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NEWBURY DISTRICT LOCAL PLAN

Land to the West of Newbury, Berkshire (including housing omission sites 5796 and 5947)

Agricultural Land Classification
ALC Map and Report

August 1997

Resource Planning Team
Eastern Region
FRCA Reading

RPT Job Number: 0202/103/97
FRCA Reference: EL 02/00297

AGRICULTURAL LAND CLASSIFICATION REPORT

NEWBURY DISTRICT LOCAL PLAN, BERKSHIRE

LAND TO THE WEST OF NEWBURY, INCLUDING HOUSING OMISSION SITES 5796 AND 5947

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately 212 ha on the western edge of Newbury in Berkshire. The site is bounded to the west by Skinners Green Lane and runs from the River Kennet in the north to Wheatlands Lane in the south. The majority of the survey work was carried out during January to March 1994 in connection with the above Local Plan at a detailed level of survey (FRCA Ref: 0202/007 and 008/94). Further detailed work on land to the west of Bonemill Lane and land immediately east of Skinners Green Lane, together with the land allocated as housing omission site 5947 at Enborne Gate Farm, was surveyed during August 1997. Information from the two 1994 sites has been used in grading the work carried out in 1997.

2. The 1997 survey work was undertaken by the Farming and Rural Conservation Agency (FRCA), on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF). The survey was carried out in connection with two housing sites (5947 and 5796) submitted as objections to the Newbury District Local Plan (please refer to attached map). Site 5947 forms part of the larger site 5796. In addition, the two fields to the immediate east of Skinners Green Lane have been surveyed in order to enable MAFF to take a wider strategic view of agricultural land quality around Newbury. This survey supersedes any previous ALC information for this land.

3. The 1997 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 the 1997 survey, the agricultural land in question was either under permanent or temporary grassland or in a Set Aside use . The areas shown as 'Other Land' comprise residential dwellings, allotment gardens, playing fields, a school, a dismantled railway, a spoil tip, areas of scrub, roads and tracks. A small area in the north of the site has been classified as 'Agricultural land not surveyed'; this land was inaccessible at the time of survey.

SUMMARY

5. The findings of both the 1994 surveys together with the results from the 1997 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 for objector site 5947 are summarised in Table 1. Table 2 depicts similar information for all of objection site 5796. The results in Tables 2 and 3 incorporate work from both 1994 and 1997.

7. The area and proportions of the ALC grades and subgrades for the entire area surveyed to the west of Newbury are summarised in Table 3.

Table 1: Area of grades and other land - housing omission site 5947

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	0.6	12.3	5.5
3a	2.8	57.1	25.5
3b	1.5	30.6	13.6
Other land	*6.1*	*N/A*	*55.4*
Total surveyed area	4.9	100.0	44.6
Total site area	11.0	-	100.0

Table 2: Area of grades and other land - housing omission site 5796

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	32.6	52.6	43.1
3a	12.4	19.9	16.3
3b	8.5	13.6	11.1
4	8.7	13.9	11.4
Other land	11.8	N/A	15.5
Agricultural land not surveyed	2.0	N/A	2.6
Total surveyed area	62.5	100.0	81.9
Total site area	76.3	-	100.0

Table 3: Area of grades and other land - land to the west of Newbury

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	40.5	21.9	19.1
3a	36.5	19.8	17.2
3b	90.5	49.0	42.6
4	17.2	9.3	8.1
Other land	25.7	N/A	12.1
Agricultural land not surveyed	2.0	N/A	0.9
Total surveyed area	184.7	100.0	87.0
Total site area	76.3	-	100.0

8. The fieldwork for the 1997 survey was conducted at an average density of one boring per hectare of agricultural land surveyed. A total of 42 borings and two soil inspection pits was described.

9. The soil profile and land quality descriptions described below refer to the survey work carried out in 1997. For descriptions relating to the areas surveyed in 1994 please refer to previous reports (FRCA Ref: 0202/007 and 008/94).

10. Land to the south-west of Oaken Hedges has been classified as Grade 2 (very good quality); the land adjoining this area, to the east of Skinners Green Lane, has been classified as Subgrade 3a (good quality). Land to the west of Bonemill Lane, together with land to the east of Skinners Green Farm, has been classified as Subgrade 3b (moderate quality).

