

SOIL PHYSICAL CHARACTERISTICS REPORT FOR LAND
INCLUDED ON THE PROPOSED OPENCAST COAL SITE AT SHORTWOOD

1. INTRODUCTION

The site was surveyed in October 1986, July 1988 and November 1990 when soils were augered to 100 cms on 100 m grid intersections, to provide a density of one boring per hectare. Additional profiles were described as necessary to determine soil and land quality boundaries. In November 1990 additional areas were surveyed using the MAFF Revised Agricultural Land Classification system and the original survey was updated to reflect land quality using the revised system, which no longer recognises Sub-grade 3c.

The site is underlain by Coal Measure deposits which in places are covered by sandier materials. The resulting soils are medium and heavy textured. Much of the site is disturbed by opencast and old bell pit mining. Most of the soils are seasonally waterlogged and mainly of a low quality mapped as Sub-grade 3b and 4. Only in the north does higher quality land occur. Several soil units have been identified.

2. CLIMACTIC LIMITATIONS

The site lies on the edge of high ground around the Wrekin and the climate is influenced by the range in altitude across the site. In the north the land has an average rainfall of 712 mm and an Accumulated Temperature of 1316°C and the area is on the climate limit of grade 1. As the land rises to the south the area becomes cooler (accumulated temperature 1226°C) and wetter (average annual rainfall 752 mm) and has a climatic limitation which prevents the land from being graded higher than grade 2.

The rain falls fairly evenly throughout the year with rainfall peaks in August and November and a relatively dry spell between February and April. The mean last frost occurs in early May.

3. SITE LIMITATIONS

The sites lies to the north east of the Wrekin on the south western outskirts of Telford, south of the M54 motorway and the village of Arleston. The site is bounded by the A4169 in the east, by Black Hayes Wood in the north and by minor roads and tracks in the west and south. The altitude varies from 150 m in the north, rising gently to 240 m in the west. The land is gently sloping over most of the site and gradient is generally not a limitation. Moderate slopes occur over small areas in the centre of the site and on the restored land in the north west. Old mining activity appears to have caused an undulating landscape to the west of New Works Lane and has created a complex pattern of disturbed and undisturbed soils.

4. SOIL LIMITATIONS

The site is largely underlain by Middle Coal Measure deposits which in most places are overlain by a sandy drift on Boulder Clay. The resulting soils are sandy loams, sandy clay loams or clay loams over clay or silty clay. The soils vary from wetness class II or III to wetness class IV on the heavier soils. Most profiles are slightly stony to stoneless and soil wetness is the main limiting factor in their classification.

The majority of the soils in the east and south appear to have been disturbed by previous opencast coal workings and have about 20 - 40 cm of clay loam or sandy clay loam containing coal fragments over very compacted clay overburden. In the north west the restored land has at least 90 cm of soil over the overburden.

An area of bell pit mining in the centre of the site has given rise to a complex pattern of natural and disturbed profiles and small spoil heaps. The random distribution of these different types of soils makes the area difficult to work and has limited the agricultural land classification.

5. INTERACTIVE LIMITATIONS

The interaction between climate, site and soil, determines whether a soil will be prone to droughtiness, wetness or erosion. The undisturbed soils on this site are deep and generally not prone to drought. However clay loam and clay subsoils have reduced their permeability and caused a wetness problem in many areas. The soils are usually gleyed within 40 cm and have a slowly permeable layer at depths below 45 cm. These soils fall into wetness class II and III. In the centre of the site adjacent to New Works Lane heavy clay loam and clay soils fall into wetness class IV.

The disturbed land in the north west has a poorly structured subsoil which impedes drainage and this area falls into wetness class IV. The majority of the disturbed land is severely compacted at the top of the heavy textured overburden and drainage is impeded. These soils fall into wetness class IV. Erosion may be a problem on the restored land which can be prone to excess runoff, but the problem does not justify further downgrading of the area.

6. LAND USE

At the time of the 1990 survey the northern part of the site was in arable production and the remainder was under grass, used for grazing and hay.

