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Wokingham District Local Plan
Site WK11, Eastheath, Berkshire
Agricultural Land Classification
February 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

WOKINGHAM DISTRICT LOCAL PLAN SITE WK11, EASTHEATH, BERKSHIRE

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 7.5 ha of land adjacent to Blagrove Lane at Eastheath, south west of Wokingham, Berkshire. The survey was carried out in February 1996.
2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading, in connection with the Wokingham District Local Plan. This survey supersedes all previous ALC surveys on this land.
3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. 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 all land on the site was under pasture.

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) | % Total site area | % Agricultural Land |
|-------------------------|-----------------|-------------------|---------------------|
| 2 | 2.5 | 33.3 | 35.7 |
| 3a | 4.5 | 60.0 | 64.3 |
| Other land | 0.5 | 6.7 | |
| Total agricultural area | 7.0 | 93.3 | 100.0 |
| Total site area | 7.5 | 100.0 | - |

7. The fieldwork was conducted at an average density of one boring per hectare. On this site a total of 8 borings and 2 soil pits were described.

8. The soil textures and structures observed in some auger borings and in one inspection pit, indicate that a crop would suffer from a lack of water in the summer months which could depress yields. Referred to as soil 'droughtiness' this can restrict the versatility of the land to varying degrees, depending on its severity.

9. The profiles described elsewhere suggest that soil drainage is impeded by slowly permeable horizons at varying depths, imposing a limitation on land quality due to soil 'wetness'. Seasonal waterlogging reduces the number of days on which the land can be worked with machinery, or grazed without the risk of poaching, and root development is restricted by prolonged wet conditions.

10. Land quality was mapped as Grade 2 (very good quality), in the north east of the site, with slight limitations imposed by both soil droughtiness and soil wetness on this land.

11. The rest of the agricultural land on the site was limited to Subgrade 3a (good quality) on the basis of more extreme soil droughtiness in the south, where profiles were sandier, and more extreme soil wetness in the north, where shallower clay subsoils and heavier textured topsoils occurred.

12. A small area of land in the north of the site is occupied by a driveway and yard, a pond and some stables. These areas were mapped as 'Other Land'.

Factors Influencing ALC Grade

Climate

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

14. 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 | SU 799 674 |
| Altitude | m, AOD | 65 |
| Accumulated Temperature | day°C | 1450 |
| Average Annual Rainfall | mm | 656 |
| Field Capacity Days | days | 136 |
| Moisture Deficit, Wheat | mm | 112 |
| Moisture Deficit, Potatoes | mm | 107 |

15. 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.

16. 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.

17. The combination of rainfall and temperature at this site mean that there is no limitation on grade due to climate. Neither exposure nor frost risk are considered to be a problem, and this site is climatically Grade 1.

Site

18. The site lies between Blagrove Lane on the western boundary, and residential properties in the north and south. Gradients on the site are overall level to gently sloping and there is no risk of flooding.

Geology and soils

19. The most detailed published geological information (BGS, 1971, Sheet 268), shows the site to be underlain by a solid geology of Lower Bagshot Beds over the majority of the site with London Clay in the north west. No drift cover is mapped.

20. The most detailed published soils information (SSEW, 1983), maps the majority of this area as having soils corresponding to the Fyfield 4 association over most of the site corresponding with the Bagshot Beds, with a small area mapped as the Wickham 4 association in the north west. Fyfield 4 association soils are described as 'deep well drained often stoneless coarse loamy and sandy soils. Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging and some slowly permeable seasonally waterlogged fine loamy over clayey soils. Risk of water erosion' (SSEW, 1984). Wickham 4 association soils are described as 'slowly permeable seasonally waterlogged fine loamy over clayey and fine silty over clayey soils associated with similar clayey soils, often with brown subsoils' (SSEW, 1984).

Agricultural Land Classification

21. 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.

22. 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 III.

Grade 2

23. Very good quality land was mapped across the north east and centre of the site on the basis of slight wetness and slight droughtiness limitations.

