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SPITTAL HARDWICK LANE
PONTEFRACT
WEST YORKSHIRE

Agricultural Land Classification and Statement of Physical Characteristics Report
November 1996

Resource Planning Team
Leeds Statutory Group
ADAS Leeds

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AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF PHYSICAL CHARACTERISTICS REPORT

SPITTAL HARDWICK LANE

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) and Statement of Physical Characteristics survey of 9.6 ha of land at Spittal Hardwick Lane, Pontefract. 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 the proposal to improve the land by tipping and regrading. This survey supersedes any previous ALC surveys.

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 in arable use, with winter cereals sown in the south and volunteer oilseed rape in the north.

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
Grade 2	1.6	16.7	16.7
Subgrade 3b	8.0	83.3	83.3
Total surveyed area	9.6	-	100
Total site area	9.6	100	-

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

8. Grade 2, very good quality agricultural land, occurs in a narrow band in the centre of the site. The soils are well drained and generally consist of medium clay loam topsoils and subsoils, although medium sandy loam topsoils and heavy clay loam or clay lower subsoils occur in places. Both topsoils and subsoils are very slightly to slightly stony and the ALC grade of the land is limited by soil droughtiness.

9. Subgrade 3b, moderate quality agricultural land, covers the remainder of the site. In the south medium silty clay loam topsoils and thin subsoils overlie weathering limestone and soil droughtiness limits the land to Subgrade 3b. Many areas, including some with deeper profiles, are also limited to Subgrade 3b by slopes of 7-8°. In the centre and north medium-textured topsoils overlie a rubbish tip. The topsoils are contaminated with glass, plastic bags, plastic bottles etc. and large quantities of rubbish occur below 35 cm depth. The soils are moderately droughty and the flexibility of the land is significantly reduced by the presence of the rubbish in the topsoil. For these reasons the land is limited to Subgrade 3b.

10. In terms of soil resources there are two main soil types on the site. The first consists of medium clay loam topsoils (median thickness 35 cm) overlying a rubbish tip. The topsoils contain significant amounts of glass, plastic bottles and plastic bags and these items should be removed before it is used in any restoration. The second soil type generally consists of medium-textured topsoils (median thickness 25 cm) and subsoils (mean thickness of shallow phase = 18 cm, mean thickness of deep phase = 95 cm), although horizons of heavy clay loam or clay occur at depth in the centre of the site. The shallow phase of this soil type overlies weathering limestone.

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 459238
Altitude	m, AOD	35
Accumulated Temperature	day°C (Jan-June)	1378
Average Annual Rainfall	mm	589
Field Capacity Days	days	125
Moisture Deficit, Wheat	mm	106
Moisture Deficit, Potatoes	mm	97

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

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

Site

16. The land on this site is level to gently sloping in the north (0-2°) but moderately to strongly sloping (6-8°) in the south. As such, those parts of the south of the site with slopes greater than 7° are limited by their gradient to Subgrade 3b. However, neither flood risk nor microrelief are of significance on this site.

Geology and soils

17. The site is underlain by Lower Magnesian Limestone in the south and by Middle Coal Measures elsewhere. A thin band of Middle Permian Marl separates the areas of Magnesian Limestone from those of Coal Measures. In the south of the site there is no drift cover and the soils are shallow overlying weathering limestone, while in an area in the centre of the site Head (locally derived drift) deposits occur at the bottom of the slope. The remaining areas on the site have been disturbed by tipping of rubbish.

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

Agricultural Land Classification

19. 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.

Grade 2

20. A small band of Grade 2, very good quality agricultural land, occurs in the centre of the site. The soils are well drained, falling in Wetness Class I (see Appendix II), and consist of medium clay loam topsoils and subsoils in most cases. Occasional medium sandy loam topsoils and heavy clay loam or clay lower subsoils also occur. The topsoils and subsoils are very slightly to slightly stony, with 4-6% limestones (3% >2 cm in the topsoil). This land is limited to Grade 2 by very slight soil droughtiness.

Subgrade 3b

21. Land in this subgrade, defined as moderate quality agricultural land, covers the remainder of the site. In the south the soils are well drained (Wetness Class I) and generally

overlie weathering limestone at between 20 cm and 45 cm depth. The topsoils and subsoils typically consist of medium silty clay loam and soil droughtiness is the main factor which limits the land to Subgrade 3b. A secondary factor which limits much of the south of the site to Subgrade 3b (including some areas with deeper soils) is slopes of between 7° and 8°. In the north and part of the centre of the site soils have been restored over a rubbish tip. The topsoils are medium-textured (medium clay loams) but are contaminated with glass, wire, plastic bottles, plastic bags etc from the underlying tip. Large quantities of rubbish and ash occur below around 35 cm depth. Due to the nature of the contamination of the topsoil this land is unsuitable for grazing or the production of hay/silage. The soils are moderately droughty and the land is only capable of producing moderate yields of a narrow range of arable crops. Subgrade 3b is, therefore, the most appropriate grade for this land.

