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Forest of Dean Local Plan

Tutshill and Sedbury, Chepstow

Agricultural Land Classification
October 1996

Resource Planning Team
Taunton Statutory Group
ADAS Bristol

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Ministry of Agriculture, Fisheries and Food
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MAFF

TUTSHILL AND SEDBURY, CHEPSTOW

AGRICULTURAL LAND CLASSIFICATION SURVEY

CONTENTS

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AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 387 ha of land at Tutshill and Sedbury, near Chepstow. Field survey was based on 150 auger borings and 7 soil profile pits, and was completed in July 1996.

2. The survey was conducted by the Resource Planning Team of ADAS Taunton Statutory Group on behalf of MAFF Land Use Planning Unit in its statutory role in the preparation of the Forest of Dean Local Plan.

3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant section. Apart from the published regional ALC map (MAFF, 1977), which shows the site at a reconnaissance scale as mainly Grade 3 with Grade 2 around Tutshill, the site had not been surveyed previously. However, the current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF, 1988) and supersedes any previous ALC survey. Grade descriptions are summarised in Appendix I.

4. At the time of survey land cover was mainly grassland, with some cereals in the west and some maize to the north.

SUMMARY

5. The distribution of ALC grades is shown on the accompanying 1: 20,000 scale ALC map. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas. Areas are summarised in the Table 1.

Table 1: Distribution of ALC grades: Tutshill and Sedbury

Grade	Area (ha)	% Surveyed Area (301 ha)
2	87	29
3a	100	33
3b	26	9
4	88	29
Other land	86	
Total site area	387	

6. The best and most versatile land covers 62% of the agricultural land within the survey area. Almost half of this is Grade 2 land which is freely draining, and limited to Grade 2 due to topsoil workability. The remainder of the best and most versatile land is Subgrade 3a. The Subgrade 3a in the south has a wetness limitation, whilst in the north it is freely draining but has a droughtiness limitation.

Almost all of the remaining land is Grade 4. On the upland this consists of deep clays with gleying and a slowly permeable layer occurring immediately below the subsoil. On the River Wye floodplain the Grade 4 land is seasonally flooded, silty clay over clay, with gleying throughout the profile.

CLIMATE

7. Estimates of climatic variables for this site were derived from the published agricultural climate dataset "Climatological Data for Agricultural Land Classification" (Meteorological Office, 1989) using standard interpolation procedures. Data for key points around the site are given in Table 2 below.

8. Since the ALC grade of land is determined by the most limiting factor present, overall climate is considered first because it can have an overriding influence by restricting land to a lower grade despite more favourable site and soil conditions. Parameters used for assessing overall climate are accumulated temperature, a measure of relative warmth and average annual rainfall, a measure of overall wetness. The results shown in Table 2 indicate that there is no overall climatic limitation.

9. Climatic variables also affect ALC grade through interactions with soil conditions. The most important interactive variables are Field Capacity Days (FCD) which are used in assessing soil wetness and potential Moisture Deficits calculated for wheat and potatoes, which are compared with the moisture available in each profile in assessing soil droughtiness limitations. These are described in later sections.

Table 2: Climatic Interpolations: Tutshill and Sedbury

Grid Reference		ST 550 940
Altitude (m)		30
Accumulated Temperature (day °C)		1506
Average Annual Rainfall (mm)		969
Overall Climatic Grade		1
Field Capacity Days		204
Moisture deficit (mm):	Wheat	89
	Potatoes	78

RELIEF

10. Altitude ranges from sea level to 57 metres with mainly gentle slopes. The slopes in "The Coombe" south of Sedbury Park exceed 11° and impose a local limitation to Grade 4.

GEOLOGY AND SOILS

11. The underlying geology of the site is shown on the published geology map (IGS, 1981). Recent deposits are found on the low lying land adjacent to the River Wye (Alluvium), on the high land around Sedbury Park (Terrace deposits) and Terrace deposits are also found around the Loop Road area, Buttington Tump, SW of Sedbury Farm, East of Tump Farm and at Day House in the north. The Terrace deposits around Sedbury Park are surrounded by a thin band of Jurassic and Triassic deposits; Lias Clays and Tea Green Marl. There are small patches of Carbonferous Dolomite and limestones around Tump Farm and Mead Farm. The rest of the site is underlain by Keuper Marl.

