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West Wiltshire Local Plan

Melksham

Agricultural Land Classification
October 1996

Resource Planning Team
Taunton Statutory Group
ADAS Bristol

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WEST WILTSHIRE LOCAL PLAN
MELKSHAM

AGRICULTURAL LAND CLASSIFICATION SURVEY

CONTENTS

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INTRODUCTION

1. This report presents the findings of a reconnaissance scale Agricultural Land Classification (ALC) survey of 974.1 ha of land surrounding Melksham, Wiltshire. Field survey was based on 168 auger borings and nine soil profile pits, and was completed in July and August 1996.

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

3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant sections. The published regional ALC map (MAFF, 1977) shows the site at a reconnaissance scale to be mainly Grade 3 and Grade 4 adjacent to the River Avon. On the slightly higher land above the flood plain Grade 1 is mapped with some smaller areas of Grade 2 to the north west of the town. Part of the current survey area, around Bowerhill and near Woodrow House, had been previously surveyed (ADAS; 1978a, 1978b and 1987). However, the current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF, 1988) and supersedes these previous ALC surveys. Grade descriptions are summarised in Appendix I.

4. Some areas of land between the current survey area and the eastern edge and on the north western and southern edges of the town, had previously been surveyed by the Resource Planning Team under the Revised Guidelines (ADAS; 1991 and 1993). The findings of these surveys were taken into account during the current survey.

5. At the time of survey the land cover was mainly winter cereals and permanent pasture. Small areas of forage maize and oats were also surveyed. An area of 24.9 ha of agricultural land within the survey area at Berryfield and near Shaw was not surveyed due to access restrictions. Other land which was not surveyed included a woodland, agricultural buildings and residential areas.

SUMMARY

6. The distribution of ALC grades is shown on the accompanying 1: 25 000 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 smaller sites. Areas are summarised in the Table 1.

7. A quarter of the agricultural land surveyed (26.3%) was found to be 'best and most versatile'. The majority of which has been classified as Grade 2 land (very good quality) with some areas of Subgrade 3a (good quality land) and a small area of Grade 1 (excellent quality). The remainder of the site was mapped as Subgrade 3b land (moderate quality).

Table 1: Distribution of ALC grades: Melksham

Grade	Area (ha)	% Surveyed Area (721.3 ha)
1	13.8	2.0
2	101.1	14.0
3a	74.6	10.3
3b	531.8	73.7
Agricultural land not surveyed	24.9	-
Other land	227.9	-
Total site area	974.1	-

8. A small area of Grade 1 land, which has no limitation, is mapped on the western side of the town, near Monkton Farm. This unit occupies a terrace above the River Avon where the profiles are deep and well drained with no drought limitation.

9. The areas of Grade 2 land have minor limitations to their agricultural use. The actual limiting factorsre variable with there being small areas of drought, wetness and workability limitations. Where there are gravel deposits the higher stone contents will reduce the amount of available moisture in the profile such that the soils will not be able to meet the potential crop moisture requirements throughout the year. In areas with heavier topsoil textures and/or impaired subsoil drainage, in combination with the local climate the amount of time during which the land is in a workable condition will be reduced.

10. The majority of the Subgrade 3a mapping units have moderate wetness limitations, although there is a small area to the west of the River Avon in the southern part of the site which has a workability limitation. The profiles generally have medium clay loam topsoils over permeable clay upper subsoils but with impaired drainage in the lower subsoils. The amount of time during which the land is in a workable condition will be reduced and crop choice may be affected. There is some variability in the drainage of the land around Beanacre with there being some small areas of better quality land which could not be mapped at this scale of survey.

11. The land mapped as Subgrade 3a to the south west of Melksham has a moderate workability limitation. These profiles are well drained and were assessed as Wetness Class I. The profiles typically have clay topsoils over permeable, stoneless clay subsoils which with the local climate will restrict the amount of time during which the land can be worked.

12. Most of the land mapped in the survey is Subgrade 3b having a moderate wetness limitation. These profiles typically have heavy clay loam and clay topsoils over clay subsoils with severely restricted drainage. These areas have similar limitations to those of the Subgrade 3a land but to a greater degree, affecting crop choice and yield.

CLIMATE

13. 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.

14. 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.

15. Climatic variables also affect ALC grade through interactions with soil conditions. The most important interactive variables are Field Capacity (FC) days 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. . The crop-adjusted soil moisture deficits at the site are above the average for the region which will increases the likelihood of soil droughtiness limitations. These are described in later sections.

