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Basingstoke and Deane
Borough Local Plan
Land at Oakdown Farm, Dummer
Agricultural Land Classification,
ALC Map and Report
March 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

BASINGSTOKE AND DEANE LOCAL PLAN
LAND AT OAKDOWN FARM, DUMMER

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 Basingstoke and Deane district of Hampshire. The work forms part of MAFF's statutory input to Basingstoke and Deane Local Plan.

1.2 The site at Oakdown Farm, Dummer comprises 24.9 hectares of land bounded to the south by the M3 and to the east and north by the A30 at Dummer, Hampshire. An Agricultural Land Classification (ALC) survey was carried out during March 1995. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 26 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 The work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of the survey the land use was a mixture of winter cereals, cereal stubble and bare soil. Land mapped as urban comprises a gravel track and residential buildings; agricultural buildings are also denoted.

1.5 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 1:10,000. 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
3a	21.8	87.6	90.8
3b	2.2	8.8	9.2
Urban	0.7	2.8	100.0 (24.0 ha)
Agricultural Buildings	0.2	0.8	
Total area of site	24.9	100.0	

1.6 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.

1.7 The majority of agricultural land on the site has been classified as Subgrade 3a, good quality. This land is primarily restricted by moderate soil wetness limitations. Medium textured topsoils overlie slowly permeable clay subsoils at moderate depths, resulting in moderately well or imperfectly drained soil profiles. Given the relatively moist prevailing local climate this land is subject to some restrictions in terms of the flexibility of cropping, stocking and cultivations. Where these clay horizons occur at shallower depths within the soil profile the restrictions to land use are more severe; thus the land is classified as Subgrade 3b, moderate quality.

1.8 Towards the northern half of the site land classified as Subgrade 3a is also limited by topsoil stoniness. Large flints within the topsoil act to impede cultivation, harvesting and crop growth, and may increase implement and tyre wear. Adjacent to the northern site boundary, where the soil profiles are well drained, topsoil stoniness is the principal limitation to agricultural use.

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 Table 2 and these show that there is no overall climatic limitation affecting the site. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. The field capacity days are relatively high at this locality (in a regional context) arising from the high altitude. High field capacity days increase the likelihood of soil wetness limitations.

Table 2 : Climatic Interpolations

Grid Reference	SU 586 473	SU 585 468
Altitude (m)	140	155
Accumulated Temperature (degree days, Jan-June)	1378	1361
Average Annual Rainfall (mm)	848	864
Field Capacity (days)	184	187
Moisture Deficit, Wheat (mm)	93	90
Moisture Deficit, Potatoes (mm)	81	78
Overall Climatic Grade	1	1

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

3. Relief

3.1 The site occupies the side of a broad dry valley and has a north-westerly aspect. Adjacent to the M3 the land lies at approximately 155 m AOD and falls to approximately 140 m AOD along the northern site boundary. Nowhere on the site do gradient or relief impose any limitation to agricultural land quality.

4. Geology and Soil

4.1 The published geological information (BGS, 1981) shows the entire site to be underlain by Upper Chalk.

4.2 The published Soil Survey map (SSEW, 1983) shows two soil types at this site. The predominant soil type is that of the Carstens Association. These soils are described as 'well drained fine silty over clayey, clayey and fine silty soils, often very flinty' (SSEW, 1983). A small area in the south of the site is shown as soils of the Charity 2 Association, described as 'well drained flinty fine silty soils in valley bottoms. Calcareous fine silty soils over chalk or chalk rubble on valley sides, sometimes shallow' (SSEW, 1983).

4.3 Detailed field examination found heavy textured soils which tend to be moderately well drained to poorly drained across most of the site. Towards the north of the site, soil profiles tend to be more flinty and better drained.

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.

Subgrade 3a

5.3 The majority of agricultural land surveyed has been classified as Subgrade 3a, good quality. Towards the north of the site, the principal limitation is that of topsoil stoniness. Although the topsoils are only slightly stony overall (c. 6-15% total flints v/v) larger flints dominate (c. 5+% of flints larger than 6 cm v/v). These large flints act to significantly increase wear and tear to implements and tyres, plus impede cultivation, harvesting and crop growth, and reduce the available water capacity of the soil.