12 Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983). Most of the area has soils of the Whimple 1 Association. These are reddish, fine loamy over clayey, and slowly permeable. The east of the area has soils of the Denchworth Association. These are slowly permeable clayey soils. The River Wye floodplain has deep calcareous clayey soils of the Newchurch 2 Association. A small area of the Crwbin Association is mapped around Tutshill. These are shallow well drained soils over limestone.

AGRICULTURAL LAND CLASSIFICATION

13. The distribution of ALC grades found by the current survey is shown on the accompanying 1: 20,000 scale map and areas are summarised in Table 1. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas.

Grade 2

14. The Grade 2 land has a medium clay loam topsoil over heavy clay loam or clay with no wetness limitation. The soils are slightly stoney but there is no stoniness or drought limitation. Pit 5 is characteristic of this land, which is downgraded to Grade 2 due to topsoil workability.

Subgrade 3a

15. The Subgrade 3a land around and south of Sedbury has a medium clay loam topsoil over a heavy clay loam or clay subsoil. These soils are developed over Jurassic and Triassic clays, and have a slowly permeable layer (SPL) typically occurring below 45cm. Gleying does not usually occur above the SPL, and the Wetness Class is III, (see Appendix II). This, in combination with the medium clay loam topsoil and the prevailing Field Capacity Days (FCD) of 204, leads to a Subgrade 3a for the unit, limited by wetness. Pit 1 is representative of these soils.

16. The Subgrade 3a land north of Sedbury is moderately stoney. The topsoil is medium clay loam, overlying a sandy clay loam or lighter subsoil. These soils were developed on terrace deposits. The soils are free draining with no wetness limitation. The stoney profile, coupled with the sandy texture, lead to a reduced moisture holding capacity. This produces a Subgrade 3a for the unit, limited by droughtiness. Pit 3 is representative of these soils.

Subgrade 3b

17. The Subgrade 3b land is similar to the Subgrade 3a land, but with the slowly permeable layer occurring higher in the profile. This leads to a Wetness Class IV, which, with a medium clay loam topsoil gives a Subgrade 3b. Pit 4 is representative of this unit.

Grade 4

18. The Grade 4 land in the east of the area is developed over both Jurassic clays and Terrace deposits. It has a heavy clay loam or clay topsoil over a clay subsoil. Gleying occurs immediately below the topsoil, as does a slowly permeable layer. This leads to a Wetness Class IV and Grade 4 due to wetness.

19. The land on the River Wye floodplain is developed on alluvium. There is a silty clay topsoil over clay with gleying throughout the profile. A slowly permeable layer extends from about 15cm. The Wetness Class is IV. This land is also subjected to a flooding limitation of 3b, but this is overridden by the wetness limitation. Pit 7 is representative of this unit.

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July 1996

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APPENDIX I

DESCRIPTION OF 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 include 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, cultivation's or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the 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.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where 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 level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable. In most 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 very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Source: MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for Grading the Quality of Agricultural Land, MAFF Publications, Alnwick.

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile.

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31 and 90 days in most years.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

Notes: The number of days specified is not necessarily a continuous period.

'In most years' is defined as more than 10 out of 20 years.

Source: Hodgson, J M (In preparation) Soil Survey Field Handbook, Revised Edition.

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report. Terms used and abbreviations are set out below. These conform to definitions contained in the Soil Survey Field Handbook (Hodgson, 1974).

1. Terms used on computer database, in order of occurrence.

GRID REF: National 100 km grid square and 8 figure grid reference.

LAND USE: At the time of survey

WHT:	Wheat	**SBT:**	Sugar Beet	**HTH:**	Heathland
BAR:	Barley	**BRA:**	Brassicas	**BOG:**	Bog or Marsh
OAT:	Oats	**FCD:**	Fodder Crops	**DCW:**	Deciduous Wood
CER:	Cereals	**FRT:**	Soft and Top Fruit	**CFW:**	Coniferous Woodland
MZE:	Maize	**HRT:**	Horticultural Crops	**PLO:**	Ploughed
OSR:	Oilseed Rape	**LEY:**	Ley Grass	**FLW:**	Fallow (inc. Set aside)
POT:	Potatoes	**PGR:**	Permanent Pasture	**SAS:**	Set Aside (where known)
LIN:	Linseed	**RGR:**	Rough Grazing	**OTH:**	Other
BEN:	Field Beans	**SCR:**	Scrub		

GRDNT: Gradient as estimated or measured by hand-held optical clinometer.