Table 2: Climatic Interpolations: Melksham

Grid Reference		ST 910 653	ST 895 630	ST 919 630
Altitude (m)		40	35	40
Accumulated Temperature (day °C)		1499	1507	1500
Average Annual Rainfall (mm)		743	744	732
Overall Climatic Grade		1	1	1
Field Capacity Days		167	167	165
Moisture deficit (mm):	Wheat	107	107	106
	Potatoes	100	100	99

RELIEF

16. The site is low lying with altitude ranging from 35 m along the River Avon to 40 m near Beanacre and Bowerhill, and 45 m near Blackmore Forest. The site has gentle and moderate gradients (0-7°) which are not limiting to agriculture.

GEOLOGY AND SOILS

17. The underlying geology of the site is shown on the published geology maps (IGS; 1965 and 1990). Recent alluvial deposits are found along the River Avon and its tributary streams. In the south western part of the site there is a large area of First Terrace gravel deposits with smaller areas also being found around Bezzle's Farm in the north. The south east is predominantly underlain by Pleistocene Head deposits with patches of Jurassic Oxford Clay. The remainder of the site is also underlain by Oxford Clay

18. Evidence from the soil types found during the survey suggests that the areas of gravel deposits are not as extensive as shown on the geological maps. Soils developed over the Oxford Clays, river alluvium and head were found to match the geology.

19. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as being from several soil associations. Their mapping closely follows that of the geology with poorly drained clayey soils from the Denchworth and Wickham 2 Associations having formed over the Oxford Clays and Head deposits. Over the river gravels shallow, well drained Badsey 1 Association are mapped. While the alluvium has developed clayey soils from the Fladbury 1 Association which are affected by groundwater. More detailed soils information is also available for most of the site in the 1:63 360 scale survey of the Bath and Malmesbury area (SSEW, 1974).

20. The soils found during the current survey closely match those identified by the Soil Survey and on the whole follow the geology of the site. The majority of the site consists of poorly drained clayey soils similar to those of the Denchworth and Wickham 2 Associations. While there are smaller areas of more permeable, slightly stony soils over the gravel deposits, especially near Beanacre, Berryfield and Snarlton Farm. Well drained soils were also found on the western side of the River Avon in the southern part of the site again over gravel deposits.

AGRICULTURAL LAND CLASSIFICATION

21. The distribution of ALC grades found by the current survey is shown on the accompanying 1: 25 000 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 1

22. The small area of Grade 1 land lies on an area of higher, overlooking the River Avon. These profiles have medium clay loam and fine sandy silt loam topsoils over stoneless, permeable heavy clay loam, sandy clay loam, silty clay and clay subsoils. In a couple of borings gleying were seen at depth. They were assessed as Wetness Class I (see Appendix II) and have no drought limitation. This area links up with a Grade 1 mapping unit in the recent survey at Holt (ADAS, 1996).

Grade 2

23. The small areas of Grade 2 land have minor limitations. The limiting factors are variable and there are small areas with drought, wetness and workability limitations. The main limitation is wetness where slightly impaired drainage has caused gleying above 40 cm in the profiles. These were assessed as Wetness Class II and have medium clay loam topsoils over heavy clay loam and clay subsoils. This means that the amount of time during which the land will be in a suitable condition for cultivation, trafficking by machinery or grazing by livestock is reduced.

24. The profiles over the gravel deposits are well drained and were assessed as Wetness Class I. However, they have relatively high stone contents in the lower subsoils. This will

restrict the amount of available moisture in the profile and the soils will not be able to meet the potential crop moisture requirements throughout the year. This is likely to have the effect of slightly restricting the level of consistency of crop yields in most years. Pit 7 is an example of this type of profile.

25. A few of the profiles in these mapping units have a workability limitation which will have similar problems to those mentioned in Paragraph 22. The profiles typically have heavy clay loam topsoils over permeable subsoils and were assessed as Wetness Class I.

Subgrade 3a

26. The majority of the Subgrade 3a mapping units have moderate wetness limitations, although there is a small area to the west of the River Avon in the southern part of the site which has a workability limitation. The profiles on the northern edge of the town, around Beanacre, and on the eastern edge, near Snarlton Farm and Berryfield, generally have medium clay loam topsoils over permeable clay upper subsoils. The lower subsoils, however, have impaired drainage and are slowly permeable layers. The profiles were assessed as Wetness Class II. The limitations are similar to those mentioned in Paragraph 22 but to a greater extent so that crop choice may be affected as well as yields. There is some variability in the drainage of the land around Beanacre with some small areas of better quality land which could not be mapped at this scale of survey.

