

**A1**

**South Oxfordshire District Local Plan  
Site 194b: Land at Winterbrook,  
Wallingford  
Agricultural Land Classification  
ALC Map and Report  
December 1994**

# AGRICULTURAL LAND CLASSIFICATION REPORT.

## SOUTH OXFORDSHIRE DISTRICT LOCAL PLAN SITE 194B: LAND AT WINTERBROOK, WALLINGFORD

### 1. Summary

- 1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the South Oxfordshire district. The work forms part of MAFF's statutory input to the South Oxfordshire District Local Plan.
- 1.2 Site 194b comprises approximately 29.7 hectares of land to the south west of Wallingford in Oxfordshire. An Agricultural Land Classification (ALC) survey was carried out on an area to the east of the site (see map enclosed) in November 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 4 borings were assessed in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on its use for agriculture. The remainder of the site was subject to a detailed survey carried out in 1989 (ADAS Ref: 3303/18/89) under the revised guidelines and a survey undertaken in 1985 (ADAS Ref: 3303/94/85), which was subsequently updated in line with the revised guidelines in 1989.
- 1.3 The work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.
- 1.4 At the time of the 1994 survey the area of agricultural land examined was under grass cover being grazed by horses. The urban area shown was a section of a private garden.
- 1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading. This map supersedes any previous ALC survey information for this site.

**Table 1: Distribution of Grades and Subgrades**

| Grade              | Area (ha)     | % of Site   | % of Agricultural Land |
|--------------------|---------------|-------------|------------------------|
| 2                  | 27.5          | 92.6        | 95.2                   |
| 3a                 | 1.4           | 4.7         | 4.8                    |
| Non-Agricultural   | 0.7           | 2.4         | <u>100% (28.9ha)</u>   |
| Urban              | 0.1           | 0.3         |                        |
| Total area of Site | <u>29.7ha</u> | <u>100%</u> |                        |

- 1.6 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.
- 1.7 The agricultural land at this site has been classified as Grade 2, very good quality, and Subgrade 3a, good quality. The principal limitation is soil droughtiness. The soil profiles examined contained varying proportions of flints and chalk fragments. These serve to slightly and moderately restrict profile available water, such that within the local climatic parameters there is a slight to moderate risk of soil droughtiness.
- 2. Climate**
- 2.1 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.
- 2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of a locality.
- 2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office, 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site.
- 2.4 No local climatic factors such as exposure or frost risk are believed to affect the site. However, climatic and soil factors interact to influence soil wetness and droughtiness limitations.

**Table 2: Climatic Interpolation**

|   |          |
|---|----------|
| Grid Reference                                | SU603885 |
| Altitude, (m, AOD)                            | 47       |
| Accumulated Temperature<br>(°days, Jan.-June) | 1465     |
| Average Annual Rainfall (mm)                  | 603      |
| Field Capacity Days                           | 131      |
| Moisture deficit, wheat (mm)                  | 117      |
| Moisture deficit, potatoes (mm)               | 111      |
| Overall Climatic Grade                        | 1        |

### **3. Relief**

- 3.1 The site lies at approximately 45 - 50m AOD, gently falling from west to east. Nowhere on the site does relief or gradient affect agricultural land quality.

### **4. Geology and Soils**

- 4.1 The published geological information (BGS, 1980), shows the majority of the site to be underlain by 1st flood plain river terrace deposits as drift. An area to the west of the site is shown as being underlain by Cretaceous Lower Chalk.
- 4.2 The published soils information (SSEW 1983), shows the site to be underlain by soils of the Sutton 2 Association. These are briefly described as, 'well drained, fine loamy and coarse loamy soils usually over gravel with a calcareous matrix.' (SSEW, 1983). Soils over the site were commonly found to be fine loamy over clayey, developed on the river terrace gravels, which were encountered at some observation points. Occasionally the subsoil contained considerable quantities of calcareous material.

