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Hampshire Structure Plan Review
Land around Knowle Hospital, Fareham
Agricultural Land Classification
Reconnaissance Survey
ALC Map and Report
November 1994

AGRICULTURAL LAND CLASSIFICATION, SUMMARY REPORT.

HAMPSHIRE STRUCTURE PLAN REVIEW
LAND AROUND KNOWLE HOSPITAL, FAREHAM
RECONNAISSANCE SURVEY

1. Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of 'areas of search' in connection with MAFF input to the Hampshire Structure Plan Review.

1.2 An 'area of search' to the north of the M27 at Fareham comprises approximately 297 hectares of land to the east of Knowle Hospital and west of the A32. An Agricultural Land Classification (ALC) survey was carried out during October 1994. The survey was completed at a reconnaissance level of detail, on a 'free' survey basis, as it was undertaken primarily to update the 1:63,360 scale provisional ALC map for the 'area of search.' Consequently the results are designed for strategic planning purposes only. For site specific proposals, further, more detailed surveys may be required. A total of 44 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 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 agricultural land was largely under newly sown winter cereals or cereal stubble, along with a small area of permanent grassland, together with some areas of set aside. Urban areas include farm buildings, private dwellings and a spoil tip. Non-agricultural land comprises overgrown grassland and scrub adjacent to the motorway and railway line.

1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in Table 1 overleaf. The map has been drawn at a scale of 1:50,000. It is accurate at this scale, but any enlargement would be misleading.

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.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
3a	215	72.4	78.2
3b	60	20.2	21.8
Urban	16	5.4	100% (275ha)
Non-Agricultural	6	2.0	
Total area of site	297ha	100%	

1.7 The agricultural land in this 'area of search' ranges from good quality (Subgrade 3a), to moderate quality (Subgrade 3b), the majority being good quality, Subgrade 3a. Principal limitations include soil wetness and workability and, to a lesser extent, soil droughtiness.

1.8 Most of the land surveyed is affected by soil wetness and workability restrictions caused by the presence of imperfectly drained clayey soils. Across much of the site soils are derived from clay-with-flints deposits and as such are reddish and medium to heavy textured throughout. Clay horizons in the lower subsoil impede drainage to the extent that Subgrade 3a is appropriate.

Across the mid slopes around Dean Farm a number of observations within the Subgrade 3a mapping unit indicated that soils here overlie chalk at moderate depth. Therefore, this land may be affected by soil droughtiness limitations rather than wetness.

Subgrade 3b land has been mapped where soils are derived from Reading Beds. Across this area, poorly structured clay horizons occur at shallow depth, thereby severely impeding soil drainage and leading to significant soil wetness and workability restrictions.

Subgrade 3b land has also been mapped in the north-west of the site where slopes measure 10°, causing a significant limitation upon 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 5 km gridpoint dataset, (Met Office, 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site.

2.4 No local climatic factors such as exposure or frost risk are believed to affect the site. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness. The climate at this locality is relatively warm and moist, in regional terms, and the likelihood of soil wetness restrictions is thereby enhanced.

Table 2 : Climatic Interpolations

Grid Reference	SU 572092	SU 570083
Altitude (m)	46	20
Accumulated Temperature (° days, Jan-June)	1502	1532
Average Annual Rainfall (mm)	826	803
Field Capacity Days	168	164
Moisture Deficit, wheat (mm)	108	113
Moisture Deficit, potatoes (mm)	102	108
Overall Climatic Grade	1	1

3. Relief

3.1 The site ranges in altitude between 15 and 45m AOD, falling gently from north to south. Towards the north-west of the site, gradients in a dry valley feature are sufficiently steep to cause a limitation upon agricultural use.

4. Geology and Soils

4.1 British Geological Survey (1958) shows the majority of the site to be underlain by Upper Chalk deposits. A band of Reading Beds have been mapped along the southern-most part of the site, south of Dean Farm and to the extreme north of the site along the northern site boundary.

