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LAND SOUTH OF HENLEY ROAD EYE AND DUNSDEN OXFORDSHIRE

Agricultural Land Classification
ALC Map and Report

November 1997

Resource Planning Team
Eastern Region
FRCA Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

LAND SOUTH OF HENLEY ROAD EYE AND DUNSDEN OXFORDSHIRE PROPOSED WATER PARK

INTRODUCTION

1 This summary report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 275 6 ha of land bounded by the Henley Road Playhatch Road and the River Thames between Caversham and Sonning Eye in Oxfordshire close to the border with Berkshire The survey was carried out during November 1997

2 The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)[1] on behalf of the Ministry of Agriculture Fisheries and Food (MAFF) in connection with the proposal for the South Oxfordshire Water Park The site is adjacent to a detailed survey carried out by FRCA (formerly Statutory ADAS) in 1992 (FRCA Ref 3303/052/92) The current survey excludes approximately 10 ha of agricultural land within the application area which was assessed in 1992 as Grade 2 and Subgrade 3b The section of the 1992 assessment between Berry Brook and Henley Road adjacent to the current survey is now being worked for gravel Therefore although the land quality assessment is different on each side of the track (Grade 2 against Subgrade 3a) unfortunately the surveys cannot be reconciled

3 The work was conducted by members of the Resource Planning Team in the Eastern Region of the 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 The majority of the site is mapped as Other land which includes gravel workings and a factory producing construction materials flooded gravel pits a marina a sailing club some woodland dwellings farm buildings and tracks The agricultural land is confined to the fringes of the survey area and at the time of survey land use comprised permanent grazing and arable fields either sown with winter cereals or remaining in stubble from the 1997 season The grassland was being used to graze cattle

SUMMARY

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

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

7 The fieldwork was conducted at an average density of slightly more than 1 boring per hectare of agricultural land Fifty nine borings and four soil pits were described

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

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	/ surveyed area	/ site area
2	1 1	2 3	0 4
3a	22 7	46 9	8 2
3b	24 6	50 8	9 0
Other land	227 2		82 4
Total surveyed area	48 4	100	17 6
Total site area	275 6		100

8 The agricultural land on this site has been classified in the range Grade 2 (very good quality) to Subgrade 3b (moderate quality) with substantial areas of Subgrade 3a (good quality) Principal limitations to land quality include soil wetness and soil droughtiness

9 A small area of Grade 2 land has been mapped towards the north east The soils in this area comprise well drained medium loams Given the local climatic parameters this land is slightly restricted on the basis of soil droughtiness as in drier years crop yield may be slightly compromised by a lack of available water

10 Approximately half of the agricultural land at this site has been mapped as Subgrade 3a Land in these areas is principally limited by soil droughtiness although at some locations soil wetness is dominant The majority of the observations comprise a loamy topsoil and upper subsoil overlying a very stony loamy lower subsoil The local climate dictates that soils of this type are likely to have inadequate available water especially during the summer As a result crop yields are likely to be adversely affected Within the Subgrade 3a mapping units some land principally towards the east of the site is limited by soil wetness The soils observed comprise medium loamy topsoils overlying loamy and clayey subsoils The clayey subsoil horizons impede soil drainage and occur at moderate depths in the profile The depth influences the severity of the soil wetness problem and in combination with topsoil texture determines the ALC grade Soil wetness reduces the versatility of the land in terms of access by machinery (e g for cultivations or harvesting) and for grazing by stock if damage to the soil is to be avoided It also has the effect of reducing the level and consistency of yields

11 The remaining agricultural land has been classified as Subgrade 3b The principal limitation in these areas is soil wetness Soils are heavy and comprise a loamy or clayey topsoil overlying clayey subsoils The clayey subsoils impede drainage and occur at a shallow depth Flexibility of agricultural use in terms of cropping and stocking is reduced and yield levels and consistency are also likely to be less predictable than on the land shown as Subgrade 3a

FACTORS INFLUENCING ALC GRADE

Climate

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

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

Table 2 Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SU 750 758	SU 733 754
Altitude	m AOD	36	40
Accumulated Temperature	day C (Jan June)	1481	1476
Average Annual Rainfall	mm	667	673
Field Capacity Days	days	141	142
Moisture Deficit Wheat	mm	116	115
Moisture Deficit Potatoes	mm	111	110
Overall climatic grade	N/A	Grade 1	Grade 1

14 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions

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

16 The combination of rainfall and temperature at this site mean that there is no overall climatic limitation Other local climatic factors such as exposure and frost risk are also not believed to affect the site it is climatically Grade 1

