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**ARUN DISTRICT LOCAL PLAN-OBJECTOR SITES
Land At Court Wick Park, Littlehampton, West Sussex
(Objector Sites 10061 and 10085)**

**Agricultural Land Classification
ALC Map and Report**

July 1998

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT

ARUN DISTRICT LOCAL PLAN - OBJECTOR SITES LAND AT COURT WICK PARK, LITTLEHAMPTON, WEST SUSSEX (OBJECTOR SITES 10061 AND 10085).

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 76.4 ha of land at Court Wick Park to the north west of Littlehampton in West Sussex. The survey was carried out during July 1998.

2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)¹ on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with its statutory input to the Arun District Local Plan. Part of this area, to the north east, had been previously surveyed in 1994 (FRCA Ref: 4202/066/94) and information from this has been used to assist in compiling this report. This survey supersedes any previous ALC information for this land.

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

4. At the time of survey the majority of the agricultural land was in wheat and barley. Towards the north of the site some areas were in permanent grass which was being utilised either for grazing or, for silage and hay production. Areas mapped as 'Other land' within the survey area include tracks, dwellings, farm buildings, industrial units, glasshouses on hard standings. Some land, to the north, which has been recently filled with inert waste was also mapped as 'Other Land' because, at the time of survey, it had no vegetation cover or topsoil material present.

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 objector sites and all of the surveyed land are summarised in Tables 1 to 3 inclusive.

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. In total, 71 borings and four soil pits were described during this survey with an additional 8 borings and one soil pit being described in 1994.

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

Table 1: Area of grades - Objector Site 10061

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	42.2	63.6	58.5
3b	24.2	36.4	33.5
Other land	5.8	-	8.0
Total surveyed area	66.4	100	92.0
Total site area	72.2	-	100

Table 2: Area of grades - Objector Site 10085

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	0.9	100	21.4
Other land	3.3	-	78.6
Total surveyed area	0.9	100	21.4
Total site area	4.2	-	100

Table 3: Area of grades and other land - Land at Court Wick Park

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	43.1	64.0	56.4
3b	24.2	36.0	31.7
Other land	9.1	-	11.9
Total surveyed area	67.3	100	88.1
Total site area	76.4	-	100

8. The agricultural land within the survey area has been classified as either Grade 2 (very good quality) or Subgrade 3b (moderate quality). Principal limitations to land quality include soil droughtiness and soil wetness.

9. Within the area mapped as Grade 2 the soils principally comprise medium loamy topsoils and subsoils. Some variation was observed with medium silty and light loamy textures recorded on occasion. Given the prevailing local climatic parameters this land is slightly restricted in terms of the amount of moisture available for crop growth and as such has a minor soil droughtiness limitation. This can adversely affect both the level and consistency of crop yields, especially in drier years.

10. The remaining agricultural land has been classified as of Subgrade 3b quality. To the west of the site medium loamy topsoils overlie clayey subsoils and the land is principally limited by soil wetness. The clayey subsoils impede soil drainage to the extent that, in the local climate, Subgrade 3b is appropriate. Soil wetness reduces the versatility of the land in terms of access by machinery (e.g. for cultivations or harvesting) and grazing by livestock if damage to the soil is to be avoided. Soil wetness will also adversely affect seed germination and root growth and will therefore reduce the level and consistency of yields.

11. Towards the north of the site much of the land has been artificially raised to the level of the railway line at the site boundary. This has been achieved by tipping inert waste onto the original land surface and importing soil material. As a result the land classification is limited to Subgrade 3b by soil wetness in winter and soil droughtiness in summer. The soils observed comprise a medium loam topsoil and upper subsoil passing to a chalky clay which overlies the waste material at moderate depths. The clay impedes drainage to the extent that Subgrade 3b is appropriate due to soil wetness given the local climatic parameters and the disturbed nature of the profile. In addition, the restricted depth of the soil resource leads to a moderate soil droughtiness limitation. The effects of these limitations are described in paragraphs 9 and 10. However, in this area their effects are likely to be more severe, ie the periods of trafficking are likely to be more restricted and the moisture available to plants is further reduced so increasing the adverse effects on crop yields and consistency.

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 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		
		TQ 013 040	TQ 021 038	TQ 016 034
Grid reference	N/A			
Altitude	m, AOD	5	5	5
Accumulated Temperature	day°C (Jan-June)	1541	1541	1541
Average Annual Rainfall	mm	752	747	747
Field Capacity Days	days	155	154	154
Moisture Deficit, Wheat	mm	120	121	121
Moisture Deficit, Potatoes	mm	117	118	118
Overall climatic grade	N/A	Grade 1	Grade 1	Grade 1

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

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

16. The combination of rainfall and temperature within this survey area means that there is no overall climatic limitation. However, climatic factors do interact with soil properties to

influence soil wetness and soil droughtiness. At this locality the high moisture deficits present as a result of the local climate may enhance the likelihood of soil droughtiness problems.