### **5. Agricultural Land Classification**

- 5.1 Paragraph 1.5 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.
- 5.2 The location of the soil observation points are shown on the attached sample point map.
- 5.3 Soil data obtained during the surveys of 1985 and 1989 is used in the following descriptions of land quality on the site.

#### **Grade 2**

- 5.4 Land of very good quality is mapped across the majority of the site. Principal limitations include soil droughtiness, soil wetness, and topsoil workability. Typically profiles fall into two groups. The first are soils derived from the river terrace deposits which comprise, very slightly stony (up to 5% total flints) medium clay loam, sandy clay loam, occasionally heavy clay loam topsoils. These overlie a similarly textured permeable upper subsoil, which commonly passes to a similarly stony permeable clay. Impenetrable gravelly or coarser textured horizons may occur from approximately 65cm. Occasionally profiles showed slight evidence of imperfect drainage in the form of gleying in the subsoil, sufficient at some observation points to place these in Wetness Class II (see Appendix II) and subsequently Grade 2. However, the majority of observations are assigned to Grade 2 on the basis of a slight soil droughtiness restriction, due primarily to the stones in the profile restricting soil available water. This is sufficient within local

climatic parameters, to place this land in Grade 2, as the reduced water holding capacity of the soil may affect plant growth and yield.

- 5.5 The remaining land in this grade is associated with heavier textured soils derived from the Lower Chalk. These typically comprise calcareous heavy clay loam and clay topsoils resting over permeable (Wetness Class I) and increasingly calcareous clayey subsoils. The heavier soil textures encountered result in these soils being slightly drought prone. When this is coupled with the minor workability restrictions caused by the heavy topsoil textures which slightly restricts the versatility of the land in terms of cultivations and/or stocking the land is classified as Grade 2 accordingly.

### **Subgrade 3a**

- 5.6 Land of good quality is mapped across a small proportion of the survey area, adjoining the Bradford Brook along the northern boundary of the site. The principal limitation in this area is soil droughtiness. The soils in this area are essentially similar to those derived from the river terrace deposits over the majority of the site, as described above in para. 5.4. However due to gravelly horizons occurring between 45 and 65cm depth, the risk of soil droughtiness affecting plant growth and yield is increased when considered alongside the climatic parameters relevant to the site.

ADAS Reference: 3303/161/94  
MAFF Reference: EL33/278

Resource Planning Team  
Guildford Statutory Group  
ADAS Reading

## **SOURCES OF REFERENCE**

ADAS (1985), Wallingford Local Plan. Reference 3303/094/85

ADAS (1989), Wallingford Local Plan. Reference 3303/018/89

British Geological Survey (1980), Sheet 254, Henley on Thames. Solid and Drift Edition.

MAFF (1988), Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.

Meteorological Office (1989), Climatic datasets for Agricultural Land Classification.

Soil Survey of England and Wales (1983), Sheet No. 6, Soils of South-East England, 1:250,000, and Accompanying Legend.

Soil Survey of England and Wales (1984), Soils and their use in South-East England. Bulletin No.15.

## APPENDIX I

### DESCRIPTION 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.

**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 parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

**Woodland**

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

**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, e.g. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.



## APPENDIX II

### DEFINITION OF SOIL WETNESS CLASS

#### 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 180 days, but only wet within 40 cm depth for 31-90 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 present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.

#### Wetness Class IV

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

**APPENDIX III**  
**SOIL PIT AND SOIL BORING DESCRIPTIONS**

**Contents :**

**Sample Point Map**

**Soil Abbreviations - explanatory note**

**Database Printout - soil pit information**

**Database Printout - boring level information**

**Database Printout - horizon level information**

## SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

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

### Boring Header Information

1. **GRID REF** : national grid square and 8 figure grid reference.
2. **USE** : Land use at the time of survey. The following abbreviations are used.

|                                  |                                  |                             |
|----------------------------------|----------------------------------|-----------------------------|
| <b>ARA</b> : Arable              | <b>WHT</b> : Wheat               | <b>BAR</b> : Barley         |
| <b>CER</b> : Cereals             | <b>OAT</b> : Oats                | <b>MZE</b> : Maize          |
| <b>OSR</b> : Oilseed rape        | <b>BEN</b> : Field Beans         | <b>BRA</b> : Brassicae      |
| <b>POT</b> : Potatoes            | <b>SBT</b> : Sugar Beet          | <b>FCD</b> : Fodder Crops   |
| <b>LIN</b> : Linseed             | <b>FRT</b> : Soft and Top Fruit  | <b>FLW</b> : Fallow         |
| <b>PGR</b> : Permanent Pasture   | <b>LEY</b> : Ley Grass           | <b>RGR</b> : Rough Grazing  |
| <b>SCR</b> : Scrub               | <b>CFW</b> : Coniferous Woodland | <b>DCW</b> : Deciduous Wood |
| <b>HTH</b> : Heathland           | <b>BOG</b> : Bog or Marsh        | <b>FLW</b> : Fallow         |
| <b>PLO</b> : Ploughed            | <b>SAS</b> : Set aside           | <b>OTH</b> : Other          |
| <b>HRT</b> : Horticultural Crops |                                  |                             |

3. **GRDNT** : Gradient as measured by a hand-held optical clinometer.
4. **GLEY/SPL** : Depth in cm to gleying or slowly permeable layers.
5. **AP (WHEAT/POTS)** : Crop-adjusted available water capacity.
6. **MB (WHEAT/POTS)** : Moisture Balance.
7. **DRT** : Best grade according to soil droughtiness.
8. If any of the following factors are considered significant, an entry of 'Y' will be entered in the relevant column.

|                                      |                           |                                  |
|--------------------------------------|---------------------------|----------------------------------|
| <b>MREL</b> : Microrelief limitation | <b>FLOOD</b> : Flood risk | <b>EROSN</b> : Soil erosion risk |
| <b>EXP</b> : Exposure limitation     | <b>FROST</b> : Frost      | <b>DIST</b> : Disturbed land     |
| <b>CHEM</b> : Chemical limitation    |                           |                                  |

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

|                             |                             |                                       |                            |
|-----------------------------|-----------------------------|---------------------------------------|----------------------------|
| <b>OC</b> : Overall Climate | <b>AE</b> : Aspect          | <b>EX</b> : Exposure                  |                            |
| <b>FR</b> : Frost Risk      | <b>GR</b> : Gradient        | <b>MR</b> : Microrelief               |                            |
| <b>FL</b> : Flood Risk      | <b>TX</b> : Topsoil Texture | <b>DP</b> : Soil Depth                | <b>ST</b> : Topsoil Stones |
| <b>CH</b> : Chemical        | <b>WE</b> : Wetness         | <b>WK</b> : Workability               |                            |
| <b>DR</b> : Drought         | <b>ER</b> : Erosion Risk    | <b>WD</b> : Soil Wetness/Droughtiness |                            |

## 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      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 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
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

6. **STONE LITH** : 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  
MSST : soft, medium grained sandstone    GH : gravel with non-porous (hard) stones  
SI : soft weathered igneous/metamorphic rock  
Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

7. **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

8. **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

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

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

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

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

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

14. 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

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| SAMPLE NO. | GRID REF   | ASPECT USE | --WETNESS-- |          | -WHEAT- |       | -POTS- |     | M. REL |     | EROSN | FROST |     | CHEM | ALC   | COMMENTS |               |
|------------|------------|------------|-------------|----------|---------|-------|--------|-----|--------|-----|-------|-------|-----|------|-------|----------|---------------|
|            |            |            | GRDNT       | GLEY SPL | CLASS   | GRADE | AP     | MB  | AP     | MB  | DRT   | FLOOD | EXP | DIST | LIMIT |          |               |
| 12         | SU60408860 | PGR        |             |          | 1       | 1     | 101    | -16 | 110    | -1  | 3A    |       |     |      | DR    | 2        | IMP FLINTS 80 |
| 13         | SU60508860 | PGR        | 45          |          | 1       | 1     | 107    | -10 | 112    | 1   | 3A    |       |     |      | DR    | 2        | IMP FLINTS 85 |
| 14         | SU60498852 | PGR        | 30          |          | 2       | 2     | 92     | -25 | 99     | -12 | 3B    |       |     |      | WD    | 2        | IMP FLINTS 65 |
| 15         | SU60408850 | PGR        | 90          |          | 1       | 1     | 143    | 26  | 114    | 3   | 2     |       |     |      | DR    | 2        |               |

