

**PHYSICAL CHARACTERISTICS REPORT FOR THE LAND INCLUDED IN THE
PROPOSED WORKING FOR COAL AND CLAY AT MUXTON, TELFORD**

1. INTRODUCTION

The site lies to the east of Muxton, near Telford. It is bounded by a minor road and a wood in the north east, housing and agricultural land in the south west and agricultural land in the north west and south east. The site was surveyed in January 1992 using the MAFF Revised Agricultural Land Classification system, with soils being augered to a depth of 100 cm at 100 m grid intersections. Additional profiles were described as necessary to determine land quality boundaries and several soil pits were dug to determine the physical characteristics. Land quality ranges from sub-grade 3a to sub-grade 3b.

2. CLIMATIC LIMITATIONS

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to lower grades, despite other favourable conditions. The main parameters used in the assessment of the climatic limitations are Average Annual Rainfall (AAR), as a measure of overall wetness, and the Accumulated Temperature above 0°C for the period January to June (ATO), as a measure of warmth. The figures for AAR and ATO indicate that there are no climatic limitations on this site.

3. SITE LIMITATIONS

The assessment of site factors is primarily concerned with the way topography influences the use of agricultural machinery and hence the cropping potential of the land. The majority of the site is level or gently undulating, with land rising gradually to the south and east, reaching a maximum altitude of 97 m near Lilleshall Grove. The land lies at a minimum altitude of 75 m near the watercourses to the north and west of Sulphur Piece Plantation. Micro-relief is a limiting factor for this part of the site.

4. SOIL LIMITATIONS

The solid geology of the site is dominated by Coal Measure beds. In the north west of the site the soils are underlain by Productive Measures, which consist of grey shales, clays and fireclays, with sandstones, coal seams and ironstones. These soils include medium sandy loam/sandy clay loam topsoils over sandy clay loam subsoils with clay at depth. In the south east of the site the soils are underlain by Coalport Beds, which consist of red and grey marls with thick sandstones, thin coals and Spirobis limestone. These soils include sandy loam/sandy clay loam topsoils over sandy clay loam/clay loam subsoils with clay at depth. In the east of the site the soils are derived from Boulder Clay and these soils are typified by sandy clay loam topsoils, with clay loam/clay at depths below 35cm.

In isolated areas sand occurs near the surface and the soils in these areas are typified by sandy loam topsoils over sandy loam subsoils, which overlie loamy sand/sand.

5. INTERACTIVE LIMITATIONS

The interactions between climate, site and soil determines whether a soil will be prone to wetness, droughtiness or erosion. The majority of soils in this site have medium to heavy textured subsoils and are therefore not prone to drought. A soil's susceptibility to drought is measured by the amount of water the profile can hold (Ap) in comparison to the potential soil moisture deficit for the area (MD). For this site the moisture deficit for wheat is 96 mm and for potatoes is 85 mm.

Seasonal waterlogging affects soil workability and crop yields, hence wetness is an important parameter in the classification of land. It is measured by reference to climate particularly field capacity days, soil wetness and topsoil texture. This site is at field capacity for approximately 156 days. Most soils have gley morphology above 40 cm and are slowly permeable within 65 cm. The

majority of soils fall into Wetness Classes III and IV.

6. LAND USE

At the time of survey the majority of the site was left fallow, with the remaining area under grass.

7. AGRICULTURAL LAND CLASSIFICATION

Land quality ranges from sub-grade 3a to sub-grade 3b.

7.1 Sub-Grade 3 a

This sub-grade is mapped extensively to include 25.5 ha and 54% of the site. The majority of soils are too poorly drained for a higher grade showing distinct gleying in profiles at depths below 32 cm and have slowly permeable layers below 42 cm. These soils fall into Wetness Class III and are characterised by medium sandy loam or more typically sandy clay loam topsoils over medium sandy loam/sandy clay loam subsoils over clay loam/clay or occasionally, loamy sand at depth. Isolated profiles of grade 2 and sub-grade 3b occur within the land mapped as sub-grade 3a, but these areas were too small to map separately at this scale.

