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**Little Rollright Quarry Extension,
Chipping Norton, Oxfordshire**

**Statement of Physical Characteristics
November 1997**

**Resource Planning Team
Eastern Region
FRCA Reading**

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STATEMENT OF PHYSICAL CHARACTERISTICS

LITTLE ROLLRIGHT QUARRY EXTENSION, CHIPPING NORTON, OXFORDSHIRE.

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) and site physical characteristics survey on approximately 15 hectares of land at Little Rollright Quarry, near Chipping Norton in Oxfordshire. 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). The work was carried out in order to determine land quality and site physical characteristics of land affected by proposals for an extension to the existing quarry and subsequent agricultural restoration. 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 all of the agricultural land was under arable cropping. Land shown as Other Land comprises the existing quarry and an area of scrub which surrounds it.

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 below.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% site area	% surveyed area
3b	8.2	54.7	100.0
Other Land	6.8	45.3	-
Total surveyed area	8.2	54.7	100.0
Total site area	15.0	100.0	-

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

7. The fieldwork was conducted at an average density in excess of 1 boring per hectare. A total of 12 borings and two soil inspection pits were described. These utilised the existing quarry face and were considered to be representative of the site as a whole.

8. All of the agricultural land on this site has been classified as Subgrade 3b (moderate quality), due to soil wetness and workability restrictions. The soils are derived from interbedded mudstones and limestones and, as such comprise variably calcareous, clayey soils interlain with several narrow horizons of limestone. The limestone itself is generally weathered and highly fissured. It is therefore easily rootable; allowing crops to exploit water from depth. However, the interbedded clay horizons are normally poorly structured from variable depths, thus impeding drainage through the profile and causing waterlogging. With the heavy topsoil textures, this degree of soil wetness will restrict the timing and flexibility of cropping, stocking and cultivations.

FACTORS INFLUENCING ALC GRADE

Climate

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

10. 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).

11. 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.

Table 2: Climatic and altitude data

Factor	Units	Values	Values
Grid reference	N/A	SP 280 306	SP 284 307
Altitude	m, AOD	245	235
Accumulated Temperature	day°C (Jan-June)	1228	1240
Average Annual Rainfall	mm	725	720
Field Capacity Days	days	163	162
Moisture Deficit, Wheat	mm	80	82
Moisture Deficit, Potatoes	mm	63	65
Overall climatic grade	N/A	Grade 2	Grade 2

12. 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 (AT0, January to June), as a measure of the relative warmth of a locality.

13. On this site, the combination of the relatively cool temperatures and relatively high rainfall (in a regional context), results in an overall climatic limitation which restricts this land to Grade 2.

14. Climatic factors can also interact with soil properties to influence soil wetness and droughtiness. At this locality the field capacity day values are slightly high (in regional terms) thus increasing the likelihood of soil wetness. Correspondingly, the crop adjusted soil moisture deficits are low thus decreasing the likelihood of soil droughtiness.

15. Other local climatic factors such as frost risk and exposure are unlikely to affect agricultural land quality on this site.

Site

16. All of the agricultural land on this site is gently sloping, ranging from a maximum of 248m AOD in the south west to 235m AOD in the north east.

17. Flood risk, gradient and micro-relief do not adversely affect land quality in this area.

Geology and soils

18. The relevant geological sheet (BGS, 1968) maps the entire site as the Sharp's Hill Beds, which are described as grey mudstones and argillaceous/silty limestones, overlying the Chipping Norton Limestone.

19. The most recent published soils information for this area (SSEW, 1983) maps the Elmton 1 soil association across the entire site. These soils are described as 'Shallow, well drained, brashy, calcareous, fine loamy soils over limestone. Some similar deeper soils and some non-calcareous and calcareous soils.' (SSEW, 1983).

20. Detailed field examination broadly confirmed the existence of soils similar to those described above.

AGRICULTURAL LAND CLASSIFICATION

21. 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.

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.

Subgrade 3b

23. All of the agricultural land on this site has been classified as Subgrade 3b (moderate quality), principally due to soil wetness and workability restrictions. The soil profiles comprise slightly stony (0-10% total limestone brash), non-calcareous, heavy silty clay loam

or clay topsoils. These overlie variably calcareous clay upper subsoils with 0-50% limestone brash and occasional shelly bands (10-20%), before the profiles become impenetrable over interbedded limestone and clay at 35-100cm depth. Soil inspection Pits 1 & 2 show that the *interstitial limestone beds are weathered and highly fissured, thus allowing roots to penetrate to depth.* Therefore, crop rooting is not significantly impeded although, the amount of profile available water for crops is reduced by the presence of hard limestone bands. Due to the relatively moist climate, droughtiness is not an overriding limitation on this site. The majority of soil profiles are, however, gleyed or slightly gleyed within 40cm as a result of prolonged seasonal waterlogging. This is due to a drainage impedance caused by poorly structured and slowly permeable clay subsoils from between 20-70cm depth. The soils on this site have therefore been assessed as Wetness Class II to IV (depending depth to slowly permeable layer). In combination with the heavy topsoil textures and local climatic regime, all of this land has been classified as Subgrade 3b due to soil wetness limitations. Opportunities for mechanised operations and grazing by livestock may be limited, reducing flexibility of agricultural use. Wet soils may also inhibit seed germination and growth.