GLEY, SPL: Depth in centimetres to gleying or slowly permeable layer.

AB (WHEAT/POTS): Crop-adjusted available water capacity.

MB (WHEAT/POTS): Moisture Balance. (Crop adjusted AP - crop potential MD)

DRT: Best grade according to soil droughtiness.

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				

LIMIT: The main limitation to land quality: The following abbreviations are used.

OC:	Overall Climate	**AE:**	Aspect	**EX:**	Exposure
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
ST:	Topsoil Stoniness				

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)

MOTTLE COL: Mottle colour using Munsell notation.

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%+

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.

PED. COL: Ped face colour using Munsell notation.

GLEY: If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

STONE LITH: Stone Lithology - One of the following is used.

HR:	All hard rocks and stones	**SLST:**	Soft oolitic or dolimitic limestone
CH:	Chalk	**FSST:**	Soft, fine grained sandstone
ZR:	Soft, argillaceous, or silty rocks	**GH:**	Gravel with non-porous (hard) stones
MISST:	Soft, medium grained sandstone	**GS:**	Gravel with porous (soft) stones

SI: Soft weathered igneous or metamorphic rock

Stone contents are given in % by volume for sizes >2cm, >6cm and total stone >2mm.

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	**VC:**	Very coarse
Ped Shape	**S:**	Single grain	**M:**	Massive
	GR:	Granular	**AB:**	Angular blocky
	SAB:	Sub-angular blocky	**PR:**	Prismatic
	PL:	Platy		

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		

SUBS STR: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G:** Good **M:** Moderate **P:** Poor

POR: Soil porosity. If a soil horizon has poor porosity with less than 0.5% biopores >0.5mm, a 'Y' will appear in this column.

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

SPL: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

CALC: If the soil horizon is calcareous with naturally occurring calcium carbonate exceeding 1% a 'Y' will appear this column.

2. Additional terms and abbreviations used mainly in soil pit descriptions.

STONE ASSESSMENT:

VIS:	Visual	**S:**	Sieve	**D:**	Displacement

MOTTLE SIZE:

EF:	Extremely fine <1mm	**M:**	Medium 5-15mm
VF:	Very fine 1-2mm>	**C:**	Coarse >15mm

F: Fine 2-5mm

MOTTLE COLOUR: May be described by Munsell notation or as ochreous (OM) or grey (GM).

ROOT CHANNELS: In topsoil the presence of 'rusty root channels' should also be noted.

MANGANESE CONCRETIONS: Assessed by volume

N:	None		**M:**	Many	20-40%
F:	Few	<2%	**VM:**	Very Many	>40%
C:	Common	2-20%			

STRUCTURE: Ped Development *

WA:	Weakly adherent	**M:**	Moderately developed
W:	Weakly developed	**S:**	Strongly developed

POROSITY:

P: Poor - less than 0.5% biopores at least 0.5mm in diameter
G: Good - more than 0.5% biopores at least 0.5mm in diameter

ROOT ABUNDANCE:

The number of roots per $100cm^2$:		Very Fine and Fine	Medium and Coarse
F:	Few	1-10	1 or 2
C:	Common	10.25	2 - 5
M:	Many	25-200	>5
A:	Abundant	>200	

ROOT SIZE

VF:	Very fine	<1mm	**M:**	Medium	2 - 5mm
F:	Fine	1-2mm	**C:**	Coarse	>5mm

HORIZON BOUNDARY DISTINCTNESS:

Sharp:	<0.5cm	**Gradual:**	6 - 13cm
Abrupt:	0.5 - 2.5cm	**Diffuse:**	>13cm
Clear:	2.5 - 6cm		

HORIZON BOUNDARY FORM: Smooth, wavy, irregular or broken.*

* See Soil Survey Field Handbook (Hodgson, 1974) for details.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 969 mm	PARENT MATERIAL
Chepstow	Pit 1	5°W	Ley	ATO: 1506 day °C	Terrace deposits
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 204	SOIL SAMPLE REFERENCES
23/96	2/7/96	ASP 126	GMS/PRW	Climatic Grade: 1	PRW/141
				Exposure Grade: 1	

