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# Aylesbury Vale District Local Plan
# Land at Edlesborough

## Agricultural Land Classification
## ALC Map and Report

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Resource Planning Team
Eastern Region
FRCA Reading

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# AGRICULTURAL LAND CLASSIFICATION REPORT

## AYLESBURY VALE DISTRICT LOCAL PLAN
## LAND AT EDLESBOROUGH

## INTRODUCTION

1. This summary report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 6 ha of land to the west of Edlesborough. The survey was carried out during September 1997.

2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)[1] on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with its statutory input to the Aylesbury Vale District Local Plan. This survey supersedes any previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey the main land use on the site was permanent grazing, sometimes within disused orchards. An area of former orchards (currently unmanaged) was also surveyed. The areas mapped as 'Other land' include a small area of woodland and the site of a former hall.

## SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

**Table 1: Area of grades and other land**

| Grade/Other land | Area (hectares) | % surveyed area | % site area |
|---|---|---|---|
| 2 | 4.7 | 88.7 | 85.5 |
| 3b | 0.6 | 11.3 | 10.9 |
| Other land | 0.2 | N/A | 3.6 |
| Total surveyed area | 5.3 | 100 | 96.4 |
| Total site area | 5.5 | - | 100 |

[1] FRCA is an executive agency of MAFF and the Welsh Office

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. A total of 6 borings and 1 soil pit were described.

8. The land on this site has predominantly been mapped as Grade 2 (very good quality) agricultural land, with an area of Subgrade 3b (moderate quality) agricultural land in the east of the site. The soils typically comprise fine silty or fine loamy topsoils, overlying similar subsoils which contain increasing amounts of chalky drift and flints with depth. These soil characteristics, in particular stone content, combined with the locally dry climate cause a slight soil droughtiness limitation and the land is classified as Grade 2 since the level and consistency of crop yields may be slightly reduced. Soils are considered to be permeable, but may be affected by fluctuating groundwater, giving rise to a minor soil wetness limitation. This also places the land in Grade 2 due to a reduction in the number of days when trafficking by machinery or grazing by animals may occur without damaging the soil, thus making the land slightly less flexible for agricultural production.

9. The land classified as Subgrade 3b is an area of land believed to have been disturbed as a result of being previously utilised as a soil storage area associated with the development of the adjoining houses. The surface of the land indicates this previous use by being uneven and containing sporadic blocks of stone and concrete. These could cause a significant mechanical limitation to cultivation, harvesting and crop growth.

## FACTORS INFLUENCING ALC GRADE

### Climate

10. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

11. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

**Table 2: Climatic and altitude data**

| Factor | Units | Values | |
|---|---|---|---|
| Grid reference | N/A | SP 972 197 | SP 971 199 |
| Altitude | m, AOD | 95 | 94 |
| Accumulated Temperature | day°C (Jan-June) | 1389 | 1390 |
| Average Annual Rainfall | mm | 689 | 689 |
| Field Capacity Days | days | 148 | 148 |
| Moisture Deficit, Wheat | mm | 103 | 104 |
| Moisture Deficit, Potatoes | mm | 94 | 95 |
| Overall climatic grade | N/A | Grade 1 | Grade 1 |

12. The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

13. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (ATO, January to June), as a measure of the relative warmth of a locality.

14. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Local climatic factors, such as exposure and frost risk do not adversely affect land quality at this location. The site is climatically Grade 1. However, climatic factors do interact with soil properties to influence soil wetness and soil droughtiness.

**Site**

15. The site is relatively flat and lies at altitudes in the range of 94-95m AOD. The site is not adversely affected by gradient, microrelief or flooding limitations.

**Geology and soils**

16. The most detailed published geological information for the site (BGS, 1992) shows the whole site to be underlain by coombe deposits. This is a drift deposit of chalk rubble and angular flints, which overlies the Upper Greensand at this location (BGS, 1992).