24. Occasional borings of slightly higher quality were also noted. However, these were not mapped separately due to their limited number and extent.

SOIL RESOURCES

Soil Units : Consideration for Restoration

25. The following section describes the pattern of topsoil and subsoil resources on the site. It should be emphasised that section is not a soil stripping plan, but merely an illustration of the soil resources available for restoration on the site. Due to the natural variability of soils the depths and volumes of topsoil and subsoil units given in Table 3 below should be treated with caution. In general terms, all the available existing topsoil and subsoil resources should be retained for restoration purposes. When considering these details it is important to remember that soils were sampled to a maximum depth of 120 cm during survey work. In some cases soil resources will extend below this depth. For example, approximately 150 cm of soil resource was observed in the existing quarry cut above the Chipping Norton Limestone bedrock. This does however, contain several narrow horizons of weathered limestone.

26. The complicated nature of the interbedded limestone and clay horizons within the Sharp's Hill Beds, means that the soil profiles are very variable across the site. On such a small area it is impossible to divide the site into coherent and uniform soil units. The entire site is therefore treated as one unit.

Unit 1

27. The topsoil comprises, on average, 26cm (range = 20-35 cm) of soil resource and extends across the 8.2 ha agricultural area. The topsoil generally consists of a brown, yellowish brown or dark yellowish brown(10YR 4/3, 4/4 or 10YR 5/4), heavy silty clay loam or clay which comprise moderately well developed, fine angular blocky peds with a friable

consistency. The topsoil matrix is non-calcareous and contains only 2-6% hard limestone brash; 2-8% of these measured more than 2cm in diameter (2% of which are >6cm).

28. The subsoil resource comprises clay horizons interspersed with several narrow (10-30cm) limestone beds which occur from 35-100cm depth. As the limestone is rootable to depth, however, the subsoil resource is considered to comprise an average of 94cm (range = 85-100cm). The colours of the clay horizons range from brown to grey though they are more typically a light brownish grey to light olive grey (25Y 5/2, 6/2, 6/3, 6/4 or 05Y 5/2, 6/1, 6/2). Gleying is generally present throughout the subsoil horizons where common to many, faint or distinct, ochreous mottles (10YR 5/6, 5/8, 6/6, 6/8 or 75YR 5/6, 5/8) are present. The subsoils are generally calcareous throughout; containing 0-50% hard limestone brash and occasional soft shelly bands (10-20%).

29. The subsoils vary in structural composition and condition depending on amount of limestone fragments present. Where described, the stonier (15-50% limestone) upper subsoils, possess moderate structural conditions, comprising weakly developed, medium sub-angular blocky peds of firm consistence. The less stony clays and most of the lower subsoils were, where described, more poorly structured. These comprise either moderately well developed, very coarse platy or strongly developed, very coarse angular blocky peds; both of which are of a firm consistency. All of the poorly structured clays contain <0.5% biopores and, where thick enough, are slowly permeable.

Table 3: Soil Resource Data (Agricultural Areas)

Unit	Average Depth (cm)	Typical Textures	Area (ha)	Volume (m ³)
Topsoil	26	HZCL, C	8.2	21,320
Subsoil	94	C, or interbedded C & hard limestone	8.2	77,080
Total Soil Resource	120	-	8.2	98,400

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SOURCES OF REFERENCE

British Geological Survey (1968) Sheet No. 218, *Chipping Norton*. 1:50,000 scale, (Solid & 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*.
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*
SSEW: Harpenden

APPENDIX 1

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.

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. **GLEYS:** 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	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS	
				GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP						MB
1	SP28303070	ARA	NE	3			1	1	48	-34	48	-17	3B		DR	3A	I35 Q 3B WET
2	SP28403070	ARA	NE	2	045	020	3	3B	74	-8	77	12	3A		WK	3B	SL. GLEY 20
3	SP27993063	ARA	W	1	025	025	4	3B	105	23	101	36	2		WE	3B	I95 LMST
4	SP28103060	ARA			031	031	4	3B	98	16	106	41	2		WE	3B	I75 LMST
5	SP28203060	ARA			025	025	4	3B	87	5	95	30	2		WE	3B	I65 LMST
6	SP28303060	ARA			030		2	3B	76	-6	76	11	3A		WK	3B	I50 LMST
7	SP28403060	ARA	NE	2	020		2	3A	60	-22	60	-5	3B		WD	3A	I40 SEE 1P
8	SP28483060	ARA	NE	2	020	020	4	3B	97	15	105	31	2		WE	3B	I90 LMST
9	SP27973052	ARA	S	1	035	035	4	3B	80	-2	85	20	3A		WE	3B	I58 LMST
10	SP28023058	ARA					1	3A	74	-8	74	9	3A		WD	3A	I48 Q 3B WET
11	SP28323053	ARA	SE	2	022		2	3B	74	-8	78	13	3A		WK	3B	I60 LMST
12	SP28423054	ARA	SE	2	030		2	3B	63	-19	63	-2	3A		WK	3B	I40 LMST
1P	SP28153063	ARA			025	070	3	3B	74	-8	53	-12	3A		WE	3B	NEAR AB 4+5
2P	SP28153063	ARA			020	020	4	3B	107	25	98	33	2		WE	3B	NEAR AB 4+5