11. The land classified as Grade 2 is limited by slight soil droughtiness. The soils are generally coarse loamy in texture and are deep, well drained and slightly stony. These characteristics in this locality slightly limit the amount of water available in the profile for extraction by crops and affect the level and consistency of yields in the growing season and in drier years.

12. Where similarly textured profiles but with stonier subsoils occur, the amount of profile available water for crops is lowered. Consequently, the ensuing soil droughtiness limitation is slightly more pronounced and Subgrade 3a is appropriate. In parts, the amount of stone in the topsoil creates a limitation which acts to increase wear to agricultural implements and impair crop growth.

13. To the west of Bonemill Lane, the soil profiles are much more stony throughout before overlying gravel at depth. This land will be prone to drought stress in most years and, consequently, is classified as Subgrade 3b.

14. To the east of Skinners Green Farm, the land is restricted to Subgrade 3b because of soil wetness and workability limitations. Here, poorly structured clay subsoils occur directly below the topsoil and act to impede soil drainage. At this locality, such land will have restricted flexibility of cropping, stocking and cultivations. Across discrete areas, the clay subsoils occur slightly deeper within the soil profile. The combination of slightly better drained soils, medium textured topsoils and the local climate means that the resulting soil wetness limitation is less severe; such profiles have been incorporated into the Subgrade 3a mapping unit.

FACTORS INFLUENCING ALC GRADE

Climate

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

16. The key climatic variables used for grading this site are given overleaf in Table 4 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 4: Climatic and altitude data

Factor	Units	Values		
Grid reference	N/A	SU 453 667	SU 452 661	SU 450 657
Altitude	m, AOD	82	90	100
Accumulated Temperature	day°C (Jan-June)	1439	1430	1419
Average Annual Rainfall	mm	719	733	746
Field Capacity Days	days	161	165	167
Moisture Deficit, Wheat	mm	105	104	102
Moisture Deficit, Potatoes	mm	97	95	93
Overall climatic grade	N/A	Grade 1	Grade 1	Grade 1

17. 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.

18. 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.

19. The combination of rainfall and accumulated temperature at this site mean that there is no overall climatic limitation. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. At this locality, the field capacity days and soil moisture deficits are average for the south-east region. No local climatic factors, such as frost risk or exposure, are believed to adversely affect the land quality on the site. All of the land on the site is climatically Grade 1.

Site

20. Of the land surveyed in 1997, the highest land occurs to the east of Skinners Green Farm, together with the land to the west of the schools (adjacent to the urban boundary of Newbury). These areas lie at 95-100 m AOD. To the south of Enborne Road, where the dismantled railway dissects the site, the land lies at 85-90 m AOD. The lowest lying land, which lies at 80 m AOD, occurs to the north of the main railway line. All of the land surveyed in 1997 falls through gentle gradients of 0-4°, with a northerly aspect. Nowhere on the site do gradient or microrelief adversely affect agricultural land quality.

Geology and soils

21. The published geology map (BGS, 1971) shows the site to be underlain by two solid deposits. London Clay is mapped across the higher land in the south of the site; the remaining area is underlain by Reading Beds. Drift deposits of river and valley gravels, together with a relatively small area of brickearth, overlie much of the Reading Beds. These deposits occur across the northern third of the site, where the land is lower-lying land, either side of Enborne Road and to the north of the main railway line.

22. The published reconnaissance soil survey map (SSEW, 1983) maps two soil types across the site. Soils of the Hucklesbrook Association are mapped in conjunction with the drift deposits of gravels and brickearth. These soils are described as 'Well drained coarse loamy and some sandy soils, commonly over gravel. Some similar permeable soils affected by groundwater. Usually on flat land.' (SSEW, 1983). Soils of the Wickham 3 Association are mapped across the remaining area. These soils are described as 'Slowly permeable seasonally waterlogged fine loamy over clayey soils, and similar more permeable soils with slight seasonal waterlogging. Some deep coarse loamy soils affected by groundwater. Landslips with irregular terrain locally.' (SSEW, 1983).