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	25	MCL	10YR3/2	2% HR sieved	None	None	-	-	Moderate	Many	Many V.Fine	-	abrupt smooth
2	45	HCL	10YR5/4	15% HR vis.Est.	Common Dist.Ochreas and grey Fine 10YR4/6	None	Moderate Coarse Subangular blocky tending to angular	Friable	Moderate	< 0.5% biopores	Common V.Fine	-	gradual wavy
3	90	HCL	10YR5/3	7% HR vis. Est.	Common Dist Fine Ochreas 7.5YR5/6	Few	Weak Coarse Subangular blocky	Friable	Moderate	< 0.5% biopores	Common V. Fine	-	-

Profile Gleyed From: 45

Depth to Slowly Permeable Horizon: 45

Wetness Class: III

Wetness Grade: 3a

Not a well developed SPL,but if no SPL then WC II and still grade 3a.

Available Water Wheat: 116 mm

Potatoes: 109 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: 27 mm

Potatoes: 31 mm

Droughtiness Grade: 2 (Calculated to 90 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks: Horizon 2 not gleyed due to matrix colour. Also not SPL due to structure but borderline - would be SPL if angular.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Chepstow	Pit 2	0°	Maize	Av Rainfall: 969 mm ATO: 1506 day °C	Jurassic Clay
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 204 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
23/96	2/7/96	asp 114	PRW/GMS		-

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	10	C	10YR42	5% HR (visual)	None	None	-	-	Mod	Good	FF.VF (dug between plants)	-	Abrupt smooth
2	30	C	2.5Y53	None	MDCO 10YR56	Common	WCAB	Firm	Poor	Low	FVF	-	clear smooth
3	60	C	5Y52	None	CDFO 10YR56	Few	MCAB	Firm	Poor	Low	FVF	-	|

Profile Gleyed From: 10cm

Depth to Slowly Permeable Horizon: 10cm

Wetness Class: IV

Wetness Grade: 4

Available Water Wheat: 75 mm

Potatoes: 81 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: -14 mm

Potatoes: +3 mm

Droughtiness Grade: 3a (Calculated to 60 cm)

Final ALC Grade: 4

Main Limiting Factor(s): Wetness

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Chepstow	Pit 3	0°	PGR	Av Rainfall: 969 mm ATO: 1506 day °C	Terrace deposits
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 204 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
23/96	3/7/96	Asp 67	PRW/GMS		-

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size,Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	24	MCL	10YR43	1% >2cm HR 9% >2mm HR 10% HR Total	None	None	-	-	-	-	MF,VF	-	clear smooth
2	52	SCL	10YR54	5% >2cm HR 32% >2mm HR 37% HR Total	FDFO 10YR58	Few	WCSAB	Friable	Moderate	Good	CF,VF	-	gradual smooth
3	110+	LMS	10YR44	5% >2cm HR 23%>2mm HR 28% HR Total	FDFO 10YR58 (probably weathering	None	Massive or single grain (no sample available)	Friable?	Moderate	Good	FVF	-	-

Profile Gleyed From: not gleyed

Depth to Slowly Permeable Horizon: no SPL

Wetness Class: I

Wetness Grade: 2

Available Water Wheat: 90 mm

Potatoes: 76 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: +1 mm

Potatoes: 2 mm

Droughtiness Grade: 3a (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Droughtness

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Chepstow	Pit 4	4° NW	PGR	Av Rainfall: 969 mm ATO: 1506 day °C	Keuper Marl
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 204 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
23/96	3/7/96	asp 65	GMS/PRW		PRW/142

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size,Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	26	MCL	10YR4/2	<1% HR	Common distinct fine ochreous 7.5YR6/6	None	-	Friable	Moderate	Many	Many V.Fine	-	Clear Smooth
2	50	C	5YR4/4 (7.5YR4/3)	None	Common distinct moderate ochreous	Few Fine	Moderate coarse subangular blocky	V.Firm	Moderate	< 0.5% biopores	Few Very Fine	-	Clear irregular
3	120 (pit dug to 85 and augured to 120)	C	5YR4/4 (5YR5/3) pale	None	Common distinct moderate ochreous	Common medium	Weak coarse subangular blocky	V.Firm	Moderate	< 0.5% biopores	Few Very Fine	-	-