Site

17 The site lies between approximately 35 and 40m AOD The majority of the site is relatively flat The land rises gently along the north western boundary towards the Henley Road Slopes across the site are gentle and do not affect agricultural land quality The River Thames at the southern and eastern boundary is effectively managed and therefore flooding is not significant in terms of agricultural land quality Other site factors such as microrelief are also not significant

Geology and soils

18 The published geological information (BGS 1971) shows the majority of the site to be underlain by loam and alluvial drift deposits Land towards the south west of this area which is mapped as valley gravel has been worked for the gravel

19 The most detailed published soils information for the site (SSEW 1967 SSGB 1968) shows it to comprise a combination of the Purley Thames and Usher soil series Purley soils cover the majority of the agricultural area at the site They are described as well drained brown earths in fine textured loamy drift over calcareous river gravel (SSGB 1968) Thames

series soils are calcareous groundwater gley soils and are mapped in the poorly drained phase They occur at the river margins towards the south of the site extending towards Sonning Eye in the north east of the site and in a band towards the west near Lowfield Farm They may be described as clayey overlying calcareous clayey alluvium (SSGB 1968) Usher series soils are mapped at the margin of the River Thames towards the east of the site in a relatively small area They are described as calcareous brown earths with gleying which are developed in very calcareous stoneless loamy alluvium which overlie either grey clay or calcareous gravel (SSGB 1968) Soils of all these broad types were encountered during the survey

AGRICULTURAL LAND CLASSIFICATION

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

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

Grade 2

22 Land of very good quality has been mapped in a small unit towards the north of the site The principal limitation is soil droughtiness

23 There is one soil type in this area The profiles observed comprise a slightly stony calcareous medium clay loam topsoil overlying slightly chalky calcareous heavy and/or sandy clay loam subsoils to depth The profiles are well drained (Wetness Class I) with no observed evidence of soil wetness The interaction of the local climate with these profiles means that they are slightly restricted in terms of soil droughtiness ie crop yields may be slightly adversely affected especially in dry years However this land is still very versatile and most crop types could be grown successfully with only minor effects on the level and consistency of yields

Subgrade 3a

24 Land of good quality has been mapped in three separate units towards the north west north east and south of the site The principal limitation to land quality in these areas is soil droughtiness with soil wetness dominating occasionally The soils are characterised by the pit observations 2P and 4P (see Appendix II)

25 Two soil types were described during the survey The most common comprises a medium clay loam topsoil overlying heavy clay loam subsoils which become more stony with depth Stone contents in the topsoil and upper subsoil (to between 50 and 60cm) were commonly up to 10% flints by volume The lower subsoils were commonly impenetrable to the soil auger from this depth In the pit observation 2P (see Appendix II) the stone content was measured at 49% flints by volume at 65cm in the lower subsoil In addition the profile was calcareous in many cases and up to 5% chalk fragments occur in addition to the flints further reducing the potential crop available water Gleying within the profile was also observed commonly within 40cm This in the absence of a slowly permeable horizon is suggestive of a fluctuating watertable Given these soil characteristics Wetness Class II best describes the drainage status However soil droughtiness is the overriding limitation The

stony subsoils restrict the moisture content of the profiles and moisture balance calculations indicate that the amount of water available to a growing crop may be insufficient for its needs throughout the growing season The resulting drought stress may adversely affect the level and consistency of yields

26 The second soil type observed represented by Pit 4 (see Appendix II) is principally limited by soil wetness The profiles comprise a medium to heavy clay loam sandy clay loam or occasionally medium silty clay loam topsoil overlying similar upper subsoils These pass to slowly permeable clay or silty clay lower subsoils from between 45 and 70cm The evidence of soil wetness in the profiles ie the depths to gleyed and slowly permeable layers are such that Wetness Class III is applied given the moderate local climate Soil pit 4 (see Appendix II) is generally representative of these soils except that the profile was found to be calcareous and as such it is of slightly better (Grade 2) quality Calcareous profiles were described sporadically throughout the mapping units However the location of this land close to water the range of topsoil textures and the local climatic parameters lead these areas to be assessed as being of Subgrade 3a quality overall Soil wetness restricts the versatility of the land by limiting cultivation and/or grazing opportunities without damaging the soil It is also likely to adversely affect plant growth and therefore the level and consistency of yields may be reduced

27 Occasional observations of both slightly better and slightly worse quality were recorded in the Subgrade 3a map units during the survey However they were of too scattered a distribution to be mapped separately

Subgrade 3b

28 Land of moderate quality has been mapped in four discrete units the majority of which are separated by water filled gravel workings The principal limitation in these areas is soil wetness with soil droughtiness dominating on occasions The soils are characterised by the pit observations 1P and 3P (see Appendix II)