7.2 Sub-Grade 3 b

This sub-grade occupies 19.8 ha and accounts for 42% of the site. The majority of sub-grade 3b land is limited by soil wetness. These soils typically have sandy clay loam topsoils which usually pass into heavy clay loam subsoils over clay. These soils fall into Wetness Class IV, showing distinct gleying in profiles at depths below 30cm and have slowly permeable layers within 42 cm. The sub-grade 3b land, adjacent to the watercourses, north and west of Sulphur Piece Plantation, is limited by micro-relief owing to an uneven slope.

7.3 Woodland

The remaining 1.6 ha and 4% of the survey area is under woodland

Table 1: Breakdown of ALC Grades

Grade	Area (ha)	%	% of agricultural land
3a	25.5	54	56
3b	19.8	42	44
Woodland	<u>1.6</u>	<u>4</u>	—
Total	46.9	100	100

8. SOIL UNITS

8.1 UNIT 1

Unit 1 is mapped over the area classified as sub-grade 3a.

This unit is mapped in the north and centre of the site and includes a small area to the west of Sulphur Piece Plantation. Typically 35 cm of dark greyish brown/brown (10 YR 4/2 or 4/3) sandy loam/sandy clay loam overlies brown (10 YR 5/3) sandy clay loam. This overlies reddish brown (5 YR 4/4 or 5/4) sandy clay loam/clay loam or clay lower subsoil in most profiles at depths below 55 cm. In isolated areas medium sandy loam topsoils overlie medium sandy loam subsoils with loamy sand/sand occurring below 60 cms.

Structure is moderately developed medium sized subangular blocky in the surface horizons, but in the sandy clay loam, clay loam

and clay horizons the structure is more typically moderately developed medium to coarse prismatic. The soils are porous at the surface but became less porous with depth, with the sandy clay loam, clay loam and clay lower subsoils being slowly permeable.

Rounded quartzite pebbles account for 2-5% of the topsoil volume. Subsoil stone content is usually less than 1%, except in the occasional sandy horizons, where contents may reach 10% of the soil volume.

8.1.1. Unit 1a

This unit has a litter layer at the surface which has developed under woodland. The underlying soils are similar to those in Unit 1.

8.2 Unit 2

Unit 2 is mapped over the area classified as sub-grade 3b. This unit is mapped in the south and east of the site and includes those soils derived from Boulder Clay. Typically 33 cm of dark brown (10 YR 4/3) sandy clay loam overlies brown (7.5 YR 5/4) heavy clay loam. Reddish brown (5 YR 4/4) clay occurs at 40 cm in most profiles. The topsoils of the permanent pasture fields in the south west of the site have a relatively high organic matter content.

The topsoils of this unit have moderately developed medium subangular blocky structures. Below 35 cm weakly developed very coarse prismatic structures predominate. The soils are gleyed below 30 cm and are slowly permeable within 42 cm. They fall into Wetness Class IV. The topsoils contain few hard quartzite stones, typically less than 5%. The heavy textured subsoils are usually stoneless.

8.3 Unit 3

This unit has no soil at the surface. It includes a tarmac road and a track, which is composed of hardcore.

Table 2: Typical Soil Descriptions

Unit	Depth (cms)	Texture	% stones
Unit 1	0- 35	MSL/SCL	2-5
	35- 55	SCL or occasionally MSL	<1-5
	55-100	SCL/CL/C or occasionally LMS/MS	<1-10
Unit 1a	0- 5	Organic Matter	
Unit 2	0- 33	SCL	2-5
	33- 40	HCL	< 1
	40-100	C	<1
Unit 3	No soils at surface		

9. SUMMARY

Over half of the site is above average quality when considered on a national scale, with 54% of the site mapped as sub-grade 3a. Forty-two percent of the site is mapped as sub-grade 3b and is of moderate quality. Three soil units have been identified. Unit 1 includes medium textured soils with heavier textured soils at depth, whereas Unit 2 has heavier textured soils closer to the surface. Unit 3 has no soil at the surface.

If the site is worked for coal and clay Units 1 and 2 may need to be handled separately.

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