7. AGRICULTURAL LAND CLASSIFICATION

7.1 Grade 2

This grade is mapped in the north over 9.1 hectares and 4.6% of the site. Sandy loam soils overlies sandy loam, loamy sand or sandy clay loam subsoils. The profiles shows evidence of gleying within 40 cm of the surface in most areas and often have a slowly permeable layer at about 60 cm. Deep freely

drain profiles have been limited to this grade because of the climatic limitation.

7.2 Grade 3

7.2.1 Sub-grade 3A

Sub-grade 3a accounts for 15.1 hectares and 7.7% of the site it is mapped at the northern end of the site where sandy loams and sandy clay loams overlie loamy sand, sandy clay loam or clay loam. The soils are slightly stony (less than 5%), show signs of gleying within 30 cm and have a slowly permeable layer within 50 cm of the surface. The soils fall into wetness class III or IV. Stony layers occur in several profiles making auger penetration difficult. Areas of Grade 2 soil have been included within Sub-grade 3A because of the complex pattern of light and medium textured soils.

7.2.2 Sub-grade 3b

Sub-grade 3b accounts for 46.6 hectares and 23.7% of the site it is mapped through the centre of the site where a complex of natural and disturbed profiles and small spoil heaps are intermingled making the area difficult to farm. Soils range from sandy loam over sandy clay loam and clay loam in wetness class III to clay loam over clay in wetness class IV. The area is undulating and contains bell pit shafts in some areas. Micro relief and a complex soil pattern are the main limiting factors. In the north west restored opencast coal land is included in this sub-grade. In the south medium textured natural soils which fall into wetness class III and IV are also included.

7.4 Grade 4

This grade accounts for 75.4 hectares and 38.4% of the site. Natural soils included in this grade have distinct mottles to

the surface and fall into wetness class IV. They are intermixed with spoil heaps and locally disturbed land. All the soils have a high clay content and typically sandy clay loams or clay loams overlie compact clay.

7.5 Grade 5

This grade accounts for 2.7 hectares and 1.4% of the site. It is mapped over isolated areas of the site to include spoil heaps from previous mine workings. These areas are grassed over and provide rough grazing.

7.6 Non Agricultural Land

Non agricultural land accounts for 2.8 hectares and 1.4% of the site. It is mapped in the west and south to include woodland, and over isolated areas in the east.

8. SOIL UNITS

Seven distinct units have been identified which will require separate handling if the site is worked for coal. Units 1 and 2 have been sub-divided into A and B because of the high organic matter content of the topsoils under woodland.

8.1 Unit 1

8.1.1. Unit 1A

This unit is mapped in the north and west of the site to include light to medium textured soils. Typically 28 cm of very dark grey (10YR 3/1) sandy loam to sandy clay loam overlies brown (10YR 5/3) sandy loam to clay loam. Brown (7.5YR 4/4) sandy clay loam to clay occurs in most profiles at depths below 60 cm but in some profiles an impenetrable stony loamy sand or weathered sandstone occurs at this depth.

Soil structure is moderately formed throughout the profile and typically moderately porous, fine sub-angular blocky structures occur in the topsoil. Below 28 cm moderately porous, coarse prismatic structures break to angular blocky under pressure. In the vicinity of the pit soil structures become coarser with depth and porosity is only slight below 60 cm.

The soils show signs of impeded drainage having grey ped faces and rusty and grey mottles at depths below 30 cm; they fall into wetness classes II and III. In areas with loamy sand subsoils the soils are quite freely drained and fall into wetness class II.

Occasional rounded quartzite pebbles occur throughout the profile and occasional small boulders occur below 30 cm. Plant roots are common to the base of the pit (80 cm) and worms occur throughout the profile.

8.1.2 Unit 1B

These soils are similar to those in unit 1A but have a 5 - 10 cm organic mat at the surface. They occur under woodland.

8.2 Unit 2

8.2.1 Unit 2A

This unit is mapped extensively throughout the centre of the site to include clay loam and sandy clay loam soils which overlie heavier subsoils. The soils are quite variable and many areas appear to have been disturbed by past mining activities. Small mounds of overburden and coal spoil occur throughout the area and in the field at grid reference (662092) weathering coal occurs in some profiles at depths between 30 and 70 cm from the surface.