29 The soils across the majority of this area are of a single type They comprise a medium/heavy clay loam or clay topsoil overlying poorly structured gleyed and slowly permeable clay at shallow (20 40cm) depths The profiles are mostly very slightly or slightly stony and occasionally chalky containing up to 10% flints and/or chalk fragments by volume Evidence of soil wetness is recorded in all the profiles either in or immediately below the topsoil in the form of gleying and manganese concretions From the pit observation 3P (see Appendix II) the clay horizons were found to be poorly structured and slowly permeable Given the moderate local climate with this soil drainage status Wetness Class IV is appropriate which in combination with the topsoil textures results in a Subgrade 3b classification The effects of soil wetness are described in para 26 above Subgrade 3b land is less versatile than that classified as Subgrade 3a because the limitations are more severe ie access restrictions are greater and crop yields are more likely to be adversely affected

30 The remaining Subgrade 3b land is that mapped to the south of Lowfield Farm This area is principally limited by a combination of soil wetness soil droughtiness and compaction probably caused during the gravel workings The soil profiles were similar to those described in the Subgrade 3a mapping unit (para 25) ie slightly stony (8% flints by volume) medium clay loam topsoils overlying increasingly stony (15 32% flints by volume) heavy clay loam

subsoils But profiles in this area became impenetrable to the auger and spade at 60 75cm due to an increase in the stone content The major differences were the presence of many manganese nodules in the upper subsoil and the structural condition of this horizon The manganese nodules suggest that groundwater often lies at this depth (30 60cm) and as such Wetness Class IV may be appropriate The upper subsoil (30 60cm) at the representative soil pit 1P (see Appendix II) was considered to be compacted as the peds were very firm in consistence and platy in structure additionally there was no visible porosity As such this horizon is slowly permeable Other similar soils on the site (see para 25) did not contain slowly permeable horizons It is therefore considered that the continual passage of heavy machinery during gravel extraction from the adjacent land has led to the formation of the slowly permeable layer between 30 and 60cm As a result these soils are now classified as Wetness Class IV where Wetness Class II may have previously been appropriate This leads to Subgrade 3b being applied given the interaction between the local climate the restricted water movement in the profile and the medium topsoil textures encountered In addition the combination of soil textures stone content and poor subsoil structural conditions leads to Subgrade 3b also being appropriate on the basis of soil droughtiness in the local climate The effects of soil droughtiness are described above (see para 25) In this area the effects are likely to be more severe and crop yields are likely to be further reduced

31 Occasional observations of both slightly better and slightly worse quality were recorded in the Subgrade 3b map units during the survey However they were of too scattered a distribution to be mapped separately

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet 268 Reading Drift Edition 1 63360 scale*
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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 (1967) *Sheet 268 Reading 1 63360 Scale*
SSEW Harpenden

Soil Survey of Great Britain (1968) *Soils of the Reading District Memoirs of the Soil Survey of Great Britain England & Wales Sheet 268*
SSGB 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	**FM** firm	**EH** extremely hard
VF very friable	**VM** very firm	
FR friable	**EM** extremely firm	

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

11 **POR** Soil porosity If a soil horizon has less than 0 5% biopores >0 5 mm a 'Y will appear in this column

