FIELD 0006, EASTFIELD FARM
WINTERINGHAM

Agricultural Land Classification and Statement of Physical Characteristics Report

SEPTEMBER 1996

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ADAS Reference: 77/96
MAFF Reference: EL 11053
LUPU Commission: N2821
RPT 201 065

FIELD 0006, EASTFIELD FARM, WINTERINGHAM AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF PHYSICAL CHARACTERISTICS REPORT.

Introduction

1. This report presents the findings of a detailed Statement of Physical Characteristics and Agricultural Land Classification (ALC) survey of 2.2 ha of land at Eastfield Farm, Winteringham. The survey was carried out during August 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Northallerton in connection with the proposal to extract sand and gravel from this land. 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 on the site was all under cereal stubble with the exception of a farm track in the west.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:2,500. 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
Subgrade 3a	1.0	45.5	47.6
Subgrade 3b	1.1	50.0	52.4
Other land	0.1	4.5	-
Total surveyed area	2.1	-	100
Total site area	2.2	100	-

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

8. Subgrade 3a, good quality agricultural land, covers 1.0 ha of the site. The soils are well drained and consist of medium sandy loam topsoils overlying loamy medium sand subsoils in most cases, although horizons of medium sand occur at depth in places. The topsoils are very slightly stony, while the subsoils are very slightly to slightly stony. The ALC grade of this land is restricted by slight soil droughtiness.

Subgrade 3b, moderate quality agricultural land, covers 1.1 ha. In the centre the soils have been restored and they consist of slightly stony medium clay loam topsoils and subsoils overlying limestone rubble at around 45cm depth. A moderate soil droughtiness limitation restricts this land to Subgrade 3b. The remainder of the Subgrade 3b land consists of well drained profiles where very slightly stony medium sandy loam or loamy medium sand topsoils overlie very slightly to slightly stony loamy medium sand or medium sand upper subsoils and medium sand lower subsoils. Again a moderate soil droughtiness restriction is the grade limiting factor in this case.

Other land consisting of a farm track covers 0.1 ha in the west of the site.

In terms of soil resources, there are two main soil types on the site. The first consists of medium sandy loam or loamy medium sand topsoils (median thickness 30cm) overlying loamy medium sand or medium sand subsoils (mean thickness 88cm). The second soil type consists of restored soils where medium clay loam topsoils (median thickness 30cm) overlie medium clay loam subsoils (mean thickness 15cm) which in turn overlie limestone rubble.

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	SE 946211
Altitude	m, AOD	10
Accumulated Temperature	day°C (Jan-June)	1398
Average Annual Rainfall	mm	593
Field Capacity Days	days	131
Moisture Deficit, Wheat	mm	113
Moisture Deficit, Potatoes	mm	106

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

13. The combination of rainfall and temperature at this site means that there is no climatic limitation on the ALC grade.

Site

14. The land on the site is level to gently sloping ($0\text{-}2^0$) with an easterly or southerly aspect. As such, gradient does not limit ALC grade at any point, and neither flood risk nor microrelief are of any significance on this site.

Geology and soils

15. This site is underlain by Jurassic Hibaldstow Limestone over which lie deep deposits of glacial sand and gravel (British Geological Survey Sheet 80 *Kingston-Upon-Hull*). In the centre of the site is an area where sand and gravel has been worked in the past and which has subsequently been restored using soils derived from limestone, limestone rubble, and, according to the landowner, builders rubble.

16. The undisturbed soils on the site correspond to the Newport 1 association as mapped by the Soil Survey of England and Wales (Sheet 1, *Northern England*).

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.

18. 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.

Subgrade 3a

19. Land in this subgrade covers the south of the site. The soils are well drained, falling in Wetness Class I (see Appendix II) and typically consist of medium sandy loam topsoils overlying loamy medium sand subsoils. Medium clay loam topsoils and subsoil horizons of medium sand occur in places. The topsoils are very slightly stony, containing around 3% total hard stones, and the subsoils are very slightly to slightly stony, with between 2% and 8% hard stones. The ALC grade of this land is limited by slight soil droughtiness, which will affect the range of crops which can be grown and their yield.

Subgrade 3b

20. Subgrade 3b, moderate quality agricultural land, covers the north of the site. In the centre restored soils occur on the site of a previously worked sand pit. The soils have been imported to the site and consist of medium clay loam topsoils and subsoils overlying limestone rubble at around 45cm depth. According to the landowner, builders rubble was also used in the restoration. The topsoils and subsoils in this area are slightly stony, containing between 8% and 12% limestones (5% >2cm in the topsoil), and the ALC grade is limited by moderate soil droughtiness.