Typically 25 cm of very dark brown (10YR2/2) slightly organic clay loam or sandy clay loam, overlies yellowish brown (10YR5/4) to dark reddish brown (5YR3/4) clay loam and sandy clay loam. Reddish yellow (7.5YR6/8) to dark brown (7.5YR3/4) clay occurs in most profiles at depths below 50 cm, although the depth to clay varies from 35 - 70 cm.

Soil structures are slightly to moderately porous, moderately formed medium and coarse sub-angular blocky in the topsoil. Below 25 cm slightly porous weakly formed coarse sub-angular blocky peds are common and in the clay horizons slightly porous, weakly formed very coarse prismatic peds occur.

The soils have only occasional stones, typically rounded quartzite pebbles with some coal fragments and weathering grey shale in the lower subsoils. Plants roots are common to the base of the pit but are confined to ped faces below 40 cm.

The soils fall into wetness class III and IV having rusty and grey mottles and grey ped faces below 25 cm, and a slowly permeable layer in the clay loam or clay horizons.

Care should be taken when stripping these soils to ensure that the spoil heaps are not mixed with the natural soils.

8.2.2. Unit 2B

These soils are similar to those in unit 2A but have a 5 - 10 cm organic mat at the surface. They occur under woodland.

8.3 Unit 3

This unit is mapped over natural soils at the southern end of the site. It includes soils which have 25 cm of dark brown (7.5YR3/2) sandy clay loam or clay loam over brown (7.5YR4/2) clay loam. Brown and grey (7.5YR5/0 and 4/4) clay occurs in most profiles at depths below 40 cm.

The soils have a medium, moderate sub-angular blocky structure in the topsoil and a medium coarse sub-angular blocky structure below 25 cm. The clay horizon tends to have a moderately formed coarse prismatic structure. The area to the south of Black Hayes Wood (field 6148) was used as a soil storage area and here topsoils are up to 60 cm deep over a massive subsoil. Along the western edge of this field overburden occurs at the surface and the natural soil is buried at about 60 cm.

The soils show signs of impeded drainage having grey colours below 25 - 35 cm and a slowly permeable layer in the clay horizon.

The soils are only slightly stony but in the south a moderately stony layer occurs at the top of the clay in some profiles.

8.4 Unit 4

This unit is mapped in the south east to include large ridges and hollows which are composed of silty clay overburden. Typically a 5 - 10 cm litter layer is underlain by slightly organic dark grey (10YR4/1) silty clay. Grey (10YR5/1) weathering silty clay and shale occurs below 15 cm. Soil structures are very slightly porous, weakly formed, coarse angular blocky or platy to 15 cm and slightly porous, weak angular blocky to massive below this depth. The profile is poorly drained with ochreous and grey mottles common throughout. Coarse and fine roots are common to 25 cm but only occasional coarse roots were seen below this depth. These soils are not suitable for agricultural restoration.

8.5 Unit 5

This unit is mapped in the north west to include the most recently restored area of opencast working. In most places at least 1 m of soil has been replaced over the overburden and the soils are generally uncontaminated by extraneous materials.

Typically 30 cm of dark brown (10YR3/3) sandy clay loam overlies clay loam which contains pockets of sandy clay loam and occasional fragments of weathering sandstone. This horizon extends to at least 100 cm in most areas.

Soil structures are weakly formed coarse sub-angular blocky and only slightly porous in the topsoil to weakly formed very coarse angular blocky to massive in the subsoil. There is no evidence of waterlogging in the vicinity of the pit, which was on a gentle slope.

Plant roots and worms are common to 30 cm but few below this depth and mainly confined to ped faces.

8.6 Unit 6

This unit includes the restored land in the south and east.

Typically 20 - 30 cm of clay loam or sandy clay loam overlies compact grey clay which contains pockets of weathering shale and red clay.

The top 20 - 30 cm has developed a weakly or moderately formed medium and coarse sub-angular blocky structure which is at least slightly porous. The clay overburden is generally massive and very compact and forms a very dense slowly permeable layer which prevents the free flow of water through the profile. These soils fall into wetness class IV.