17. At the local scale differences in the aspect, gradient and elevation of the land can significantly modify the overall climate, particularly in relation to temperature, exposure and frost risk. This area is mapped as being rather exposed by the Met. Office (1969). This may constitute a significant climatic factor in its own right, especially on land that is otherwise of high quality. Persistent strong or cold winds can be damaging to crops or cause stress to livestock, especially in wet weather. Many coastal areas are exposed to strong, salt-laden winds and their effects can extend for several miles inland. At this site however, there was no evidence, in the form of wind pruning of surrounding trees and hedgerows, that the land is adversely affected by exposure. Therefore it is considered that this does not have a significant effect on the final classification.

Site

18. The survey area lies between approximately 2m and 5m AOD. Much of the land is level at around 5m AOD. To the west and north of the site, the land gently falls away to approximately 2m AOD onto the floodplain of the River Arun. None of the slopes on the site are of sufficient gradient to adversely affect land quality. Although a significant part of the site is on a river floodplain, it is protected by both flood defence barriers on the river and the railway embankments which form the western and northern boundary to the site. The areas that have been disturbed are either at or below the level of the railway. Other restrictions such as adverse microrelief do not affect the survey area.

Geology and soils

19. The most detailed published geological information for this area (BGS, 1972 and 1975) shows the majority to be underlain by brickearth drift deposits, overlying Cretaceous Upper Chalk. Towards the west of the site alluvium is mapped in association with the River Arun floodplain. To the extreme north a small area of valley gravel drift is shown.

20. The most detailed published soils information covering the area (SSGB, 1967) shows the site to comprise soils from four series which, in order of coverage, largest first, are the Lyminster, Arundel, Hamble (in two phases) and Calcetto series'. Lyminster soils are mapped across the majority of the site and are described as a variably stony brown earth soil comprising moderately to well drained sandy loam to clay loam textures which can overlie intercalated bands of sand and gravel. Arundel series soils are mapped along the western boundary of the site and are generally coincident with the lower lying alluvial land found in this area. These are described as poorly drained clayey groundwater gley soils developed in deep estuarine alluvial drift deposits. Hamble series soils are mapped in two phases (deep and shallow over pebbly drift) towards the east of the site. In the deep phase, they are described as well drained deep brown earths developed in silty drift. The shallow phase comprises similar textures but they overlie pebbly drift which may contain sandier textures. The Calcetto soil series are mapped in small discrete areas on the slopes between the Lyminster and Arundel series'. They are described as a range of loamy non-calcareous gley soils developed in loamy pebbly marine drift. Drainage is imperfect to poor with textures in the range sandy loam to clay loam. Similar soils to the above were found to be on the site, with the exception of the Calcetto series which could not be distinguished from the Lyminster type soils. The soil map

predates the raising of the land surface on the site and consequently the disturbed area towards the north of the site is not represented by any of the soil descriptions.

AGRICULTURAL LAND CLASSIFICATION

21. The details of the classification of the survey area are shown on the attached ALC map and the area statistics of each grade are given in Table 3.

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

Grade 2

23. Land of very good quality has been mapped over the majority of the area surveyed. The principal limitation to land quality is soil droughtiness. The soils are characterised by the pit observations, 3P and 4P (see Appendix II).

24. Two soil types are described within this Grade at this site, none of which exhibited significant evidence of wetness and as such all are assigned to Wetness Class I. The most extensive soil type is characterised by soil pit 4. These principally occur towards the east of the mapped unit. The soils comprise non-calcareous medium clay loam, occasionally fine sandy silt loam or medium silty clay loam topsoils, overlying similar or sandier (sandy clay loam, occasionally medium sandy loam) subsoils to 120cm. All the soils encountered are moderately structured and permeable. These profiles were assessed as being very slightly stony, containing up to 5% total flints by volume. The combination of these soil factors in the prevailing local climate, characterised by high soil moisture deficits, results in a slight soil droughtiness limitation. This means that there may be insufficient moisture available in the profile for crops to realise their full potential, especially in drier years. This can have an adverse effect on the level and consistency of yields and leads to a Grade 2 classification being appropriate.

25. The second soil type in the Grade 2 map unit is characterised by soil pit 3 (see Appendix II) and occurs principally towards the west of the Grade 2 unit. The soils are essentially similar, being well drained (Wetness Class I) and comprising non-calcareous medium clay loam topsoils over similar or sandier (sandy clay loam or medium sandy loam) subsoils. The principal difference is in subsoil stone content. Typically the profiles were impenetrable to the soil auger below 50cm due to flints in the profile. The pit (3P) shows that the soils are not particularly stony (up to 15% flints by volume in the lower subsoil), but the dry soil conditions prevalent at the time of the survey prevented deeper investigation by the soil auger. The net result is that this area is also slightly limited by soil droughtiness to Grade 2. Occasional observations may be of a slightly poorer quality but their scattered location precluded their being mapped separately.

Subgrade 3b

26. Land of moderate quality has been mapped over the remaining agricultural land, to the west and north of the surveyed area. Principal limitations to land quality include both soil wetness with, additionally, soil droughtiness also present where the land has been disturbed. The soils are characterised by the pit observations 1P and 2P (see Appendix II).

