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KENT MINERALS LOCAL PLAN REVIEW
Land at Woodfalls Farm, Laddingford

Agricultural Land Classification
ALC Map and Report

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Resource Planning Team
Eastern Region
FRCA Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

KENT MINERALS LOCAL PLAN REVIEW
LAND AT WOODFALLS FARM, LADDINGFORD

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 47 2 of land at Woodfalls Farm Laddingford near Yalding in Kent The fieldwork was carried out during December 1998 and January 1999

2 The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)[1] on behalf of the Ministry of Agriculture Fisheries and Food (MAFF) in connection with its statutory input to the Kent Minerals Local Plan Review This survey supersedes any previous ALC information for this land

3 The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF 1988) A description of the ALC grades and subgrades is given in Appendix I

4 At the time of survey the land use on the site was predominantly arable (ploughed land and stubble) with an area of horse paddocks and grazing adjacent to and north west of Woodfalls Farm The areas mapped as Other land comprise a menage an industrial estate and an area used for dumping scrap and for the storage of old agricultural equipment

SUMMARY

5 The findings of the survey are shown on the enclosed ALC map The map has been drawn at a scale of 1 10 000 It is accurate at this scale but any enlargement would be misleading

6 The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	18 9	41 0	40 0
3a	2 2	4 8	4 7
3b	25 0	54 2	53 0
Other Land	1 1		2 3
Total surveyed area	46 1	100 0	97 7
Total site area	47 2		100 0

7 The fieldwork was conducted at an average density of 1 boring per hectare In total 49 borings and three soil pits were described

[1] FRCA is an executive agency of MAFF and the Welsh Office

8 The agricultural land at this site has been classified as Grade 2 (very good quality) Subgrade 3a (good quality) and Subgrade 3b (moderate quality) The principal limitations include soil wetness and soil droughtiness

9 The Grade 2 land comprises medium silty clay loam and medium clay loam topsoils overlying similar or heavier subsoils The upper horizons are stoneless or slightly stony the lower subsoils are very stony Given these characteristics and the dry nature of the local climate the soils hold insufficient reserves of water all the year round and consequently a slight soil droughtiness limitation exists which will affect the level and consistency of crop yields particularly in drier years Signs of soil wetness are also evident in some of these soils

10 The Subgrade 3a land has been mapped in the north west of the site and comprises medium clay loam topsoils overlying medium clay loam or sandy loam upper subsoils and lower subsoils of sand The topsoils are slightly stony the subsoils are moderately to very stony Given the sandier nature of these soils this land is droughtier than the Grade 2 land

11 The Subgrade 3b land occurs in the centre of the site and along the southern boundary and is generally co-incident with the geological deposit of alluvium The soils comprise heavy clay loam or clay topsoils over deep slowly permeable clay subsoils and suffer from a significant soil wetness problem Soil wetness reduces the versatility of the land in terms of access by machinery (e g for cultivations or harvesting) and grazing by livestock if damage to the soil is to be avoided and also adversely affects seed germination and root growth and will therefore reduce the level and consistency of yields This subgrade also includes some disturbed land to the west of Woodfalls Farm

FACTORS INFLUENCING ALC GRADE

Climate

12 Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics

13 The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5 km grid datasets using the standard interpolation procedures (Met Office 1989)

Table 2 Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	TR 689 495	TR 686 486
Altitude	m AOD	13	12
Accumulated Temperature	day°C (Jan June)	1496	1498
Average Annual Rainfall	mm	653	659
Field Capacity Days	days	136	137
Moisture Deficit Wheat	mm	123	123
Moisture Deficit Potatoes	mm	121	121
Overall climatic grade	N/A	Grade 1	Grade 1

14 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

15 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR) as a measure of overall wetness and accumulated temperature (ATO January to June) as a measure of the relative warmth of a locality

16 The combination of rainfall and temperature within this survey area means that there is no overall climatic limitation However climatic factors do interact with soil properties to influence soil wetness and soil droughtiness No climatic factors such as exposure or frost risk are believed to adversely affect the land quality on the site This site is climatically Grade 1

Site

17 The survey area is situated in the Medway valley and lies at 12–14m AOD The land is level to gently sloping and nowhere on the site do gradient or microrelief adversely affect agricultural land quality

18 The Environment Agency has assessed the return frequency of flooding in the area in which the site lies as being about one in seven or eight years The landowner reports that there have been no major flood events since 1968 and that flooding is not a constraint to the agricultural use of the land