17. The most detailed published soils information covering the area (SSEW, 1983) shows it to comprise mainly soils of the Block association. These soils are described as, 'moderately permeable calcareous loamy soils over chalky gravel variably affected by groundwater' (SSEW, 1983). In the west of the site, soils of the Grove association may also be mapped. These are described as 'moderately permeable calcareous loamy soils over chalky gravel affected by groundwater. Some fine loamy over clayey soils with slowly permeable subsoil and slight seasonal waterlogging. Some slowly permeable seasonally waterlogged clayey soils.' (SSEW,1983). Soils similar to the Block association were found on the site being typically calcareous, fine loamy over similar and fine silty subsoils, which contain increasing amounts of chalky and flinty drift in the subsoils.

## AGRICULTURAL LAND CLASSIFICATION

18. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

19. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix II.

**Grade 2**

20. Land of very good quality is mapped across the majority of the site. Land is classified on the basis of a minor soil droughtiness limitation. Soils are calcareous and comprise medium clay loam or medium silty clay loam topsoils. These may be very slightly stony, containing 2-4% total flints and chalk. Topsoils overlie similar or heavy silty clay loam upper and lower subsoils. Stone content typically increases from slightly stony to moderately stony (8-23% total stones; flints and chalk) in the upper subsoils, to slightly stony to very stony (15-45% total chalk and flints) in the lower subsoils. Pit 1 (see Appendix II) describes these soils. Soils are well drained, but are varied in colour due to the weathering of parent materials and

therefore may appear mottled. These soils are not considered to be gleyed and are placed in Wetness Class I. The combination of topsoil textures and stone contents, at this locality may result in a minor restriction to the amount of water available to growing crops. The resulting drought stress may cause the level and consistency of yields to be slightly depressed and Grade 2 is appropriate.

**Subgrade 3b**

21. Land of moderate quality has been mapped in the east of the site due to this area having been disturbed. Soils are similar to those described in paragraph 20., however topsoils and upper subsoils typically comprise heavy clay loams. Across this area there are occasional large blocks of stone and concrete and the surface is uneven. Information from a local resident suggests that this may be associated with its previous use as a soil storage area in connection with the development of the adjacent houses. The stone and concrete blocks cause a mechanical limitation by increasing production costs due to the extra wear and tear to implements and tyres. Crop quality may also be significantly reduced and a classification of Subgrade 3b is appropriate.

Judith Clegg
Resource Planning Team
Eastern Region
FRCA Reading

## SOURCES OF REFERENCE

British Geological Survey (1992) *Sheet No. 220, Leighton Buzzard,* 1:50,000, Solid and Drift Edition. BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

Soil Survey of Great Britain (1964) *The Soils and Land Use of the District around Aylesbury and Hemel Hempstead* HMSO: London.

Soil Survey of England and Wales (1983]) *Sheet 6, Soils of South-East England,* 1:250,000. SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England* SSEW: Harpenden

## APPENDIX I

## DESCRIPTIONS OF THE 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 includes 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 or horticultural crops can usually be grown but on some land of this 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 land.

### Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the 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 moist 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

# APPENDIX II

# SOIL DATA

Contents:

# SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

**Boring Header Information**

1. **GRID REF**: national 100 km grid square and 8 figure grid reference.

2. **USE**: Land use at the time of survey. The following abbreviations are used:

| | | | | | |
|---|---|---|---|---|---|
| **ARA:** | Arable | **WHT:** | Wheat | **BAR:** | Barley |
| **CER:** | Cereals | **OAT:** | Oats | **MZE:** | Maize |
| **OSR:** | Oilseed rape | **BEN:** | Field beans | **BRA:** | Brassicae |
| **POT:** | Potatoes | **SBT:** | Sugar beet | **FCD:** | Fodder crops |
| **LIN:** | Linseed | **FRT:** | Soft and top fruit | **FLW:** | Fallow |
| **PGR:** | Permanent pasture | **LEY:** | Ley grass | **RGR:** | Rough grazing |
| **SCR:** | Scrub | **CFW:** | Coniferous woodland | **OTH** | Other |
| **DCW:** | Deciduous woodland | **BOG:** | Bog or marsh | **SAS:** | Set-Aside |
| **HTH:** | Heathland | **HRT:** | Horticultural crops | **PLO:** | Ploughed |

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

4. **GLEY/SPL**: Depth in centimetres (cm) to gleying and/or slowly permeable layers.