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

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

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

15 Other notations

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

SAMPLE NO	GRID REF	USE	ASPECT		WETNESS		WHEAT		POTS		M REL	EROSN	FROST	CHEM	ALC	
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT		COMMENTS
8	SU74977610	CER				1	1	153	37	114	3	2				DR	2	
9	SU75047603	CER				1	1	149	33	110	1	2				DR	2	
20	SU75007590	RGR				2	2	57	59	57	54	4			Y	DR	4	IMPCH 20 QROOT
21	SU75007586	STB		25	25	4	3B		0		0					WE	3B	
25	SU74937580	STB		20	20	4	3B	76	40	78	33	3B				WE	3B	IMP FLINTS 55
26	SU75007580	STB		25	25	4	3B		0		0					WE	3B	SEE P3
27	SU75147579	STB		57		1	1	101	15	112	1	3A				DR	2	IMP69 DR2 120
28	SU75207580	STB		50		1	1	91	25	97	14	3B				DR	3A	IMP60 DR3A 120
36	SU75017574	STB		22	22	4	3B		0		0					WE	3B	
37	SU75107570	STB		67	67	2	2	133	17	115	4	2				WD	2	
38	SU73607560	PGR		26		2	2	63	53	63	48	4				DR	3A	IMP40 DR3A 120
48	SU75137562	FLW		70	70	2	3A		0		0					WE	3A	
49	SU73407550	PGR				1	1	74	42	74	37	3B				DR	3A	IMP50 DR3A 120
50	SU73507550	PGR		27		2	2	62	54	62	49	4				DR	3A	IMP40 DR3A 120
51	SU73607550	PGR		25		2	3A	48	68	48	63	4				DR	3A	IMP30 DR3A 120
52	SU73707550	PGR		35	35	4	3B		0		0					WE	3B	
65	SU75127554	FLW		60	60	2	3A		0		0					WE	3A	
66	SU73307540	PGR		22	50	3	2	103	13	111	0	3A				WD	2	IMP75 DR2 120
67	SU73407540	RGR		22	22	4	3B		0		0					WE	3B	
68	SU73527540	PGR		27	27	4	3B		0		0					WE	3B	
69	SU73607540	PGR		26		2	2	59	57	59	52	4				DR	3A	IMP40 DR3A 120
84	SU73307527	PGR		35	35	4	3B		0		0					WE	3B	
85	SU73407530	PGR		35		2	2	69	47	69	42	3B				DR	3A	IMP40 DR3A 120
86	SU73507530	PGR		17		2	2	59	57	59	52	4				DR	3A	IMP40 DR3A 120
87	SU73607530	PGR		32		2	2	69	47	69	42	3B				DR	3B	IMP50 DR3B 120
89	SU73807530	PGR		18		2	2	55	61	55	56	4				DR	3B	IMP40 DR3B 120
101	SU75017528	PGR		0	35	4	3B		0		0					WE	3B	
102	SU73207520	PGR		30		2	2	95	21	103	8	3B				DR	3A	IMP65 SEE P2
104	SU73407520	PGR		35		2	2	82	34	85	26	3B				DR	3A	IMP55 DR3A 120
120	SU75007520	PGR		20	35	4	3B		0		0					WE	3B	
121	SU73007510	PGR		28	28	4	3B		0		0					WE	3B	IMP FLINT 60
122	SU73107510	ARA		26		2	1	90	26	94	17	3B				DR	2	IMP60 DR2 120
123	SU73207510	ARA		25		2	2	93	23	100	11	3B				DR	3A	IMP65 DR3A 120
124	SU73307510	ARA		29	55	3	3B		0		0					WE	3B	IMP FLINTS 78
125	SU73407510	PGR		32		2	2	88	28	93	18	3B				WD	3B	IMP 60 SEE P1
141	SU74987510	PGR		20	20	4	3B		0		0					WE	3B	
142	SU72907496	PGR		28		2	2	150	34	113	2	2				WD	2	QSPL 35 Q3B
143	SU73007500	PGR				1	1	48	68	48	63	4				DR	3A	IMP30 DR3A 120
144	SU73147500	ARA				1	1	90	26	95	16	3B				DR	3A	IMP60 DR3A 120
145	SU73237500	ARA				1	1	83	33	87	24	3B				DR	3A	IMP55 DR3A 120
162	SU74967500	PGR		20	20	4	3B		0		0					WE	3B	
163	SU72807490	PGR		20		2	2	93	23	99	12	3B				DR	3A	IMP65 DR3A 120

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	WETNESS CLASS	WHEAT GRADE	WHEAT AP	WHEAT MB	POTS AP	POTS MB	M REL	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
172	SU74067489	PGR		25	25	4	3B			0		0					WE	3B	QG4 HYDRO VEG
175	SU74307490	PGR		45	45	3	3A			0		0					WE	3A	
176	SU74407491	PGR		45	45	3	2			0		0					WD	2	SEE P4
177	SU75407488	PGR		70	70	2	2	134	18	115	4	2					WD	2	
178	SU74607490	PGR		10	35	4	3B			0		0					WE	3B	
179	SU74707490	PGR		0	60	3	2	110	6	112	1	3A					WD	2	IMP85 DR2 120
180	SU74807490	PGR		25	65	3	2	139	23	116	5	2					WD	2	
181	SU74907490	PGR		10	20	4	3B			0		0					WE	3B	
191	SU74107480	PGR		28	28	4	3B			0		0					WE	3B	
192	SU74247480	PGR		20	20	4	3B			0		0					WE	3B	QG4 HYDRO VEG
201	SU74007470	PGR		20	20	4	3B			0		0					WE	3B	
202	SU74157470	PGR		25	25	4	3B			0		0					WE	3B	
212	SU74057460	PGR		28	28	4	3B			0		0					WE	3B	
226	SU73967450	PGR		45	45	3	3A			0		0					WE	3A	
239	SU73877440	PGR		22	22	4	3B			0		0					WE	3B	
250	SU73807430	PGR		22	22	4	3B			0		0					WE	3B	
261	SU73827423	PGR		45	45	3	3A			0		0					WE	3A	
P1	SU73407510	PGR		30	30	4	3B	88	27	93	17	3B				Y	WD	3B	COMPACT 30 60
P2	SU73207520	PGR		24		2	2	91	21	100	7	3B					DR	3A	IMP70 DR3A 120
P3	SU75007580	STB		24	24	4	3B	89	27	101	10	3B					WE	3B	PIT 55 AUG 70
P4	SU74407491	RGR		42	42	3	2	130	14	114	3	2					WD	2	PIT 70 AUG 120