Geology and soils

19 The published geological information for this area (BGS 1976) shows the northern part of the site to be underlain by Alluvium The southern part is underlain by First Terrace River Gravels with a small deposit of Weald Clay underlain by Paludina Limestone occurring on the eastern side of the site near to Woodfalls Farm

20 The most detailed published soils information at 1 25 000 scale covering the area (SSEW 1986) shows five soil series across the site Over the alluvium the Breamore Conway and Fladbury series have been mapped The Breamore series is mapped in the north of the site and is described as Permeable slightly mottled coarse loamy soils over flint gravel at 50 to 80 cm depth Occasional deeper fine loamy soils in places (SSEW 1986) The Conway series is mapped in the central part of the site and is described as Deep stoneless prominently mottled greyish fine silty soils (SSEW 1986) The Fladbury Series occurs along the southern boundary of the site and is described as Deep stoneless prominently mottled greyish clayey soils occasionally over gravel at between 80 and 100 cm depth Some wetter soils with dark humose tops in depressions and a few similar fine silty soils in places (SSEW 1986) The Hook and Hamble series are mapped over the river terrace deposits in the south of the site The Hamble is the most extensive of the two and is described as Deep permeable stoneless brown silty soils sometimes over gravel between 80 and 100 cm depth Common similar stony or fine loamy soils (SSEW 1986) The Hook series is described as Deep permeable slightly mottled silty soils occasionally calcareous below 40 cm depth Common similar stony or fine loamy soils in places (SSEW 1986) Detailed field examination found the distribution and description of the soils on site to accord with that outlined above

AGRICULTURAL LAND CLASSIFICATION

21 The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1 page 2

22 The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix II

Grade 2

23 Land classified as Grade 2 very good quality occurs over the First Terrace River Gravels in the southern half of the site and has minor soil droughtiness and wetness limitations The profiles are represented by Pit 3 (see Appendix II) and typically comprise medium silty clay loam and medium clay loam topsoils Subsoils are of similar texture sometimes becoming heavier with depth (heavy silty clay loam) and the profiles have a moderate structure The topsoils are stoneless or very slightly stony containing up to 5% total stones by volume Upper subsoils have a similar or smaller stone content However across the central part of this area the soils were impenetrable to an auger at between 70 and 90 cm At the soil pit the lower subsoil was very stony containing approximately 40% total stones by volume Given the local climate the reserves of soil available water act to impart a slight soil droughtiness limitation which may adversely affect crop growth as water supply may not match demand especially in drier years Therefore this area is classified as Grade 2 on the basis of soil droughtiness

24 Most profiles are permeable and well drained (Wetness Class I) However a small number of profiles in the south east of this area exhibit signs of soil wetness in the lower subsoil Where gleying occurs in the absence of a slowly permeable layer the profiles remain in Wetness Class I However at three borings the heavy silty clay loam textured lower subsoil was assessed as being slowly permeable This leads to Wetness Class II being applied given the local climatic parameters When combined with the medium silty clay loam topsoils Grade 2 is appropriate This slight soil wetness limitation acts equally with the soil droughtiness limitation to restrict land to this grade The soil wetness limitation may restrict the number of days when either cultivations or grazing should occur without damaging the soil and may reduce flexibility of use Nevertheless such land is suitable for a wide range of agricultural and horticultural crops

Subgrade 3a

25 The land classified as Subgrade 3a (good quality) occurs in the north west of the site and is limited by soil droughtiness Pit 2 is representative of the soils in this subgrade The soils typically comprise medium clay loam textured topsoil over medium sandy loam upper subsoil and medium to coarse sand lower subsoil the profiles are moderately structured The topsoils are slightly stony containing approximately 6% stone by volume as assessed by eye The stone content increases in the upper subsoil to 25% stone by volume and the lower subsoil contains 18% stone by volume Subsoil stone content was assessed by wet sieving Given the local climate the reserves of soil available water act to impart a soil droughtiness limitation which may adversely affect crop growth as water supply may not match demand Therefore this area is classified as Subgrade 3a on the basis of soil droughtiness

26 Within the pit water was present at a depth of 58 cm The absence of a slowly permeable layer indicates that the presence of the water is likely to be due to a seasonally fluctuating water table The profile was assessed as Wetness Class II on the basis of probable duration of waterlogging

