

**DONCASTER UDP
LAND AT ARMTHORPE**

**Agricultural Land Classification
March 1997**

**Resource Planning Team
Leeds Statutory Group
ADAS Leeds**

**ADAS Reference: 8/97
MAFF Reference: EL 47/6
LUPU Commission: N3117**

AGRICULTURAL LAND CLASSIFICATION REPORT
DONCASTER UDP, LAND AT ARMTHORPE

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 22.8 ha of land at Armthorpe, north east of Doncaster. The survey was carried out during March 1997.
2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Northallerton in connection with an objection to the Doncaster UDP.
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 on the site was all in arable use growing winter cereals.

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
3a	5.4	23.7	23.7
3b	17.4	76.3	76.3
Total surveyed area	22.8	-	100
Total site area	22.8	100	-

7. The fieldwork was conducted at an average density of one boring per hectare. A total of 23 borings and 2 soil pits were described.

Subgrade 3a

8. This subgrade was found towards the east of the site adjacent to the A630 link road. Topsoils were organic sands over sand subsoils. Profiles were generally only very slightly stony (up to 5% stones). Droughtiness limits the ALC grade of this land.

Subgrade 3b

9. The remainder of the site was classified as Subgrade 3b. Soils are light textured and often stony. Topsoils are a slightly or moderately stony loamy medium sand over a similar stony, sand subsoil. These profiles have a significant droughtiness problem and this limits them to Subgrade 3b.

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	SE 635058
Altitude	m, AOD	10
Accumulated Temperature	day°C (Jan-June)	1411
Average Annual Rainfall	mm	575
Field Capacity Days	days	118
Moisture Deficit, Wheat	mm	113
Moisture Deficit, Potatoes	mm	106

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

14. The combination of rainfall and temperature at this site means there is no climatic limitation on ALC grade at Armthorpe.

Site

15. The north east corner of the site contains level land at about 5 m AOD. Away from this area relief is gentle and slopes rise up to a maximum of 12 m AOD in the south and west of the site.

Geology and soils

16. Bunter sandstones are covered with a thick layer of sandy drift, mostly older river gravel, river terrace deposits and sand. Organic mineral topsoils have developed over the sandy deposits in the north east corner of the site where relief is level and altitude below 5 m AOD. These organic soils will have developed during post glacial waterlogging prior to 20th century land improvements.

17. Sandy deposits have produced light textured freely drained soils often stony. The lowest lying land contains organic sand topsoils over sand subsoils. Following land improvement these soils are also freely drained. The site is covered by Soil Survey 1:25,000 soils map "Soils of Yorkshire II" SE60 Armthorpe. This map shows Newport Series over most of the site and Gilberdyke Series in the organic area. These series correspond closely with soils mapped and described by this report.

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.

Subgrade 3a

19. Organic sand topsoils over medium sand subsoils are found in the 3a part of the site. Following drainage these soils are free from any soil wetness limitation. However, due to the sandy nature of the subsoil, water holding capacity of the profile is low and this land is limited to Subgrade 3a by a droughtiness limitation.

Subgrade 3b

20. Remaining land is Subgrade 3b. Topsoils are loamy medium sand over a medium sand subsoil. Profiles are slightly to moderately stony. This land is also freely drained but has a very low water holding capacity and suffers a significant 3b droughtiness limitation.

File Ref: RPT 20,152
Resource Planning Team
Leeds Statutory Group
ADAS Leeds

SOURCES OF REFERENCE

British Geological Survey (1969) *Sheet No. 88, Doncaster, Solid and Drift*.
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 (1973) *Soils of Yorkshire II, Sheet SE60*

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.