27. Towards the west, on the lowest land, soil wetness alone limits the classification. The soils in this area are characterised by pit 1 and comprise a virtually stoneless heavy clay loam topsoil overlying a gleyed, poorly structured slowly permeable clay subsoil to at least 120cm. The clay reduces vertical water movement in the soil to the extent that it is poorly drained (Wetness Class IV). This, in combination with the topsoil texture and local climate lead this area to be appropriately placed in Subgrade 3b. Excessive soil wetness can adversely affect crop growth and development. It can also limit the flexibility of the land by reducing the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock.

28. Towards the north of the site some land has been raised by the addition of inert waste material, to the height of the adjacent railway. This waste has then been covered with a moderate depth of imported soil resource. Many of the soil auger borings in the area were impenetrable at shallow depths and as such the classification of this area is based around the pit observation, 2P (see Appendix II). Topsoils across the site comprised a slight to moderately stony (10-20% flints and up to 10% chalk by volume) calcareous medium clay loam. From evidence obtained in the pit, 2P, this overlies similar subsoil horizon(s) to 58cm. The lower subsoil horizon is a poorly structured very slowly permeable very firm clay containing approximately 30% chalk fragments by volume. This may have been deliberately compacted during reinstatement in order to 'cap' the waste. Below this 'cap' the waste was encountered, at 85cm. This was found to comprise blocks of concrete, bricks and glass fragments. The land was in grass and roots were observed to penetrate the soil to the depth of the clay (58cm). This combination of textures, stoniness and the restriction in rooting depth causes the moisture available to crops to be limited to the extent that, in the local climate, Subgrade 3b is appropriate. The effects of soil droughtiness are described in paragraph 25 above, but in this area, the effects are likely to be more severe, especially in the drier and warmer summer months. The moderate (58cm) depth to the very slowly permeable clay horizon would normally lead to a Wetness Class III classification under the prevailing climatic conditions. However, because of the highly compact form of the clay, any underdrainage scheme is unlikely to be fully effective. Consequently a lower grading in relation to soil wetness is considered appropriate due to the increased duration of waterlogging (Wetness Class IV). As a result, given the medium topsoil textures present across this area, a conservative Subgrade 3b classification has been applied. The effects of soil wetness are described above in paragraph 28. In this area they are likely to be of a similar nature to those encountered along the western boundary of the site, restricting winter access to the land if damage to the soil is to be avoided. Occasional observations of slightly better quality were noted in this part of the site. However, these have not been mapped separately because of their scattered nature.

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SOURCES OF REFERENCE

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SSEW: Harpenden

APPENDIX I

DESCRIPTIONS OF THE GRADES AND SUBGRADES

Grade 1: Excellent Quality Agricultural Land

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

Grade 2: Very Good Quality Agricultural Land

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

Grade 3: Good to Moderate Quality Land

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

Subgrade 3a: Good Quality Agricultural Land

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

Subgrade 3b: Moderate Quality Agricultural Land

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

Grade 4: Poor Quality Agricultural Land

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

Grade 5: Very Poor Quality Agricultural Land

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

APPENDIX II

SOIL DATA

Contents:

Sample location map

Soil abbreviations - explanatory note

Soil boring descriptions (boring and horizon levels)

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

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

Boring Header Information

1. **GRID REF:** national 100 km grid square and 8 figure grid reference.
2. **USE:** Land use at the time of survey. The following abbreviations are used:

ARA: Arable	WHT: Wheat	BAR: Barley
CER: Cereals	OAT: Oats	MZE: Maize
OSR: Oilseed rape	BEN: Field beans	BRA: Brassicae
POT: Potatoes	SBT: Sugar beet	FCD: Fodder crops
LIN: Linseed	FRT: Soft and top fruit	FLW: Fallow
PGR: Permanent pasture	LEY: Ley grass	RGR: Rough grazing
SCR: Scrub	CFW: Coniferous woodland	OTH: Other
DCW: Deciduous woodland	BOG: Bog or marsh	SAS: Set-Aside
HTH: Heathland	HRT: Horticultural crops	PLO: Ploughed