Subgrade 3b

27 The land classified as Subgrade 3b moderate quality is subject to significant soil wetness and workability limitations Across much of this mapping unit poorly drained profiles arise from slowly permeable subsoils which occur directly below the topsoil Topsoils are variably textured typically medium/heavy clay loams and clays These pass into clay subsoils which are poorly structured and slowly permeable The surface water movement through these layers will be significantly reduced This results in poor soil drainage (Wetness Class IV) as indicated by gleying either from the surface or below the topsoil Such profiles are typified by Pit 1

28 To the west of Woodfalls Farm is an area where the land appears to have been lowered possibly by the extraction of brickearth The soils comprise medium clay loam topsoils over medium clay loam upper subsoils and loamy coarse sand lower subsoils The upper subsoils are very slightly stony whilst the lower subsoils are very stony and the profiles were impenetrable to an auger at between 65 and 85 cm The soils exhibit signs of wetness in the form of gleyed subsoils however no slowly permeable layer occurs within 80 cm At the time of survey (December 1998) there was standing water over much of this area and the water in the ditch was almost at field level The flat and low lying nature of this land means that artificial drainage measures are likely to prove inadequate due to lack of fall and freeboard and that groundwater levels would be high for much of the year Consequently this land was assessed as being poorly drained (Wetness Class IV)

29 Across this entire mapping unit the interaction between the soil drainage characteristics the topsoil textures and the prevailing climate means that all of this land is classified as Subgrade 3b because of soil wetness Soil wetness of this degree 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

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SOURCES OF REFERENCE

British Geological Survey (1976) *Sheet No 288 1 50 000 Maidstone (solid and drift edition)* BGS London

Ministry of Agriculture Fisheries and Food (1988) *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land* MAFF London

Met Office (1989) *Climatological Data for Agricultural Land Classification* Met Office Bracknell

Soil Survey of England and Wales (1986) *Sheet TQ64 (Paddock Wood) Soils in Kent IV 1 25 000 Soil Survey record No 99* SSEW Harpenden.

APPENDIX I

DESCRIPTIONS 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 (e g 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

APPENDIX II

SOIL DATA

Contents

Sample location map

Soil abbreviations - explanatory note

Soil pit and soil boring descriptions (boring and horizon levels)

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	**OTH**	Other
DCW	Deciduous woodland	**BOG**	Bog or marsh	**SAS**	Set Aside
HTH	Heathland	**HRT**	Horticultural crops	**PLO**	Ploughed

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	**ST**	Topsoil Stoniness
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
EX	Exposure				

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	**FSST**	soft, fine grained sandstone
ZR	soft, argillaceous, or silty rocks	**CH**	chalk
MSST	soft, medium grained sandstone	**GS**	gravel with porous (soft) stones
SI	soft weathered igneous/metamorphic rock	**GH**	gravel with non porous (hard) stones

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

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

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	WETNESS CLASS	WETNESS GRADE	WHEAT AP	WHEAT MB	POTS AP	POTS MB	DRT	M REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ68904960	FLW			34		2	2	74	-49	74	-47	3B				DR	3A	Imp50 see 2P
1A	TQ68954973	FLW			34	34	4	3B	128	5	105	-16	3A				WE	3B	
2	TQ68804950	FLW					1	1	87	-36	90	-31	3B				DR	3A	Imp60 see 2P
3	TQ68904950	FLW					1	1	82	-41	83	-38	3B				DR	3A	Imp52 see 2P
4	TQ68704940	PLO			30	30	4	3B	90	-33	93	-28	3B				WE	3B	I65 prob3aDR
5	TQ68804940	FLW			32	32	4	3B	109	-14	107	-14	3A				WE	3B	Water 90
6	TQ68904940	FLW			37	70	4	3B	114	-9	104	-17	3A				WE	3B	Impen 100
7	TQ68604930	PLO			47		1	1	78	-45	78	-43	3B				DR	3A	Imp50 see 2P
7A	TQ68554925	PLO			34	34	4	3B	130	7	107	-14	3A				WE	3B	Lower land
8	TQ68704930	PLO			30	30	4	3B	156	33	118	-3	2				WE	3B	
9	TQ68804930	PLO			62	62	2	2	118	5	115	-6	3A				DR	3A	Imp90 Q 2 DR
10	TQ68904930	PLO			34	34	4	3B	108	-15	104	-17	3A				WE	3B	
11	TQ68604920	PLO			30	30	4	3B	101	-22	106	-15	3B				WE	3B	Impen 80
12	TQ68704920	PLO			28		2	3A	78	-45	82	-39	3B				DR	3B	Impen 70
13	TQ68804920	PLO			30	30	4	3B	91	-32	102	-19	3B				WE	3B	Impen 70
14	TQ68904920	PLO			25	25	4	3B	127	4	104	-17	3A				WE	3B	H2 feint motts
15	TQ68404920	PLO			30	30	4	3B	156	33	118	-3	2				WE	3B	
16	TQ68504910	PLO			45	45	3	3B	133	10	109	-12	3A				WE	3B	
17	TQ68604910	PLO			34	34	4	3B	116	-7	114	-7	3A				WE	3B	
18	TQ68704910	PLO			34	34	4	3B	118	-5	116	5	3A				WE	3B	
19	TQ68804910	PLO			26	26	4	3B	137	14	114	-7	2				WE	3B	See 1P
20	TQ68304900	PLO					1	1	138	15	125	4	2				DR	2	Imp97 see 3P
21	TQ68404900	PLO					1	1	126	3	118	-3	3A				DR	2	Imp90 see 3P
22	TQ68504900	PLO					1	1	108	-15	118	-3	3A				DR	2	Imp70 see 3P
23	TQ68604900	ARA			30	30	4	3B	129	6	106	-15	3A				WE	3B	H3 many Mn
24	TQ68704900	ARA			30	30	4	3B	132	9	109	-12	3A				WE	3B	V wet at 90
25	TQ68804900	PGR					1	1	156	33	118	-3	2				DR	2	
26	TQ68304890	ARA	S	2			1	1	108	-15	100	-21	3A				DR	3A	3a dr -pots
27	TQ68404890	ARA					1	1	123	0	117	-4	3A				DR	2	Imp90 see 3P
28	TQ68504890	SAS					1	1	156	33	118	-3	2				DR	2	
29	TQ68604890	SAS					1	1	157	34	119	-2	2				DR	2	S1 sandy
30	TQ68704890	PGR			29		1	1	76	-47	78	-43	3B				DR	3B	Wet at 65
31	TQ68804890	PGR			28		4	3B	121	2	118	-3	3A				WE	3B	G water WC IV
32	TQ68404880	PGR			0	30	4	3B	132	9	109	12	3A				WE	3B	Standing water
33	TQ68504880	PLO			48		2	2	121	2	125	4	3A				WD	2	Imp80 see 3P
34	TQ68604880	FLW					1	1	109	14	123	2	3A				DR	2	Imp70 see 3P
35	TQ68704880	FLW					1	1	104	19	116	-5	3A				DR	2	Imp70 see 3P
36	TQ68804880	FLW			38		2	2	104	19	116	-5	3A				DR	2	Imp70 see 3P
38	TQ68504870	PGR			0	20	4	3B	124	1	101	20	3A				WE	3B	
39	TQ68604870	PLO			60	60	2	2	161	38	125	4	2				WD	2	
40	TQ68704870	MZL					1	1	128	5	127	6	2				DR	2	Imp85 see 3P
41	TQ68804870	FLW			60		1	1	131	8	125	4	2				DR	2	Imp90 see 3P

SAMPLE NO	GRID REF	USE	ASPECT	GRONT	GLEY	SPL	WETNESS CLASS	WETNESS GRADE	WHEAT AP	WHEAT MB	POTS AP	POTS MB	M REL DRT	EROSN FLOOD	FROST EXP	CHEM DIST	LIMIT	ALC	COMMENTS
42	TQ68904870	FLW			80		1	1	155	32	117	-4	2				DR	2	
43	TQ68604860	PLO			50	50	2	2	161	38	125	4	2				WD	2	
44	TQ68704860	FLW			78		1	1	161	38	125	4	2				DR	2	
45	TQ68804860	FLW			60	60	2	2	156	33	120	-1	2				WD	2	
46	TQ68604850	PGR			0	30	4	3B	129	6	106	-15	3A				WE	3B	
47	TQ68704850	ARA					1	1	155	32	110	-11	3A				DR	3A	3a dr- pots
48	TQ68604840	PGR			30	30	4	3B	135	12	112	-9	2				WE	3B	H3 plastic
1P	TQ68904950	PLO			28	28	4	3B	135	12	114	-7	2				WE	3B	
2P	TQ68904950	STB	SE	1			1	1	107	-16	99	-22	3A				DR	3A	Water 58
3P	TQ68604880	FLW					1	1	149	26	124	3	2				DR	2	H2 mixed