5.4 Profiles within this area, in the north of the site, comprise non-calcareous medium silty clay loam topsoils over similarly textured or heavier subsoils, typically heavy clay loams and clays. Upper subsoils are generally slightly to moderately stony (c. 10-20% total flints v/v). These pass into more stony lower subsoils (c. 30-40% total flints v/v) at approximately 40-60 cm depth. The flinty nature of these soils meant that many of the borings within this area proved impenetrable to a soil auger at depth. However from Pit 1, which represents such profiles, it was seen that at

approximately 65 cm depth there is a chalky clay horizon, containing about 50% total chalk fragments. The flinty and chalky nature of these profiles means that they are permeable and well drained (Wetness Class I). The interaction between these soil conditions and the moist prevailing climate means that this land is subject to only minor soil droughtiness limitations. Topsoil stoniness is the principal limitation to agricultural use.

5.5 Elsewhere on the site land of good quality is limited by moderate soil wetness limitations, sometimes in conjunction with topsoil stoniness limitations. Topsoils consist of non-calcareous medium silty clay loams. Upper subsoils comprise pale clays which either remain similar to depth or pass into reddish clay lower subsoils. From Pit 2, which represents such profiles, it could be seen that the reddish clays are gleyed (due to pale ped faces), poorly structured and slowly permeable. However, despite being gleyed, the pale clays were found to be moderately structured and permeable. Soil profiles where the pale clay extends to depth are considered to be moderately well drained (Wetness Class II) with gleying within 40 cm. Where horizons of the reddish clay occur, typically at 55 to 65 cm depth, such profiles are imperfectly drained (Wetness Class III). The interaction between the medium textured topsoils and these soil drainage conditions with the moist prevailing climate means that this land is subject to moderate soil wetness limitations. These will arise from some restricted flexibility of cropping, stocking and cultivations. Occasional profiles were better drained (Wetness Class I), but were considered too sporadic to delineate as a separate Grade 2 mapping unit.

Subgrade 3b

5.6 Land classified as Subgrade 3b, moderate quality, is restricted by significant soil wetness and workability limitations. Non-calcareous medium silty clay loam topsoils overlie gleyed heavy silty clay loam upper subsoils. These pass into gleyed reddish clay lower subsoils at approximately 45 to 50 cm depth. Occasionally, the reddish clays occur directly below the topsoil. The moist prevailing climate means that these profiles are assessed as being poorly drained (Wetness Class IV). The interaction between the medium textured topsoils and these soil drainage conditions with the local climate means that this land is subject to significantly reduced flexibility of cropping, stocking and cultivations.

Note: A topsoil sample (taken from auger boring 26) was assessed for total lead content as the land owner had expressed concern regarding lead pollution from the adjoining M3 motorway. The results of the sample indicated that total lead within this sample (27. 7 mg/kg) is significantly below that of the 'threshold level' (300 mg/kg), as identified in ADAS guidance (ADAS, 1993). It is thus considered that this land is not subject to atmospheric pollution from vehicle exhausts to a degree that constrains its long term agricultural versatility.

SOURCES OF REFERENCE

ADAS (1993), Agricultural Land Classification of England and Wales : Assessment of disturbed and contaminated land (draft edition)

British Geological Survey (1981), Sheet No. 284, Basingstoke, 1:50,000 (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 6, Soils of South East England, 1:250,000 and accompanying legend.

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.

[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 : BASINGSTOKE LP DUMMER Pit Number : 1P

Grid Reference: SU584 471
Average Annual Rainfall : 864 mm
Accumulated Temperature : 1361 degree days
Field Capacity Level : 187 days
Land Use :
Slope and Aspect : 02 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MZCL	10YR42 43	5	10	HR					
30- 45	MZCL	10YR44 00	0	10	HR		MDCSAB	FR	M	
45- 66	C	75YR54 00	0	40	HR	F		FM	M	
66- 90	C	75YR66 82	0	50	CH			FM	M	Y

Wetness Grade : 2
Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 2
APW : 106mm MBW : 16 mm
APP : 101mm MBP : 23 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Topsoil Stoniness