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	ABUN	CONT	PED COL	GLEY	STONES 2	6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
8	0 33	MCL	10YR42						1	0	HR	5						Y	
	33 65	HCL	10YR44						0	0	CH	5		M				Y	
	65 120	SCL	10YR54						0	0	CH	3		M				Y	
9	0 26	MCL	10YR42						1	0	HR	5						Y	
	26 55	SCL	10YR54						0	0	CH	3		M				Y	
	55 120	SCL	10YR64						0	0	CH	5		M				Y	
20	0 10	HCL	10YR42 52	10YR56	C	D		Y	0	0	HR	2						Y	
	10 20	CH	10YR81 64						0	0	HR	2		P				Y	IMP CHALK 20
21	0 25	HCL	10YR41						1	0	HR	5						Y	3% CHALK
	25 70	C	25Y 51	75YR58	M	D		Y	0	0	HR	3				Y		Y	3% CHALK
25	0 20	HCL	10YR32 52	10YR46	C	D	FEW MN	Y	0	0	HR	2						Y	
	20 45	C	10YR62	10YR46	M	D	FEW MN	Y	0	0		0		P		Y			
	45 55	C	10YR63	10YR46	M	D	FEW MN	Y	0	0	HR	20		P		Y			IMP FLINTS 55
26	0 25	C	10YR32	10YR56	C	F		Y	0	0	HR	2						Y	SEE P3
	25 60	C	25Y 62	75YR56	M	D		Y	0	0		0		P		Y		Y	
27	0 27	HCL	10YR42						0	0	HR	5						Y	5% CHALK
	27 57	HCL	10YR54						0	0		0		M				Y	
	57 69	HCL	25Y 71	75YR58	C	D		Y	0	0		0		M				Y	IMP FLINTS 69
28	0 27	HCL	10YR42						0	0	HR	2						Y	
	27 50	C	10YR54						0	0		0		M				Y	
	50 60	C	25Y 71 63	75YR58	C	D		Y	0	0	HR	20		M				Y	IMP FLINTS 60
36	0 22	C	10YR42						2	0	HR	5						Y	5% CHALK
	22 60	C	25Y 51	75YR58	M	D		Y	0	0	CH	5		P		Y		Y	
37	0 25	HCL	10YR42						0	0	HR	2						Y	
	25 67	HCL	10YR54						0	0		0		M				Y	
	67 120	HZCL	25Y 63	10YR46	C	D		Y	0	0		0		P		Y		Y	
38	0 26	MCL	10YR44						0	0	HR	10							
	26 40	HCL	10YR53	10YR46	C	D	COM MN	Y	0	0	HR	10		M					IMP FLINTS 40
48	0 25	C	10YR42						0	0	HR	3						Y	
	25 70	C	25Y 53	10YR66	F	F	FEW MN	Y	0	0		0		M				Y	
	70 120	C	25Y 53 63	10YR68	C	D		Y	0	0	CH	5		M		Y		Y	
49	0 25	MCL	10YR43						3	0	HR	10							
	25 45	MSZL	10YR43 53	10YR56	C	F			0	0	HR	20		M					
	45 50	HCL	10YR54	10YR56	F	D			0	0	HR	30		M					IMP FLINTS 50
50	0 27	MCL	10YR43						0	0	HR	10							
	27 40	C	10YR62	10YR56	M	D		Y	0	0	HR	15		M				Y	IMP FLINTS 40

