0	0		P		Y	
1P	0-38	c	10YR42 00 10YR46 00 F						0	0	HR	2				
	38-78	c	25Y 53 00 10YR58 00 M				10YR53 00	Y	0	0	HR	2	MDMAB	FM	P	Y
2	0-30	c	10YR42 00 00MN00 00 F						0	0	HR	3				
	30-70	c	25Y 53 00 10YR58 00 M					Y	0	0	0		P		Y	
2P	0-22	c	10YR42 00 00MN00 00 F						0	0	0					
	22-65	c	10YR53 00 10YR58 00 C					Y	0	0	0	MDCAB	FM	P	Y	Y
	65-80	c	10YR53 00 10YR58 00 C				10YR42 00	Y	0	0	0	MDCAB	FM	P	Y	Y
3	0-30	c	10YR42 00 10YR46 56 F						0	0	HR	3				
	30-50	c	10YR53 63 10YR58 00 M					Y	0	0	HR	10		P	Y	
	50-70	c	10YR63 00 10YR58 00 M					Y	0	0	0		P		Y	
3P	0-28	c	10YR42 00 00MN00 00 F						0	0	HR	2				
	28-65	c	25Y 53 00 10YR58 00 M				10YR53 00	Y	0	0	0	MDCAB	FM	P	Y	Y
4	0-30	hc1	10YR42 00 10YR46 00 F						0	0	0					
	30-60	c	25Y 53 52 10YR58 00 M					Y	0	0	0		P		Y	
5	0-30	hc1	10YR42 00 10YR46 00 F						0	0	HR	3				
	30-70	c	10YR42 00 10YR56 00 M					Y	0	0	0		P		Y	
6	0-25	hc1	10YR42 00 10YR46 56 F						0	0	HR	3				
	25-60	c	10YR53 52 10YR58 00 M					Y	0	0	HR	5		P	Y	
	60-80	c	25Y 53 00 10YR58 00 M					Y	0	0	0		P		Y	
7	0-30	c	10YR42 00 10YR46 00 F						0	0	0					
	30-50	c	10YR53 00 10YR58 00 M					Y	0	0	0		P		Y	
	50-70	c	25Y 52 00 10YR68 00 M					Y	0	0	0		P		Y	
8	0-35	hzc1	10YR42 00 10YR46 00 F						0	0	0					
	35-80	c	25Y 52 53 10YR58 00 M					Y	0	0	HR	3		P	Y	
9	0-38	hc1	10YR42 00 00MN00 00 F						0	0	HR	2				
	38-70	c	10YR53 00 10YR58 00 M					Y	0	0	0		P		Y	
10	0-30	hc1	10YR42 00						0	0	HR	2				
	30-70	c	10YR53 00 10YR58 00 M					Y	0	0	0		P		Y	
11	0-33	c	10YR42 00 00MN00 00 F						0	0	0					
	33-70	c	25Y 53 00 10YR58 00 M					Y	0	0	0		P		Y	
12	0-30	c	10YR42 00 10YR46 00 C					Y	0	0	HR	2				
	30-60	c	25Y 42 00 10YR46 00 M					Y	0	0	HR	10		P	Y	
	60-80	c	25Y 52 00 10YR58 00 M					Y	0	0	0		P		Y	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES----			STRUCT/ CONSIST	SUBS				
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR	IMP	SPL
13	0-30	c	10YR42 00 10YR46 00 F						0	0	HR	2					
	30-60	c	25Y 42 00 10YR58 00 M					Y	0	0	HR	5	P			Y	
	60-80	c	25Y 53 00 10YR58 00 M					Y	0	0		0	P			Y	
14	0-33	hzc1	10YR41 00 10YR46 00 C						Y	0	0	HR	3				
	33-50	c	25Y 42 00 10YR58 00 M					Y	0	0	HR	5	P			Y	
	50-70	c	25Y 53 00 10YR58 68 M					Y	0	0		0	P			Y	
15	0-30	c	10YR42 00 10YR46 00 F				00MN00 00			0	0	0					
	30-40	c	25Y 42 00 10YR46 56 M					Y	0	0	HR	3	P			Y	
	40-70	c	25Y 53 00 10YR58 00 M					Y	0	0		0	P			Y	
16	0-26	c	10YR43 00							0	0	0					
	26-75	c	10YR53 00 00C00 00 F					Y	0	0		0	P			Y	
	75-100	c	10YR52 00 10YR58 00 C					Y	0	0		0	P			Y	
17	0-30	c	10YR42 00							0	0	0					
	30-70	c	10YR53 00 00C00 00 F				00MN00 00	Y	0	0		0	P			Y	