SOIL PIT DESCRIPTION

Site Name : BASINGSTOKE LP DUMMER Pit Number : 2P

Grid Reference: SU586 470
Average Annual Rainfall : 864 mm
Accumulated Temperature : 1361 degree days
Field Capacity Level : 187 days
Land Use :
Slope and Aspect : 02 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 33	MZCL	10YR43 00	3	6	HR					
33- 57	C	10YR53 00	0	15	HR	C	MDCSAB	FR	M	
57- 80	C	05YR46 00	0	15	HR	M	MDCAB	FM	P	

Wetness Grade : 3A
Wetness Class : III
Gleying :033 cm
SPL :057 cm

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

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SU588 474	CER	W		055		1	2	110	20	114	36	2				ST	3A	Imp flints 80
1P	SU584 471	STB	W	02			1	2	106	16	101	23	2				ST	3A	5% flints>6cm
2	SU586 473	STB	NW	02	055		1	2	126	36	105	27	1				ST	3A	Sl gley 28
2P	SU586 470	STB	W	02	033	057	3	3A		0		0					WE	3A	Pit 80 Spl 57
3	SU587 473	STB	NW	02	050		1	2	128	38	106	28	1				WK	2	Sl gley 30
4	SU588 473	CER					1	2	106	13	112	31	2				DR	2	
5	SU585 472	STB	SW	02	030		2	3A		0		0					WE	3A	3A st also;I75
6	SU586 472	STB	W	02	028	050	4	3B		0		0					WE	3B	Just WC IV
7	SU587 472	STB	W	02	060	060	3	3A		0		0					WE	3A	3A st also;I95
9	SU584 471	STB	W	01			1	2	084	-6	090	12	3A				ST	3A	Imp flints 60
10	SU585 471	STB	W	02			1	2	075	-15	075	-3	3A				ST	3A	Imp flints 50
11	SU586 471	STB	W	02	045		1	2	116	26	113	35	2				WK	2	Imp flints 95
12	SU587 471	STB	W	02	030		2	3A		0		0					WE	3A	
13	SU588 471	STB	NW	02	038		2	3A		0		0	2				WE	3A	Sl gley 28
14	SU583 470	CER					1	1	068	-22	068	-10	3B				DR	3A	Imp flints 50
15	SU584 470	STB	W	02	030	065	3	3A		0		0					WE	3A	Imp flints 100
16	SU585 470	STB	W	02	030		2	3A		0		0					WE	3A	
17	SU586 470	STB	W	02	030	065	3	3A		0		0					WE	3A	Imp flints 100
18	SU587 470	STB	NW	02	060	060	3	3A		0		0					WE	3A	Sl gley 25
19	SU582 469	CER			060		1	2	084	-6	091	13	3A				WD	2	Imp flints 60
20	SU583 469	CER	NW	02	070	070	2	3A		0		0					WE	3A	Sl gley 55
21	SU584 469	CER	NW	02	028		2	3A		0		0					WE	3A	
22	SU585 469	STB	W	03	045		1	2	121	31	115	37	1				WK	2	Imp flints 100
23	SU586 469	STB	NW	03	100	100	1	2	138	48	117	39	1				WK	2	
24	SU583 468	CER	NW	02	028	050	4	3B		0		0					WE	3B	
25	SU584 468	CER	NW	02	028	047	4	3B		0		0					WE	3B	
26	SU585 468	STB	NW	03	075	075	2	3A		0		0					WE	3A	
27	SU584 467	STB	NW	03	0	025	4	3B		0		0					WE	3B	