Profile Gleyed From: 0cm

Depth to Slowly Permeable Horizon: 26cm

Wetness Class: IV

Wetness Grade: 3b

Available Water Wheat: 141 mm

Potatoes: 117 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: 52 mm

Potatoes: 39 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: Horizon 2 not gleyed because ped faces not pale

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Chepstow	Pit 5	0°	PGR	Av Rainfall: 969 mm ATO: 1506 day °C	Keuper Marl
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 204 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
23/96	4/7/96	asp 75	PRW/GMS		PRW/143

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	18	MCL	7.5YR43	<1% (visual) HR	CDFO 7.5YR56	None	-	-	-	Good	MF	-	Clear smooth
2	56	HCL	7.5YR46	<1% HR (visual)	None	Few	MSCAB	Friable	Moderate	Good	CF	-	Clear smooth
3	100+	C	5YR43	<1% HR (visual)	FFFO 10YR56	Few	MCAB/SAB	Friable	Moderate	Good	CVF	-	-

Profile Gleyed From: not gleyed

Depth to Slowly Permeable Horizon: no SPL

Wetness Class: I

Wetness Grade: 2

Available Water Wheat: 124 mm

Potatoes: 115 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: 35 mm

Potatoes: 37 mm

Droughtiness Grade: 1 (Calculated to 100 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Workability

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Chepstow	Pit 6	2° S	Ley	Av Rainfall: 969 mm ATO: 1506 day °C	Terrace Deposits
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 204 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
23/96	8/7/96	between asps 141 and 130	PRW		PRW/146

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size,Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	26	HCL	10YR42	<1%>2cm 2% Total Sieved	None	None	-	Friable	Moderate	Many	Many Fine	-	abrupt smooth
2	48	C	10YR4/3	10% HR vis. Est.	Many Distinct Coarse Ochreous 10YR5/6	Common medium	Moderate Coarse Angular Blocky	Firm	Moderate	<0.5% biopores	Common Fine exped	-	clear smooth
3	90*	C	7.5YR5/3 5/2	-	Common Distinct Medium Ochreous	Common fine	Moderate Coarse Angular Blocky	V.Firm	Moderate	<0.5% biopores	V. Few Fine	-	clear smooth
4	110+	C	2.5Y6/4	-	Many Distinct Coarse Ochreous	Common fine	Not estimated in auger sample	V.Firm	Moderate	<0.5% biopores	Not seen	-	

Profile Gleyed From: 26cm

Depth to Slowly Permeable Horizon: 26cm

Wetness Class: IV

Wetness Grade: 4

* Pit dug to 80cm and augured to 110cm

Available Water Wheat: 129 mm

Potatoes: 113 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: 40 mm

Potatoes: 35 mm

Droughtiness Grade: 1 (Calculated to 110 cm)

Final ALC Grade: 4

Main Limiting Factor(s): Wetness

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Chepstow	Pit 7	Flat	Permanent Grass	Av Rainfall: 969 mm ATO: 1506 day °C	Alluvium
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 204 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
23/96	8/7/96	Near asp 172	PRW		-

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	15	ZC	10YR4/1	None	Common distinct medium ochreous	None	-	-	Moderate	Many	Many Fine	-	Clear smooth
2	44	C	10YR4/2	None	Many distinct medium and coarse ochreous	Common medium	Strong coarse prismatic	Very Firm	Poor	<0.5% biopores	Common Fine mainly exped	-	Clear Smooth
3	80+	C	10YR5/1	None	Many distinct coarse ochreous	None	Strong coarse prismatic	Very Firm	Poor	<0.5% biopores	Few fine and very fine mainly exped	-	-

Profile Gleyed From: 0cm

Depth to Slowly Permeable Horizon: 15cm

Wetness Class: IV

Wetness Grade: 4

Available Water Wheat: 92 mm

Potatoes: 97 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: 3 mm

Potatoes: 19 mm

Droughtiness Grade: 3a (Calculated to 80 cm)

Final ALC Grade: 4

Main Limiting Factor(s): Wetness

Remarks: Flood limitation 3b