4.2 The published Soil Survey map of the area, (SSEW, 1983) shows the site to comprise two associations in conjunction with the geological deposits. Soils of the Wickham 4 association are shown to correspond with deposits of Reading Beds to the north and south of the site. These soils are described as 'slowly permeable, seasonally waterlogged, fine loamy over clayey and coarse loamy over clayey', (SSEW, 1984). Much of the site is mapped as soils of the Carstens associations these being described as, 'well drained, fine silty over clayey, often very flinty soils', (SSEW, 1984).

4.3 Detailed field examination of the soils on the site found them to be broadly consistent with both British Geological Survey and Soil Survey of England and Wales published sources. Reddish brown variably flinty and clayey soils with slowly permeable subsoils were encountered across much of the site in association with clay-with-flints deposits overlying chalk. Towards the south and south-west of the site poorly drained clayey soils, greyish and mottled in appearance, were found to have developed from Reading Beds.

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 Good quality land has been mapped across the majority of the site. It is primarily associated with soils developed from clay-with-flints deposits which are affected by soil wetness and/or workability limitations, although a small proportion of land assigned to this grade is represented by soils overlying chalk which are affected by soil droughtiness restrictions.

Soils derived from clay-with-flints deposits typically comprise non-calcareous topsoils of medium clay loams, medium silty clay loam, or occasionally, heavy clay loam. These may be very slightly stony having 2-10% total flints by volume, (up to 6% of which may be > 2cm in size). Upper subsoils are similarly textured but perhaps slightly more stony. Profiles tend to pass to slowly permeable clay horizons in the lower subsoil which may be gleyed or slightly gleyed, thus indicating impeded drainage. A number of profiles were found to be impenetrable (to soil auger) at varying depths due to the presence of flints in the subsoil. However, soil inspection pits 1 and 2 confirmed subsoil conditions and showed that in general the soil resource extends to at least 1m. The presence of slowly permeable clay horizons in these profiles which impede drainage and cause soils to be seasonally waterlogged, results in Wetness Class III being appropriate, given the depth at which slowly permeable layers were encountered. Given the prevailing climatic conditions, a classification of Subgrade 3a is appropriate, the land being limited by soil wetness and workability. This will result in the utilisation of the land, in terms of the timings of cultivations and/or grazing by livestock, being restricted.

Around Dean Farm, a small number of observations were found to be affected by soil droughtiness in addition to soil wetness. Profiles typically comprise, medium clay loam, or more usually, heavy clay loam topsoils containing up to 10% total flints by volume. These overlie clay subsoils which may be slightly gleyed and slowly permeable below about 40-45 cm and which pass to chalky horizons (ie 10-20% chalk) from 60-75 cm depth and soft white chalk below 70-80 cm.

Soil properties, particularly the poorly structured clayey subsoils and restricted soil depth over chalk, interact with climatic factors to cause profile available water to be slightly restricted. As a result this land is limited to Subgrade 3a equally by soil wetness and soil droughtiness.

Subgrade 3b

5.4 Moderate quality land towards the south and north-west of the site is significantly affected by soil wetness, workability and slope restrictions.
In general terms, profiles comprise very slightly stony, (ie 1-2% total flints) heavy clay loam topsoils, directly overlying slowly permeable clay in the subsoil. These subsoil horizons severely impede drainage, causing prolonged seasonal waterlogging, as evidenced by the dominance of grey and ochreous gley colours. Such drainage status is consistent with Wetness Class IV and thus Subgrade 3b, given the prevailing climate and topsoil textures. This land will suffer significant restrictions on trafficking by machinery, cultivations and grazing. Crop growth and development will also be adversely affected by excessive soil wetness.

In the north-west, the slope gradient measured using an optical reading clinometer was found to be 10°, which is sufficient to cause a significant limitation on agricultural operations. Gradient has an effect upon mechanised farm operations since most conventional agricultural machinery performs best on level ground. Therefore, steep slopes can restrict the safe and efficient use of machinery.

ADAS Reference: 1504/245/94
MAFF Reference: EL15/518

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1958), Sheet No. 316, Fareham, 1:50,000 Series (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.