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	0-30	mzcl	10YR42 43						5	5	HR	6							
	30-55	mzcl	10YR44 54						0	0	HR	10		M					
	55-75	mzcl	10YR53 52	10YR56 00	C			Y	0	0	HR	15		M					
	75-80	hzcl	10YR53 63	10YR56 00	C			Y	0	0	HR	30		M					
1P	0-30	mzcl	10YR42 43						5	5	HR	10							
	30-45	mzcl	10YR44 00						0	0	HR	10	MDCSAB	FR	M				
	45-66	c	75YR54 00	00MN00 00	F				0	0	HR	40		FM	M				
	66-90	c	75YR66 82						0	0	CH	50		FM	M			Y	
2	0-28	mzcl	10YR42 43						5	5	HR	12							
	28-55	c	10YR54 00	10YR56 00	C		00MN00 00	S	0	0	HR	15		M					sl gleyed
	55-120	c	10YR53 52	10YR56 58	C		00MN00 00	Y	0	0	HR	15		M					
2P	0-33	mzcl	10YR43 00						3	1	HR	6							
	33-57	c	10YR53 00	10YR56 00	C		00MN00 00	Y	0	0	HR	15	MDCSAB	FR	M				
	57-80	c	05YR46 00	00MN00 00	M		75YR53 00	Y	0	0	HR	15	MDCAB	FM	P	Y		Y	Pale ped faces(ppf)
3	0-30	mzcl	10YR42 43						8	2	HR	15							
	30-50	mzcl	10YR54 00	10YR56 00	C			S	0	0	HR	15		M					sl gleyed
	50-75	hzcl	10YR53 51	10YR56 00	C			Y	0	0	HR	20		M					
	75-90	hzcl	25Y 52 00	10YR58 00	C			Y	0	0	HR	20		M					
	90-120	c	25Y 52 00	75YR58 00	M			Y	0	0	HR	30		M					
4	0-25	mzcl	10YR43 00						5	0	HR	7							
	25-45	mzcl	10YR54 00						0	0	HR	5		M					
	45-60	hzcl	10YR54 00						0	0	HR	7		M					
	60-80	c	75YR44 00						0	0	HR	30		M					
5	0-30	mzcl	10YR42 43						7	5	HR	15							
	30-55	c	10YR53 43	75YR58 00	M		00MN00 00	Y	0	0	HR	15		M					
	55-75	c	75YR66 00						0	0	CH	40		M				Y	
6	0-28	mzcl	10YR43 00						8	5	HR	15							
	28-50	c	75YR53 00	75YR58 00	C		00MN00 00	Y	0	0	HR	10		M					
	50-95	c	05YR46 00	00MN00 00	C			Y	0	0	HR	20		P		Y			Assume ppf
	95-120	c	75YR46 81					Y	0	0	CH	50		M				Y	
7	0-25	mzcl	10YR42 00						5	5	HR	10							
	25-60	c	05YR46 00						0	0	HR	15		M					
	60-95	c	05YR46 00	00MN00 00	C			Y	0	0	HR	15		P		Y			Assume ppf
9	0-30	mzcl	10YR42 43						8	5	HR	12							
	30-50	hzcl	10YR44 00						0	0	HR	20		M					
	50-60	c	10YR46 00						0	0	HR	30		M					
10	0-25	mzcl	10YR42 43						8	5	HR	12							
	25-40	mzcl	10YR54 00						0	0	HR	15		M					
	40-50	mzcl	10YR54 64						0	0	HR	40		M					