The remaining Subgrade 3b land consists of well drained (Wetness Class I) soils where medium sandy loam or loamy medium sand topsoils overlie loamy medium sand or medium sand upper subsoils and medium sand lower subsoils. The topsoils are very slightly stony, with around 2% total hard stones, and the subsoils are very slightly to slightly stony, with between 2% and 6% hard stones. Again, the factor which limits this land to Subgrade 3b is moderate soil droughtiness.

Other Land

21. This occurs in the west of the site and consists of a farm track.

Statement of Physical Characteristics

22. Two main soil types occur on this site, descriptions of which are given below. Topsoil and subsoil resources are also shown on the accompanying maps along with soil thickness and volume information.

(a) Soil Type 1:- Light textured to sandy soils (T1/S1). (Full profile description, Appendix III).

This soil, formed on deposits of glacial sand and gravel, covers all but the centre of the site. It is characterised by light or very light textured topsoils overlying very light textured or sandy subsoils.

(b) Soil Type 2:- Restored medium-textured soil (T2/S2). (Full profile description, Appendix III).

This soil has been restored on the site of a former sand pit. It is derived from limestone and is characterised by medium-textured topsoils and subsoils overlying limestone rubble.

Soil Resources

23. (i) Topsoils

Unit T1 occurs over most of the site with the exception of the restored area in the centre (where topsoil T2 occurs) and the track in the west (where there is no topsoil). It is light or very light-textured, generally consisting of medium sandy loam or loamy medium sand, and it is very slightly stony, with around 3% hard stones. This soil has a moderately developed medium subangular blocky structure and a median thickness of 30cm.

Unit T2 occurs on the restored land in the centre of the site. It is medium - textured (medium clay loam) and slightly stony, with 8% to 14% very small to medium limestones. Unit T2 has a weakly developed medium angular and subangular blocky structure and a median unit thickness of 30cm.

(ii) Subsoils

Unit S1 underlies topsoil T1. On the accompanying map it has been assumed that the track in the west of the site is also underlain by this subsoil. It is very light-textured or sandy (either medium sand or loamy medium sand) and very slightly to slightly stony, with between 2% and 8% very small to medium hard stones. This subsoil has a weakly developed medium angular blocky or single grain structure, and a mean thickness of 88cm.

Unit S2 underlies topsoil T2 and has also been restored. It is medium-textured (medium clay loam) and slightly stony, containing around 12% very small to medium limestones. It has a weakly developed coarse angular blocky structure and a mean thickness of 15cm.

File Ref: RPT 20.065
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SOURCES OF REFERENCE

British Geological Survey (1983) *Sheet No.* 80, *Kingston-Upon-Hull*, (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) *Sheet* 1, *Northern England*, (1:250,000 scale) SSEW: Harpenden.

Soil Survey of England and Wales (1984) *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 PROFILE DESCRIPTIONS

1. Light-textured to sandy soil (T1/S1)

Location: north west of boring 1

Slope: 0^0

Land Use: Cereal stubble

Weather: Cool, showery

Depth (cm)	**Horizon Description**
0-28	Dark brown (10YR3/3) medium sandy loam; no mottles; very slightly stony, with around 2% very small to medium hard stones (1% >2cm); moist; moderately developed medium subangular blocky structure; friable; very porous; many very fine fibrous roots; slightly sticky; slightly plastic; non-calcareous; clear, smooth boundary.
28-40	Dark brown (10YR3/3) loamy medium sand; no mottles; very slightly stony, with around 2% very small to medium hard stones; slightly moist; moderately developed medium subangular blocky structure; friable; very porous; many very fine fibrous roots; slightly sticky ; slightly plastic; non-calcareous; abrupt smooth boundary.
40-120	Yellowish brown (10YR5/4) medium sand becoming reddish yellow (7.5YR7/6) below 70cm; no mottles; very slightly stony, with around 2% very small and small hard stones; slightly moist; weakly developed medium angular blocky and single grain structure; very friable; extremely porous; few very fine fibrous roots; non-sticky; non-plastic; non-calcareous.

2. Restored medium-textured soil (T2/S2)

Location: north east of boring 4

Slope: 1^0E

Land Use: Cereal stubble

Weather: Cool, showery

Depth (cm)	**Horizon Description**
0-32	Brown/dark brown (10YR4/3) medium clay loam; no mottles; slightly stony, with approximately 8% very small to medium limestones (5% > 2cm); moist; weakly developed medium angular blocky structure; firm; moderately porous ; many very fine fibrous roots; moderately sticky; moderately plastic; calcareous; clear smooth boundary.
32-54	Yellowish brown (10YR5/4) medium clay loam; no mottles; slightly stony, with around 12% very small to large limestones; moist; weakly developed coarse angular blocky structure; very firm; many very fine fibrous roots; moderately sticky; moderately plastic; calcareous; clear wavy boundary
54 +	Limestone rubble, impenetrable to spade and auger.