To the east of New Works Lane 10 - 15 cm band of subsoil has been spread over the overburden, to give a total soil depth of between 25 and 45 cm.

8.7 Unit 7

This unit is mapped over land which has been restored after opencast mining. Typically 15 cm of very dark grey (10YR3/1) clay loam overlies dark brown (10YR3/3) and dark grey (10YR4/1) clay loam with pocket of clay and weathering shale. Soil structure is slightly porous, weakly formed, coarse sub-angular blocky to 15 cm and very slightly porous, platy to weak angular blocky below this depth. The soils are very compact.

The soils are gleyed throughout the profile. Weathering shale and occasional rounded quartzite pebbles occur to depth. Plant roots are abundant to 15 cm but only common and confined to ped faces below 15 cm, few roots extend below 40 cm. There is little worm activity in the subsoil.

The soil horizons have begun to develop since the land was restored. There appears to have been little topsoil and subsoil replaced in this area.

8.8 Unit 8

This unit is mapped over areas which are devoid of soil and include hardcore tracks and spoil heaps.

8.9 Summary of Soil Units

Unit	Texture	Depth (cm)	Comments
1	SL - SCL	0 - 29	(Unit 1B has a 5 - 10 cm
	SL - CL	28 - 60	(litter layer above the
	LS - C	60 - 100	(profile
2	CL - SCL	0 - 25	(Unit 2B has a 5 - 10 cm
	CL - SCL	25 - 50	(litter layer above the profile.
	C	50 - 100	(Locally disturbed
3	SCL - CL	0 - 25	Natural soil
	SCL - CL	25 - 40	
	C	40 - 100	
4	Litter layer	7 - 0	No natural soils
	ZC	0 - 15	
	ZC & shale	15 +	
5	SCL	0 - 30	Occasional pockets of overburden below 60 cm in some areas
	CL	30 - 100	
6	CL (m)	0 - 25	Coal fragments in topsoil overburden
	overburden	25 - 100	
7	CL (h)	0 - 15	Restored with little soil overburden
	overburden	15 - 100	
8	No soil		Spoil heaps and tracks

MRS R A PEEL
November 1990

PIT DESCRIPTION

Shortwood/Arleston

Site Name: Extension Slope: - ATO: MD Wheat: .

Pit No: 1 Aspect: - FCD: MD Potatoes:

Land use: Grass Microrelief: AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-22 cm	MCL	10 YR 3/2 Very dark greyish brown	10 YR 4/1 dark grey ped faces grey col.	Common ochreous mottles	Weakly formed very coarse sub-angular blocky prismatic	-	<0.5%	Coal fragments & pebbles		
22-35 cm	MCL	10 YR 3/2 Very dark greyish brown	Ped faces gleyed		Moderately formed angular blocky coarse	✓	<0.5%	Coal fragments & pebbles	Roots confined to ped faces	Few roots below 35 cm
35-45+	C Slightly organic	N4 Gleyed colour	Matrix gleyed		Mainly platy to massive	✓	<0.5%	Lot of coal fragments		Overburden
Below 45	Subsoil	Impenetrable								

Wetness Class:

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade: 4

General Comments: Poorly defined structure
Ochre in drains
Flat site - evidence of poaching

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension

Slope: Gentle

ATO:

MD Wheat:

Pic No: 2

Aspect: East

FCD:

MD Potatoes:

Land use: Grass

Microrelief: -

AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-25	Medium clay loam	10 YR 4/1	No	None	Moderately formed medium coarse subangular blocky.	No	Moderate	Few small pebbles of sandstone and quartzite	Common	Common coal & grit inclusions
25-90	Heavy clay loam & pockets of clay & organ-ic clay	Matrix 10YR6/1 and 10YR4/1 with pockets of 10YR 8/2 & 10YR 7/8	Yes	"	Massive and compact.	Yes	-	Weathering sandstone & shale together with gravel to boulder size	Rare	Weathered coal, water seeping into pit at 55cm.