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

APPENDIX I

DESCRIPTION OF THE GRADES AND SUBGRADES

Grade 1 : Excellent Quality Agricultural Land

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

Grade 2 : Very Good Quality Agricultural Land

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

Grade 3 : Good to Moderate Quality Land

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

Subgrade 3a : Good Quality Agricultural Land

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

Subgrade 3b : Moderate Quality Agricultural Land

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

Grade 4 : Poor Quality Agricultural Land

Land with severe limitations which significantly restrict the range of crops and/or the level of yields. It is mainly suited to grass with occasional arable crops (eg. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 : Very Poor Quality Agricultural Land

Land with severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religous buildings, cemetries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural Buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

Open Water

Includes lakes, ponds and rivers as map scale permits.

Land Not Surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

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

Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years.[2]
II	The soil profile is wet within 70 cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

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

[1]The number of days specified is not necessarily a continuous period.
[2]'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

Boring Header Information

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

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

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

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

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

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

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

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

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

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

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

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

Soil Pits and Auger Borings

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

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

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

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

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

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

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

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

4. **MOTTLE CONT** : Mottle contrast

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SOIL PIT DESCRIPTION

Site Name : HANTS SP,KNOWLE HOSPITAL Pit Number : 1P

Grid Reference: SU57550905 Average Annual Rainfall : 815 mm
Accumulated Temperature : 1515 degree days
Field Capacity Level : 166 days
Land Use : Cereals
Slope and Aspect : 01 degrees E

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 24	MCL	10YR43 00	0	5	HR					
24- 45	HCL	10YR44 54	0	10	HR		MDCSAB	FR	M	
45-100	C	10YR46 56	0	10	HR	C	WKMCAB	FM	P	

Wetness Grade : 3A Wetness Class : III
Gleying : cm
SPL :045 cm

Drought Grade : 3A APW : 109mm MBW : -4 mm
APP : 101mm MBP : -7 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : HANTS SP,KNOWLE HOSPITAL Pit Number : 2P

Grid Reference: SU57150845 Average Annual Rainfall : 815 mm
Accumulated Temperature : 1515 degree days
Field Capacity Level : 166 days
Land Use : Cereals
Slope and Aspect : 02 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MCL	10YR42 00	3	10	HR					
30- 44	C	75YR56 00	0	15	HR	F	MDMDAB	FM	P	
44- 65	C	75YR58 00	0	10	HR	C	WKCOAB	VM	P	
65- 80	C	75YR58 00	0	20	CH	C			P	Y

Wetness Grade : 3A Wetness Class : III
Gleying : cm
SPL :044 cm

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

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : HANTS SP,KNOWLE HOSPITAL Pit Number : 3P

Grid Reference: SU56200850 Average Annual Rainfall : 815 mm
Accumulated Temperature : 1515 degree days
Field Capacity Level : 166 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 19	HCL	10YR52 00	0	0						
19- 50	C	25 Y70 00	0	2	HR	M	MDCOAB	VM	P	

Wetness Grade : 3B Wetness Class : IV
Gleying :019 cm
SPL :019 cm

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

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	DRT	M.REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SU56700980	LEY			055	055	3	3A	116	3	107	-1	3A				WE	3A	
1P	SU57550905	CER	E	01		045	3	3A	109	-4	101	-7	3A				WE	3A	SL. GLEY 45
2	SU56990969	SAS			027	045	3	3A	117	4	109	1	3A				WE	3A	JUST WC3
2P	SU57150845	CER	S	02		044	3	3A		0		0					WE	3A	SL. GLEY 44
3	SU57300950	CER					1	1	084	-29	084	-24	3B				WE	3A	IMP 50, SEE 1P
3P	SU56200850	PGR			019	019	4	3B		0		0					WE	3B	WICKHAM
4	SU57400960	CER	E	01		038	3	3A	088	-25	099	-9	3B				WE	3A	SL. GLEY 38
5	SU57550940	CER	E	01			1	1	087	-26	089	-19	3B				DR	3A	SEE 1P
6	SU56600940	LEY			024	048	3	3A		0		0					WE	3A	
7	SU56850940	SAS			025	050	3	3A	120	7	112	4	2				WE	3A	
8	SU57000932	CER			052	052	3	3A	113	0	111	3	3A				WE	3A	
9	SU57200925	CER				052	3	3A	105	-8	110	2	3A				WE	3A	SL. GLEY 52
10	SU57600925	CER	N	02			1	1	093	-20	103	-5	3B				DR	3A	IMP, SEE 1P
11	SU56450935	PLO					1	1	062	-51	062	-46	4				DR	3A	IMP 40, SEE 1P
12	SU56600925	CER			050	050	3	3A	110	-3	108	0	3A				WE	3A	
13	SU57300910	HOR	S	02		048	3	3A		0		0					WE	3A	SL. GLEY 48
14	SU57550905	CER	E	01		045	3	3A	136	23	112	4	2				WE	3A	SL. GLEY 45
15	SU56200915	PLO			026	045	3	3A	108	-5	106	-2	3A				WE	3A	
16	SU56300895	PLO			025		2	2	072	-41	072	-36	3B				DR	3B	IMP 45
17	SU56300885	PLO			030	030	4	3B	088	-25	094	-14	3B				WE	3B	
18	SU56750900	CER					1	1	103	-10	100	-8	3A				DR	3A	SL. GLEY 28
19	SU57050890	CER	S	02		048	3	3A		0		0					WE	3A	SL. GLEY 48
20	SU56100875	OSR				050	3	3A	098	-15	109	1	3A				WE	3A	SL. GLEY 50
21	SU56600875	CER			050	050	3	3A	095	-18	103	-5	3A				WE	3A	IMP 75
22	SU57250865	OSR	S	02		045	3	3B		0		0					WE	3B	SL. GLEY 45
23	SU57500865	CER	E	01			1	2	105	-8	112	4	3A				DR	3A	SEE 1P
24	SU57750860	CER	E	01			1	2	100	-13	112	4	3A				DR	3A	SEE 1P
25	SU56450860	OSR			020	020	4	3B		0		0					WE	3B	
26	SU56800850	CER					1	1	105	-8	117	9	3A				DR	3A	IMP 70
27	SU57150845	CER	S	02		042	3	3A	119	6	102	-6	2				WE	3A	SL. GLEY 42
28	SU57550840	STB	S	01			1	2	106	-7	096	-12	3A				DR	3A	CHALK 75
29	SU56200850	PGR			019	019	4	3B		0		0					WE	3B	WICKHAM
30	SU56500825	PGR			015	015	4	3B		0		0					WE	3B	WICKHAM
31	SU56600820	PGR			020	020	4	3B		0		0					WE	3B	WICKHAM
32	SU56900825	PGR			049	049	3	3A	096	-17	104	-4	3A				WE	3A	
33	SU57050820	CER				045	3	3B	096	-17	108	0	3A				WE	3B	SL. GLEY 45
34	SU57200810	STB	S	02	055	055	3	3B	120	7	111	3	2				WE	3B	WICKHAM
35	SU57300810	STB	S	01			1	2	078	-35	078	-30	3B				DR	3A	IMP 50, SEE 1P
36	SU57600825	STB	S	01		040	3	3B	117	4	100	-8	3A				WE	3B	SL. GLEY 40
37	SU57600800	STB	S	02		058	2	3A	105	-8	108	0	3A				WE	3A	SL. GLEY 58
38	SU56700810	PGR			021	040	4	3B		0		0					WE	3B	
39	SU56310988	PGR			035		2	2	064	-44	064	-38	3B				DR	3B	I45 HR

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
40	SU56500955	PGR			026	053	3	3A	088	-20	099	-3	3B				WE	3A	
41	SU56350975	PGR			040		1	1	095	-13	106	4	3A				DR	3A	I70
42	SU56261010	PGR			000	012	4	3B	000	0	000	0					WE	3B	
43	SU56101005	PGR			000	029	4	3B	000	0	000	0					WE	3B	
44	SU56150990	PGR			000		1	1	000	0	000	0					DR	3B	I30

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
1	0-25	mcl	10YR42 00						0	0	HR	3							
	25-55	hcl	75YR52 00						0	0	HR	8		M					
	55-100	c	25Y 63 00	10YR78 73	M			Y	0	0	HR	2		P		Y			
1P	0-24	mcl	10YR43 00						0	0	HR	5							
	24-45	hcl	10YR44 54						0	0	HR	10	MDCSAB	FR M					
	45-100	c	10YR46 56	75YR56 00	C		00MN00 00	S	0	0	HR	10	WKMCAB	FM P	Y		Y		
2	0-27	mcl	10YR42 00						0	0	HR	1							
	27-45	hcl	10YR52 00	10YR58 00	C			Y	0	0	HR	2		M					
	45-65	c	75YR53 00	75YR58 00	C			Y	0	0		0		P		Y			
	65-100	c	75YR63 00	75YR68 00	C		05YR58 00	Y	0	0	HR	2		P		Y			
2P	0-30	mcl	10YR42 00						3	0	HR	10							
	30-44	c	75YR56 00	00MN00 00	F				0	0	HR	15	MDMDAB	FM P	Y				
	44-65	c	75YR58 00	75YR68 00	C		00MN00 00	S	0	0	HR	10	WKCOAB	VM P	Y		Y		
	65-80	c	75YR58 00	75YR68 00	C		00MN00 00	S	0	0	CH	20		P	Y		Y	Y	
3	0-26	mzcl	75YR53 00						2	0	HR	6							
	26-50	mzcl	75YR54 00						0	0	HR	10		M					IMP 50, FLINTS
3P	0-19	hcl	10YR52 00						0	0		0							
	19-50	c	25 Y70 00	75YR68 00	M			Y	0	0	HR	2	MDCOAB	VM P	Y		Y		
4	0-28	mcl	10YR42 00						4	0	HR	15							
	28-38	hcl	10YR44 00						0	0	HR	10		M					
	38-65	c	75YR54 00	75YR56 68	C		00MN00 00	S	0	0	HR	5		P		Y			IMP 65, FLINTS
5	0-27	mcl	10YR43 00						0	0	HR	3							
	27-40	mcl	10YR44 00						0	0	HR	2		M					
	40-55	hcl	10YR44 54						0	0	HR	10		M					IMP 55, FLINTS
6	0-24	mzcl	75YR53 00						0	0	HR	3							
	24-48	mzcl	10YR53 00	10YR58 00	C			Y	0	0	HR	8		M					
	48-80	c	75YR53 00	75YR58 00	C			Y	0	0	HR	10		P		Y			
7	0-25	mzcl	10YR52 00	10YR58 00	F				0	0	HR	3							
	25-50	mzcl	10YR52 00	10YR58 00	C			Y	0	0	HR	2		M					
	50-100	c	75YR53 00	75YR56 00	C		00MN00 00	Y	0	0	HR	8		P		Y			
8	0-24	mzcl	75YR53 00						0	0	HR	4							
	24-52	hzcl	10YR54 00						0	0	HR	5		M					
	52-90	c	75YR52 53	75YR58 00	C			Y	0	0	HR	8		P		Y			
9	0-28	mzcl	75YR53 00						2	0	HR	6							
	28-52	hzcl	10YR42 53	10YR58 00	F				0	0	HR	5		M					
	52-80	c	75YR54 00	75YR68 00	C		00MN00 00	S	0	0	HR	12		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
10	0-28	mcl	10YR43 00						2	0	HR	3						
	28-38	hcl	75YR56 00						0	0	HR	5		M				
	38-50	c	75YR56 00						0	0	HR	5		M				
	50-65	c	75YR56 00	00MN00 00 C					0	0	HR	15		M				IMP 65, FLINTS
11	0-26	mzcl	10YR42 00						10	0	HR	15						
	26-40	mcl	10YR54 42						0	0	HR	15		M				IMP 40, FLINTS
12	0-22	mzcl	10YR52 00						0	0	HR	2						
	22-50	hcl	10YR54 52	10YR58 00 F					0	0	HR	8		M				
	50-90	c	10YR53 00	10YR58 00 C				Y	0	0	HR	2		P		Y		
13	0-29	mcl	10YR43 00						3	0	HR	5						
	29-48	c	75YR54 56						0	0	HR	5		M				
	48-60	c	75YR56 00	75YR68 00 C				S	0	0	HR	2		P		Y		IMP 60, FLINTS
14	0-28	mcl	10YR42 00						0	0	HR	2						
	28-45	c	10YR46 00						0	0	HR	10		M				
	45-60	c	10YR46 00	75YR56 00 C			00MN00 00	S	0	0	HR	10		P		Y		
	60-120	c	10YR46 00	75YR56 00 C			00MN00 00	S	0	0	HR	2		P		Y		
15	0-26	mzcl	10YR52 00						6	0	HR	8						
	26-45	hcl	75YR53 00	75YR58 00 C				Y	0	0	HR	5		M				
	45-90	c	75YR53 68	05YR58 00 C				Y	0	0	HR	5		P		Y		
16	0-25	mzcl	10YR52 00						8	0	HR	12						
	25-45	hcl	10YR53 00	10YR68 00 C				Y	0	0	HR	8		M				IMP 45, FLINTS
17	0-30	mzcl	10YR52 00						0	0	HR	3						
	30-60	c	10YR63 00	10YR68 00 M				Y	0	0		0		P		Y		
18	0-28	mcl	10YR43 00						6	0	HR	8						
	28-47	c	10YR54 42	10YR68 00 C			00MN00 00	S	0	0	HR	10		M				
	47-55	mcl	10YR64 00						0	0	CH	50		M				
	55-85	ch	05Y 82 00						0	0		0		M				
19	0-30	mcl	10YR42 00						2	0	HR	3						
	30-48	c	75YR56 00	00MN00 00 F					0	0	HR	5		M				
	48-80	c	75YR58 00	75YR68 00 C			00MN00 00	S	0	0	HR	10		P		Y		
20	0-26	mzcl	10YR52 00						0	0	HR	3						
	26-50	hcl	10YR53 54	00MN00 00 F					0	0	HR	5		M				
	50-70	c	75YR54 00	00MN00 00 C				S	0	0	HR	5		P		Y		
21	0-24	mcl	10YR52 00						4	0	HR	6						
	24-50	hcl	10YR54 00						0	0	HR	8		M				
	50-75	c	10YR53 54	10YR68 00 C			00MN00	Y	0	0	HR	10		P		Y		IMP 75, FLINTS

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	
22	0-28	hcl	10YR43 00						3	0	HR	5							
	28-45	c	75YR56 00	00MN00	00	F			0	0	HR	5		M					
	45-60	c	75YR56 00	75YR68	00	C	10YR61 00	S	0	0	HR	10		P		Y			
23	0-29	hcl	10YR43 00						2	0	HR	5							
	29-40	hcl	75YR46 56						0	0	HR	5		M					
	40-60	c	75YR56 00	00MN00	00	C			0	0	HR	2		M					
	60-80	c	75YR56 00	00MN00	00	C			0	0	HR	10		M					IMP 80, FLINTS
24	0-32	hcl	10YR43 00						3	0	HR	5							
	32-64	hcl	10YR43 53						0	0	HR	5		M					
	64-70	c	75YR56 00	00MN00	00	C			0	0	HR	10		M					IMP 70, FLINTS
25	0-20	mcl	10YR42 52						0	0	HR	3							
	20-55	c	10YR63 00	10YR68	00	M		Y	0	0	HR	10		P		Y			
	55-100	c	10YR62 00	10YR68	71	M		Y	0	0		0		P		Y			
26	0-30	mzcl	10YR43 00						3	0	HR	6							
	30-70	hcl	10YR54 00	00MN00	00	F			0	0	CH	5		M					IMP 70, FLINTS
27	0-30	mcl	10YR42 00						3	0	HR	8							
	30-42	c	75YR54 00			F	00MN00 00		0	0	HR	10		M					
	42-70	c	75YR56 00	75YR58	00	C	00MN00 00	S	0	0	HR	5		P		Y			
	70-80	c	10YR56 00					S	0	0	CH	10		P		Y	Y		
	80-110	ch	10YR81 00						0	0		0		P			Y		
28	0-30	hcl	10YR43 00						3	0	HR	10							
	30-70	c	75YR56 00	00MN00	00	C			0	0	HR	10		M					
	70-75	c	10YR56 00						0	0	CH	20		M			Y		
	75-100	ch	10YR81 00						0	0		0		P			Y		
29	0-19	hcl	10YR52 00						0	0	HR	2							
	19-60	c	10YR62 00	10YR68	71	M		Y	0	0		0		P		Y			
30	0-15	hcl	10YR52 00						0	0	HR	2							
	15-60	c	10YR73 00	10YR68	71	M		Y	0	0	HR	5		P		Y			
31	0-20	hcl	10YR52 00						0	0	HR	1							
	20-60	c	10YR63 00	10YR68	71	M		Y	0	0		0		P		Y			
32	0-20	mcl	10YR43 00						2	0	HR	5							
	20-49	hcl	10YR54 00	00MN00	00	F			0	0	HR	5		M					
	49-75	c	10YR53 00	10YR68	00	C	00MN00 00	Y	0	0	HR	8		P		Y			
33	0-30	hcl	10YR42 00						0	0	HR	2							
	30-45	hcl	10YR54 00						0	0	HR	5		M					
	45-58	c	10YR46 00	75YR58	00	C		S	0	0	HR	2		P		Y			
	58-70	c	10YR56 00	75YR58	00	C		S	0	0	CH	10		P		Y	Y		IMP 70, CHALK

