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SUNDERLAND UDP
HETTON BY-PASS
TYNE & WEAR

Agricultural Land Classification
May 1996

Resource Planning Team
Leeds Statutory Group
ADAS Leeds

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AGRICULTURAL LAND CLASSIFICATION REPORT

SUNDERLAND UDP (HETTON BY-PASS)

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 56.9 ha of land at Hetton-le-Hole, Tyne and Wear. The survey was carried out during May 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Northallerton in connection with the Sunderland UDP (proposed Hetton by-pass). This survey supersedes any previous ALC surveys on this land.

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 arable, setaside, grass and oilseed rape.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The maps have been drawn at a scale of 1:10,000. They are 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	0.2	0.4	0.4
3a	7.9	13.9	17.6
3b	31.8	55.8	71.1
4	4.9	8.6	10.9
Other land	12.1	21.3	-
Total surveyed area	44.8	-	100
Total site area	56.9	100	-

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 54 borings and 4 soil pits were described.

8. Grade 2, very good quality agricultural land, was found in a small area to the south of the site and is restricted by climatic limitations.

Subgrade 3a, good quality agricultural land, is found in small areas along the length of the site, and is limited by slight soil wetness and workability restrictions.

Subgrade 3b, moderate quality agricultural land, is the predominant subgrade over the site and is limited by moderate soil wetness and workability restrictions.

Grade 4, poor quality agricultural land, is found in two areas in the north of the site. The northernmost area consists of restored land with limited topsoil resources and is poorly drained causing severe soil wetness and workability restrictions. The second area of Grade 4 is also poorly drained, being affected by high water table, and the profile also contains shale and spoil material.

Other land consists of metalled roads, tracks, private housing and parts of an existing golf course.

Factors Influencing ALC Grade

Climate

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

10. 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	NZ347467
Altitude	m, AOD	90
Accumulated Temperature	day°C (Jan-June)	1265
Average Annual Rainfall	mm	677
Field Capacity Days	days	173
Moisture Deficit, Wheat	mm	90
Moisture Deficit, Potatoes	mm	75

11. 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.

12. 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 (AT0, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean that this land has an overall climatic limitation of Grade 2.

Site

14. The site is mainly level to moderately sloping (0°-6°). However a small area of strongly sloping land (8°-10°) occurs in the southern part of the site, causing a site limitation of Subgrade 3b. Microrelief and flooding do not cause a limitation on this site.

Geology and soils

15. The Geological Survey of Great Britain (England and Wales) Sheet 27, Durham shows the site to be underlain by Coal Measures to the north of Coal Bank, with Permian Sand at Coal Bank and Magnesian Limestone south of Coal Bank. The drift geology is mainly boulder clay, but with Permian Sand and Magnesian Limestone exposed at Coal Bank.

16. The Soil Survey of England and Wales (Soils of England and Wales, Sheet 1 Northern England, 1:250,000) shows the whole site to be covered by the Dunkeswick Association.

Agricultural Land Classification

17. 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.

Grade 2

18. Grade 2, very good quality agricultural land, covers a small area to the far south of the site. Soils consist of very slightly stony medium clay loam topsoils, over very slightly stony sandy clay loam subsoils. These soils are well drained falling into Wetness Class I (Appendix II). This land is limited to Grade 2 by an overall climatic restriction, which means yields may be lower and more variable than Grade 1 land with similar physical properties.

Subgrade 3a

19. Subgrade 3a, good quality agricultural land, covers several bands across the length of the site. Soils consist of very slightly stony medium clay loam and medium silty clay loam topsoils over similar gleyed upper subsoils, in turn over gleyed slowly permeable heavy clay loam, heavy silty clay loam and clay lower subsoils. These soils are imperfectly drained, falling into Wetness Class III (see Appendix II). The slowly permeable layer occurs between 50 cm and 60 cm depth. This land is limited to Subgrade 3a by slight soil wetness and workability restrictions, which may adversely affect plant growth and restrict cultivations or grazing by livestock.

Subgrade 3b

20. Subgrade 3b, moderate quality land, covers the majority of the site. Soils consist of very slightly stony medium clay loam and medium silty clay loam topsoils over gleyed slowly permeable heavy clay loam and clay subsoils. These soils are poorly drained, falling into Wetness Class IV (see Appendix II). A small area in the south of the site is also restricted to Subgrade 3b by a gradient of 8-10°. This land is limited to Subgrade 3b by moderate soil wetness, workability and gradient restrictions which cause a reduction in the flexibility of the land, reducing it's ability to produce moderate to high yields of a wide range of crops.

Grade 4

21. Grade 4, poor quality agricultural land, occurs in two small areas in the north of the site. The northernmost area is restored, with soils consisting of 15 cm to 20 cm of very slightly stony silty clay loam topsoil over moderately stony (20% medium soft sandstones) gleyed slowly permeable heavy clay loam subsoil to 45 cm depth. Overburden is present to depth below the subsoil. This land is limited to Grade 4 by severe soil wetness and workability restrictions, with the soils falling into Wetness Class IV (see Appendix II), and lack of topsoil and subsoil resources. The combination of these factors will cause severe limitations on the flexibility of the land and restrict its use for growing arable crops.

The remaining area consists of low lying wet land, with soils consisting of gleyed slowly permeable topsoils and subsoils. A high water table is also present. These soils are poorly drained, falling into Wetness Class IV (see Appendix II). This land is limited to Grade 4 by a combination of the above factors, causing severe wetness and workability problems resulting in much reduced flexibility of the land for growing arable crops.

Other Land

Other land consists of metalled roads, urban areas, tracks and parts of an existing golf course.

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SOURCES OF REFERENCE

British Geological Survey (1965) *Sheet No.* 27, *Durham.*
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 and their Use in Northern 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 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.