Wetness Class: IV

Wetness ALC grade: IV

Ap wheat:

Drought ALC grade:

ALC grade: 4

General Comments:

Disturbed - overburden at 25cm

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension

Slope:

ATO:

MD Wheat:

Pic No: 3

Aspect:

FCD:

MD Potatoes:

Land use: Grass

Microrelief:

AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-28	Medium clay loam	10 YR 3/2	No	No	Medium moderately formed subangular blocky	No	-	Occasional small & medium hard rounded stones	Many	-
28-53	Medium clay loam /sandy clay loam	10 YR 5/3 matrix 10 YR 6/3 ped face colour	Yes	Ochreous/ grey mottles many	Weakly formed very coarse subangular block	No	Moderate >0.5%	Occasional hard pebbles <2%	Common fine	Numerous worm and channels
53-60	Clay loam /sandy clay loam	10 YR 6/3	Yes	Many	Very coarse subangular blocky /prismatic weakly developed	Yes	Good >0.5%	"	Few	
60-90	Loamy sand with pockets of sandy loam & clay loam	5 YR 4/6 and 7.5 YR 7/4 (Pale)	Yes	Pale ped faces & iron staining Few mottles	Weakly formed subangular blocky to massive		>0.5%	Common very small hard pebbles	None	Blocks of weathering sand stone

90+ Continuous weathered sandstone

Wetness Class:

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade: 3a

General Comments:

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension
 Pic No: 4
 Land use: Grass

Slope:
 Aspect:
 Microrelief:

ATO:
 FCD:
 AAR:

MD Wheat:
 MD Potatoes:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-28	Sandy clay loam	10 YR 4/2	No	No	Very coarse subangular blocky	No	>0.5%	Some hard sandstone and few rounded pebbles	Common good vertical penetration	Some worm casts
28-40	Sandy clay loam	10 YR 4/3 Pale Ped faces	No	No	Weak medium and coarse subangular blocky. Friable with dense compact lenses	No	>0.5%	Angular shale & occasional rounded pebbles	Few	
40-65 ⁺	Clay matrix with numerous shale fragments	10 YR 5/1 and 10 YR 6/2	Gleyed ped faces	No	Mainly massive	Yes	<0.5%	Weathering shale & sandstone abundant	Confined to occ. fissures roots penetrating into this horizon	Disorientated roots Some very large sandstone boulders

Wetness Class:

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade: 3b/4

General Comments:

Little contamination of top and subsoil. Occasional coal fragments. Very dense compact overburden at 40cm⁺.

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension

Slope: Very gentle slope

ATO:

MD Wheat:

Pit No: 5

Aspect:

FCD:

MD Potatoes:

Land use: Grass

Microrelief: .

AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-25	Medium clay loam	10 YR 3/1	No	Rushy root mottles	Weak coarse subangular blocky. Friable	No	<0.5%	Few	Numerous roots	Coal accounting for 10-15% of the profile -few worms
25-60	Weathering shale & clay overburden	7.5 YR 2/0	No	No	Massive	Yes	<0.5%	Shale & sandstone & coal fragments small to large in size	Few roots	Moist - No evidence of worms

Wetness Class:

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade:

General Comments:

Disturbed profile

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension

Slope: Very gentle slope

ATO:

MD Wheat:

Pit No: 6

Aspect:

FCD:

MD Potatoes:

Land use: Grass

Microrelief:

AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-22	Medium clay loam /sandy silt loam	10 YR 3/2	No	No	Medium moderately subangular blocky	No	Slightly porous	Common rounded hard stones	Many roots	Worms present
22-33	Medium clay loam	10 YR 2/2	No	Grey colours & occasional faint mottles	Angular blocky medium/coarse	No	<0.5%	Occasional small gravel/pieces of coal & shale	Common roots	Broken coal material common occasional small gravel size stones

Wetness Class:

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade:

General Comments:

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension

Slope: Very gentle slope

ATO:

MD Wheat:

Pic No: 7

Aspect:

FCD:

MD Potatoes:

Land use: Grass

Microrelief:

AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-38	Sandy clay loam with pockets of medium clay loam	Matrix 10 YR 3/2 lenses of 7.5 YR 4/4 grey colours 7.5 YR 5/0	No	No	Medium coarse subangular blocky	No	Slightly >0.5% but dense	Few hard rounded pebbles	Many slight disorientation	10% inclusion of sub-soil and coal in topsoil
38-58	Sandy clay loam	Matrix 10 YR 3/1 Ped faces 10 YR 4/1	Yes	Occasional rushy mottles 10 YR 5/6	Massive	No	Slightly porous	Occasional round hard pebbles	Few in worm channels & along ped faces	Possibly original topsoil. Bunked top soil? Evidence of worms.
58-85	Sandy clay loam	Matrix 10 YR 4/4 Ped faces 10 YR 4/2	Yes	Stains 10 YR 5/6 Ochreous mottles	Blocky subangular	No	Very porous	Few rounded hard pebbles	"	Very large worm channels
85+ ?	Heavy clay loam at base of the pit					Yes				

Wetness Class:

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade:
3b

General Comments:

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension

Slope:

ATO:

MD Wheat:

Pic No: 8

Aspect:

FCD:

MD Potatoes:

Land use:

Microrelief:

AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-11	Medium clay loam		Yes	Rushy root mottles	Medium subangular blocky. Moderately formed. Some places massive	Yes	<0.5%	Few hard rounded pebbles	Many	Compact at surface
11-	Clay	Ped faces 10 YR 4/2	Ped faces gleyed		Massive some platy lamination. Some weak angular blocky					Numerous coal fragments

Wetness Class:

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade:

General Comments:

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension

Slope:

ATO:

MD Wheat:

Pic No: 9

Aspect:

FCD:

MD Potatoes:

Land use:

Microrelief:

AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-30	Sandy clay loam	10 YR 3/3	No	No	Weakly formed coarse subangular blocky	No	Slightly porous	Few small uncontaminated	Many	Few worms
30-60	Sandy clay loam with clay infusions & packets of sandy loam	7.5 YR 3/4	No	No	Massive fa Very weak coarse blocky	Yes	<0.5%	Many	Few	
60+								<i>weathering soil slacks incorporated</i>		

Wetness Class:

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade:

General Comments:

Revised profile

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension

Slope: Very gentle slope/
almost level

ATO:

MD Wheat:

Pit No: 10

Aspect:

FCD:

MD Potatoes:

Land use: Permanent pasture

Microrelief:

AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-25	Medium clay loam	Very dark brown	No	No	Medium coarse Moderately formed Subangular blocky	No	>0.5%	Few small to large rounded quartz	Many	Occasional coal fragments
25-55	Sandy clay loam	Pale brown	Yes	Common ochreous mottles. Iron concretions. Pale ped faces. Gleyed	Firm consistency Weak coarse sub-angular blocky to massive	No	Variable but generally >0.5%	<2% small rounded quartz	Mainly confined to worm channels	Few worms Some iron cementing. Horizon very dense
55-75	Heavy clay foam	Reddish brown grey ped faces	Yes	Abundant ochreous mottles in peds. Many manganese concretions	Very coarse prismatic & very coarse angular	Yes	<0.5%	Large subangular and hard	Roots confined mainly to ped faces	Very sandy Ped faces

Wetness Class:

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade: 3b

General Comments:

Roots confined to ped faces below 45cm.
Large worm channels to depth.

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension

Slope:

ATO:

MD Wheat:

Pic No: 11

Aspect:

FCD:

MD Potatoes:

Land use:

Microrelief:

AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-32	Medium clay loam	Dark brown	No	No	Moderately formed coarse subangular blocky	No	>0.5%	Few subangular hard stones	Common	Disturbed topsoil. Coal fragments com- <5% of horizon
32-85	Medium clay loam becoming heavier with depth Pockets of sandy clay loam below 65cm	Greyish brown		Ochreous Mottles many	Weakly formed Very coarse prismatic		Mainly <0.5%	Rare	Mainly confined to ped faces of worm channels	Occasional large worm channels & worms
85-100	Heavy clay loam	Very yellow		Very grey ped faces & many mottles	Angular blocky/ prismatic. Very coarse Weakly formed		<0.5%	Rare	Rare	Quite dry by 100cm