3. **GRDNT:** Gradient as estimated or measured by a hand-held optical clinometer.
4. **GLEYSPL:** 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	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M. REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB					
1	TQ01400410	PGR			1	1	62	-59	62	-56	4		Y	DR 3B	IMP 40 2P
2	TQ01500410	PGR		36 45	3	3A	100	-21	108	-10	38			WE 3A	
3	TQ01310406	PGR			1	1	90	-31	98	-20	38			DR 3B	IMP 70 Q3A DR
4	TQ01100400	PGR		10 42	3	3A	90	-31	99	-19	38			WE 3B	IMP 65
5	TQ01200400	PGR		0 15	4	3B	78	-43	83	-35	38			WE 3B	
6	TQ01300400	PGR			1	1	18	-103	18	-100	4		Y	DR 3B	IMP 10 2P
7	TQ01400400	PGR		20	2	2	71	-50	71	-47	38		Y	DR 3B	IMP 45 2P
8	TQ01490399	PGR		20	2	2	41	-80	41	-77	4		Y	DR 3B	IMP 25 2P
9	TQ01600400	PGR	N	1	1	1	161	40	123	5	2			DR 2	
10	TQ01700400	PGR	N	1	75	1	1	162	41	124	6	2		DR 2	
11	TQ01800400	PGR	N	1		1	1	180	59	141	23	1			1
12	TQ01900400	PGR	N	1	80	1	1	165	44	127	9	2		DR 2	
13	TQ01100390	PGR		10	2	2	50	-71	50	-68	4		Y	DR 3B	IMP 30 2P
14	TQ01200390	PGR		10	2	2	33	-88	33	-85	4		Y	DR 3B	IMP 20 2P LOC
15	TQ01300390	PGR			1	1	36	-85	36	-82	4		Y	DR 3B	IMP 25 2P
16	TQ01400390	PGR		22	2	2	101	-20	113	-5	3A		Y	DR 3A	IMP 70 2P
17	TQ01500391	PGR		20	1	1	83	-38	83	-35	38		Y	DR 3B	IMP 50 2P
18	TQ01630390	WHT			2	2	60	-61	60	-58	4		Y	DR 3B	IMP 35 2P
19	TQ01700390	WHT		80	1	1	155	34	117	-1	2			DR 2	
20	TQ01800390	WHT		110	1	1	154	33	116	-2	2			DR 2	
21	TQ01900390	WHT		75	1	1	153	32	115	-3	2			DR 2	SL GLEY 55
22	TQ02000390	WHT		92	1	1	155	34	117	-1	2			DR 2	
24	TQ01100380	RGR			1	1	46	-75	46	-72	4		Y	DR 3B	IMP 30 2P
25	TQ01100376	RGR			1	1	51	-70	51	-67	4		Y	DR 3B	IMP 35 2P
26	TQ01200380	PGR			1	1	127	6	115	-3	2		Y	DR 2	IMP 95 2P
27	TQ01300380	WHT		27 27	4	3B	91	-30	103	-15	38			WE 3B	
28	TQ01400380	BAR			1	1	145	24	108	-10	2			DR 2	
29	TQ01500380	BAR	W	1	1	1	146	25	108	-10	2			DR 2	
30	TQ01600380	BAR			1	1	149	28	114	-4	2			DR 2	
31	TQ01700382	BAR		70	1	1	161	40	125	7	2			DR 2	
32	TQ01800380	WHT		56	1	1	159	38	121	3	2			DR 2	
33	TQ01900384	WHT		70	1	1	154	33	116	-2	2			DR 2	SL GLEY 40
34	TQ02000384	WHT		80	1	1	144	23	118	0	2			DR 2	IMP 110 FLINTS
35	TQ02100380	WHT		60	1	1	149	28	110	-8	2			DR 2	
36	TQ02200380	WHT		25	2	1	151	30	139	21	1			1	IMP 95 FLINTS
37	TQ01100370	WHT		22 22	4	3B	89	-32	101	-17	38			WE 3B	
38	TQ01200370	WHT		25 25	4	3B	90	-31	102	-16	38			WE 3B	
39	TQ01300370	WHT		26 26	4	3B	91	-30	103	-15	38			WE 3B	
40	TQ01400370	BAR	W	1	1	1	147	26	108	-10	2			DR 2	BORDER 3A POTS
41	TQ01500370	BAR			1	1	148	27	112	-6	2			DR 2	
42	TQ01600370	BAR			1	1	152	31	115	-3	2			DR 2	
43	TQ01700370	BAR			1	1	152	31	114	-4	2			DR 2	SL GLEY 60

