7/95

Land at Junction 26, M5 West Buckland
Agricultural Land Classification

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MAFF

Land at Junction 26, M5
(West Buckland)

AGRICULTURAL LAND CLASSIFICATION

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LAND AT JUNCTION 26, M5

AGRICULTURAL LAND CLASSIFICATION SURVEY

SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in the preparation of the Taunton Deane Local plan. The fieldwork around Junction 26 of the M5 and West Buckland was completed at a semi-detailed level in April 1995 at a scale of 1:25,000. Data on climate, soils, geology and from previous Agricultural Land Classification (ALC) Surveys was used and is presented in the report. The distribution of grades is shown on the accompanying ALC map and summarised below. Information is correct at this scale but could be misleading if enlarged.

Distribution of ALC grades: Land at Junction 26, M5

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (586.0 ha)
1	4.8	0.7	0.8
2	12.5	1.8	2.1
3a	220.9	32.2	37.7
3b	238.4	34.8	40.7
4	109.4	15.9	18.7
Urban	79.3	11.6	0.0
Non Agricultural	10.2	1.5	0.0
Agricultural Buildings	9.9	1.4	0.0
Open Water	0.4	0.1	0.0
TOTAL	685.8	100.0	100.0

Just over 40 % of the agricultural surveyed was found to be 'best and most versatile'. The majority of the site has an overall wetness limitation although due to the variable nature of the alluvium and the Upper Marls there are small areas of better drained soils. Some isolated well drained profiles have been mapped in lower grade mapping units where it was not reasonable to map them individually.

1. INTRODUCTION

A semi-detailed Agricultural Land Classification (ALC) Survey was carried out in April 1995 around Junction 26 of the M5 on behalf of MAFF as part of its statutory role in the preparation of the Taunton Deane Local Plan. The fieldwork covering 685.8 ha of land was conducted by ADAS at a scale of 1:25,000 with approximately one boring per two hectares of agricultural land. A total of 314 auger borings were examined and 13 soil profile pits used to assess subsoil conditions.

The published provisional one inch to the mile ALC map of this area (MAFF 1971) shows most of the site to be Grade 3. There are however two areas of Grade 2 land, one around Burts Farm and the other covering an area from Heatherton Park House to west Buckland encompassing Pitt Farm, Silver Street and Barber's Farm. The village of West Buckland is mapped as predominantly urban and two areas of woodland are shown as non-agricultural land.

The area to the south of the A38 from Burts Farm to Chelston Nurseries was surveyed in December 1994 at a scale of 1:10,000. An area to the north of Morrish's Farm was also surveyed in July 1994 at a scale of 1:10,000. The former shows the land has a moderate wetness limitations and was mapped as Subgrades 3a and 3b, with a small area of Grade 4 land to the south of Pennant. The survey to the south of West Buckland mapped the land as Subgrade 3b due to a moderate wetness limitation.

The recent survey supersedes the 1971 map having been carried out at a more detailed level and using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988) and expands upon the two 1994 surveys. The Revised Guidelines and Criteria provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The grading takes account of the top 120 cm of the soil profile. A description of the grades used in the ALC system can be found in Appendix 2.

2. CLIMATE

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 a lower grade despite other favourable conditions.

Estimates of climatic variables were interpolated from the published agricultural climate dataset (Meteorological Office 1989). The parameters used for assessing overall climate are accumulated temperature, a measure of the relative warmth of a locality, and average annual rainfall, a measure of overall wetness. The results shown in Table 1 indicate there is no overall limitation due to climate.

Table 1: Climatic Interpolations: Land at Junction 26, M5

Grid Reference		ST 166 214	ST 171 190	ST 150 195	ST 167 198
Altitude (m)		40	115	85	62
Accumulated Temperature (day °)		1536	1451	1486	1512
Average Annual Rainfall (mm)		853	931	899	892
Overall Climatic Grade		1	1	1	1
Field Capacity Days		180	192	187	186
Moisture deficit (mm):	Wheat	102	90	94	98
	Potatoes	93	78	83	88

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat and potatoes are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections.