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	ABUN	CONT	PED COL	GLEY	STONES 2	6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
51	0 25	HCL	10YR43						0	0	HR	10							
	25 30	HCL	10YR42	10YR56	C	F		Y	0	0	HR	10		M					IMP FLINTS 30
52	0 35	MCL	10YR43						0	0	HR	5						Y	
	35 65	C	10YR61	10YR56	M	D	FEW MN	Y	0	0	HR	10		P		Y		Y	
	65 90	C	10YR52	10YR58	M	D	FEW MN	Y	0	0	HR	10		P		Y		Y	
	90 120	C	10YR51	10YR58	M	D	FEW MN	Y	0	0	HR	15		P		Y		Y	
65	0 26	C	10YR31 41						0	0	HR	3						Y	2% CHALK
	26 60	C	25Y 53	10YR66	F	F	FEW MN		0	0		0		P		Y		Y	
	60 120	C	25Y 53	10YR68	C	D	COM MN	Y	0	0	CH	5		P		Y		Y	
66	0 22	MZCL	10YR41	10YR46	C	D		Y	0	0	CH	5						Y	
	22 50	MZCL	10YR51	10YR58	C	D	FEW MN	Y	0	0	CH	15		M				Y	
	50 75	C	25Y 51 61	10YR58	M	D		Y	0	0	CH	3		P		Y		Y	IMP FLINTS 75
67	0 22	MZCL	10YR31						0	0	HR	2							
	22 80	C	25Y 61 62	10YR68	M	D		Y	0	0	CH	5		P		Y			2% FLINTS
	80 120	C	05Y 51	10YR68	M	D		Y	0	0	HR	2		P		Y			
68	0 27	MCL	10YR43						0	0	HR	10							
	27 60	C	10YR62	10YR56	C	D	MANY MN	Y	0	0	HR	15		P		Y			
	60 80	C	10YR63	10YR56	M	D	MANY MN	Y	0	0	HR	15		P		Y			
69	0 26	SCL	10YR43						0	0	HR	10							
	26 40	HCL	10YR42	10YR56	C	D		Y	0	0	HR	15		M					IMP FLINTS 40
84	0 20	MCL	10YR32						2	0	HR	8							
	20 35	SCL	10YR44						0	0	HR	25		M					
	35 70	C	25Y 51 61	10YR58	M	D		Y	0	0	HR	3		P		Y			
	70 120	C	25Y 61	10YR68	M	D		Y	0	0	HR	10		P		Y			
85	0 35	MCL	10YR42	10YR46	C	D		Y	0	0	HR	5							
	35 40	MCL	10YR52 53	10YR56	M	D		Y	0	0	HR	5		M					IMP FLINTS 40
86	0 17	MCL	10YR44						0	0	HR	10							
	17 40	HCL	10YR41	10YR56	M	D		Y	0	0	HR	15		M					IMP FLINTS 40
87	0 22	SCL	10YR44	10YR46	C	D		S	0	0	HR	10							SLIGHTLY GLEYED
	22 32	MSL	10YR44	10YR46	C	D		S	0	0	HR	15		M					SLIGHTLY GLEYED
	32 50	C	10YR42	10YR56 66	C	D		Y	0	0	HR	25		P					IMP FLINTS 50
89	0 18	SCL	10YR43						0	0	HR	10							
	18 40	SCL	75YR42	75YR46	C	D		Y	0	0	HR	20		M					IMP FLINTS 40
101	0 20	MCL	10YR32	10YR56	C	D		Y	0	0	HR	5						Y	
	20 35	HZCL	25Y 52	75YR56	C	D		Y	0	0	HR	2		M				Y	
	35 80	C	25Y 62	75YR58	M	D		Y	0	0	HR	2		P		Y		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	
102	0 30	MCL	10YR33 43						0	0 HR	5							SEE P2
	30 60	HCL	10YR54 52	10YR56	C	D	COM MN	Y	0	0 HR	5		M					
	60 65	HCL	10YR54 52	10YR56	C	D	COM MN	Y	0	0 HR	30		M					IMP FLINTS 65
104	0 35	MCL	10YR42	10YR46	C	D		Y	0	0 HR	5							
	35 55	MCL	10YR53	10YR56	C	D		Y	0	0 HR	25		M					IMP FLINTS 55
120	0 20	MCL	10YR42						0	0 HR	5						Y	
	20 35	HCL	25Y 52	10YR56	C	D		Y	0	0 HR	2		M				Y	
	35 50	C	25Y 62	75YR58	M	D		Y	0	0 HR	2		P		Y		Y	
	50 100	C	25Y 71	75YR58	M	D	COM MN	Y	0	0 SLST	5		P		Y		Y	
121	0 28	HCL	10YR41	10YR46	C	D		Y	0	0 HR	2							
	28 60	C	25Y 51	10YR58	M	D		Y	0	0 HR	5		P		Y			
122	0 26	MSZL	10YR42						1	0 HR	5							
	26 50	MCL	10YR53	10YR58	C	F		Y	0	0 HR	5		M				Y	5% CHALK
	50 60	HCL	10YR52	10YR58	C	D		Y	0	0 HR	30		M				Y	5% CH IMP 60
123	0 25	MCL	10YR42						1	0 HR	8							
	25 55	MCL	10YR52 53	10YR56	C	F		Y	0	0 HR	5		M					
	55 65	HCL	10YR52 53	10YR56	C	F		Y	0	0 HR	20		M					IMP FLINTS 65
124	0 29	MCL	10YR43						1	0 HR	5							
	29 55	MCL	75YR53	75YR46	C	F		Y	0	0 HR	5		M					
	55 78	C	75YR42	75YR56	M	D	COM MN	Y	0	0 HR	15		P		Y			IMP FLINTS 78
125	0 32	MCL	75YR43	75YR46	C	F		Y	0	0 HR	5							SEE P1
	32 60	HCL	10YR52	75YR46	M	D	MANY MN	Y	0	0 HR	15		M					IMP FLINTS 60
141	0 20	HCL	10YR32						0	0 HR	2						Y	
	20 50	C	25Y 62	75YR58	M	D		Y	0	0 HR	2		P		Y		Y	
	50 100	C	25Y 71	75YR58	C	D		Y	0	0 SLST	5		P		Y		Y	
142	0 28	MCL	10YR42	10YR46	F	D			0	0 HR	2							
	28 35	MCL	10YR52 53	10YR58	C	D		Y	0	0 HR	5		M					
	35 120	HCL	25Y 51 52	10YR58	M	D		Y	0	0 HR	5		M					
143	0 20	MSZL	10YR42						0	0 HR	5							
	20 30	MCL	10YR43						0	0 HR	30		M					IMP FLINTS 30
144	0 30	MCL	10YR41 42						1	0 HR	5							
	30 60	MCL	10YR54 56						0	0 HR	10		M					IMP FLINTS 60
145	0 26	MCL	10YR43						1	0 HR	5							
	26 55	C	75YR44						0	0 HR	10		M					IMP FLINTS 55
162	0 20	MCL	10YR32						0	0 HR	2						Y	
	20 50	C	25Y 62	75YR58	M	D		Y	0	0 SLST	5		P		Y		Y	
	50 100	C	25Y 71	75YR58	M	D		Y	0	0 SLST	5		P		Y		Y	