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS		
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP						MB	DRT
44	TQ01800370	PGR			1	1	51	-70	51	-67	4		Y	DR	3B	IMP 30	
45	TQ01940368	WHT			1	1	152	31	113	-5	2			DR	2		
46	TQ02020372	STB	100		1	1	151	30	117	-1	2			DR	2		
49	TQ01200360	WHT	26	26	4	3B	90	-31	102	-16	3B			WE	3B		
50	TQ01300362	WHT	26	26	4	3B	97	-24	102	-16	3B			WE	3B		
51	TQ01400360	BAR W	1	56	1	1	151	30	114	-4	2			DR	2		
52	TQ01500360	BAR W	1	70	1	1	150	29	114	-4	2			DR	2		
53	TQ01600360	BAR			1	1	117	-4	114	-4	3A			DR	3A	IMP85 G2DR?	
54	TQ01700360	BAR			1	1	155	34	117	-1	2			DR	2	SLGLE70 4PLOC	
55	TQ01800360	WHT	80		1	1	162	41	126	8	2			DR	2		
56	TQ01900360	WHT			1	1	158	37	126	8	2			DR	2		
58	TQ01550325	LEY			1	1	49	-72	49	-69	4		Y	DR	4	IMP 30 FLINTS	
59	TQ01300350	WHT	26	26	4	3B	92	-29	104	-14	3B			WE	3B		
60	TQ01400350	LEY	0	0	25	4	3B	127	6	102	-16	3A		WE	3B	1P LOC	
61	TQ01500350	LEY W	2		1	1	81	-40	81	-37	3B			DR	3B	IMP 50 3P LOC	
62	TQ01600350	WHT			1	1	152	31	114	-4	2			DR	2		
63	TQ01700350	WHT	65		1	1	157	36	119	1	2			DR	2		
64	TQ01800350	WHT			1	1	161	40	125	7	2			DR	2		
65	TQ01900350	WHT			1	1	181	60	126	8	2			DR	2		
66	TQ02000350	WHT	70		1	1	166	45	126	8	2			DR	2		
67	TQ02100350	WHT			1	1	166	45	126	8	2			DR	2		
68	TQ01400340	LEY	24	24	4	3B	91	-30	103	-15	3B			WE	3B		
69	TQ01500340	LEY W	1		1	1	59	-62	59	-59	4			DR	4	IMP 35 FLINTS	
70	TQ01600340	WHT	55		1	1	125	4	112	-6	3A			DR	2	IMP95 DR120=2	
71	TQ01700340	WHT			1	1	96	-25	99	-19	3B			DR	3A	IMP55 DR120=3	
72	TQ01800340	WHT			1	1	161	40	125	7	2			DR	2		
73	TQ01400330	LEY	23	23	4	3B	126	5	103	-15	3A			WE	3B		
74	TQ01500330	LEY	21	21	4	3B	89	-32	100	-18	3B			WE	3B		
75	TQ01600330	WHT			1	1	165	44	126	8	2			DR	2	SL GLEY 75	
76	TQ01700330	WHT	85		1	1	192	71	147	29	1				1		
77	TQ01500320	LEY	30	40	4	3B	129	8	106	-12	3A			WE	3B		
78	TQ01600312	WHT			1	1	105	-16	105	-13	3A			DR	3A	I50 Q GR 1/2	
1P	TQ01400350	LEY	20	20	4	3B	88	-33	100	-18	3B			WE	3B	PIT 60	
2P	TQ01200390	PGR W	1	19	58	3	3B	77	-44	80	-38	3B		Y	WD	3B	IMP85 DR&RTSS8
3P	TQ01500350	LEY W	2	89	1	1	140	19	109	-9	2			DR	2	P102A120SLGL68	
4P	TQ01700360	STB			1	1	154	33	116	-2	2			DR	2	PIT 105 AUG12	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES----			STRUCT/ CONSIST	SUBS			CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR	
14	0-10	MCL	10YR31						0	0	0					2P LOCATION
	10-20	SCL	10YR42	10YR56	C	D		Y	0	0	0					IMP 20 FLINTS
15	0-20	SCL	10YR44						0	0	HR	10			Y	2P DISTURBED
	20-25	HCL	10YR43						0	0	HR	40		M	Y	IMP 25 +15%CH
16	0-22	MCL	10YR43						0	0	HR	5			Y	SEE 2P DISTURBED
	22-45	MZCL	10YR43 53	10YR56	C	D	FEW MN	Y	0	0	HR	5		M	Y	
	45-70	HCL	25Y 53	10YR58	M	D	MANY MN	Y	0	0	HR	5		M	Y	+GLASS IMP 70
17	0-20	MZCL	10YR41 42						0	0	HR	5			Y	SEE 2P DISTURBED
	20-35	MZCL	10YR53	10YR56	C	D		Y	0	0	CH	5		M	Y	+5% HR
	35-50	MZCL	10YR53	10YR58	M	D		Y	0	0	CH	5		M	Y	IMP 50 +10% HR
18	0-30	MCL	10YR32	10YR46	F	D		Y	0	0	HR	3				ROOT MOTS-DISTUR
	30-35	MCL	10YR42 52						0	0	HR	5		M	Y	IMP 35 +3% HR
19	0-30	MCL	10YR42						0	0	HR	2				
	30-80	MCL	10YR44 54				FEW MN		0	0		0		M		
	80-120	HCL	10YR52 53	10YR56 58	C	F	FEW MN	Y	0	0		0		M		
20	0-30	MCL	10YR42						0	0	HR	2				
	30-65	MCL	10YR44						0	0	HR	2		M		BORDER MZCL
	65-110	MCL	10YR52 53	10YR56 58	F	F	FEW MN		0	0		0		M		
	110-120	HCL	10YR52 53	10YR56 58	C	D	FEW MN	Y	0	0		0		M		
21	0-30	MCL	10YR42						0	0	HR	2				
	30-55	MCL	10YR44						0	0	HR	5		M		
	55-75	MCL	10YR44 54	10YR46 58	C	F	FEW MN	S	0	0		0		M		SLIGHTLY GLEYED
	75-120	MCL	10YR52 53	10YR58	C	D	COM MN	Y	0	0		0		M		
22	0-33	MCL	10YR42						0	0	HR	2				
	33-70	MCL	10YR44						0	0		0		M		
	70-92	HCL	10YR44 46				FEW MN		0	0		0		M		
	92-120	HCL	10YR52 53	10YR56 58	C	D	FEW MN	Y	0	0		0		M		
24	0-22	HCL	10YR42 53						0	0	HR	5			Y	SEE 2P DISTURBED
	22-30	MCL	10YR63						0	0	CH	40		M	Y	IMP30 +15%HR
25	0-25	HCL	10YR42 43						0	0	CH	10			Y	+10% HR SEE 2P
	25-35	HCL	10YR53						0	0	CH	20		M	Y	IMP 35 +15% HR
26	0-28	MZCL	10YR44	10YR58	C	D			0	0	HR	5			Y	ROOTMOTS.DISTURE
	28-55	MCL	10YR44 54	10YR56	F	F			0	0	HR	5		M		
	55-90	HCL	10YR43 44	10YR58	F	D			0	0	HR	5		M	Y	
	90-95	MZCL	10YR73						0	0	HR	5		M	Y	CHALKDRIFT IMP95
27	0-27	HCL	10YR32	10YR56	F	F			0	0	HR	2				SEE 1P
	27-70	C	25Y 51	10YR58	M	D	COM MN	Y	0	0	HR	2		P	Y	Y