3. RELIEF AND LANDCOVER

The western and northern edges of the site are bordered by Ford Street, Wellington and the A38 respectively. The site then extends to Middle Ford Farm and Gifford's Farm in the south, and to Stoford Bridge and Overland Copse in the east. The area is gently undulating with a high point of 115 m AOD at Overland Copse and low points of 40 m at Hockholler and Stoford Bridge. The valley of Hayward's Water occupies the west and the relatively flat higher land of Silver Street and West Buckland in the eastern part of the site. At the time of survey the land was mainly being used for permanent pasture, ley grassland and cereal cultivation.

4. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:50,000 scale drift geology map, sheet 311 (Institute of Geological Sciences, 1976) as being mainly Upper Marls (Keuper Marl). There are small areas of valley gravels mapped between Pennant and Piccadilly Farm, around Middle Ford Farm, to the north of Gerbestone Manor and to the east of Junction 26. Bands of alluvium are shown running from Stoford Bridge to the M5 to the east of West Buckland and from Hockholler Bridge to Haywards and Park Bridge Cottage.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000. Five different soil types are identified in the survey area. Soils from the Whimple 1 Association, which are described as being reddish fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging and they are associated with similar well drained soils, some over gravel, are found around Manley's Farm and Coombe Land Copse. There is also an area on the eastern side of the site running from Chelston Heathfield to Blackham Bridge. The land from Park farm and Hockholler to the northern side of Judge's Cottages is shown as belonging to the Whimple 3 Association which is described as being reddish fine loamy or fine silty over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some similar clayey soils can be found on brows. Slowly permeable, seasonally waterlogged, fine loamy and fine silty over calyey soils are found on lower slopes The soils around West Buckland are shown to belong to the Worcester Association. These are described as being slowly permeable, non-calcareous and calcareous, reddish clayey soils over mudstone, which can be shallow on steeper slopes. They are associated with non-calcareous fine loamy over clayey soils. Two areas of soils from the Newnham Association are mapped in the site, one running from Stoford Bridge to the east of West Buckland and the other running from Hockholler to Haywards. They are described as being well drained, reddish coarse and fine loamy soils over gravel which can be locally deep. Some similar soils are affected by groundwater. The rest of the site, from Middle Ford Farm to Haywards, around Gerbestone Manor, Voker's Bridge, Park Bridge, Five Cross Way and Overland Copse is mapped as belonging to the Brockhurst 1 Association. These soils are described as being slowly permeable, seasonally waterlogged, reddish fine loamy over clay soils. Some similar soils have slowly permeable layers and slight seasonal waterlogging.

5. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades is shown in Table 2 and on the accompanying ALC map. This information could be misleading if shown at a larger scale.

Table 2: Distribution of ALC grades: Land at Junction 26, M5

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (586.0 ha)
1	4.8	0.7	0.8
2	12.5	1.8	2.1
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TOTAL	685.8	100.0	100.0

Grade 1

A small area of land to the north of Junction 26 has been mapped as Grade 1 with no limitations to its agricultural use. The profiles are deep, well drained with light textures and as there was only gleying in the lower subsoils they were assessed as Wetness Class I (see Appendix 3). The stone contents in the profiles were variable but droughtiness had no overall limitation.

Grade 2

Three small areas of Grade 2 land have been mapped. One around Junction 26, M5 and two to the north of West Buckland near Silver Street. These profiles were deep, well drained clay loams and were assessed as Wetness Class I. The combination of the relatively high local FCD value and their medium clay loam topsoils lead to a minor workability limitation to their agricultural versatility. Other isolated Grade 2 profiles have been included in Subgrade 3a map units were it was not reasonable to map them individually at this scale. The stone contents in the profiles were variable but droughtiness had no overall limitation.