AGRICULTURAL LAND CLASSIFICATION

23. 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 Tables 1-3, page 2.

24. 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, page 11. All of these details relate to the survey work carried out in 1997.

Grade 2

25. Grade 2, very good quality, land occurs to the south-west of Oaken Hedges, in the centre of the site. All of this land is limited by soil droughtiness; parts of the land are also equally limited by soil wetness. This land occurs in conjunction with deep, coarse loamy soils. Topsoils comprise non-calcareous medium clay loams which are slightly stony, containing 2-4% flints larger than 2 cm and 3-10% total flints by volume. These overlie similarly textured and, occasionally, heavy clay loam subsoils. The subsoils in this area are slightly stony, typically containing 5-15% total flints by volume, and are moderately structured.

26. Due to the relatively dry subsoil conditions at the time of survey, most of the auger borings within this area proved impenetrable to a soil auger between 60 and 95 cm depth. However, data from Pit 8 of the previous survey (FRCA Ref: 0202\007\94) suggest that some lower subsoils are likely to comprise poorly structured clay containing up to 10% total flints by volume. This clay was found to be slowly permeable. Such clay would act to slightly impede soil drainage, as indicated by gleying in Pit 8 from 45 cm. This profile was assessed as moderately well drained (Wetness Class II). With regard to the 1997 survey, only a minority of profiles showed signs of gleying before proving 'impenetrable'. Consequently, it is likely that the profiles in this mapping unit are likely to be either well drained (Wetness Class I) or, where they are gleyed prior to becoming 'impenetrable', moderately well drained.

27. Where profiles are well drained, the overriding limitation to land quality is soil droughtiness. The interaction between the soil characteristics and the prevailing climate means that the profile available water is not quite sufficient to fully meet crop needs. Consequently, there is a minor risk of drought stress which will result in a slightly lower yield potential and less consistent crop yields. Where profiles are moderately well drained, the land is also equally limited by minor soil wetness. This land will be subject to slight restrictions on the flexibility of cropping, stocking and cultivations.

Subgrade 3a

28. Subgrade 3a, good quality, land occurs to the east of Skinners Green Lane and, also, as a smaller block of land in the west of the site (adjacent to the urban boundary). The majority of this land is limited by soil droughtiness, sometimes in conjunction with a topsoil stoniness limitation. Discrete areas of land are limited by soil wetness.

29. Where soil droughtiness is limiting, profiles are derived from gravelly deposits. Topsoils comprise non-calcareous medium clay loams which tend to be moderately stony, containing 2-14% flints larger than 2 cm, 0-5% flints larger than 6 cm and 15-22% total flints by volume. Where topsoils contain over 10% flints larger than 2 cm, the land is also subject to a topsoil stoniness limitation. This will act to impede cultivation, harvesting and crop growth. Upper subsoils, where penetrable to an auger, were found to comprise medium clay loams which are moderately stony (10-35% total flints by volume). However, the dry subsoil conditions at the time of survey, together with underlying gravelly deposits, meant that most of the profiles within this unit proved 'impenetrable' to a soil auger either below the topsoil or at shallow depths (40-50 cm) within the soil profile.

30. A soil inspection pit (Pit 1) was used in association with Pit 7 from the 1994 survey (FRCA Ref: 0202\007\94) to describe this mapping unit. From the two pits, it could be seen that these 'impenetrable' horizons comprise variably textured soils, generally medium clay loams and, to a lesser extent, medium sandy loams, loamy medium sands and clay. These subsoils, which were assessed as moderately structured, are very stony with stone contents in the range of 35-65% total flints by volume. All of these profiles are well drained (Wetness Class I). The gravelly subsoils restrict the moisture content of the profiles, and moisture balance calculations indicate that the amount of water available to a growing crop may not be sufficient to meet its needs throughout the growing season. The resulting drought stress may cause the level and consistency of crop yields to be depressed. Subgrade 3a is appropriate.