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT		GLEYS	>2	>6		LITH	TOT	STR		POR
28	0-35	SCL	10YR42					0	0	0						
	35-120	SCL	10YR44					0	0	HR 8		M				
29	0-30	SCL	10YR42					0	0	0						
	30-120	SCL	10YR44					0	0	HR 5		M				
30	0-27	SCL	10YR42					0	0	0						
	27-60	MCL	10YR44					0	0	0		M				
	60-100	SCL	10YR54					0	0	0		M				
	100-120	C	10YR54					0	0	0		M				
31	0-30	MZCL	10YR42					0	0	0					BORDER MCL	
	30-70	MZCL	10YR44 46				FEW MN	0	0	0		M			BORDER MCL	
	70-120	MCL	10YR52 53 10YR56	C	F		COMM MN	Y	0	0	0		M			
32	0-32	MZCL	10YR42					0	0	HR 3					BORDER MCL	
	32-56	MZCL	10YR44 46				FEW MN	0	0	HR 3		M				
	56-120	HCL	10YR53 54 10YR56 58	C	F		FEW MN	Y	0	0	0		M			
33	0-26	MCL	10YR42					0	0	HR 2						
	26-40	MCL	10YR46 54					0	0	0		M				
	40-70	HCL	10YR53 54 10YR46	C	D		FEW MN	S	0	0	0		M			SLIGHTLY GLEYED
	70-120	HCL	10YR52 53 10YR56 58	C	F		COM MN	Y	0	0	0		M			
34	0-35	MCL	10YR42					0	0	HR 2						
	35-52	MCL	10YR44					0	0	0		M				
	52-80	HCL	10YR44				FEW MN		0	0	0		M			
	80-110	HCL	10YR53 10YR56 58	C	D		FEW MN	Y	0	0	HR 5		M			IMP 110 FLINTS
35	0-28	MCL	10YR42					1	0	HR 5					SLIGHTLY SANDY	
	28-60	MCL	10YR54					0	0	HR 8		M			SLIGHTLY SANDY	
	60-90	SCL	10YR54 53 10YR56	C	F			Y	0	0	HR 3		M			
	90-120	SCL	10YR63 10YR68	C	D		COM MN	Y	0	0	0		M			HEAVY SCL
36	0-25	FSZL	10YR42					0	0	HR 3					SEE 3P	
	25-60	FSZL	10YR52 54 10YR58	C	F		FEW MN	Y	0	0	HR 5		M			
	60-95	MCL	10YR53 54 10YR58	C	D		COM MN	Y	0	0	HR 5		M			IMP 95 FLINTS
37	0-22	HCL	10YR32 10YR56	F	D				0	0	HR 2					SEE 1P
	22-70	C	25Y 52 51 10YR58	M	D		FEW MN	Y	0	0	0		P		Y	
38	0-25	HCL	10YR32 10YR56	F	F				0	0	HR 2					SEE 1P
	25-45	C	25Y 51 10YR58	C	D			Y	0	0	HR 1		P		Y	
	45-70	C	25Y 52 10YR58	M	D			Y	0	0	0		P		Y	
39	0-26	HCL	10YR32						0	0	HR 2					SEE 1P
	26-70	C	25Y 51 10YR58	M	D		COM MN	Y	0	0	0		P		Y Y	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- PED			----STONES-----			STRUCT/ TOT CONSIST	SUBS STR POR IMP	SPL	CALC	
				COL	ABUN	CONT	COL.	GLE	>2					>6
40	0-30	MCL	10YR34					1	0	HR	3		SLIGHTLY SANDY	
	30-55	MCL	10YR44					0	0	HR	8	M	SLIGHTLY SANDY	
	55-100	MSL	10YR46					0	0	HR	20	M		
	100-120	MSL	10YR46					0	0	HR	10	M		
41	0-25	MCL	10YR34					1	0	HR	5			
	25-40	MCL	10YR44					0	0	HR	8	M		
	40-85	MCL	10YR44					0	0	HR	3	M	SLIGHTLY SANDY	
	85-95	MCL	10YR46					0	0	HR	3	M	SLIGHTLY SANDY	
	95-120	MSL	10YR46					0	0	HR	15	M	BORDER MCL	
42	0-30	MCL	10YR44					1	0	HR	2		SLIGHTLY SANDY	
	30-90	MCL	10YR44					0	0	HR	3	M		
	90-120	MCL	10YR46					0	0	HR	3	M		
43	0-20	MCL	10YR43					1	0	HR	4			
	20-30	MCL	10YR44					0	0	HR	2	M		
	30-40	MCL	10YR46					0	0		0	M		
	40-60	HCL	10YR46					0	0		0	M		
	60-85	HCL	10YR46	75YR46	C	D	FEW MN	S	0	0	0	M	SLIGHTLY GLEYED	
	85-120	MCL	10YR46					0	0		0	M	SOME SAND	
44	0-30	MCL	10YR42					0	0	HR	5		Y IMP 30 DISTURBED	
45	0-30	MCL	10YR42					0	0	HR	3		Y	
	30-75	MCL	10YR54 56					0	0	HR	5	M	Y	
	75-120	HCL	10YR64 54	10YR46 56	F	F	FEW MN		0	0	0	M		
46	0-28	MCL	10YR42					0	0	HR	2			
	28-65	MCL	10YR54					0	0		0	M		
	65-100	HCL	10YR54	10YR66	C	D	FEW MN	S	0	0	0	M	SLIGHTLY GLEYED	
	100-120	C	10YR53 54	10YR68	C	D	COM MN	Y	0	0	0	M		
49	0-26	HCL	10YR32	10YR56	F	F			0	0	HR	2		SEE 1P
	26-70	C	25Y 52	10YR58	M	D	FEW MN	Y	0	0	HR	2	P	Y Y
50	0-26	HCL	10YR32	10YR56	F	F			0	0	HR	2		Y SEE 1P
	26-80	C	25Y 52	10YR58	M	D	COM MN	Y	0	0	HR	2	P	Y Y
51	0-32	MCL	10YR42 43					0	0	HR	2			
	32-56	MCL	10YR44 53					0	0	HR	5	M	SOME SAND	
	56-85	MCL	10YR53 63	10YR56 58	C	F	FEW MN	Y	0	0	HR	5	M	SOME SAND
	85-120	HCL	25Y 53	10YR46 56	C	D	COM MN	Y	0	0	HR	5	M	SOME SAND
52	0-31	MCL	10YR42 43					0	0	HR	2			
	31-70	MCL	10YR44					0	0	HR	5	M	SOME SAND	
	70-120	HCL	10YR53 54	10YR56 58	C	D	COM MN	Y	0	0	HR	5	M	SOME SAND