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	
11	0-28	mzcl	10YR42 43						5	2	HR	8							
	28-45	hzcl	10YR43 00						0	0	HR	5		M					
	45-75	c	10YR53 00	10YR56 00	C			Y	0	0	HR	10		M					
	75-85	c	10YR52 00	10YR58 00	M		00MN00 00	Y	0	0	HR	10		M					
	85-95	c	75YR52 00	75YR58 00	M		00MN00 00	Y	0	0	HR	15		M					Q spl
12	0-30	mzcl	10YR42 43						3	0	HR	5							
	30-75	c	10YR53 00	10YR56 00	C		00MN00 00	Y	0	0	HR	5		M					
	75-120	c	75YR53 00	75YR56 58	C		00MN00 00	Y	0	0	HR	15		M					
13	0-28	mzcl	10YR43 00						0	0	HR	2							
	28-38	hzcl	10YR43 00	10YR56 00	C			S	0	0	HR	2		M					sl gleyed
	38-60	c	10YR53 00	10YR56 00	M			Y	0	0	HR	10		M					
	60-80	c	10YR53 00	75YR58 00	M			Y	0	0	HR	15		M					
14	0-28	mzcl	10YR43 00						6	3	HR	20							
	28-50	c	10YR43 00	10YR56 00	C		00MN00 00	S	0	0	HR	30		M					sl gleyed
15	0-30	mzcl	10YR43 00						5	5	HR	10							
	30-65	c	75YR53 00	75YR56 00	C			Y	0	0	HR	20		M					
	65-100	c	05YR56 00	00MN00 00	C			Y	0	0	HR	30		P		Y			Assume ppf
16	0-30	mzcl	10YR43 00						3	1	HR	6							
	30-65	c	10YR53 52	10YR56 58	C			Y	0	0	HR	10		M					
	65-80	c	75YR56 58	00MN00 00	C			Y	0	0	HR	10		M					Q pale matrix
	80-100	c	75YR53 00	75YR56 00	C			Y	0	0	HR	10		M					
17	0-30	mzcl	10YR43 00						3	1	HR	6							
	30-65	c	75YR53 00	75YR56 58	C		00MN00 00	Y	0	0	HR	10		M					
	65-90	c	05YR56 00	00MN00 00	C			Y	0	0	HR	10		P		Y			Assume ppf
	90-100	c	75YR53 54	75YR58 00	M		00MN00 00	Y	0	0	HR	15		M					
18	0-25	mzcl	10YR43 00						0	0	HR	2							
	25-45	hzcl	10YR43 00	10YR56 00	C			S	0	0	HR	5		M					sl gleyed
	45-60	c	10YR43 00	75YR58 00	M			S	0	0	HR	10		M					sl gleyed
	60-120	c	05YR58 00	00MN00 00	C			Y	0	0	HR	10		P		Y			Assume ppf
19	0-25	mzcl	10YR43 00						2	0	HR	12							
	25-45	mzcl	10YR54 00						0	0	HR	15		M					
	45-60	c	10YR54 00	75YR58 00	M			S	0	0	HR	20		M					sl gleyed
20	0-28	mzcl	10YR43 00						0	0	HR	5							
	28-40	mzcl	10YR44 00						0	0	HR	15		M					
	40-55	hzcl	10YR54 00						0	0	HR	15		M					
	55-70	c	10YR54 00	10YR56 00	M			S	0	0	HR	15		M					sl gleyed
	70-100	c	05YR56 00	00MN00 00	C			Y	0	0	HR	10		P		Y			Assume ppf
21	0-28	mzcl	10YR43 00						0	0	HR	4							
	28-45	hzcl	10YR53 00	10YR56 00	M			Y	0	0	HR	5		M					
	45-70	c	10YR53 00	10YR56 00	M			Y	0	0	HR	5		M					
	70-90	c	10YR53 00	10YR56 00	M		00MN00 00	Y	0	0	HR	10		M					

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
22	0-35	mzcl	10YR43 00						3	0	HR	5						
	35-45	c	10YR56 00						0	0	HR	5		M				
	45-60	c	10YR53 00	10YR56 00	C			Y	0	0	HR	5		M				
	60-100	c	75YR53 00	75YR58 00	M		00MN00 00	Y	0	0	HR	15		M				
23	0-30	mzcl	10YR43 00						2	0	HR	5						
	30-45	mzcl	10YR54 44						0	0	HR	5		M				
	45-60	hzcl	10YR54 44						0	0	HR	5		M				
	60-70	c	10YR44 00						0	0	HR	10		M				
	70-100	c	75YR46 00						0	0	HR	10		M				
	100-120	c	05YR56 00	00MN00 00	C			Y	0	0	HR	10		P		Y		Assume ppf
24	0-28	mzcl	10YR43 00						4	0	HR	7						
	28-35	hzcl	10YR53 54	75YR56 00	C			Y	0	0	HR	5		M				
	35-50	c	10YR53 54	75YR56 00	M			Y	0	0	HR	5		M				
	50-70	c	05YR46 00	10YR53 00	C		00MN00 00	Y	0	0	HR	5		P		Y		Assume ppf
25	0-28	mzcl	10YR43 00						3	0	HR	5						
	28-47	hzcl	10YR53 54	10YR56 00	M			Y	0	0	HR	5		M				
	47-70	c	05YR46 00	00MN00 00	C			Y	0	0	HR	2		P		Y		Assume ppf
26	0-28	mzcl	10YR43 00						4	1	HR	6						
	28-45	hzcl	10YR54 44						0	0	HR	10		M				
	45-60	c	75YR46 00						0	0	HR	10		M				
	60-75	c	75YR46 00						0	0	HR	20		M				
	75-90	c	05YR56 00	10YR53 00	C			Y	0	0	HR	10		P		Y		Assume ppf
27	0-25	mzcl	10YR43 00						3	0	HR	5						
	25-70	c	05YR46 00	00MN00 00	C			Y	0	0	HR	5		P		Y		Assume ppf