| SAMPLE | DEPTH  | TEXTURE | COLOUR    | ----MOTTLES----- |      |      | PED    |     | ----STONES----- |    |      | STRUCT/<br>CONSIST | SUBS |     |     |     |                    |
|--------|--------|---------|-----------|------------------|------|------|--------|-----|-----------------|----|------|--------------------|------|-----|-----|-----|--------------------|
|        |        |         |           | COL              | ABUN | CONT | COL.   | GLE | >2              | >6 | LITH |                    | TOT  | STR | POR | IMP | SPL                |
| 12     | 0-30   | sc1     | 10YR41 00 |                  |      |      |        |     | 0               | 0  | HR   | 3                  |      |     |     |     | BORDER MCL         |
|        | 30-50  | sc1     | 10YR44 00 |                  |      |      |        |     | 0               | 0  | HR   | 2                  |      | M   |     |     |                    |
|        | 50-70  | c       | 75YR44 00 |                  |      |      |        |     | 0               | 0  | HR   | 3                  |      | M   |     |     | SANDY              |
|        | 70-80  | c       | 75YR44 00 | 00MN00           | 00   | C    |        |     | 0               | 0  | HR   | 15                 |      | M   |     |     |                    |
| 13     | 0-25   | mc1     | 10YR41 00 |                  |      |      |        |     | 0               | 0  | HR   | 5                  |      |     |     |     | BORDER SCL         |
|        | 25-45  | sc1     | 10YR44 00 |                  |      |      |        |     | 0               | 0  | HR   | 2                  |      | M   |     |     |                    |
|        | 45-75  | c       | 10YR53 00 | 10YR58           | 00   | M    |        | Y   | 0               | 0  | HR   | 2                  |      | M   |     |     | SLIGHTLY SANDY     |
|        | 75-85  | c       | 10YR63 62 | 10YR68           | 00   | M    | 00MN00 | 00  | Y               | 0  | 0    | HR                 | 10   |     | M   |     |                    |
| 14     | 0-30   | mc1     | 10YR41 00 |                  |      |      |        |     | 0               | 0  | HR   | 5                  |      |     |     |     | BORDER SCL         |
|        | 30-40  | hc1     | 10YR42 00 | 10YR46           | 00   | C    |        | Y   | 0               | 0  | HR   | 5                  |      | M   |     |     | SANDY              |
|        | 40-65  | mc1     | 10YR63 00 | 10YR56           | 00   | C    |        | Y   | 0               | 0  | HR   | 20                 |      | M   |     | Y   | SANDY +5% CH FRAGS |
| 15     | 0-23   | mc1     | 10YR41 00 | 00MN00           | 00   | F    |        |     | 0               | 0  | HR   | 3                  |      |     |     |     | SANDY              |
|        | 23-30  | mc1     | 10YR42 00 | 00MN00           | 00   | F    |        |     | 0               | 0  | HR   | 5                  |      | M   |     |     | SANDY              |
|        | 30-75  | c       | 10YR43 44 | 10YR56           | 00   | F    | 00MN00 | 00  | 0               | 0  | HR   | 2                  |      | M   |     |     | SANDY              |
|        | 75-90  | c       | 10YR43 00 | 10YR46           | 00   | C    | 00MN00 | 00  | 0               | 0  | HR   | 2                  |      | M   |     |     | SANDY              |
|        | 90-120 | sc1     | 10YR63 00 | 10YR58           | 00   | M    | 00MN00 | 00  | Y               | 0  | 0    | CH                 | 10   |     | M   |     | Y                  |