LAND AT HOLME PIERREPOINT, NOTTS.

Agricultural Land Classification & Soil Physical Characteristics Report

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FRCA Cambridge

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AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS REPORT

LAND AT HOLME PIERREPONT, NOTTINGHAMSHIRE

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 30.1 ha of land to the east of Nottingham and south west of the village of Holme Pierrepont centred on grid reference SK 625 385. The survey was carried out during August 1998.

2. The survey was carried out by the Farming and Rural Conservation Agency (FRCA) for the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with an application to extract sand and gravel. This survey supersedes previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. 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 a mixture of cereal crops which had either just been harvested or were awaiting harvest and two fields of rough grassland/set aside. An area mapped as 'Other Land' consisted of the tree lined Polser Brook which runs west to east towards the south of the site.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10 000; 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)	% surveyed area	% site area
2	1.5	5	5
3a	16.3	55	54
3b	11.8	40	39
Other land	0.5	-	2
Total surveyed area	29.6	100	98
Total site area	30.1	-	100

7. The fieldwork was conducted at an average density of one boring per hectare. A total of 32 borings and 2 soil pits was described.

8. The agricultural land within the site has been assessed as a mix of Subgrade 3a (good quality agricultural land) and Subgrade 3b (moderate quality agricultural land) with a small area of Grade 2 (very good quality agricultural land) occurring in the north of the site. The limitation to the quality of the agricultural land in the south of the site is wetness and workability with this area having an underlying slowly permeable clay horizon. Land is restricted to Subgrade 3a or 3b depending on the texture of the topsoil. However the main limitation in the north of the site is one of droughtiness with the severity of the limitation being determined by the depth to underlying sand and gravel.

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	SK 625 385
Altitude	m, AOD	21
Accumulated Temperature	day°C (Jan-June)	1428
Average Annual Rainfall	mm	576
Field Capacity Days	days	120
Moisture Deficit, Wheat	mm	116
Moisture Deficit, Potatoes	mm	110
Overall climatic grade	N/A	1

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 mean there is no overriding climatic limitation within the site and hence the overall climatic grade is 1.

Site

14. The site lies at an altitude of approximately 21 m AOD is generally level with a very gentle rise to the north and west of the site. Topography and microrelief do not therefore impose any limitations to the farming of the site.

Geology and soils

15. The published 1:50 000 scale geology map for the area (British Geol. Survey, 1972) shows the north to central area of the site to consist of glacial sand and gravel. From the centre to the south of the site alluvium is mapped.

16. The 1:250 000 scale reconnaissance soil survey map for the area (Soil Survey, 1983) shows soils of the Fladbury Association to cover the whole of the site. These soils are briefly described as stoneless clayey soils variably affected by groundwater, with some sandy subsoils. Some similar fine loamy soils on flat land.

17. During the current, more detailed survey, two soil types have been identified and are described briefly below.

Soil Type I

18. This soil type covers the southern half of the site and consists predominantly of a stoneless medium or heavy clay loam textured topsoil overlying a stoneless reddish brown clay textured upper subsoil containing prominent ochreous mottles. This upper subsoil overlies a stoneless grey clay textured lower subsoil, however, very occasionally a sandy clay or heavy clay loam textured lower subsoil is encountered. The upper subsoil constitutes a slowly permeable layer and hence profiles of this soil type are assessed as Wetness Class III. all horizons are non calcareous.

Soil Type II

19. This soil type covers the north of the site and consists of a very slightly or slightly stony medium sandy loam, or very occasionally sandy clay loam, textured topsoil overlying a similar upper subsoil. The upper subsoil in turn overlies sand and gravel which contains typically 25-50% stones. The thickness of the upper subsoil horizon varies within this soil type and is occasionally absent with the topsoil directly overlying the sand and gravel. The profiles of this soil type are well drained and are assessed as Wetness Class I. Profiles are non calcareous throughout.

AGRICULTURAL LAND CLASSIFICATION

20. 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.

21. The location of the auger borings and pits is shown on the attached sample location map.

Grade 2

22. Land of Grade 2 quality is associated with a small area of Soil Type II (described in paragraph19) in the north of the site in which the thickness of the topsoil and upper subsoil above the underlying sand and gravel is sufficiently deep to only have a slight droughtiness limitation. Very occasionally similar profiles of Grade 2 quality are found in other areas of the site but these did not constitute a sufficient area to be mapped separately.