24. Soils typically have very slightly to slightly stony medium sandy loam topsoils and upper subsoils, which become gleyed at approximately 30 cm depth. Lower subsoils are clay and can be moderately stony in localised areas as shown in the pit 1P. Subsoils are slowly permeable at 43 to 70 cm depth. Where slowly permeable horizons occur at the shallower depth described, the land is imperfectly drained, falling into Wetness Class III, and is mapped as Grade 2 on the basis of wetness and droughtiness limitations. Where these horizons are deeper, the land is moderately well drained and falls into Wetness Class II, mapped as Grade 2 on the basis of droughtiness alone. The soils in the centre of the site have slightly heavier textured topsoils and upper subsoils, but overlie slowly permeable clay to fall into Wetness Class III and Grade 2.

Subgrade 3a

25. Good quality land was mapped across the rest of the site on the basis of moderate wetness limitations in the north east, and moderate droughtiness limitations in the south.

26. Soils in the north east have medium clay loam or medium silty clay loam topsoils, over medium or heavy silty clay loam upper subsoils which are gleyed and very slightly stony. Lower subsoils are clay and are slowly permeable at approximately 40 to 45 cm depth. This land is imperfectly drained, falling into Wetness Class III, and is graded Subgrade 3a as topsoils have a higher clay content than soils in the Grade 2 mapping unit in the same Wetness Class.

27. Generally, soils with slowly permeable subsoils can prove difficult to work during the wetter months of the year and the yield potential and choice of crops grown are limited by poor drainage.

28. Soils in the south of the site typically have very slightly stony medium sandy loam topsoils and upper subsoils which can be gleyed within 40 cm depth. Lower subsoils are loamy medium sand or medium sand to 120 cm, and the land is well to moderately well drained, falling into Wetness Class I-II. The grade of this land is not limited by a wetness limitation.

29. The textures of these soils result in there being a limited amount of available water in the profile that a crop could utilise, which would result in drought stress. This would affect the crop during the drier months of the year and it therefore imposes a limitation on the type of crops that can be grown or their potential yield. This soil droughtiness limitation restricts the land quality to Subgrade 3a.

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet No. 268, Reading*, 1:63,360 Scale, (Solid & 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 England and Wales (1983) *Sheet 6, Soils of South-East England*, 1:250,000 Scale, SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England, Bulletin 15*, SSEW: Harpenden

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 that 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 that restricts use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

| Wetness Class | Duration of waterlogging ¹ |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I | The soil profile is not wet within 70 cm depth for more than 30 days in most years. ² |
| 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 only wet within 40 cm depth for 30 days in most years. |
| 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. |
| 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. |
| V | The soil profile is wet within 40 cm depth for 211-335 days in most years. |
| VI | The soil profile is wet within 40 cm depth for more than 335 days in most years. |

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

¹ The number of days is not necessarily a continuous period.

² 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL DATA

Contents:

Sample location map

Soil abbreviations - Explanatory Note

Soil Pit Descriptions

Soil boring descriptions (boring and horizon levels)

Database Printout - Horizon Level Information

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 | DCW: Deciduous Wood |
| HTH: Heathland | BOG: Bog or Marsh | FLW: Fallow |
| PLO: Ploughed | SAS: Set aside | OTH: Other |
| HRT: Horticultural Crops | | |
3. **GRDNT:** Gradient as estimated or measured by a hand-held optical clinometer.
4. **GLEYSPL:** 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 | 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 | | |

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. **GLEYS:** 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 | 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 | GS: gravel with porous (soft) stones |
| SI: soft weathered igneous/metamorphic rock | |

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 **VC:** very 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 **VF:** very friable **FR:** friable **FM:** firm **VM:** very firm
EM: extremely firm **EH:** extremely hard

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

SOIL PIT DESCRIPTION

Site Name : WOKINGHAM DLP WK11 Pit Number : 1P

Grid Reference: SU80006740 Average Annual Rainfall : 649 mm
 Accumulated Temperature : 1455 degree days
 Field Capacity Level : 135 days
 Land Use : Permanent Grass
 Slope and Aspect : 01 degrees N

| HORIZON | TEXTURE | COLOUR | STONES >2 | TOT. STONE | LITH | MOTTLES | STRUCTURE | CONSIST | SUBSTRUCTURE | CALC |
|---------|---------|-----------|-----------|------------|------|---------|-----------|---------|--------------|------|
| 0- 30 | MSL | 10YR42 00 | 0 | 2 | HR | | | | | |
| 30- 43 | MSL | 10YR42 00 | 0 | 10 | HR | C | WKCSAB | FR | G | |
| 43- 58 | C | 10YR53 00 | 0 | 2 | HR | C | MDCSAB | FR | M | |
| 58-120 | C | 10YR61 00 | 0 | 0 | | M | STCOAB | FM | P | |