5. **AP (WHEAT/POTS)**: Crop-adjusted available water capacity.

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

7. **DRT**: Best grade according to soil droughtiness.

8. 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 | | | | |

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

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

**Soil Pits and Auger Borings**

1. **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)

2. **MOTTLE COL**: Mottle colour using Munsell notation.

3. **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% +

4. **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

5. **PED. COL**: Ped face colour using Munsell notation.

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

7. **STONE LITH**: Stone Lithology - one of the following is used:

| | | | |
|---|---|---|---|
| **HR:** | all hard rocks and stones | **FSST:** | soft, fine grained sandstone |
| **ZR:** | soft, argillaceous, or silty rocks | **CH:** | chalk |
| **MSST:** | soft, medium grained sandstone | **GS:** | gravel with porous (soft) stones |
| **SI:** | soft weathered igneous/metamorphic rock | **GH:** | gravel with non-porous (hard) stones |

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

8. **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 | | |
| Ped shape | **S**: | single grain | **M**: | massive |
| | **GR**: | granular | **AB**: | angular blocky |
| | **SAB**: | sub-angular blocky | **PR**: | prismatic |
| | **PL**: | platy | | |

9. **CONSIST**: Soil consistence is described using the following notation:

| | | |
|---|---|---|
| **L**: loose | **FM**: firm | **EH**: extremely hard |
| **VF**: very friable | **VM**: very firm | |
| **FR**: friable | **EM**: extremely firm | |

10. **SUBS STR**: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G**: good **M**: moderate **P**: poor

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

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

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

14. **CALC**: If the soil horizon is calcareous, a 'Y' will appear in this column.

15. Other notations:

| | |
|---|---|
| **APW**: | available water capacity (in mm) adjusted for wheat |
| **APP**: | available water capacity (in mm) adjusted for potatoes |
| **MBW**: | moisture balance, wheat |
| **MBP**: | moisture balance, potatoes |

| SAMPLE NO. | GRID REF | USE | ASPECT GRDNT | GLEY | SPL | --WETNESS-- CLASS | GRADE | -WHEAT- AP | MB | -POTS- AP | MB | M.REL DRT | FLOOD | EROSN EXP | FROST DIST | CHEM LIMIT | ALC | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SP97101990 | PGR | 0 | | | 1 | 1 | 65 | -39 | 65 | -30 | 3B | | | | DR | 2 | See 1P |
| 1P | SP97101980 | PGR | 0 | | | 1 | 1 | 112 | 8 | 109 | 14 | 2 | | | | DR | 2 | BorderGrl |
| 2 | SP97301990 | PGR | 0 | | | 1 | 1 | 80 | -24 | 80 | -15 | 3B | | | | DR | 3B | Disturbed |
| 3 | SP97101980 | PGR | 0 | | | 1 | 1 | 76 | -28 | 76 | -19 | 3B | | | | DR | 2 | See 1P |
| 4 | SP97201980 | PGR | 0 | | | 1 | 1 | 111 | 7 | 114 | 19 | 2 | | | | WD | 2 | See 1p |
| 5 | SP97301980 | RGR | 0 | | | 1 | 1 | 116 | 12 | 114 | 19 | 2 | | | | DR | 2 | |
| 6 | SP97201970 | PGR | 0 | | | 1 | 1 | 97 | -7 | 103 | 8 | 3A | | | | DR | 2 | See 1P |

| SAMPLE | DEPTH | TEXTURE | COLOUR | MOTTLES COL | MOTTLES ABUN | MOTTLES CONT | PED COL. | GLEY | STONES >2 | STONES >6 | STONES LITH | STONES TOT | STRUCT/ CONSIST | SUBS STR | SUBS POR | SUBS IMP | SUBS SPL | SUBS CALC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0-25 | MCL | 10YR4142 | 10YR46 | C | D | | Y | 0 | 0 | HR | 3 | | | | | | Y | Root Mottles |
| | 25-35 | MZCL | 25Y7172 | 10YR58 | C | D | 00MN00 | | 0 | 0 | CH | 15 | | | M | | | Y | +8% Flints |
| | 35-40 | MZCL | 25Y62 | | | | | | 0 | 0 | CH | 30 | | | M | | | Y | +15% Flints |
| 1P | 0-25 | MCL | 10YR32 | | | | | | 0 | 0 | HR | 3 | | | | | | Y | |
| | 25-50 | MCL | 25Y62 | 25Y56 | C | D | | | 0 | 0 | CH | 10 | MDCSAB | FR | M | | | Y | +5% Flints |
| | 50-65 | MCL | 25Y52 | 25Y56 | C | D | | | 0 | 0 | CH | 19 | MDCSAB | FR | M | | | Y | +5% Flints |
| | 65-85 | HZCL | 05Y52 | 25Y56 | C | D | | | 0 | 0 | CH | 10 | MDCSAB | FM | M | | | Y | +5% Flints |
| 2 | 0-25 | HCL | 10YR42 | | | | | | 0 | 0 | HR | 3 | | | | | | Y | Few Root Mottles |
| | 25-32 | HCL | 25Y72 | 10YR68 | C | D | | | 0 | 0 | CH | 15 | | | M | | | Y | +2% Flints |
| | 32-50 | MZCL | 25Y71 | 10YR68 | C | D | | | 0 | 0 | CH | 30 | | | M | | | Y | +2% Flints |
| 3 | 0-25 | MZCL | 10YR33 | | | | | | 0 | 0 | HR | 3 | | | | | | Y | +1% Chalk |
| | 25-35 | HZCL | 25Y62 | 10YR58 | C | D | | | 0 | 0 | CH | 5 | | | M | | | Y | |
| | 35-45 | MZCL | 25Y6272 | 10YR68 | C | D | | | 0 | 0 | CH | 30 | | | M | | | Y | +5% Flints |
| 4 | 0-28 | MZCL | 10YR33 | | | | | | 0 | 0 | HR | 2 | | | | | | Y | +1% Chalk |
| | 28-60 | MZCL | 25Y72 | 10YR68 | C | D | | | 0 | 0 | CH | 20 | | | M | | | Y | +3% Flints |
| | 60-80 | MZCL | 25Y71 | 10YR58 | C | D | | | 0 | 0 | CH | 40 | | | M | | | Y | +5% Flints |
| 5 | 0-35 | MCL | 10YR33 | | | | | | 0 | 0 | HR | 2 | | | | | | Y | |
| | 35-60 | MZCL | 25Y72 | 25Y56 | C | D | | | 0 | 0 | CH | 15 | | | M | | | Y | +5% Flints |
| | 60-85 | MZCL | 25Y72 | | | | | | 0 | 0 | CH | 30 | | | M | | | Y | |
| 6 | 0-35 | MZCL | 10YR33 | | | | | | 0 | 0 | HR | 2 | | | | | | Y | |
| | 35-45 | MZCL | 10YR52 | 10YR58 | C | D | | | 0 | 0 | HR | 5 | | | M | | | Y | +3% Chalk |
| | 45-53 | HZCL | 10YR52 | 10YR58 | C | D | | | 0 | 0 | HR | 5 | | | M | | | Y | +10% Chalk |
| | 53-60 | MZCL | 25Y72 | 10YR58 | C | D | | | 0 | 0 | CH | 30 | | | M | | | Y | +5% Flints |