Wetness Class:

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade: 3b

General Comments:

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: Shortwood extension

Slope:

ATO:

MD Wheat:

Pic No: 12

Aspect:

FCD:

MD Potatoes:

Land use: Permanent pasture

Microrelief:

AAR:

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-29	Sandy loam/ sandy clay loam	Dark brown	No	No	Coarse weakly formed subangular blocky	No	>0.5% moderately porous	<5% small & medium rounded quartz. Occasional large hard hard rock	Many	Very occasional coal fragments
29-65	Sandy loam	Very pale brown	Yes	Faint ochreous mottles. Iron concretions & cementing	Weakly formed coarse subangular blocky Firm consistency	No	>0.5% Very porous	<5% small & medium rounded quartz. Occasional large hard rock gravelly 15%	Common	
65+	Heavy clay loam	Reddish brown	Yes	Manganese concretions grey ped faces. Faint ochreous mottles. High manganese on ped faces	Coarse prismatic breaking to moderately medium angular blocky	Yes	<0.5%	Rare	Rare	Slowly permeable layer

Wetness Class: III

Wetness ALC grade:

Ap wheat:

Drought ALC grade:

ALC grade:
2

General Comments:

Soil fauna mainly found above 15cm.
Few below 15cm.

Ap potatoes

Main limitation:

PIT DESCRIPTION

Site Name: SHORTWOOD
EXTENSION

Slope: 4°

ATO: 1240

MD Wheat: 72

Pit No: 13

Aspect: SW

FCD: 180

MD Potatoes: 53

Land use: GRASS

Microrelief: EVEN SLOPE

AAR: 795

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-30	SCL <i>psd m cl</i>	7.5 YR 3/2	-	Few feint rusty root mottles	Medium moderate Subangular	-	70.5	Few S + M rounded hard	Many	Diffuse boundary
30-45	SCL <i>psd m cl</i>	7.5 YR 4/2	YES	Few ochreous	Medium coarse subangular blocky	-	70.5	15-20% S to L hard stone & rock	Common	
65-100	C + CL <i>psd c/cl</i>	7.5 YR 4/2 5/0 & 4/4	YES	Abundant O & G	Moderate coarse prismatic	YES	<0.5	Few	Few	More grey with depth

Wetness Class: IV

Wetness ALC
grade: 3b

Ap wheat:

Drought ALC
grade:

ALC grade:

General Comments:

Ap potatoes

Main limitation:

3b

Wetness

PIT DESCRIPTION

Site Name: SHORTWOOD
EXTENSION

Slope: 2°

ATO: 1330

MD Wheat: 83

Pit No: 14

Aspect: N

FCD: 163

MD Potatoes: 67

Land use: CEREALS

Microrelief: SERIES OF
GENTLE RIDGES & GULLIES

AAR: 720

Depth (cm)	Texture	Munsell Colour	Gleyed	Mottles Abundance/ Colour	Structure Size/Shape/Grade Consistency	Slowly Perm Layer	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-35	SL <i>psd sl</i>	7.5 YR 3/2 Dk brown	-	-	Very weak coarse sub-angular blocky	-	>0.5%	Few hard rounded >2%	Common	Litter at 20cm
35-75	LS pockets <i>psd LS</i>	7.5 YR 4/4 brown/dk brown	Pale ped fences 60+	Fe cons & run	Weak coarse subang. block to weak fine crumb. Friable.	-	>0.5%	Few	Few	Some Fe cementing 40-50cm discontinuous
75-120+	SCL <i>psd sl</i>	5 YR 4/4 reddish br.	Pale ped fences	O & G common	Moderate very coarse subang. block. Friable.	-	>0.5%	None	Few	

Wetness Class: II/I

Wetness ALC grade: Grade 1

Ap wheat:

Drought ALC grade:

ALC grade:

General Comments:

Ap potatoes

Main limitation:

G 1/2

Series of ridges and hollows map area as G2

Climatically G 1/2