Statement of Physical Characteristics

22. Two main 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. Representative pit descriptions are given in Appendix III.

a. Soil Type 1 (T1/Tip), Disturbed medium-textured topsoil overlying rubbish tip.

   This soil type occurs in the north and in a smaller area in the centre of the site. It is characterised by the presence of rubbish at the soil surface and within the topsoil. Large amounts of rubbish are generally found below 35-40 cm depth.

b. Soil Type 2 (T2/S1A and S1B), Medium-textured topsoils and either shallow medium-textured subsoils overlying weathering limestone (S1B) or deep medium-textured subsoils (S1A).

   This soil type occurs in the centre and south of the site. It is derived from limestone and is generally undisturbed, although occasional items of rubbish occur on the soil surface.

Soil Resources

Topsoil

23. Unit T1 occurs in the north of the site and in a separate area in the centre. It is medium-textured (generally medium clay loam) and has a weakly to moderately developed medium subangular blocky structure. The median unit thickness is 35 cm. Topsoil T1 contains significant quantities of rubbish including plastic bottles, plastic bags, bricks, and glass. Many of the items are hazardous to animal health and as such this topsoil should not be used in any restoration unless these items can be successfully screened out.

24. Topsoil T2 occurs in the centre and south of the site. It is generally medium-textured (medium clay loam or medium silty clay loam) although it is light-textured (medium sandy loam) in some parts of the centre of the site. It is very slightly to slightly stony, with 4-14% very small to medium limestones, and has a moderately developed coarse subangular blocky structure. The median unit thickness of T2 is 25 cm.

Subsoils

25. Subsoil S1 occurs in the centre and south of the site, and it can be subdivided into Unit S1A (mean thickness 95 cm) and Unit S1B (mean thickness 18 cm). This subsoil is medium-textured (usually medium clay loam or medium silty clay loam) although heavy-textured horizons (heavy clay loam or clay) occur at depth in places within Unit S1A. Unit S1 is very slightly to slightly stony with 4-12% very small to medium limestones, and typically has a strongly developed medium subangular blocky structure. Unit S1A extends to 120 cm depth whilst S1B overlies weathering Magnesian Limestone at between 20 cm and 70 cm depth.

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SOURCES OF REFERENCE

British Geological Survey (1972) *Sheet No. 78, Wakefield, 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, Soils of 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 DESCRIPTION

Soil Type 1:	Disturbed medium-textured topsoil overlying rubbish tip.
Location:	Grid Reference: SE 4583 2386
Land Use:	Arable (volunteer oilseed rape and chickweed)
Slope:	2°N
Recent Weather:	Mild and bright after overnight rain.
Depth (cm)	Horizon Description
0-42	Very dark greyish brown (10 YR 3/2) medium clay loam; no mottles; slightly stony, with around 8% very small to large sandstones, limestones and brick fragments; moist; weakly to moderately developed medium subangular blocky structure; firm; moderately porous; abundant very fine fibrous roots to 10 cm, many below 10 cm; significant amounts of rubbish including glass, plastic bottles and plastic bags; moderately sticky; moderately plastic; non-calcareous; gradual, wavy boundary.
42+	Large quantities of ash, glass, plastic bags, plastic bottles, wire etc.

Soil Type 2:	(T2/S1B) Medium-textured topsoils and subsoils overlying weathering limestone.
Location:	Grid Reference: SE 4600 2382
Land Use:	Arable (volunteer oilseed rape)
Slope:	6°N
Recent Weather:	Mild and bright after overnight rain.
Depth (cm)	Horizon Description
0-32	Dark brown (10 YR 3/3) medium silty clay loam; no mottles; slightly stony, with approximately 7% very small to medium limestones (3% >2 cm); moist; moderately developed coarse subangular blocky structure; firm; slightly porous; few fine and common very fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; clear wavy boundary.
32-70	Yellowish brown (10 YR 5/4) medium silty clay loam; no mottles; slightly stony, with around 7% very small to medium limestones; slightly moist; strongly developed medium subangular blocky structure; firm; moderately porous; common very fine fibrous roots; moderately sticky; moderately plastic; calcareous; clear, smooth boundary.
70+	White (10 YR 8/2) weathering limestone.