31. Land where soil wetness is limiting tends to occur on the geological boundary between the Reading Beds and London Clay. Here, non-calcareous medium clay loam topsoils overlie similarly textured and heavy clay loam upper subsoils. These upper subsoils are moderately structured and permeable. At approximately 45-50 cm, these pass into poorly structured clay lower subsoils. These clay subsoils are slowly permeable which, at this locality, results in imperfect soil drainage (Wetness Class III). The combination of imperfect soil drainage, medium textured topsoils and climatic factors means that this land is limited by soil wetness and workability. This land will be subject to seasonal restrictions on the flexibility of cropping, stocking and cultivations.

Subgrade 3b

32. Land of Subgrade 3b, moderate quality, is mapped to the north of the main railway line and to the east of Skinners Green Farm. The former is limited by significant soil droughtiness; the latter by soil wetness and workability.

33. Land limited by soil droughtiness occurs in conjunction with the stonier phases of the valley and river gravel deposits. Here, topsoils comprise non-calcareous medium clay loams. Topsoils tend to be moderately stony, containing between 3-13% flints larger than 2 cm, 0-5% flints larger than 6 cm and 8-22% total flints by volume. Where penetrable to a soil auger, upper subsoils were found to be of similar texture and stone content. However, the underlying gravelly deposits meant that the majority of profiles within this area proved impenetrable to the soil auger at about 30-40 cm depth. A soil inspection pit (Pit 2, see Appendix II) was used to describe the subsoils of this mapping unit. Subsoils comprise medium clay loam textures with approximately 37-62% total flints by volume, passing to pure gravel below about 70 cm depth. These stony subsoils severely restrict the amount of water in the profile, and the interaction between such gravelly soils and the prevailing climate results in significant soil droughtiness. Consequently, this land is likely to suffer from low and inconsistent crop yields.

34. Land subject to soil wetness restrictions occurs on the higher land in the south of the site. This land, which is underlain by London Clay, comprises medium and heavy clay loam textured topsoils. These directly overlie poorly structured clay in the subsoil. These subsoils are slowly permeable, and act to significantly impede soil drainage, as indicated by gleying either from the surface or directly below the topsoil. Given the prevailing climate, these profiles are assessed as poorly drained (Wetness Class IV). The interaction between the topsoil textures, poor soil drainage and prevailing local climate means that this land is limited by soil wetness and workability. Soil wetness can adversely affect seed germination and survival and can inhibit the development of a good root system. It also influences the sensitivity of soil to structural damage and is, therefore, a major factor in determining the number of days when cultivation, trafficking or grazing can take place.

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SOURCES OF REFERENCE

British Geological Survey (1971), *Sheet 267, Hungerford, 1:63,360 (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 (1983), *Sheet 6, Soils of South East England, 1:250,000 and accompanying legend.*
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:

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

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

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

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

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

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

15. Other notations:

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

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
4	SU45306680	PGR	N	1	28	28	4	3B		0		0					WE	3B	
5	SU45406680	PGR	NE	1			1	1	54	-51	54	-43	4				DR	3B	Imp35 see1P
6	SU45506680	PGR	W	1			1	1	46	-59	46	-51	4				DR	3B	Imp30 see1P
7	SU45606680	SAS	N	1			1	1	50	-55	50	-47	4				DR	3B	Imp30 see1P
8	SU45106670	PGR	N	3	35		2	2	64	-41	64	-33	3B				DR	3B	Imp40 Q sp1
9	SU45206670	PGR	N	1			1	1	51	-54	51	-46	4				DR	3B	Imp35 see1P
10	SU45306670	SAS	N	1	30		2	2	59	-46	59	-38	3B				DR	3B	Imp40 see1P
11	SU45406670	SAS	E	2			1	1	43	-62	43	-54	4				DR	3B	Imp30 see1P
12	SU45506670	SAS	W	1			1	1	48	-57	48	-49	4				DR	3B	Imp30 see1P
13	SU45606670	SAS	N	1			1	1	57	-48	57	-40	3B				DR	3B	Imp35 see1P
14	SU45746665	SAS					1	1	39	-66	39	-58	4				DR	3B	Imp25 see1P
19	SU44966640	PGR	NW	3	45	45	3	3A		0		0					WE	3A	Sl. gleyed 0
20	SU45106640	LEY	NW	1			1	1	44	-60	44	-51	4				DR	3A	I30 see7P 7/94
21	SU45206640	SAS					1	1	58	-46	58	-37	3B				DR	3A	I40 see7P 7/94
24	SU45106630	SAS					1	1	118	14	106	11	2				DR	2	Imp95 flinty
25	SU45206630	SAS					1	1	46	-58	46	-49	4				DR	3A	I30 see7P 7/94
26	SU45006620	LEY					1	1	96	-8	103	8	3A				DR	2	Imp62 prob G2
27	SU45106620	SAS					1	1	101	-3	111	16	3A				DR	2	Imp68 prob G2
28	SU45206620	SAS			35		2	2	97	-7	106	11	3A				WD	2	Imp65 prob G2
30	SU45006610	SAS					1	1	60	-44	60	-35	3B				DR	3A	Imp40 see2P
31	SU45106610	SAS			55		1	1	95	-9	106	11	3A				DR	2	Imp65 prob G2
32	SU45206610	SAS			28		2	2	65	-39	65	-30	3B				DR	2	I40 see8P 7/94
33	SU45306610	SAS			30		2	2	88	-16	93	-2	3A				DR	2	I60 see8P 7/94
35	SU45006600	SAS	N	1			1	1	82	-22	82	-13	3B				DR	3A	Imp50 see2P
36	SU45106600	SAS	N	1			1	1	59	-45	59	-36	3B				DR	3A	Imp48 see2P
37	SU45706600	PGR			60		1	1	98	-6	111	16	3A				DR	2	I70dry prob G2
39	SU44906590				30	48	3	3A		0		0					WE	3A	
40	SU45006590	SAS			0	35	4	3B		0		0					WE	3B	Sl sandy C
41	SU45106590	SAS	NE	1			1	1	93	-11	94	-1	3A				DR	3A	Imp80 dry
42	SU45606590	PGR	N	1	30		2	2	65	-39	65	-30	3B				DR	3A	I40dry prob 3a
43	SU45706590	PGR	NE	1	30		2	2	73	-31	73	-22	3B				DR	3A	I50dry prob 3a
44	SU45806590	PGR					1	1	59	-45	59	-36	3B				DR	3A	I35dry prob 3a
45	SU44806580	LEY	NW	2	0	85	2	2	139	37	107	14	1				WE	2	
46	SU44906580	LEY	NW	1	0	28	4	3B		0		0					WE	3B	
47	SU45006580	LEY	N	1	0	48	3	3A		0		0					WE	3A	
48	SU45106580	PGR	NE	3	38	38	4	3B		0		0					WE	3B	
49	SU45666580	PGR	N	3			2	2	50	-54	50	-45	4				WE	3B	Imp see ab 50
50	SU45756581	PGR	N	4	38	38	4	3B		0		0					WE	3B	
51	SU44906570	LEY	NW	2	0	35	4	3B		0		0					WE	3B	Plastic 35+
52	SU45006570	LEY	NW	2	0	25	4	3B		0		0					WE	3B	
53	SU45106570	LEY	E	2	0	25	4	3B		0		0					WE	3B	FS content
54	SU45106560	LEY	NE	1	0	25	4	3B		0		0					WE	3B	

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
P	SU45506670	SAS	W	1			1	1	77	-28	78	-19					DR	3B	Gravel at 70
P	SU44976610	SAS					1	1	62	-42	62	-33					ST	3A	Pit48 Prob3adr

				----MOTTLES-----			PED		----STONES----				STRUCT/	SUBS				
SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC	
4	0-28	MCL	10YR33						2	0	HR	10						Y	
	28-50	C	10YR53	75YR58	C			Y	0	0	HR	5		P			Y	Y	Prob spl
	50-78	SC	25Y 53	10YR56	C			Y	0	0	HR	5		P			Y	Y	Prob spl
	78-100	SCL	25Y 53	10YR56	C			Y	0	0	HR	5		M				Y	Tending msl
5	0-35	MZCL	10YR33						13	0	HR	20							Impen 35 flinty
6	0-30	MCL	10YR33						8	0	HR	15							Impen 30 flinty
7	0-30	MCL	10YR42						3	0	HR	8							Impen 30 flinty
8	0-35	HCL	10YR32						0	0	CH	5						Y	
	35-40	C	25Y 53 63	10YR58	C			Y	0	0	CH	15		P				Y	Imp40flinty Q spl
9	0-35	MCL	10YR42						10	1	HR	20							Impen 35 flinty
10	0-30	SCL	10YR42						4	2	HR	8							
	30-40	SCL	10YR52	75YR56	C			Y	0	0	HR	20		M					Impen 40 flinty
11	0-30	MCL	10YR42						6	2	HR	12							Impen 30 flinty
12	0-30	MCL	10YR41						6	2	HR	12							Impen 30 flinty
13	0-30	MCL	10YR42						3	1	HR	8							
	30-35	MCL	10YR43						0	0	HR	15		M					Impen 35 flinty
14	0-25	MCL	10YR41						8	3	HR	15							Impen 25 flinty
19	0-32	MCL	10YR43	000C00	C			S	2	0	HR	5							Sl. gleyed
	32-45	HCL	10YR54	000C00	C			S	0	0	HR	2		M					Sl. gleyed
	45-50	C	25Y 62	000C00	M			Y	0	0		0		P		Y			
	50-70	C	25Y 52	000C00	M			Y	0	0		0		P		Y			
20	0-30	MCL	10YR33						5	0	HR	20							Impen 30 flinty
21	0-40	MCL	10YR33						2	0	HR	20							Impen 40 flinty
24	0-35	MCL	10YR33						2	0	HR	10							
	35-50	MCL	10YR43						0	0	HR	10		M					
	50-80	HCL	10YR31						0	0	HR	15		M					
	80-95	MCL	75YR44						0	0	HR	10		M					Impen 95 flinty
25	0-30	MCL	10YR33						2	0	HR	15							Impen 30 flinty
26	0-28	MCL	10YR43						1	0	HR	3							
	28-62	MCL	10YR34						0	0		0		M					Impen 62 flinty
27	0-32	MCL	10YR33						2	0	HR	5							
	32-68	MCL	10YR54						0	0	HR	2		M					Impen 68 flinty

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
28	0-35	MCL	10YR33						2	0	HR	5							
	35-65	MCL	10YR53	000C00	C			Y	0	0	HR	5		M					Impen 65 flinty
30	0-30	MCL	10YR32						6	2	HR	15							
	30-36	MCL	10YR33						0	0	HR	15		M					Impen 36 flinty
31	0-30	MCL	10YR43						1	0	HR	5							
	30-40	MCL	10YR44	10YR58	C			S	0	0	HR	5		M					Sl. gleyed
	40-55	HCL	10YR56	10YR58	C			S	0	0	HR	1		M					Sl. gleyed
	55-65	C	10YR53	10YR58	C			Y	0	0	HR	1		M					Impen 65 flinty
32	0-28	MCL	10YR42						2	0	HR	5							
	28-40	HCL	25Y 63	000C00	M			Y	0	0	HR	10		M					Impen 40 flinty
33	0-30	MCL	10YR43						1	0	HR	5							
	30-35	MCL	10YR52	10YR56	C			Y	0	0	HR	5		M					Q plough pan
	35-60	MCL	10YR56						0	0	HR	15		M					Impen 60 flinty
35	0-30	MCL	10YR42						2	0	HR	6							
	30-40	MCL	10YR44	10YR58	C			S	0	0	HR	1		M					Sl. gleyed
	40-50	HCL	75YR56	10YR68	C			S	0	0	HR	5		M					Sl. gleyed;Imp50
36	0-30	MCL	10YR32						3	0	HR	7							
	30-40	MCL	10YR33						0	0	HR	35		M					Impen 40 flinty
37	0-30	MCL	10YR42						4	0	HR	8							
	30-60	MCL	10YR54	000C00	F				0	0	HR	8		M					
	60-70	MZCL	10YR53	000000	C			Y	0	0	HR	5		M					Impen 70 dry
39	0-30	MCL	10YR43						0	0		0							Tending hcl
	30-48	MCL	10YR53	10YR58	C			Y	0	0		0		M					
	48-70	C	25Y 53	25Y 56	M			Y	0	0		0		P			Y		
40	0-25	MCL	10YR42	10YR56	C			Y	1	0	HR	5							
	25-35	MCL	10YR53	10YR56	C			Y	0	0		0		M					Impen 80 dry
	35-70	C	25Y 62	75YR68	M			Y	0	0		0		P			Y		
41	0-25	MSL	10YR43						1	0	HR	5							Impen 40 dry
	25-50	MSL	10YR43						0	0	HR	5		M					
	50-70	LMS	10YR54						0	0	HR	1		G					
	70-80	MS	10YR54						0	0	HR	0		G					Impen 80 dry
42	0-30	MCL	10YR42						1	0	HR	5							
	30-40	MCL	10YR42	10YR58	C			Y	0	0	HR	15		M					Impen 40 flinty
43	0-20	MCL	10YR32						1	0	HR	5							
	20-30	MCL	25Y 41	10YR58	F				0	0	HR	10		M					
	30-50	MCL	25Y 63	10YR58	C			Y	0	0	HR	25		M					Impen 50 flinty