Subgrade 3a

Nearly 38 % of the agricultural land surveyed in the site has been mapped as Subgrade 3a with overall moderate wetness limitations. Where the profiles had gleying above 40 cm and no slowly permeable layer or gleying below 40 cm and a slowly permeable layer starting below 66 cm they were assessed as Wetness Class II. These profiles had heavy clay loam topsoils. If there was gleying above 40 cm and a slowly permeable layer starting below 50 cm or gleying below 40 cm and a slowly permeable layer starting above 66 cm they were assessed as Wetness Class III. These profiles have medium clay loam topsoils. The slowly permeable layers were either pale clays over the alluvium or pale and dark red clays over the Upper Marls. There are also a few well drained profiles which were assessed as Wetness Class I but these have heavy clay loam topsoils and therefore a moderate workability limitation. The stone contents in the profiles were variable but droughtiness had no overall limitation.

Subgrade 3b

The profiles in these mapping units are similar to some of those in the Subgrade 3a mapping units except that the gleying and slowly permeable layers are found higher up the profiles and the topsoil textures are heavier. These areas also have a moderate wetness limitation to their agricultural versatility. Where there is gleying above 40 cm and slowly permeable layers starting at 50 cm or gleying below 40 cm and slowly permeable layers starting above 66 cm the profiles were assessed as Wetness Class III. These profiles have heavy clay loam and clay topsoils. A few of the profiles have gleying above 40 cm and slowly permeable layers starting above 50 cm so they were assessed as Wetness Class IV. The stone contents in the profiles were variable but droughtiness had no overall limitation.

Grade 4

There are some areas, mainly over the alluvium deposits, which are gleyed above 40 cm and have slowly permeable layers starting above 50 cm. These profiles were assessed as Wetness Class IV and with their heavy clay loam and clay topsoils suffer from a severe wetness limitation.

Other Land

Areas of housing and roads are shown as urban land. The few areas of non-agricultural land include a few copses and some playing fields. Agricultural buildings and horticultural buildings are also identified.

Resource Planning Team
Taunton Statutory Unit
April 1995

APPENDIX 1

REFERENCES

INSTITUTE OF GEOLOGICAL SCIENCES (1976) Drift Edition, Sheet 311, Wellington, 1:50,000

MAFF (1971) Agricultural Land Classification Map, Sheet 164, Provisional 1:63,360 scale.

MAFF (1988) Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for grading the quality of agricultural land), Alnwick.

METEOROLOGICAL OFFICE (1989) Climatological Data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 5, Soils of South West England, 1:250,000 scale.

APPENDIX 2

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, cultivations 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 (e.g. 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.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private park land, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (e.g. polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above landcover types, e.g. buildings in large grounds, and where may be shown separately. Otherwise, the most extensive cover type will usually be shown.

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

APPENDIX 3

DEFINITION OF SOIL WETNESS CLASSES

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).

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 1 (ASP 292)	1° North East	Cereal	Av Rainfall: 892 mm ATO: 1512 day °C	Upper Marls (Keuper)
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 186 Climatic Grade: 1 Exposure Grade: 1-	SOIL SAMPLE REFERENCES
7/95	24.2.95	ST 157 194	HLJ/PRW		RPT/HLJ/122

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	32	FSZL	10YR54	5% HR Total (Vis)	FFFO (7.5YR56)	None	-	-	-	Good	MF+VF	-	Clear Smooth
2	52	HCL	10YR53	55% HR Total (Vis)	None	None	MCSAB	Friable	M	Good	CF+VF	-	Clear Wavy
3	90+	C	2.5YR54	35% HR Total (Vis)	MDMO (05YR58)	Common	Too stony	Friable	M (assumed)	Poor (between stones)	FVF	-	-

Profile Gleyed From: 52 cm

Depth to Slowly Permeable Horizon: 52 cm

Wetness Class: III

Wetness Grade: 3a

Available Water Wheat: 106 mm

Potatoes: 90 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 8 mm

Potatoes: 2 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 2 (ASP 294)	0°	Permanent Grass	Av Rainfall: 892 mm ATO: 1512 day °C FC Days: 186 Climatic Grade: 1 Exposure Grade: 1	Upper Marls (Keuper)
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
7.95	24.2.95	ST 160 194	PRW/HLT		RPT/HLJ/123