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED	----STONES----			STRUCT/	SUBS	SPL	CALC		
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT			CONSIST	STR
53	0-33	SCL	10YR43							0	0	HR	1		SEE 3P	
	33-75	MCL	10YR44							0	0	HR	1	M		
	75-85	CSL	10YR46							0	0	HR	10	M	IMP 85 FLINTS	
54	0-28	MCL	10YR44							0	0	HR	1		4P LOCATION	
	28-45	MCL	10YR44							0	0		0	M		
	45-70	MCL	10YR54	10YR58	F	F	FEW MN			0	0		0	M		
	70-85	HCL	10YR54	10YR56	C	D	COM MN	S		0	0		0	M	SLIGHTLY GLEYED	
	85-120	SCL	10YR54	10YR58	C	F		S		0	0		0	M	SLIGHTLY GLEYED	
55	0-35	MZCL	10YR42							0	0		0			
	35-80	MZCL	10YR44 46							0	0		0	M		
	80-120	MCL	10YR53	10YR46	56	C	F	FEW MN	Y	0	0		0	M		
56	0-20	FSL	10YR42							0	0		0			
	20-70	FSL	10YR53							0	0		0	M		
	70-80	SCL	10YR54							0	0		0	M		
	80-120	C	10YR54	10YR56	C	D	FEW MN	S		0	0		0	M	SLIGHTLY GLEYED	
58	0-30	HCL	10YR32 42							0	0	HR	10		IMP 30 DISTURBED	
59	0-26	HCL	10YR32	10YR56	F	F				0	0	HR	1		SEE 1P	
	26-70	C	25Y 51	10YR58	M	D		Y		0	0		0	P	Y	
60	0-25	HZCL	25Y 51	75YR56	C	D		Y		0	0		0		N	1P LOCATION
	25-120	ZC	10YR51	10YR56	M	D	FEW MN	Y		0	0		0	P	Y	
61	0-25	MZCL	10YR32 42							0	0	HR	3		3P LOCATION	
	25-50	MCL	10YR43 53							0	0	HR	15	M	IMP 50 FLINTS	
62	0-40	MCL	10YR43							0	0	HR	3		SOME SAND	
	40-65	SCL	10YR56							0	0	HR	2	M	NO MOTS VISIBLE	
	65-120	SCL	10YR56	10YR58	F	F				0	0	HR	5	M	VAR. MSL--(H)SCL	
63	0-34	MCL	10YR42 43							0	0		0			
	34-65	MCL	10YR44					FEW MN		0	0		0	M		
	65-120	HCL	10YR63 53	10YR56	58	C	D	FEW MN	Y	0	0		0	M	SOME SAND	
64	0-32	MZCL	10YR42							0	0		0			
	32-120	MZCL	10YR54							0	0		0	M		
65	0-22	FSL	10YR42							0	0		0			
	22-120	FSL	10YR43							0	0		0	M		
66	0-30	FSL	10YR42							0	0		0			
	30-70	FSL	10YR43							0	0		0	M		
	70-120	SCL	10YR53	10YR56	C	F		Y		0	0		0	M		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES-----			STRUCT/ CONSIST	SUBS			SPL	CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR			IMP
67	0-25	FSL	10YR42						0	0	0							
	25-70	FSL	10YR53						0	0	0			M				
	70-120	SCL	10YR44						0	0	0			M				
68	0-24	HCL	10YR31						0	0	HR	1					SEE 1P	
	24-45	C	25Y 52 51	10YR58	M	D		Y	0	0	0			P		Y	Y	
	45-70	C	25Y 52	10YR58	C	D		Y	0	0	0			P		Y		
69	0-20	MZCL	10YR32						0	0	HR	3					BORDER MCL SEE 3P	
	20-35	MZCL	10YR43						0	0	HR	15		M			BORDER FSZL/IMP35	
70	0-25	MCL	10YR43						0	0	HR	3					SOME SAND SEE 3P	
	25-55	MCL	10YR54						0	0	HR	2		M				
	55-85	SCL	10YR54	10YR56	58	C	F	Y	0	0	HR	5		M				
	85-95	SCL	10YR54	10YR56	58	C	F	Y	0	0	HR	15		M			IMP 95 FLINTS	
71	0-25	FSZL	10YR43 44						0	0	HR	2					SEE 3P	
	25-50	MCL	10YR54						0	0	HR	5		M				
	50-55	MCL	10YR54						0	0	HR	20		M			IMP 55 FLINTS	
72	0-30	MZCL	10YR42						0	0	0							
	30-120	MZCL	10YR53						0	0	0			M				
73	0-23	HCL	10YR32						0	0	0					Y	SEE 1P	
	23-120	C	05Y 52	10YR58	M	D	COM MN	Y	0	0	0			P		Y	Y	
74	0-21	HCL	10YR32	10YR46	C	D		Y	0	0	0						SEE 1P	
	21-70	C	05Y 62 61	75YR58	M	D		Y	0	0	HR	2		P		Y	PLASTIC	
75	0-30	FSZL	10YR43						0	0	HR	2						
	30-50	MCL	10YR44						0	0	HR	2		M			BORDER SCL	
	50-75	SCL	10YR44	10YR58	F	D	FEW MN		0	0	0			M				
	75-120	MCL	10YR54	10YR58	C	D	FEW MN	S	0	0	HR	3		M			HCL@120 SL.GLEYE	
76	0-35	FSZL	10YR42 43						0	0	0						BORDER MZCL	
	35-85	FSZL	10YR44						0	0	HR	5		M				
	85-120	HCL	10YR52 53	10YR46	58	C	F	COM MN	Y	0	0	0		M				
77	0-30	HCL	10YR32 42						0	0	0						SEE 1P	
	30-45	C	25Y 52 53	10YR58	M	D		Y	0	0	0			P		Y		
	45-120	C	05Y 61 62	75YR58	M	D		Y	0	0	0			P		Y		
78	0-35	FSZL	10YR42 43						0	0	HR	5					BORDER MZCL	
	35-50	ZL	10YR43 44						0	0	HR	5		M			IMP 50 FLINTS	
1P	0-20	HCL	10YR21	75YR46	56	C	D		Y	0	0	HR	2				PIT @ BOR 60	
	20-70	C	05Y 52	75YR46	58	M	D	FEW MN	Y	0	0	0	STCPR	FM	P	Y	Y	PIT 70