	70-90	c	10YR53 00 10YR58 00 C				00MN00 00	Y	0	0		0	P			Y	
18	0-35	c	10YR42 00 10YR46 00 F							0	0	0					
	35-80	c	25Y 41 42 10YR56 00 C				00MN00 00	Y	0	0		0	P			Y	
19	0-30	c	10YR42 00 10YR46 00 C						Y	0	0	0					
	30-70	c	25Y 53 52 10YR58 00 M					Y	0	0		0	P			Y	
20	0-30	c	10YR42 00 10YR46 00 C						Y	0	0	0					
	30-45	c	25Y 53 63 10YR58 00 M					Y	0	0		0	P			Y	
	45-70	c	25Y 52 00 10YR58 00 M					Y	0	0		0	P			Y	
21	0-33	c	10YR42 00 10YR46 00 F							0	0	0					
	33-70	c	10YR53 00 10YR58 00 M					Y	0	0		0	P			Y	
22	0-30	c	10YR42 00 10YR46 00 F				00MN00 00			0	0	0					
	30-45	c	25Y 52 00 10YR56 00 C					Y	0	0		0	P			Y	
	45-70	c	25Y 53 00 10YR58 00 M					Y	0	0		0	P			Y	
23	0-25	hc1	10YR42 00							0	0	0					
	25-70	c	10YR53 00 10YR58 00 M					Y	0	0		0	P			Y	
24	0-25	c	25Y 41 00 10YR46 00 C						Y	0	0	0					
	25-60	c	25Y 51 00 10YR58 00 M					Y	0	0		0	P			Y	
25	0-35	c	10YR42 00							0	0	0					
	35-45	c	25Y 53 00 10YR56 00 C					Y	0	0		0	P			Y	
	45-70	c	25Y 52 51 10YR58 00 M				00MN00 00	Y	0	0		0	P			Y	
26	0-33	c	10YR42 00 00MN00 00 F							0	0	0					
	33-90	c	25Y 54 53 10YR56 00 C					Y	0	0		0	P			Y	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES----			STRUCT/ CONSIST	SUBS				
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR	IMP	SPL
27	0-35	c	10YR42 00 10YR46 00 F						0	0	0						
	35-60	c	10YR53 00 10YR56 00 C						Y	0	0		P				Y
	60-100	c	25Y 53 00 10YR56 00 C						Y	0	0		P				Y
28	0-30	c	10YR42 00 10YR46 00 F						0	0	0						
	30-120	c	25Y 54 53 10YR56 00 C						Y	0	0		P				Y
29	0-30	c	10YR42 00 10YR46 00 F						0	0	0						
	30-120	c	25Y 54 53 10YR56 00 C						Y	0	0		P				Y
30	0-33	c	10YR42 00 10YR46 00 F						0	0	0						
	33-60	c	25Y 54 53 10YR56 00 C						Y	0	0		P				Y
	60-120	c	25Y 53 00 10YR58 00 C						Y	0	0		P				Y
31	0-33	c	10YR42 41 10YR46 00 F						0	0	0						Y
	33-60	c	25Y 53 63 10YR58 00 M						Y	0	0		P				Y
32	0-28	c	10YR53 52 10YR56 00 C						Y	0	0						
	28-70	c	25Y 53 63 10YR58 00 M						Y	0	0		P				Y
33	0-30	c	10YR43 00 00MN00 00 F						0	0	0						
	30-70	c	10YR52 00 10YR58 61 M				00MN00 00	Y	0	0	0		P				Y
34	0-28	c	10YR43 00						0	0	0						
	28-65	c	10YR52 00 10YR58 61 C						Y	0	0		P				Y
35	0-31	c	10YR43 00						0	0	0						
	31-70	c	10YR52 00 10YR58 61 C						Y	0	0		P				Y
36	0-25	c	10YR43 00						0	0	0						
	25-70	c	10YR53 00 00OC00 00 F				00MN00 00	Y	0	0	0		P				Y
	70-85	c	10YR52 00 10YR58 00 C						Y	0	0		P				Y
	85-100	c	10YR52 00 75YR78 00 M						Y	0	0		P				Y
37	0-23	c	10YR42 00						0	0	0						
	23-65	c	10YR53 00 00OC00 00 F				00MN00 00	Y	0	0	0		P				Y