Wetness Grade : 2 Wetness Class : III
 Gleying : 030 cm
 SPL : 058 cm

Drought Grade : 2 APW : 131mm MBW : 19 mm
 APP : 109mm MBP : 2 mm

FINAL ALC GRADE : 2

MAIN LIMITATION : Soil Wetness/Droughtiness

SOIL PIT DESCRIPTION

Site Name : WOKINGHAM DLP WK11 Pit Number : 2P

Grid Reference: SU79906710 Average Annual Rainfall : 649 mm
 Accumulated Temperature : 1455 degree days
 Field Capacity Level : 135 days
 Land Use : Permanent Grass
 Slope and Aspect : degrees N

| HORIZON | TEXTURE | COLOUR | STONES >2 | TOT.STONE | LITH | MOTTLES | STRUCTURE | CONSIST | SUBSTRUCTURE | CALC |
|---------|---------|-----------|-----------|-----------|------|---------|-----------|---------|--------------|------|
| 0- 40 | MSL | 10YR42 00 | 0 | 5 | HR | | | | | |
| 40- 50 | LMS | 10YR43 53 | 0 | 10 | HR | | WKCOAB | VF | M | |
| 50- 80 | LMS | 10YR53 00 | 0 | 15 | HR | C | | | M | |
| 80-120 | MS | 10YR53 00 | 0 | 0 | | M | | | M | |

Wetness Grade : 1 Wetness Class : I
 Gleying : 050 cm
 SPL : No SPL

Drought Grade : 3A APH : 100mm MBW : -12 mm
 APP : 084mm MBP : -23 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Droughtiness

| SAMPLE NO. | GRID REF | ASPECT USE | --WETNESS-- | | -WHEAT- | | -POTS- | | M. REL | | EROSN | FROST | CHEM | ALC | COMMENTS |
|------------|------------|------------|-------------|---------|---------|-------|--------|---------|--------|----|-------|-------|------|------|-------------|
| | | | GRDNT | GLEYSPL | CLASS | GRADE | AP | MB | AP | MB | DRT | FLOOD | EXP | DIST | |
| 1P | SU80006740 | PGR N | 01 | 030 058 | 3 | 2 | 131 | 19 109 | 2 | 2 | | | WD | 2 | AT BORING 3 |
| 2 | SU79906740 | PGR E | | 0 040 | 3 | 3A | 000 | 0 000 | 0 | | | | WE | 3A | SEE 1P |
| 2P | SU79906710 | PGR N | | 050 | 1 | 1 | 100 | -12 084 | -23 | 3A | | | DR | 3A | AT BORING 8 |
| 3 | SU80006740 | PGR N | 01 | 030 065 | 2 | 1 | 124 | 12 100 | -7 | 2 | | | DR | 2 | SEE 1P |
| 4 | SU79906730 | PGR E | | 0 045 | 3 | 3A | 133 | 21 110 | 3 | 2 | | | WE | 3A | SEE 1P |
| 5 | SU80006730 | PGR N | 01 | 035 070 | 2 | 1 | 138 | 26 111 | 4 | 2 | | | DR | 2 | SEE 1P&2P |
| 6 | SU79906720 | PGR E | | 0 060 | 3 | 2 | 134 | 22 110 | 3 | 2 | | | WD | 2 | SEE 1P |
| 7 | SU80006720 | PGR E | 01 | 0 080 | 2 | 1 | 145 | 33 110 | 3 | 2 | | | DR | 2 | WET |
| 8 | SU79906710 | PGR E | | 050 | 1 | 1 | 106 | -6 089 | -18 | 3A | | | DR | 3A | SEE 2P&1P |
| 9 | SU80006710 | PGR E | | 030 | 2 | 1 | 106 | -6 090 | -17 | 3A | | | DR | 3A | SEE 2P&1P |