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
1	0-34	SCL	75YR43						0	0	HR	8							
	34-48	SCL	10YR53	10YR56	C	F		Y	0	0	HR	10		M					
	48-50	SCL	10YR52						0	0	HR	50		M					Imp50 gravelly
1A	0-34	C	10YR42						0	0		0							
	34-56	C	10YR53	10YR56	C	F		Y	0	0		0		P		Y			
	56-120	C	25Y63					Y	0	0		0		P		Y			
2	0-33	MCL	10YR43						0	0	HR	6							
	33-48	MCL	75YR54						0	0		0		M					
	48-60	SCL	75YR42						0	0	HR	50		M					Imp60 gravelly
3	0-36	MCL	75YR42						0	0	HR	6							
	36-49	MCL	10YR54						0	0	HR	10		M					
	49-52	MCL	10YR52						0	0	HR	50		M					Imp52 gravelly
4	0-30	MCL	10YR43						0	0	HR	5							
	30-50	HCL	25Y73	10YR56	M	D		Y	0	0		0		M		Y			
	50 65	SCL	10YR53						0	0	HR	60		M					Imp65 gravelly
5	0-32	HCL	10YR42						0	0		0							
	32-60	C	10YR42	10YR46	C	D		Y	0	0		0		P		Y			
	60-80	C	10YR42	10YR46	C	D		Y	0	0		0		P		Y			
	80 90	C	25Y53	10YR56	M	P		Y	0	0		0		P		Y			Water at 90
6	0-37	HCL	75YR42						0	0	HR	5							
	37-70	C	10YR53					Y	0	0	HR	5		P					
	70-100	C	25Y74	10YR58	M	D		Y	0	0		0		P		Y			Imp100 gravelly
7	0 30	MCL	10YR43						2	0	HR	8							
	30-47	HCL	75YR43						0	0	HR	8		M					
	47-50	HCL	75YR42	75YR56	C	D		Y	0	0	HR	50		M					Imp50 gravelly
7A	0 34	MCL	10YR42						0	0		0							
	34 45	HCL	10YR53	10YR56	C	D		Y	0	0		0		M		Y			
	45 120	C	25Y73	10YR56	C	D		Y	0	0		0		P		Y			
8	0-30	MCL	10YR42						0	0		0							
	30-65	HCL	75YR53	75YR46	M	D		Y	0	0		0		M		Y			
	65-82	MCL	75YR53	75YR46	M	D		Y	0	0		0		M					
	82 120	SCL	75YR53						0	0		0		M					
9	0-30	MCL	10YR42						0	0		0							
	30 62	HCL	75YR42						0	0		0		M					
	62 90	HCL	10YR74	10YR46	M	D		Y	0	0		0		M		Y			Imp90 gravelly
10	0-34	HCL	10YR42						0	0		0							
	34-90	C	25Y73	10YR68	M	D		Y	0	0		0		P		Y			