Subgrade 3a

23. Land of this quality occurs across much of the site and is associated with Soil Type I in the south of the site. Land quality is restricted by a moderate wetness and workability limitation with the soil profiles being assessed as Wetness Class III, which together with a medium clay loam textured topsoil and the prevailing climate for the site, limit the quality of such land to Subgrade 3a.

24. Land of Subgrade 3a quality is also associated with areas of Soil Type II in the north of the site in which coarse textures predominate within the soil profile and available moisture for plant growth is relatively low. Hence such profiles have a moderate droughtiness limitation for agricultural land quality, excluding this land from a higher grade.

Subgrade 3b

25. Land of Subgrade 3b quality is associated with profiles of Soil Type I which are assessed as Wetness Class III and have a heavy clay loam textured topsoil. The combination of wetness class, heavy textured topsoil and the prevailing climate for the site result in a significant wetness and workability limitation restricting such land to Subgrade 3b.

26. . Additionally, areas of Soil Type II in which the upper subsoil is thin or absent above the sand and gravel have a significant droughtiness limitation restricting land quality to Subgrade 3b.

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SOURCES OF REFERENCE

British Geological Survey (1972) *Sheet No.* 126, *Nottingham*, 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 (1983) *Sheet* 3, *Midland and Western 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

Statement of Soil Physical Characteristics

Soil Type I

Topsoil

Texture	:	Medium clay loam / heavy clay loam
Colour	:	7.5YR4/2, 3/2, brown, dark brown - 5YR4/2, 3/2, dark reddish grey, dark reddish brown
Stones	:	Stoneless
Roots	:	Many fine and very fine
Calcium carbonate	:	Non calcareous
Boundary	:	Abrupt, smooth
Depth	:	26 cm

Upper Subsoil

Texture	:	Clay
Colour	:	5YR5/3
Mottles	:	Many prominent ochreous
Stones	:	Stoneless
Structure	:	Moderately developed coarse prismatic breaking to coarse angular blocky
Consistence	:	Firm
Structural condition	:	Poor
Pores	:	<0.5% biopores
Roots	:	Many fine and very fine
Calcium carbonate	:	Non calcareous
Boundary	:	Clear, smooth
Depth	:	57 cm

Lower Subsoil

Texture	:	Clay
Colour	:	10YR5/1, 6/1, grey
Mottles	:	Common to many prominent ochreous
Stones	:	Stoneless
Structure	:	Moderately developed coarse angular blocky (tending to prismatic)
Consistence	:	Firm
Structural condition	:	Poor
Pores	:	<0.5% biopores
Roots	:	Many fine and very fine
Calcium carbonate	:	Non calcareous
Depth	:	120 cm

Wetness Class III

Appendix III continued

Soil Type II

Topsoil

Texture	:	Medium sandy loam (occ. sandy clay loam)
Colour	:	7.5YR3/2, 4/2, dark brown, brown
Stones	:	Typically 5%
Roots	:	Many fine and very fine
Calcium carbonate	:	Non calcareous
Boundary	:	Abrupt, smooth
Depth	:	35 cm

Upper Subsoil (very occasionally absent)

Texture	:	Medium sandy loam
Colour	:	5YR4/4, 7.5YR4/4, reddish brown, brown
Mottles	:	None
Stones	:	Typically 5%
Structure	:	Weakly developed medium to coarse subangular blocky
Consistence	:	Friable
Structural condition	:	Good
Pores	:	>0.5% biopores
Roots	:	Common fine and very fine
Calcium carbonate	:	Non calcareous
Depth	:	56 cm

Lower Subsoil

Texture	:	Medium sand and gravel
Colour	:	7.5YR4/4, 5/4, 5/6 brown, strong brown
Mottles	:	None
Stones	:	Typically 30%
Structure	:	Single grain
Consistence	:	Loose
Structural condition	:	Moderate
Roots	:	Few fine
Calcium carbonate	:	Non calcareous
Depth	:	120 cm

Wetness Class : I