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	ABUN	CONT	PED COL	GLEY	STONES 2	6	LITH	STRUCT/ TOT	CONSIST	SUBS STR	POR	IMP	SPL	CALC	
163	0 20	MCL	10YR33	10YR46	C	F		Y	0	0	HR	2							
	20 50	HCL	25Y 61	10YR58	M	D		Y	0	0	HR	5		M					
	50 65	HCL	25Y 61	10YR58	M	D		Y	0	0	HR	25		M					IMP FLINTS 65
172	0 25	HCL	25Y 32 42	10YR58	C	D		Y	0	0	HR	2						Y	
	25 60	C	25Y 61	10YR58	M	D		Y	0	0	CH	5		P		Y		Y	
175	0 22	HCL	25Y 42						0	0	HR	2						Y	
	22 45	C	25Y 53 54						0	0	CH	5		M				Y	
	45 70	C	25Y 52 61	10YR68	C	D		Y	0	0	CH	5		P		Y		Y	
176	0 20	MCL	25Y 42						0	0	HR	2						Y	SEE P4
	20 45	C	25Y 53	10YR66	F	F			0	0	CH	5		M				Y	
	45 70	C	25Y 53	10YR58	C	D		Y	0	0	CH	5		P		Y		Y	
177	0 25	HCL	25Y 42						0	0	HR	2						Y	
	25 70	C	25Y 53 54						0	0	CH	5		M				Y	
	70 120	C	25Y 53	10YR58	C	D		Y	0	0	CH	5		P		Y		Y	
178	0 10	MZCL	10YR32						0	0		0						Y	
	10 35	HZCL	25Y 63	10YR56	C	D		Y	0	0		0		M				Y	
	35 100	C	25Y 62	75YR58	M	D		Y	0	0		0		P		Y		Y	
179	0 35	MCL	10YR42	10YR56	C	D		Y	0	0	HR	5						Y	
	35 60	HCL	25Y 52	75YR56	C	D		Y	0	0	HR	2		M				Y	
	60 75	C	25Y 62	75YR58	M	D		Y	0	0	HR	2		P		Y		Y	
	75 85	C	25Y 62	75YR58	M	D		Y	0	0	HR	10		P		Y		Y	
180	0 25	MCL	10YR42						0	0		0						Y	
	25 40	MCL	10YR53	75YR46	C	D		Y	0	0		0		M				Y	
	40 65	HCL	25Y 52	75YR56	C	D		Y	0	0		0		M				Y	
	65 120	C	25Y 71	75YR58	M	D		Y	0	0		0		P		Y		Y	
181	0 10	MZCL	10YR32						0	0	HR	2						Y	
	10 20	HZCL	25Y 52	75YR56	C	D		Y	0	0	HR	2		M				Y	
	20 40	ZC	25Y 62	75YR58	C	D		Y	0	0	HR	2		P		Y		Y	
	40 100	ZC	25Y 71	75YR58	C	D		Y	0	0		0		P		Y		Y	
191	0 28	HCL	25Y 32 42						0	0	HR	2						Y	
	28 40	C	25Y 53	10YR66	C	D		Y	0	0	CH	5		P		Y		Y	
	40 70	C	25Y 61	10YR58	M	D		Y	0	0	CH	5		P		Y		Y	
192	0 20	C	25Y 42	10YR58	C	D		Y	0	0	HR	2						Y	
	20 40	C	25Y 53	10YR58	M	D		Y	0	0	CH	5		P		Y		Y	
	40 70	C	25Y 51	10YR58	M	D		Y	0	0	CH	5		P		Y		Y	
201	0 20	HCL	10YR32						0	0	HR	2						Y	