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES----- COL	ABUN	CONT	PED COL	GLEY	--- STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
11	0-30	HCL	10YR42						0	0		0							
	30-50	C	25Y 53	10YR58	C	D		Y	0	0		0		P			Y		
	50-80	C	25Y 53	10YR58	M	D		Y	0	0		0		P			Y		Imp80 gravelly
12	0-28	HCL	10YR42						2	0	HR	8							
	28-45	C	25Y 53	10YR58	C	D		Y	0	0	HR	20		P					
	45-55	HCL	10YR43						0	0	HR	40		M					
	55-70	LCS	10YR46						0	0	HR	45		M					Imp70 gravelly
13	0-30	HCL	10YR42						0	0	HR	2							
	30-50	C	25Y 53	10YR58	C	D		Y	0	0	HR	2		P			Y		
	50-70	C	25Y 63	10YR58	M	D		Y	0	0	HR	12		P			Y		Imp70 gravelly
14	0-25	HCL	10YR42						0	0		0							
	25-60	C	25Y 53	10YR56	C	F		Y	0	0		0		P			Y		
	60-120	C	25Y 72	10YR58	M	D		Y	0	0		0		P			Y		
15	0-30	HCL	10YR43						0	0		0							
	30-48	HCL	10YR53	10YR56	C	F		Y	0	0		0		M			Y		
	48-97	MCL	10YR63	10YR56	C	D		Y	0	0		0		M			Y		
	97-120	SCL	10YR56						0	0		0		M					
17	0 34	HCL	10YR42						0	0		0							
	34 55	HCL	25Y53	10YR56	C	D		Y	0	0		0		M			Y		
	55-90	C	25Y74	10YR56	C	D		Y	0	0		0		P			Y		Imp90 gravelly
18	0-34	HCL	10YR42						0	0		0							
	34-60	HCL	10YR63	10YR56	C	D		Y	0	0		0		M			Y		
	60-90	C	10YR53	10YR56	M	D		Y	0	0		0		P			Y		Imp90 gravelly
19	0-26	C	10YR42						0	0		0							Hand textd hzcl
	26 50	HCL	25Y 53	10YR58	C	D		Y	0	0		0		M			Y		Q clay texture
	50 120	C	25Y 62 72	10YR58	M	D		Y	0	0		0		P			Y		
20	0-29	MZCL	10YR43						0	0		0							
	29-50	MZCL	75YR54						0	0		0		M					
	50-70	HZCL	75YR66						0	0		0		M					
	70-97	HZCL	10YR64						0	0		0		M					Imp97 gravelly
21	0 30	MCL	10YR43						0	0		0							
	30-45	MCL	10YR44						0	0		0		M					
	45-64	MCL	10YR54						0	0		0		M					
	64-90	MCL	10YR66						0	0		0		M					Imp90 gravelly
22	0-28	MCL	10YR43						0	0		0							
	28-48	MCL	10YR64						0	0		0		M					
	48-70	CSL	10YR53						0	0		0		M					Imp70 gravelly

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	
23	0-30	HCL	10YR42						0	0		0							
	30-50	C	25Y 52	10YR58	C	D		Y	0	0		0		P			Y		
	50-120	C	05Y 61	10YR58	M	D		Y	0	0		0		P			Y		
24	0-30	HCL	10YR42						0	0		0							
	30-40	HCL	25Y 53	10YR56	C	D		Y	0	0		0		M			Y		
	40-120	C	05Y 61	10YR58	M	D		Y	0	0		0		P			Y		
25	0-30	MCL	10YR43						0	0		0							
	30-120	MCL	10YR44						0	0		0		M					
26	0-30	MCL	10YR43						0	0		0							
	30-45	HCL	10YR56 43						0	0	HR	2		M					Mixed horizon
	45-60	HCL	10YR58						0	0	HR	30		M					
	60-80	LCS	10YR58						0	0	HR	40		M					
	80-100	LMS	10YR58						0	0	HR	20		M					Imp100 gravelly
27	0-30	MCL	10YR43						0	0		0							
	30-60	MCL	10YR56	10YR58	C	D		S	0	0		0		M					S1 gleyed
	60-80	MCL	10YR56	10YR58	C	D		S	0	0	HR	8		M					S1 gleyed
	80 90	HCL	10YR56	10YR58	C	D		S	0	0	HR	15		M					S1 gleyed I90
28	0 30	MCL	10YR43						0	0		0							
	30 90	MCL	75YR43						0	0		0		M					
	90 120	MCL	75YR43	10YR56	F	F			0	0		0		M					
29	0-35	MCL	10YR43						0	0		0							
	35-90	MCL	75YR43						0	0		0		M					
	90-120	MCL	10YR54						0	0		0		M					
30	0-29	MCL	10YR43	10YR56	F	D		S	0	0		0							
	29-36	MCL	10YR42	10YR56	C	D		Y	0	0		0		M					
	36-65	LCS	10YR52						0	0	HR	40		M					
31	0-28	MCL	10YR43	10YR56	C	D		S	0	0		0							
	28-85	MCL	10YR53	10YR56	C	D		Y	0	0		0		M					Imp85 wet85
32	0 30	HZCL	05Y 52	10YR56	C	D		Y	0	0		0							
	30-70	C	05Y 51	10YR58	M	D		Y	0	0		0		P			Y		
	70 120	C	10GY 5	10YR58	M	D		Y	0	0		0		P			Y		
33	0-30	MZCL	10YR43						0	0		0							
	30-48	MZCL	10YR54						0	0		0		M					
	48-80	MZCL	10YR74	10YR56	C	D		Y	0	0		0		M					Imp80 gravelly
34	0-38	MCL	10YR43						0	0		0							
	38-50	MZCL	10YR53						0	0		0		M					
	50-70	HZCL	10YR64						0	0		0		M					Imp70 gravelly