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED	----STONES----			STRUCT/	SUBS								
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC		
1	0-20	HZCL	10YR44 00					8	0	HR	20						Y			
	20-35	C	10YR43 00					0	0	HR	30	M					Y	IMP LMST		
2	0-20	C	10YR44 00					0	0	HR	5									
	20-45	C	10YR44 00	05YR58 00	C	D		S	0	0	0	P					Y			
	45-55	C	25Y 52 62	10YR58 00	M	D		Y	0	0	SLST	10	P				Y	Y	IMP LMST	
3	0-25	HZCL	10YR44 00					3	2	HR	6									
	25-40	C	05Y 62 00	10YR66 00	C	F		Y	0	0	HR	2	P				Y			
	40-79	C	05Y 52 00	10YR68 00	C	D		Y	0	0	HR	5	P				Y			
	79-95	C	05Y 52 00	10YR66 00	M	F		Y	0	0	SLST	20	P				Y	Y	SLST = SHELLS	
4	0-31	HZCL	10YR44 00					2	0	HR	3									
	31-50	C	10YR53 00	05YR58 00	C	F		Y	0	0	HR	1	P				Y			
	50-75	C	05Y 52 00	75YR58 00	C	D		Y	0	0	HR	5	P				Y	Y	IMP LMST	
5	0-25	HZCL	10YR44 00					2	3	HR	5									
	25-55	C	10YR53 00	10YR58 00	C	D		Y	0	0	HR	2	P				Y			
	55-65	C	25Y 53 00	10YR58 00	M	D		Y	0	0	HR	10	P				Y	Y	IMP LMST	
6	0-30	C	10YR54 00					0	0	HR	5									
	30-50	C	10YR53 00	10YR58 00	C	D		Y	0	0	HR	15	M				Y	WEATHERED LMST		
7	0-20	HZCL	10YR42 00					0	1	HR	5									
	20-40	C	25Y 52 00	10YR58 00	M	D		Y	0	0	HR	10	M				Y	WEATHERED LMST		
8	0-20	C	10YR44 00					4	0	HR	6									
	20-40	C	25Y 63 64	10YR56 00	C	D		Y	0	0	HR	5	P				Y			
	40-55	C	05Y 52 00	10YR66 00	C	F		Y	0	0	HR	5	P				Y			
	55-75	C	05Y 52 00	10YR56 00	M	D		Y	0	0	0	0	P				Y			
	75-90	C	05Y 52 00	10YR56 00	C	F		Y	0	0	SLST	20	M				Y	WEATHERED LMST		
9	0-35	C	10YR44 00					3	2	HR	6									
	35-58	C	10YR53 64	10YR58 00	C	F		Y	0	0	HR	5	P				Y	IMP LMST		
10	0-35	C	10YR44 00					4	3	HR	8									
	35-48	C	25Y 64 00					0	0	HR	10	M					Y	WEATHERED LMST		
11	0-22	C	10YR44 00					1	0	HR	2									
	22-45	C	25Y 64 00	75YR56 00	C	D		Y	0	0	HR	5	P					TOO THIN FOR SPL		
	45-60	C	25Y 63 62	75YR56 00	C	D		Y	0	0	HR	50	M				Y	WEATHERED LMST		
12	0-30	C	10YR44 00					1	0	HR	2									
	30-40	C	25Y 64 00	75YR58 00	C	D		Y	0	0	HR	2	P					TOO THIN FOR SPL		
1P	0-25	HZCL	10YR43 00					0	0	HR	5	MDFAB	FR							
	25-35	C	25Y 63 00	10YR56 58	C	D		Y	0	0	HR	50	WKMSAB	FM	M			Y	WEATHERED LMST	
	35-70	HR	25Y 64 66						0	0	0			P				Y	FISSURED-ROOTS	
	70-90	C	05Y 62 00	10YR58 00	C	D		Y	0	0	HR	30	MDVCPL	FM	P	Y		Y	Y	
	90-100	HR	25Y 64 66						0	0	0				P				Y	FISSURED-ROOTS
	100-120	C	25Y 52 00	75YR44 56	M	D		Y	0	0	SLST	10	MDVCPL	FM	P	Y		Y	Y	SLST = SHELLS

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED	----STONES----			STRUCT/	SUBS	SPL	CALC				
				COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT			CONSIST	STR	POR	IMP
2P	0-20	C	10YR43 00					0	0	HR	2	MCFAB	FM					
	20-70	C	25Y 52 00	10YR56	58	C	D	Y	0	0	0	STVCAB	FM	P	Y	Y		
	70-100	C	05Y 61 62	10YR56	58	M	D	Y	0	0	SLST	10	MDVCPL	FM	P	Y	Y	Y
	100-120	HR	25Y 64 66						0	0	0			P			Y	

SLST = SHELLS
FISSURED-ROOTS