27. The land mapped as Subgrade 3a to the south west of Melksham has a moderate workability limitation. These profiles are well drained and were assessed as Wetness Class I. The profiles typically have clay topsoils over permeable, stoneless clay subsoils. The limitation will be similar to those mentioned in Paragraph 26. Pit 4 was examined in this mapping unit.

Subgrade 3b

28. All of the Subgrade 3b mapping units in the site, developed over the Oxford Clays, head deposits and alluvium, have a moderate wetness limitation. The land use is restricted to a narrow range of crops with moderate yields, or a wider range of crops with lower yields. The profiles typically have clay and heavy clay loam topsoils over clay subsoils. Slowly permeable layers and gleying are found higher up in these profiles, starting at around 25-30 cm, immediately below the topsoil in most cases. The profiles were therefore assessed as Wetness Class IV. The types of limitation to their agricultural use are similar, but to a greater extent, to those mentioned in Paragraph 26. Pits 2, 3, 5 and 9 are examples of this type of profile.

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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, 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.

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		PARENT MATERIAL
Melksham	Pit 1 (Asp 94)	0°	PGR	Av Rainfall: 743 mm ATO: 1499 day °C FC Days: 167 Climatic Grade: 1 Exposure Grade: -	River terrace gravel
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
19.96	19.7.96	ST89726288	GS/PB		RPT/PB/385

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	10YR42	0% (VIS)	FDFO (7.5YR58)	NONE	-	-	-	-	MVF	-	Clear Smooth
2	52	C	10YR54	1% SLST (VIS)	FFFO (10YR58)	Few	WCSAB	Firm*	Moderate	Good	CVF	-	Clear Smooth
3	72	C	10YR54, 53	2% HR (VIS)	MDFO, G (7.5YR58, 10YR52)	Common	WCSAB	Firm*	Moderate	Poor (Few large worm)	FVF	-	Clear Wavy
4	115+	LCS*	10YR73	30% HR (S+D)	CDFO (7.5YR58)	None	Fine Gran.	Loose	Good	(G)	None	-	-

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: 52cm

Wetness Class: III, Borderline II

Wetness Grade: 3a

Available Water Wheat: 121 mm

Potatoes: 116 mm

Moisture Deficit Wheat: 107 mm

Potatoes: 100 mm

Moisture Balance Wheat: +14 mm

Potatoes: +16 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks: H4 variable CLS to SCL in pockets.
H2, H3 Consistences likely to be firm when moist
H3 Unconvincing SPL but starts at 52cm

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Melksham	Pit 2 (Asp 14)	2° North West	Permanent Grass	Av Rainfall: 743 mm ATO: 1499 day °C	Oxford clay
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 167 Climatic Grade: 1	SOIL SAMPLE REFERENCES
19/96	23/7/96	ST910656	PB/HLJ	Exposure Grade: -	None

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	8	C	10YR43	<1% HR (VIS)	CRRC	NONE	-	-	-	GOOD	MF + VF	-	Clear Smooth
2	22	C*1	10YR52	<1% HR (VIS)	MDFO (75YR56)	NONE	MCSAB (breaking to FSAB)	FIRM	POOR	GOOD	MF + VF	-	Clear Smooth
3	38	C	10YR51	0% (VIS)	MDFO (75YR56)	Common	MVCPr	Very Firm	POOR	POOR*2	CF + VF	-	Gradiant Smooth
4	74+	C	10YR61 2.5YR62	0% (VIS)	CFFO (10YR68)	NONE	MVCPr	Very Firm	POOR	POOR	FF + VF	-	-

Profile Gleyed From: 8cm

Depth to Slowly Permeable Horizon: 22cm

Wetness Class: IV

Wetness Grade: 3b

Available Water Wheat: 117 mm

Potatoes: 94 mm

Moisture Deficit Wheat: 106 mm

Potatoes: 100 mm

Moisture Balance Wheat: 10 mm

Potatoes: -6 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: *(1) increased sand %
*(2) Few large worm channels

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Melksham	Pit 3(Asp 100)	0°	Permanent Grass	Av Rainfall: 743 mm ATO: 1499 day °C FC Days: 167 Climatic Grade: 1 Exposure Grade:	Pleistocene Head
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
19/96	24/6/96	ST919629	GMS/HLJ		RPT/HLJ/221