	20 40	C	25Y 52 53	10YR58	C	F		Y	0	0	CH	5		P		Y		Y	
	40 70	C	25Y 62 61	10YR58	C	D		Y	0	0	CH	5		P		Y		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	
202	0 25	HCL	25Y 32 42						0	0	HR	2						Y	
	25 50	C	25Y 52 53	10YR58	C	D		Y	0	0	CH	5		P			Y	Y	
	50 70	C	25Y 61	10YR58	M	D		Y	0	0	CH	5		P			Y	Y	
212	0 28	HCL	25Y 32 42	10YR58	C	D		Y	0	0	HR	2						Y	
	28 45	C	25Y 52	10YR58	C	D		Y	0	0	CH	5		P			Y	Y	
	45 70	C	25Y 61	10YR58	M	D		Y	0	0	CH	5		P			Y	Y	
226	0 22	HCL	10YR32						0	0	HR	2						Y	
	22 35	HCL	25Y 54						0	0	CH	5		M				Y	
	35 45	C	25Y 53	10YR66	F	F			0	0	CH	10		M				Y	
	45 80	C	25Y 53	10YR68	C	D		Y	0	0	CH	10		P			Y	Y	
239	0 22	MCL	10YR32						0	0	HR	2						Y	
	22 50	C	25Y 52 53	10YR58	C	D		Y	0	0	CH	2		P			Y	Y	
	50 70	C	25Y 61	10YR58	M	D		Y	0	0	CH	2		P			Y	Y	
250	0 22	MCL	10YR32						0	0	HR	2						Y	
	22 60	C	25Y 51 52	10YR68	M	D		Y	0	0	CH	2		P			Y	Y	
261	0 20	HCL	10YR32						0	0	HR	2						Y	
	20 45	C	25Y 53	10YR66	F	F			0	0	CH	2		M				Y	
	45 80	C	25Y 53	10YR68	C	F		Y	0	0	CH	2		P			Y	Y	
P1	0 30	MCL	75YR42	75YR46	C	F		Y	3	1	HR	8						N	AT BOR 125 COM MN
	30 60	HCL	25Y 53	10YR56	C	F	25YR53	Y	0	0	HR	15	MDCPL	FM P	Y		Y	N	COMPCT MANYMN SVD
	60 75	HCL	25Y 52	10YR56	C	F	25YR53	Y	0	0	HR	32	MDCAB	FM M	N		N	N	IMP FLINTS 75 SVD
P2	0 24	MCL	10YR52	10YR56	C	D	FEW MN	Y	1	0	HR	4						N	AT BOR 102
	24 61	HCL	10YR53	10YR56	C	D	FEW MN	Y	0	0	HR	7	MDCSAB	FR M	N		N	N	SVD SIEVED
	61 70	HCL	10YR62	10YR56	M	D	FEW MN	Y	0	0	HR	49		M	N			N	IMP FLINTS 70 SVD
P3	0 24	HCL	10YR32	10YR56	C	D		Y	0	0	HR	2						Y	AT BOR 26
	24 46	C	25Y 62	75YR46	M	D		Y	0	0	HR	3	MASSIV	FM	Y		Y	Y	
	46 70	C	25Y 61	75YR58	M	D		Y	0	0	HR	3	WKCAB	FM	Y		Y		
P4	0 20	MCL	10YR32						0	0		0						Y	AT BOR 176
	20 29	HCL	10YR42						0	0		0	MDVCAB	FR M				Y	
	29 42	C	10YR52	10YR56	F	F			0	0		0	MDVCAB	FR M				Y	
	42 100	C	25Y 62	75YR56	C	D	COM MN	Y	0	0	HR	5	MDCAB	FM M	Y		Y	Y	
	100 120	C	25Y 62	75YR56	C	D	05Y 61	Y	0	0	HR	40		P				Y	