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----		PED COL.	----STONES----			STRUCT/ CONSIST	SUBS			SPL	CALC	
				COL	ABUN		CONT	GLY	>2		>6	LITH	TOT			STR
2P	0-19	SCL	10YR42	10YR46	C	D		Y	0	1	HR	5			Y	@ BOR 14 M ROOTS
	19-42	SCL	10YR53	10YR46	C	D		Y	0	0	HR	8	MDCSAB FR M	N	N	+3% CH CF ROOTS
	42-58	MCL	10YR42	10YR58	C	D		Y	0	0	HR	30	MDCSAB FR M	Y	N	+5% CH FF ROOTS
	58-85	C	10YR54	10YR68	M	D		Y	0	0	CH	30	MASSIV VM P	Y	V	Y
3P	0-16	MSZL	10YR32						0	0		0				PIT @ BOR 61
	16-68	SCL	10YR43						0	0	HR	3	MDCSAB FR M	N		
	68-89	SCL	10YR54 44	10YR56	C	D		S	0	0	HR	3	MDCSAB FR M	N	N	SLIGHTLY GLEYED
	89-115	HCL	10YR62	10YR56	C	D	10YR53	Y	0	0	HR	15	WKCSAB FR M	N	N	PIT 102 AUG 120
4P	0-25	MCL	10YR43						0	0	HR	1				@BOR54 SL.SANDY
	25-49	MCL	10YR42						0	0	HR	1	MDCSAB FR M	N	N	
	49-88	MCL	10YR43 44	75YR46	C	D	FEW MN	S	0	0	HR	1	MDCAB FR M	N	N	SLIGHTLY GLEYED
	88-120	SCL	10YR44 54	10YR58	C	D	FEW MN	S	0	0		0	MDCAB FR M	N	N	SL.GLEYPIT105A120