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	
35	0-36	MCL	10YR43						0	0	HR	5							
	36 70	HCL	10YR56						0	0		0		M					Imp70 gravelly
36	0-38	MCL	10YR43						0	0	HR	5							
	38-70	MCL	10YR64	10YR56	C	D		Y	0	0		0		M					Imp70 gravelly
38	0-20	HCL	10YR52	10YR56	C	D		Y	0	0		0							
	20-120	C	05Y 72	10YR68	M	D		Y	0	0		0		P		Y			
39	0-30	MZCL	10YR43						0	0		0							
	30-60	MZCL	10YR44						0	0		0		M					
	60-120	HZCL	10YR64	10YR66	M	D		Y	0	0		0		M		Y			
40	0-38	MZCL	10YR43						0	0		0							
	38-85	HZCL	10YR54						0	0		0		M					Imp85 gravelly
41	0-30	MZCL	10YL43						0	0		0							
	30-60	MZCL	10YR53						0	0		0		M					
	60-90	MZCL	10YR64	10YR66	C	D		Y	0	0		0		M					Imp90 gravelly
42	0 25	MCL	10YR43						0	0		0							
	25-37	MCL	10YR54						0	0		0		M					
	37-80	MCL	10YR66					S	0	0		0		M					
	80-120	MZCL	10YR64	10YR66	C	D		Y	0	0		0		M					
43	0-30	MZCL	10YR43						0	0		0							
	30-50	HZCL	10YR54						0	0		0		M					
	50-75	HZCL	10YR64	10YR56	C	D		Y	0	0		0		M		Y			
	75-120	HZCL	10YR63	10YR5658	M	D		Y	0	0		0		M		Y			
44	0-30	MZCL	10YR43						0	0		0							
	30-78	MZCL	10YR64						0	0		0		M					
	78-120	MZCL	10YR53	10YR66	C	D			0	0		0		M					
45	0-30	MCL	10YR43						0	0		0							
	30-50	HCL	10YR44	00MN00	C				0	0		0		M					
	50-60	MZCL	10YR54	00MN00	C				0	0		0		M					
	60-120	HZCL	10YR53	10YR58	C	D		Y	0	0		0		M		Y			
46	0-30	HCL	10YR51	10YR46	C	D		Y	0	0		0							
	30-60	C	05Y 51	10YR58	M	D		Y	0	0		0		P		Y			
	60-120	C	05Y 72	10YR58	M	D		Y	0	0		0		P		Y			
47	0-30	MCL	10YR43						0	0		0							
	30-50	MCL	75YR43						0	0		0		M					
	50-60	LMS	10YR44						0	0		0		M					
	60-90	MSL	10YR44						0	0		0		M					
	90-120	MCL	10YR54	10YR56	C	D		S	0	0		0		M					Sl gleyed

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	
48	0-30	MCL	10YR43						0	0		0							
	30-50	HCL	25Y 53	10YR58	C	D		Y	0	0		0		M			Y		
	50-120	C	05Y 61	10YR58	M	D		Y	0	0		0		P			Y		
1P	0-28	C	10YR42						0	0		0							Hand textd hzcl
	28-50	HCL	10YR53	10YR56	C	D		Y	0	0		0	MDCAB	FR M	Y		Y		
	50-92	C	25Y 62	10YR58	M	D		Y	0	0		0	MDCPR	FM P	Y		Y		
	92-110	C	25Y 62	10YR58	M	D		Y	0	0	HR	20		P			Y		
	110-120	MCL	25Y 62	10YR58	M	D		Y	0	0	HR	30		M					
2P	0-36	MCL	10YR43						1	0	HR	5							
	36-68	MSL	10YR54						0	0	HR	25	MDCSAB	FR M					
	68-120	CS	10YR54						0	0	HR	18	WKFSAB	VF G					
3P	0-32	MZCL	10YR43						0	0	HR	2							
	32-72	MZCL	10YR5643						0	0		0	MDCSAB	FR M					
	72-95	SCL	10YR56						0	0	HR	10	MDCPL	FR M					
	95-120	MCL	10YR56						0	0	HR	40		M					