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	
44	0-30	MCL	10YR42						0	1	HR	5							
	30-35	MCL	10YR43						0	0	HR	8		M					Imp35 dry/flinty
45	0-23	MCL	10YR52	10YR56	C			Y	3	0	HR	5							
	23-70	SCL	25Y 62 63	10YR56	C			Y	0	0	HR	5		M					
	70-85	SCL	25Y 63	10YR58	M			Y	0	0	HR	5		M					
	85-110	C	25Y 72	10YR58	M			Y	0	0		0		P			Y		
	110-120	SCL	25Y 72	10YR68	M			Y	0	0		0		M					
46	0-28	MCL	10YR42	10YR56	C			Y	5	0	HR	10							
	28-50	C	10YR64 46	75YR58	C			Y	0	0	HR	25		P			Y		
	50-80	ZC	10YR61	10YR56	M			Y	0	0		0		P			Y		
47	0-28	MCL	10YR42	10YR56	C				2	0	HR	2							
	28-48	MCL	10YR53	10YR56	C			Y	0	0		0		M					
	48-70	C	10YR61 63	10YR58	M			Y	0	0		0		P			Y		
48	0-38	MCL	10YR42						1	0	HR	3							
	38-60	C	10YR53	000C00	M			Y	0	0		0		P			Y		
49	0-30	MCL	10YR42	000C00	C			Y	4	0	HR	8							Impen 30 flinty
50	0-38	MCL	10YR42	000C00	C			Y	4	0	HR	8							
	38-52	C	25Y 63	000C00	M			Y	0	0	HR	2		P			Y		
51	0-20	MCL	10YR42	10YR56	C			Y	5	0	HR	10							
	20-35	MCL	10YR42 43	10YR56	C			Y	0	0	HR	10		M					
	35-70	C	10YR61	10YR56	M			Y	0	0		0		P			Y		
52	0-25	HCL	10YR42	10YR56	C			Y	0	0		0							
	25-60	C	25Y 61 63	10YR56	M			Y	0	0		0		P			Y		
53	0-25	MCL	10YR42	10YR56	C			Y	0	0		0							
	25-60	C	25Y 63 61	10YR56	M			Y	0	0		0		P			Y		
54	0-25	HCL	25Y 42	10YR56	C			Y	0	0		0							
	25-48	C	25Y 63	10YR46	C			Y	0	0		0		P			Y		
	48-70	C	25Y 63 61	10YR46	C			Y	0	0		0		P			Y		
1P	0-30	MCL	10YR41						12	5	HR	22							Est. 20% stone
	30-45	MCL	10YR42 43						0	0	HR	37		M				Y	Est. 35% stone
	45-55	MCL	10YR42 43						0	0	HR	44		M				Y	Est. 40% stone
	55-70	MCL	10YR42 43						0	0	HR	62		M					Est. 65% stone
	70-120	GH	10YR42 43						0	0		0		P					
2P	0-28	MCL	10YR42						14	0	HR	20							
	28-48	MCL	10YR43						0	0	HR	35		M					