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Ministry of
Agriculture
Fisheries
and Food

PROPOSED MOTORWAY SERVICE AREA
KIRBY HILL, BOROUGHBRIDGE
NORTH YORKSHIRE

Agricultural Land Classification
November 1996

Resource Planning Team
Leeds Statutory Group
ADAS Leeds

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AGRICULTURAL LAND CLASSIFICATION REPORT

PROPOSED MOTORWAY SERVICE AREA
KIRBY HILL, BOROUGHBRIDGE, NORTH YORKSHIRE

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 13.4 ha of land adjacent to the A1 motorway at Kirby Hill, north of Boroughbridge. The survey was carried out during November 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Northallerton in connection with a proposal to develop a motorway service area. A small part of the site adjacent to north bound carriageway was originally surveyed in 1990 by ADAS in connection with the proposal to improve the A1(T) to a motorway. Information collected during this survey is used in this report.

3. The work was conducted by members of the Resource Planning Team in the Leeds Statutory Group in 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 the land use on the site was mostly agricultural with a small strip of land in the eastern area (site B) associated with Leeming Lane classed as other non-agricultural land. Cropping was cereals and root crops.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:5,000. 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	% Surveyed Area
2	9.3	69.4	73.2
3a	3.4	25.4	26.8
Other land(as req)	0.7	5.2	-
Total surveyed area	12.7	-	100
Total site area	13.4	100	-

7. The fieldwork was conducted at an average density of one boring per hectare. A total of 20 borings and two soil pits were described.

Grade 2

8. This grade is found on both sides of the motorway but is more widespread on site B. Topsoil and upper subsoils are typically medium or fine sandy loam. Lower subsoils are more variable but are often loamy medium or loamy fine sand or a reddish slowly permeable clay. All horizons are very slightly stony (max 5% stones). Droughtiness is limiting where subsoils are sandy and soil wetness where clay subsoils are found.

Subgrade 3a

9. Remaining agricutural land is all Subgrade 3a and mostly found west of the motorway (site A). Generally this subgrade is found on higher land where soils are lighter. Topsoils are generally medium or fine sandy loam over loamy medium sand or loamy fine sand subsoils often becoming a sand at depth. This land has a lower water holding capacity than the Grade 2 land, and is more droughty. Droughtiness limits the ALC grade of this land.

Other land

10. Leeming Lane and excavations adjacent to it are classed as other non-agricultural land.

Factors Influencing ALC Grade

Climate

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

12. 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	SE 384 691
Altitude	m, AOD	40
Accumulated Temperature	day°C (Jan-June)	1355
Average Annual Rainfall	mm	652
Field Capacity Days	days	151
Moisture Deficit, Wheat	mm	103
Moisture Deficit, Potatoes	mm	93

13. 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.

14. 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.

15. The combination of rainfall and temperature at this site mean there is no overall climatic limitation.

Site

16. The land is level or gently sloping with a variable aspect. Following construction of the A1 motorway a small part of site A adjacent the B6265 Ripon road, is liable to very short term flooding following heavy rain. Currently the farmer is in contact with the highway authority to rectify this problem.

Geology and soils

17. Soils on the site are all developed from sandy textured drift, described as sandy boulder clay by the BGS (Sheet 62, Harrogate, 1:50,000 1987). This drift forms a thick cover over solid Sherwood Sandstones below. Soils reflect parent material and are generally light textured. Topsoils are typically a medium or fine sandy loam. Upper subsoils are similar or lighter textured - medium or fine sandy loam or loamy sand. Lower subsoils are often a loamy medium sand or fine sand but are occasionally a reddish slowly permeable clay. Profiles are mostly free drained and Wetness Class I but where clayey subsoils occur they meet the criteria for Wetness Class III (Appendix II). Soils in this area are mapped as and correspond with the Wick 1 association, Soil Survey of England and Wales (1984).

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.

19. Grade 2

This grade is found on both sides of the motorway but is more widespread on site B. Topsoils are generally a medium or fine sandy loam. Upper subsoils are similar in texture or occasionally a loamy fine sand. Lower subsoils are variable but are often a loamy sand. Occasionally lower subsoils are a reddish, slowly permeable clay. All horizons typically contain up to 5% hard stones. Where subsoils are sandy a slight droughtiness limitation applies to this land. The occasional area with a clayey lower subsoil has a slight topsoil wetness and workability limitation.

20. Subgrade 3a

This subgrade is most common west of the motorway and is found mostly on higher land in the west of the site. Here topsoils are usually medium or fine sandy loam over loamy sand or sand subsoils, the sand fraction again being either medium or fine. This land has a lower water holding capacity than adjoining Grade 2 land and is therefore limited to Subgrade 3a. This subgrade also includes some profiles in the south of site A with a clayey slowly permeable subsoil occurring at about 35 cm depth. Soil wetness and workability limit this land to Subgrade 3a.

21. Other land

Leeming Lane and adjacent excavations are classed as other non-agricultural land.

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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.

SOURCES OF REFERENCE

British Geological Survey (1987) *Sheet No.62 solid and drift, Harrogate, 1:50,000.* 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) *Soils of Northern England.* SSEW: Harpenden.

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

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.