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
34	0-30	hcl	10YR42 00						0	0	HR	2							
	30-55	hcl	10YR54 00						0	0	HR	2		M					
	55-100	c	10YR53 00	75YR58 00	C		10YR61 00	Y	0	0	HR	2		P			Y		
35	0-30	hcl	10YR43 00						3	0	HR	10							
	30-45	c	10YR44 54						0	0	HR	5		M					
	45-50	c	10YR44 54						0	0	HR	25		M					IMP 50, FLINTS
36	0-28	hcl	10YR42 00						3	0	HR	10							
	28-40	c	10YR54 00						0	0	HR	10		M					
	40-65	c	10YR46 56	75YR56 00	C		00MN00 00	S	0	0	HR	5		P			Y		
	65-80	c	10YR56 00					S	0	0	CH	10		P			Y	Y	
	80-110	ch	10YR81 00						0	0		0		P				Y	
37	0-30	hcl	10YR43 00						2	0	HR	5							
	30-58	c	10YR44 54						0	0	HR	5		M					
	58-85	c	75YR56 00	75YR68 00	C		00MN00 00	S	0	0	HR	10		P			Y		
38	0-21	mcl	10YR43 00						0	0	HR	2							
	21-40	hcl	10YR52 00	10YR68 61	C		00MN00 00	Y	0	0		0		M					
	40-70	c	10YR73 00	10YR68 71	M			Y	0	0		0		P			Y		
39	0-20	mzcl	10YR42 00						10	0	HR	15							
	20-26	mcl	10YR42 52						6	0	HR	12							
	26-35	mzcl	10YR43 00						0	0	HR	25		M					
	35-45	c	10YR52 00	10YR58 61	C			Y	0	0	HR	25		M					
40	0-53	mcl	10YR54 00	10YR58 00	C			S	0	0	HR	15		M					
	53-70	c	10YR46 00	75YR68 62	C			S	0	0	HR	10		P			Y		
41	0-25	mcl	10YR42 00						0	0	HR	8							
	25-40	mcl	75YR46 00						0	0	HR	15		M					
	40-70	hcl	75YR54 00	75YR58 00	C			S	0	0	HR	10		M					
42	0-12	mzcl	10YR52 00	10YR58 00	C			Y	0	0	HR	6							
	12-55	c	10YR62 00	10YR68 00	C			Y	0	0		0		P			Y		
43	0-29	hcl	10YR52 00	10YR58 00	C			Y	0	0	HR	5							
	29-70	c	10YR62 00	10YR68 71	M			Y	0	0		0		P			Y		
44	0-20	mcl	10YR42 00						10	0	HR	12							
	20-30	mcl	10YR42 00						0	0	HR	20		M					