

**Gardeners House Farm,
Tyne & Wear
Agricultural Land Classification
Statement of Physical Characteristics
Report
July 1996**

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

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AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF PHYSICAL CHARACTERISTICS REPORT

GARDENERS HOUSE FARM - PROPOSED OPEN CAST COAL SITE

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) and Statement of Physical Characteristics (ALC/SPC) survey of 18.6 ha of land at Gardeners House Farm. Survey work was conducted in July 1996. Information on soils and ALC provided by the applicants, H J Banks was also considered during the survey.
2. The survey was commissioned by Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Northallerton in connection with the proposal to extract coal by open cast methods from the site. This survey supersedes a reconnaissance survey of the site also undertaken by ADAS Statutory for LUPU in connection with the Northumberland Minerals Local Plan - ref. 149/95 Brenkley. The Brenkley reconnaissance survey covered approximately 300 ha of land. No map was published for this survey.
3. Survey 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 the 1996 survey all the site was under grass except for a narrow strip of an arable field in the east of the site. The 7 ha triangular field to the south west of the site contained rigg and furrow. The northernmost 2 fields on the site have been restored about 4 years ago following open cast coal mining.

Summary

5. The findings of the survey are shown on the enclosed ALC and soil resources maps. The findings have been drawn at a scale of 1:5,000. 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)	% of Site Area
3b	18.6	100%
Total surveyed area	18.6	100

7. Fieldwork was conducted at an average density of one boring per hectare. A total of 19 borings and 2 soil profile pits were described.

8. Subgrade 3b, moderate quality agricultural land is found on the whole site. Soils are poorly drained (Wetness Class IV). Topsoils are typically medium clay loam over clayey, slowly permeable subsoils. Soil wetness and workability restrictions limit the ALC grade of this land.

9. In terms of soil resources two main soil types were identified on the site. The first (T1/S1) is derived from restored medium to heavy textured material with overburden encountered at variable depth. The second soil type (T2/S2) also contains medium to heavy textured soils and is derived from boulder clay drift.

Factors Influencing ALC Grade

Climate

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	NZ205743
Altitude	m, AOD	65
Accumulated Temperature	day°C (Jan-June)	1284
Average Annual Rainfall	mm	692
Field Capacity Days	days	179
Moisture Deficit, Wheat	mm	87
Moisture Deficit, Potatoes	mm	73

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 there is an overall, climatic limitation of Grade 2.

Site

14. Land on the site is mostly level or gently sloping (0 - 3°) with a south westerly aspect and at no point does slope limit the ALC grade.

Geology and soils

15. The published geology map of the area (sheet 14 1:50,000 scale) Morpeth shows the whole site to be covered with boulder clay drift below which are upper carboniferous coal measures.

16. The Soils of England and Wales (sheet 12, Northern England 1:250,000 scale) shows soils on the site belong to the Foggathorpe II 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.

18. The location of the two representative soil profile pits are shown on the attached soil resource maps and full profile descriptions are given in Appendix III.

Subgrade 3b

19. This subgrade covers the whole site. Soils are poorly drained (Wetness Class IV) and are typically medium clay loam over a clayey, slowly permeable subsoil. Soils on the restored land tend to have coarse or platy structures and pass on to overburden at variable depth. Soil wetness and workability restrictions limit the ALC grade of the this land.

Statement of Physical Characteristics

20. Two soil types were identified on the site, descriptions of which are given below. Topsoil and subsoil resources are shown on the accompanying maps along with soil thickness and volume information.

a) Soil Type 1 (T/S1) - Medium to Heavy textured restored soil.

This soil is found in the northern two fields on the site. Topsoils are typically medium to heavy clay loam over a clayey textured subsoil. Overburden is often encountered at depths of less than one metre.

b) Soil Type 2 (T2/S2) - Medium to heavy textured boulder clay derived soil. This soil type is found on the rest of the site. Topsoils are medium textured over a clayey textured subsoil. Subsoils are occasionally medium textured.

Soil Resources

Topsoils

21. Unit T1 occurs in the north of site. It is heavy textured with a weakly developed coarse angular blocky structure. The unit contains up to 10% volume of clayey subsoil material. The unit has a mean depth of 25 cm.

22. Unit T2 is found over the remaining undisturbed land. It is also medium textured and has a strongly developed medium subangular blocky structure. The units mean thickness is 30 cm. However, T2 displays considerable variation in depth across the rigg and furrow area with depths greatest on the riggs and shallowest in the furrow areas.

Subsoils

23. Unit S1 underlies topsoil T1. It is clayey (heavy) textured and has a massive to very coarse platy structure. Unit thickness was variable. Overburden was encountered at a variety of depths across the site with a mean thickness for the unit of 35 cm.

24. Unit S2 if found below topsoil T2. It is undisturbed with a heavy texture. It typically has a strongly developed coarse angular blocky structure. Mean unit thickness of S2 is 90 cm.

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Leeds Statutory Group
ADAS Leeds

SOURCES OF REFERENCE

British Geological Survey (1977) *Sheet No. 14 (Morpeth)*, 1:50,000 scale.
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.

APPENDIX III

SOIL DATA

Soil type 1 - Medium to heavy textured restored soil. (T1/S1)
Location - Pit 1 nr auger boring 8.
Land use - Grass
Slope - Level
Weather - Overcast, showers.

**Depth
(cm)**

0 - 28 Very dark greyish brown (10YR3/2) unmottled, medium clay loam; very slightly stony with 2% sandstones; moist; 10% volume light yellowish brown (10YR6/4) subsoil material; weakly developed coarse angular blocky; very firm; <0.5% pores >0.5 mm; many fine fibrous roots; moderately sticky; moderately plastic; non calcareous; clear smooth boundary.

28 - 104 Dark grey (10YR4/1) with many distinct brownish yellow (10YR6/6) mottles; clay; very slightly stony with 3% sandstones and shales; moist; weakly developed very coarse platy to massive; extremely firm; <0.5% pores >0.5 mm; few very fine fibrous roots; moderately sticky, very plastic; non calcareous; abrupt smooth boundary too.

104 + Dark grey (5YR5/1) clayey overburden with shale.

Soil Type 2 - **Medium to Heavy Textured Boulder Clay Derived Soil**

Location - Pit 2 nr auger boring 12.

Land used - P. Grass - Rigg and Furrow

Slope - Level

Weather - Overcast, showers

**Depth
(cm)**

0 - 31 Dark greyish brown (10YR4/2) unmottled; medium clay loam; very slightly stony with 2% sandstones; dry; strongly developed medium subangular blocky; friable; <0.5% pores >0.5 mm; abundant fine fibrous roots; moderately sticky; moderately plastic; non calcareous; clear smooth boundary.

31 - 120 Grey (10YR5/1) with many distinct brownish yellow (10YR6/6) mottles; clay; very slightly stony with 5% stones of mixed lithology (mostly sandstones and shales); moist; weakly developed coarse angular blocky; firm; <0.5% pores >0.5 mm; common fine fibrous roots, few below 80 cm depth; moderately sticky; very plastic; non calcareous.