	65-90	c	10YR52 00 10YR58 00 C				00MN00 00	Y	0	0	0		P				Y
38	0-21	c	10YR42 00						0	0	0						
	21-45	c	10YR53 00 10YR58 00 F						0	0	0		P				
	45-70	c	10YR52 00 10YR58 00 C				00MN00 00	Y	0	0	0		P				Y
39	0-26	c	10YR42 00						0	0	0						
	26-42	c	10YR52 00 10YR58 00 C						Y	0	0		P				Y
	42-65	c	10YR52 00 10YR58 71 M						Y	0	0		P				Y
40	0-31	hc1	10YR42 00						0	0	HR	2					
	31-65	c	10YR62 00 10YR58 71 M						Y	0	0	0	P				Y

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- PED			----STONES-----			STRUCT/	SUBS								
				COL	ABUN	CONT	COL.	GLE	>2		>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
41	0-36	hc1	10YR42 00																
	36-70	c	10YR52 00	10YR58	00	C		Y	0	0	0		P						Y
42	0-28	c	10YR42 00																
	28-70	c	10YR52 00	10YR58	61	M		Y	0	0	0		P						Y
43	0-25	c	10YR42 00																
	25-45	c	10YR52 00	10YR58	61	C		Y	0	0	0		P						Y
	45-70	c	10YR62 00	10YR58	61	M		Y	0	0	0		P						Y
44	0-32	c	10YR42 00																
	32-70	c	10YR52 00	10YR58	61	M		Y	0	0	0		P						Y
45	0-32	c	10YR42 00																
	32-70	c	10YR53 00	00OC00	00	F	00MN00	00	Y	0	0	0	P						Y
	70-90	c	10YR52 00	10YR58	00	C		Y	0	0	0		P						Y
46	0-20	c	10YR42 00																
	20-55	c	10YR53 00	00OC00	00	F	00MN00	00	Y	0	0	0	P						Y
	55-80	c	10YR53 00	10YR58	00	C	00MN00	00	Y	0	0	0	P						Y
47	0-32	c	10YR41 00																
	32-75	c	10YR52 00	10YR58	61	M		Y	0	0	0		P						Y
48	0-24	c	10YR42 00																
	24-65	c	10YR52 00	10YR58	61	C		Y	0	0	0		P						Y
49	0-25	c	10YR42 00																
	25-35	c	10YR52 00	00OC00	00	F	00MN00	00	Y	0	0	0	P						Y
	35-70	c	10YR52 00	10YR58	61	C	00MN00	00	Y	0	0	0	P						Y
50	0-32	c	10YR42 00	00MN00	00	F													
	32-70	c	10YR52 00	10YR58	61	M		Y	0	0	0		P						Y
51	0-26	c	10YR43 00																
	26-35	c	10YR53 00																
	35-70	c	10YR52 00	10YR58	61	C		Y	0	0	0		P						Y
52	0-30	c	10YR43 00																
	30-65	c	10YR53 00	00OC00	00	F	00MN00	00	Y	0	0	0	P						Y
	65-90	c	10YR53 00	10YR58	00	C	00MN00	00	Y	0	0	0	P						Y
53	0-28	c	10YR42 00																
	28-49	c	10YR62 00	10YR58	61	M		Y	0	0	0		P						Y
	49-70	c	10YR52 00	10YR58	61	C		Y	0	0	0		P						Y
54	0-25	c	10YR42 00																
	25-70	c	10YR52 00	10YR58	61	C		Y	0	0	0		P						Y

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED	----STONES-----			STRUCT/	SUBS					
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL
55	0-29	c	10YR42 00							0	0	0					
	29-70	c	10YR52 00	10YR58	61	C		Y	0	0	0		P				Y
56	0-25	c	10YR42 00							0	0	0					
	25-38	c	10YR53 00	00MND0	00	F				0	0	0		P			
	38-70	c	10YR52 00	10YR58	00	C	00MND0	00	Y	0	0	0		P			Y