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	28	MCL	10YR42	NONE	CDFO (7.5YR58)	NONE	-	-	-	-	MF, VF	-	Clear Smooth
2	45	C	10YR53	NONE	CDMO (10YR68)	FEW	MMPr	FIRM	POOR	POOR	CF, VF on ped faces	-	Clear Smooth
3	75+	C	2.5Y62	NONE	MDMO (10YR68)	FEW	MCPr	FIRM	POOR	POOR	VF, VF on ped faces	-	-

Profile Gleyed From: Surface

Depth to Slowly Permeable Horizon: 28cm

Wetness Class: IV

Wetness Grade: 3b

Available Water	Wheat:	128 mm
	Potatoes:	105 mm
Moisture Deficit	Wheat:	107 mm
	Potatoes:	100 mm
Moisture Balance	Wheat:	+21 mm
	Potatoes:	+5 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: Topsoil clay content 27%

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Melksham	Pit 4 (Asp 122)	0°	Wheat (bare patch)	Av Rainfall: 743 mm ATO: 1499 day °C FC Days: 167 Climatic Grade: 1 Exposure Grade: -	Rive Gravel/Alluvium
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
19/96	24/7/96	ST885625	GMS		RPT/GMS/545

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	10YR42	Negligible	NONE	NONE	-	-	-	-	CVF	-	Clear Smooth
2	35	C	10YR53	NONE	NONE	NONE	MCSAB	Friable	Moderate	GOOD	FVF	-	Clear Smooth
3	80	ZC	10YR54	NONE	NONE	NONE	MCSAB	Friable	Moderate	GOOD	FVF	-	Clear Smooth
4	120	C	10YR53	27% HR (S+D)	NONE	NONE	WCSAB	Friable	Moderate	GOOD	NONE	-	-

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 134 mm

Potatoes: 116 mm

Moisture Deficit Wheat: 107 mm

Potatoes: 100 mm

Moisture Balance Wheat: +27 mm

Potatoes: +16 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Workability

Remarks: H4 Sieved 18%, 27%, 36% average 27%. Likely to be slightly high as larger stones increase % disproportionally ∴ Pit Grade 1 drought. Topsoil sampled twice.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Melksham	Pit 5 (near Asp62)	0°	Permanent Grass	Av Rainfall: 743 mm ATO: 1499 day °C FC Days: 167 Climatic Grade: 1 Exposure Grade: -	Oxford Clay
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
19/96	25/7/96	ST922645	HLJ		None

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	C	10YR42	<1% HR (VIS)	CAFO (75YR68)	NONE	-	-	-	GOOD	MF+VF	-	Clear Smooth
2	70+	C	25YR62	NONE	MDMO (10YR68)	FEW	MCPr	FIRM	POOR	POOR	CF+VF (ex-ped)	-	-

Profile Gleyed From: Surface (0cm)

Depth to Slowly Permeable Horizon: 24cm

Wetness Class: IV

Wetness Grade: 3b

Available Water	Wheat:	124 mm
	Potatoes:	101 mm
Moisture Deficit	Wheat:	107 mm
	Potatoes:	100 mm
Moisture Balance	Wheat:	17 mm
	Potatoes:	1 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Melksham	Pit 6 (Asp 24)	1° S	Maize	Av Rainfall: 743 mm ATO: 1499 day °C FC Days: 167 Climatic Grade: 1 Exposure Grade: -	Oxford Clay
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
19.96	25.7.96	ST902653	HLJ/PB		RPT/PB/386

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	10YR42	0% (VIS)	FFFO (10YR56)	NONE	-	-	-	-	MF, VF	-	Abrupt Smooth
2	52	C	10YR54	0% (VIS)	NONE	FEW	WCSAB	FIRM	Moderate	GOOD	FF, VF	-	Clear Smooth
3	75	C	10YR54	0% (VIS)	CFFO (10YR56)	FEW	WC, MSAB	Friable	Moderate	GOOD	FF, VF	-	Clear Smooth
4	95+	C	2.5Y63	0% (VIS)	CDFO (10YR56)	Common	WCSAB	Friable	Moderate	FEW(P)	FVF	-	-

Profile Gleyed From: 75cm

Depth to Slowly Permeable Horizon: 75cm

Wetness Class: II

Wetness Grade: 3a

Available Water Wheat: 140 mm

Potatoes: 116 mm

Moisture Deficit Wheat: 107 mm

Potatoes: 100 mm

Moisture Balance Wheat: 33 mm

Potatoes: 16 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks: H4 Dubious SPL: borderline porosity
TS 25 = HCL