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	30	ZC	10YR44	1% HR Total (Vis)	FFFO (10YR56)	None	-	-	-	Good	CF+VF	-	Clear Smooth
2	52	C	10YR53	1% HR Total (Vis)	MDMO (10YR58)	None	MCPr breaking MCAB	Firm	Poor	Poor	CF+VF	-	Abrupt Smooth
3	70+	C	10YR62	0% Total (Vis)	CMDO (10YR56)	None	MCAB	Firm	Poor	Poor	FVF	-	-

Profile Gleyed From: 30 cm

Depth to Slowly Permeable Horizon: 30 cm

Wetness Class: IV

Wetness Grade: 4

Available Water Wheat: 189 mm

Potatoes: 126 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 91 mm

Potatoes: 38 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 4

Main Limiting Factor(s): Wetness

Remarks:

Roots in H2 between peds. Mottles in H2 within peds.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 3 (ASP 194)	1° East	PGR	*Av Rainfall:* 892 mm ATO: 1512 day °C FC Days: 186 Climatic Grade: 1 Exposure Grade: 1	Upper Marls (Keuper)
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
7/95	24.2.95	ST 175 201	HLJ/PRW		RPT/HLJ/121

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	33	MCL	10YR44	1% HR Total (Vis)	Rusty root channels	None	-	-	-	Good	CF+VF	-	Clear Smooth
2	52	HCL	10YR64	5% HR Total (Vis)	CFFO (75YR58)	Few	WCSAB	Friable	M	Good	CF+VF	-	Abrupt Smooth
3	80+	C	05YR64	55% HR Total (Vis)	MDMO (75YR58)	Common	WCSAB	Firm	P	Good	FVF	-	-

Profile Gleyed From: 33 cm

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: II

Wetness Grade: 3a

Available Water Wheat: 113 mm

Potatoes: 102 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 15 mm

Potatoes: 14 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks:

Only just too many pores in H_3.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 4 (ASP 24)	0°	Ley	Av Rainfall: 892 mm ATO: 1512 day °C	Upper Marls (Keuper)
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 185 Climatic Grade: 1	SOIL SAMPLE REFERENCES
7.95	6.3.95	ST 175 215	N A Done	Exposure Grade: 1	RPT/NAD/201

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	22	MSZL	10YR43	3% HR (Vis)	None	None	-	-	-	-	-	None	Clear Smooth
2	43	MSZL	10YR44	5% HR (Vis)	None	None	M C+MSAB	Friable	M	Good	Many fine + v fine	None	Clear Smooth
3	120	MSL	10YR53	5% HR (Vis) (some increase in stones below 80 cm)	CDOM (10YR58)	Common	M MSAB	Friable (almost v friable)	G	Good	Common fine + v fine	None	-

Profile Gleyed From: 43 cm

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 1

Available Water	Wheat:	173 mm
	Potatoes:	118 mm
Moisture Deficit	Wheat:	98 mm
	Potatoes:	88 mm
Moisture Balance	Wheat:	75 mm
	Potatoes:	30 mm
Droughtiness Grade:		1 (Calculated to 120 cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks:

Water at 75 cm. Surrounding profiles less sandy at depth, and gleying higher in profile.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 5 (ASP 239)	0°	Ley	Av Rainfall: 892 mm ATO: 1512 day °C FC Days: 186 Climatic Grade: 1 Exposure Grade: 1	Upper Marls (Keuper)
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
7.95	6.3.95	ST 176 198	N A Done		RPT/NAD/201

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	30	MCL	10YR43	5% HR Total (Vis)	None	None	-	-	-	-	Many fine + v fine	None	Clear/ smooth
2	55	SCL	10YR53	40 % HR (Vis)	CDOM (10YR58)	Common	WCSAB	Friable	M	Good	Few fine	None	Clear/wavy
3	80+	SCL	7.5YR53	55% HR (Vis)	MDOM (7.5YR58)	Many	WCSAB (too stony)	Friable	M	Well fissured due to stones	Few fine	None	-

Profile Gleyed From: 30 cm

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: II

Wetness Grade: 3a

Available Water Wheat: 104 mm

Potatoes: 86 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 6 mm

Potatoes: -2 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks:

Stone contents visually estimated due to sticky clay matrix. Also large area of subsoil exposed for track construction showing very stony subsoils.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 6 (ASP 44)	0°	Ley	Av Rainfall: 892 mm ATO: 1512 day °C	Alluvium
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 186 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
7.95	6.3.95	ST 167 212	N A Done		RPT/NAD/202

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	20	C	10YR43	0% (Vis)	None	None	-	-	-	-	Many fine + v fine	None	Gradual/ smooth
2	50	C	75YR54	2% HR (Vis)	FDOM 75YR56	None	WDCSAB	Friable	M	Good	Many fine + v fine	None	Clear/ smooth
3	70	C	75YR53	0% HR (Vis)	CDOM 75YR58	Common	WDCSAB	Friable	M	Poor	Common fine + v fine	None	Clear/ irregular
4	120	C	25YR46 + 5Y54	2% HR (Vis)	FDOM 75YR56	Common	WD Adherent CSAB	Friable	M	Poor	Common fine + v fine	None	-

Profile Gleyed From: 50 cm

Depth to Slowly Permeable Horizon: 50 cm

Wetness Class: III

Wetness Grade: 4

Available Water Wheat: 136 mm

Potatoes: 113 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 38 mm

Potatoes: 25 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 4

Main Limiting Factor(s): Wetness

Remarks:

Some pores in H3 but not consistently more than 0.5%.
Some red sandy lenses in H4.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 7 (ASP 14)	1° East	Cereals	Av Rainfall: 892 mm ATO: 1512 day °C FC Days: 186 Climatic Grade: 1 Exposure Grade: 1	Upper Marls (Keuper)
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
7.95	7.3.95	ST 173 217	NAD/PB		RPT/NAD/204 + 205

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	23	MSZL	75YR53	3% HR (Vis)	None	None	-	-	-	-	CF	-	Clear Wavy
2	32	MSZL	75YR54	3% HR (Vis)	FFMOM	None	MCAB	Friable	M	G	MF, VF	-	Gradual Smooth
3	75	MSZL	10YR63	3% HR (Vis)	MDMOM (10YR56)	None	WCSAB	Friable	M	P(i)	None	-	Gradual Wavy
4	120 (pit 80)	C	05YR54	3% HR (Vis)	MDCG/OM (75YR72) (05YR58)	M	WCSAB (ii)	Friable	M	P	None	-	-

Profile Gleyed From: 32 cm

Depth to Slowly Permeable Horizon: 75 cm

Wetness Class: III

Wetness Grade: 3a

Available Water Wheat: 149 mm

Potatoes: 120 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 51 mm

Potatoes: 32 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks:

(i) Some small pores in H3.
(ii) Pockets of lighter textures MCAB H4.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 8 (ASP 97)	3° North	Fallow	Av Rainfall: 892 mm ATO: 1512 day °C FC Days: 186 Climatic Grade: 1 Exposure Grade: 1	Upper Marl (Keuper)
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
7.95	7.3.95	ST 169 208	PB/NAD		RPT/NAD/206

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	20	MCL	10YR44	5% HR (Vis)	None	None	-	-	-	-	Many fine	-	Abrupt/ smooth
2	52	C	05Y44	30% HR (i) (Vis)	MDMG+OM (75YR63) (75YR68)	Common	WD Adherent MAB	Firm	P	Poor	Common v fine roots	-	Gradual/ wavy
3	80	C	05YR46	2% HR (Vis)	CDCPM 05YR54	Common	WDCSAB Adherent	Firm	P	Poor	Few fine	-	Gradual/ wavy
4	120	SC (variable with clay)	25YR46	Variable stones 5% HR	CDPGM 05YR54	None	WDCSAB with some CAB	Friable	M	Poor	None	-	-

Profile Gleyed From: 20 cm

Depth to Slowly Permeable Horizon: 20 cm

Wetness Class: IV

Wetness Grade: 3b

Available Water Wheat: 121 mm

Potatoes: 87 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 23 mm

Potatoes: -1 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks:

(i) Very variable stones.
(ii) Stone content increases below 105 cm.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 9 (ASP 63)	2° North	PGR	Av Rainfall: 892 mm ATO: 1512 day °C FC Days: 186 Climatic Grade: 1 Exposure Grade: 1	Upper Marl (Keuper)
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
7.95	7.3.95	ST 171 211	NAD/PB		RPT/NAD/207

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	75YR43	2% HR (Vis)	None	None	-	-	-	G	MF, FM	-	Clear Smooth
2	55	MCL	75YR54	5% HR (Vis)	None	F	MCSAB	Friable	M	G	CF, VF	-	Gradual Smooth
3	70	C	5YR54	2% HR (Vis)	MDCGM 75YR73	C	WCSAB	Friable	M	P	CF	-	Diffuse Smooth
4	120	C	25YR46	7% HR (Vis)	CDMGM	M	WM and CSAB	Friable	M	P	CF	-	-

Profile Gleyed From: 55 cm

Depth to Slowly Permeable Horizon: 55 cm

Wetness Class: III

Wetness Grade: 3a

Available Water Wheat: 136 mm

Potatoes: 113 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 38 mm

Potatoes: 25 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks:

Pit dug to 90 cm.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 10 (ASP 167)	1° West	PGR	Av Rainfall: 892 mm ATO: 1512 day °C	Valley Gravel
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 186 Climatic Grade: 1	SOIL SAMPLE REFERENCES
7.95	7.3.95	ST 165 203	NAD/PB	Exposure Grade: 1	RPT/NAD/208

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	30	FSZL	75YR53	2% HR (Vis)	None	None	-	-	-	G	MF,VF	-	Gradual Smooth
2	60	MZCL	75YR54	5% HR (Vis)	None	None	WCSAB	Friable	G	G	MF,VF	-	Clear Smooth
3	80+	SCL	75YR54	30% HR (Vis)	CDMOM	C	WC and M SAB	Friable	M	G	CVF	-	-

Profile Gleyed From: 60 cm

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 159 mm

Potatoes: 136 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 61 mm

Potatoes: 48 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 11 (ASP 301)	6° North	PGR	Av Rainfall: 892 mm ATO: 1512 day °C FC Days: 186 Climatic Grade: 1 Exposure Grade: 1	Upper Marl (Keuper)
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
7.95	8.3.95	ST 170 194	PRW/PB		RPT/NAD/209

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	HCL	75YR44	5% HR (Vis)	None	None	-	-	-	G	MF, VF	-	Abrupt Smooth
2	35	HCL	75YR54	35% >2 15% <2 50% HR (S+D)	None	F	Too stony	Friable	M (assumed)	G	CF, VF	-	Gradual Wavy
3	50	C	75YR64	35% HR (Vis)	CDMOM (10YR56)	C	Too stony	Firm	M (assumed)	P	FVF	-	Good Smooth
4	120	C	25YR43	10% HR (Vis)	CDMGM (75YR52)	C	WCPr (breaking to MFAB)	Firm	Poor	P	FVF	-	-

Profile Gleyed From: 35 cm

Depth to Slowly Permeable Horizon: 35 cm

Wetness Class: IV

Wetness Grade: 4

Available Water Wheat: 111 mm

Potatoes: 90 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 13 mm

Potatoes: 2 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 4

Main Limiting Factor(s): Wetness

Remarks:

Pit dug to 85 cm.
T/S 1% away from MCL.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 12 (ASP 358)	3° North	PGR	Av Rainfall: 892 mm ATO: 1512 day °C	Upper Marl (Keuper)
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 186 Climatic Grade: 1	SOIL SAMPLE REFERENCES
7.95	8.3.95	ST 166 190	RRW/PB	Exposure Grade: 1	RPT/NAD/210

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	22	MCL	7.5YR4/4	10% HR (Vis)	None (Common RRC in top 15 cm)	None	-	Friable	Moderate	Good	Many fine and very fine	-	Gradual Smooth
2	40	HCL	7.5YR5/4	25% >2cm 17% <2cm 42% HR (S+D)	None	Few	WCSAB	Friable	Moderate	Good	Common very fine	-	Clear Wavy
3	50	C	05YR6/4	42% HR	MCDO 75YR6/3	Common	WCAB	Firm	Moderate	Good	Common very fine	-	Gradual Smooth
4	80	C	2.5YR4.6	15% HR (Vis)	CDMO	Common	WCPr breaking to MFAB	Firm	Poor	Poor	Few very fine	-	-

Profile Gleyed From: 40 cm

Depth to Slowly Permeable Horizon: 50 cm

Wetness Class: III

Wetness Grade: 3a

Available Water	Wheat:	105 mm
	Potatoes:	85 mm
Moisture Deficit	Wheat:	98 mm
	Potatoes:	88 mm
Moisture Balance	Wheat:	7 mm
	Potatoes:	-3 mm
Droughtiness Grade:		2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
West Buckland - Wellington	Pit 13 (ASP 76-77)	0°	Ley	Av Rainfall: 892 mm ATO: 1512 day °C FC Days: 186 Climatic Grade: 1 Exposure Grade: 1	Alluvium
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
7.95	8.3.95	ST 166 210	PRW/PB		RPT/NAD/211

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	30	FSL	10YR44	1% HR (Vis)	RRC only	None	-	-	-	G	MF, VF	-	Gradual Smooth
2	48	SCL	75YR54	1% HR (Vis)	None	None	WCSAB	Friable	M	G	CVF	-	Clear Wavy
3	120	SCL	75YR64	5% HR (Vis)*	CFM+GM (10YR58) (10YR52)	None	WCSAB	Friable	M	G	FVF	-	-

Profile Gleyed From: 48 cm

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 150 mm

Potatoes: 112 mm

Moisture Deficit Wheat: 98 mm

Potatoes: 88 mm

Moisture Balance Wheat: 52 mm

Potatoes: 24 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks:

* H3 stone content increases with depth.
T/S texture 1% away from FSZL and close to MCL.
Pit dug to 90 cm.
Pit is close WCII in area of variable depth to gleying.

SOIL PLASTICITY RECORDING SHEET

ANNEX 2

SITE DATA

Grid Ref	ST		Site Name	West Buckland - Wellington		LPA	Taunton Deane Borough Council		
AAR	892	ATO 1512		FCD	186	MD (wheat)	98	MD (potatoes)	88

SOIL PIT DATA

	PIT 12: ST 166 190 SOIL SERIES Whimple 1			PIT 13: ST 166 210 SOIL SERIES Newnham			PIT 1: ST 157 194 SOIL SERIES Brockhurst 1		
DEPTH	TEXTURE	PLASTIC Y/N	COMMENTS	TEXTURE	PLASTIC Y/N	COMMENTS	TEXTURE	PLASTIC Y/N	COMMENTS
10 cm	MCL	N	No ball, no worm	FSL	N	Ball, no worm	FSZL	N	No ball
20 cm	MCL	N	Ball, no worm	FSL	N	No ball	FSZL	N	"
30 cm	HCL	Y	Worm	FSL	Y	Worm	FSZL	N	"
40 cm	HCL	Y	"	SCL	Y	"	HCL	N	Ball, no worm
50 cm	C	Y	"	SCL	Y	"	HCL	Y	Worm
60 cm	C	Y	"	SCL	Y	"	HCL	Y	"

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