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Melksham	Pit 7 (Asp 126)	0°	Pernanent Grass	Av Rainfall: 743 mm ATO: 1499 day °C	River Gravels
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 167 Climatic Grade: 1 Exposure Grade: -	SOIL SAMPLE REFERENCES
19/96	25/7/96	ST894624	PB/HJL		RPT/PB/387

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	SCL	10YR42	1% HR (VIS)	NONE	NONE	-	-	-	-	MF, VF	-	Abrupt Smooth
2	48	C	10YR54	3% HR (S+D)	NONE	FEW	MC, FSAB	FM	Moderate	GOOD	CF, VF	-	Clear Smooth
3	60	C	10YR64	6% HR (S+D)	CDFO (76YR58)	FEW	WC, FSAB	Friable	Moderate	GOOD	FVF	-	Clear Smooth
4	116+	LCS	10YR72	33% HR (S+D)	CDMO (10YR58)	Common	Granular	V. Friable	GOOD	(G)	FVF	-	-

Profile Gleyed From: 48cm

Depth to Slowly Permeable Horizon: No spl

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 114 mm

Potatoes: 104 mm

Moisture Deficit Wheat: 107 mm

Potatoes: 100 mm

Moisture Balance Wheat: +7 mm

Potatoes: +4 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Droughtiness

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Melksham	Pit 8 (Asp 78)	0°	Grass Ley	Av Rainfall: 743 mm ATO: 1499 day °C	Oxford Clay
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 167 Climatic Grade: 1	SOIL SAMPLE REFERENCES
19/96	7/8/96	ST923635	HLJ/GMS	Exposure Grade: -	PRT/HLJ/225

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	19	HCL	10YR43	1% HR (VIS)	NONE	NONE	-	-	-	GOOD	CF+VF	-	Clear Smooth
2	57	C	10YR41	1% HR (VIS)	MDFO (10YR58)	FEW	MCPr breaking to) WMP	FIRM	POOR	GOOD*'	FF+VF	-	Clear Smooth
3	65	SC	10YR56	10% HR (VIS)	CFFO (10YR58)	NONE	WCSAB	FIRM	Moderate	GOOD*²	FF+VF	-	Abrupt Wavy
4	76	MS	10YR54	60% HR <2cm 60% HR TOTAL	-	-	WMSAB	Friable	GOOD	GOOD	FVF	-	Abrupt Wavy
5	90+	C	2.5Y50	NONE	MDMO (10YR68)	NONE	WCAB	FIRM	POOR	POOR	FVF	-	-

Profile Gleyed From: 19cm

Depth to Slowly Permeable Horizon: 76cm

Wetness Class: II

Wetness Grade: 3a

Available Water Wheat: 119 mm

Potatoes: 95 mm

Moisture Deficit Wheat: 107 mm

Potatoes: 100 mm

Moisture Balance Wheat: 12 mm

Potatoes: -5 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks: *' worm holes are all coarse in size. Using Soil Survey diagram 1% porosity was estimated. In a 150 cm² block five of the six 25cm² squares were porous.
*² The warm channels from above continue into this horizon.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Melksham	Pit 9 (Asp 157)	0°	Permenent Grass	Av Rainfall: 743 mm ATO: 1499 day °C FC Days: 167 Climatic Grade: 1 Exposure Grade: -	Alluvium
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
19/96	7/8/96	ST883619	HLJ/GMS		NONE

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	ZC	10YR31	<1% HR	NONE	NONE	-	-	-	GOOD	MF+VF	-	Gradual Smooth
2	56	C	10YR53	NONE	CDFO (7.5YR58)	NONE	WMPr (breaking to CSAB)	FIRM	POOR	POOR	CF+VF	-	Gradual Smooth
3	75+	C	2.5Y64	NONE	CDFO (10YR58)	NONE	WCSAB (breaking to MCAB)	FIRM	Moderate	POOR	FVF	-	-

Profile Gleyed From: 22cm

Depth to Slowly Permeable Horizon: 22cm

Wetness Class: IV

Wetness Grade: 3b

Available Water Wheat: 129 mm

Potatoes: 104 mm

Moisture Deficit Wheat: 107 mm

Potatoes: 100 mm

Moisture Balance Wheat: 22 mm

Potatoes: 4 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: