Ducks Hill Farm, Holt,
Norfolk.

Agricultural Land Classification
and Soil Physical Characteristics
ALC Map and Report

March 1998

Resource Planning Team
Eastern Region
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AGRICULTURAL LAND CLASSIFICATION REPORT

Ducks Hill Farm, Holt, Norfolk.

INTRODUCTION

1. This report presents the findings of a detailed, Agricultural Land Classification (ALC) survey of 22.3 ha of land at Ducks Hill Farm, Holt, Norfolk. The survey was carried out during March 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 for mineral extraction. 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 was cropped with winter sown cereals. 'Other Land' occurs on the eastern and south western boundaries where trees have been planted for screening purposes.

Irrigation

5. The whole site can be irrigated and has an adequate and reliable water supply to enhance the productive capacity and flexibility of the agricultural land.

6. In accordance with Planning Policy Guidance Note & (PPG 7, 1997) the site has been graded without reference to the availability of irrigation.

7. Annexe B, para. B 11 of PPG 7 gives guidance on comparisons to be made in connection with irrigated and non-irrigated land. Attention is therefore drawn to the importance and increased agricultural significance that should be afforded to this part of the site relative to comparable but non-irrigated land in the locality.

SUMMARY

8. 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.

9. 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	Area (hectares)	% surveyed area	% site area
2	5.8	27	26
3a	6.4	30	29
3b	7.4	35	33
4	1.7	8	8
Other Land	1.0	N/A	4
Total surveyed area	21.3	100	-
Total site area	22.3	-	100

10. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 23 borings and 3 soil pits was described.

11. Land mapped as grade 2 (very good quality agricultural land) occurs in the eastern central part of the site and is restricted to this grade due to a minor droughtiness limitation.

12. Land mapped as subgrade 3a occurs in the north east and south east and is restricted to this subgrade due to a moderate droughtiness limitation.

13. Land mapped as subgrade 3b occurs in the west and is restricted to this subgrade due to topsoil stone (>2cm) being in the range 18-25%.

14. Land mapped as grade 4 occurs in the south west corner of the site and is restricted to this grade due to a severe droughtiness limitation.

FACTORS INFLUENCING ALC GRADE

Climate

15. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

16. 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	TG 074 373
Altitude	m, AOD	62
Accumulated Temperature	day°C (Jan-June)	1349
Average Annual Rainfall	mm	691
Field Capacity Days	days	145
Moisture Deficit, Wheat	mm	106
Moisture Deficit, Potatoes	mm	97
Overall climatic grade	N/A	Grade 1

17. 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.

18. 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.

19. The combination of rainfall and temperature impose no overall limitation to land quality and hence the site has a climatic grade of 1.

Site

20. The site is slightly undulating at an approximate height of 62m AOD. It is bounded in the east by the Hunworth Road, the north and south by tracks and open farmland in the west.

Geology and soils

21. There is no detailed geological information available for the area. The published 1: 253 440 scale geology map (BGS. 1971) shows the site to comprise glacial drift - sands and gravels of various dates including 'Plateau Gravels' of Norfolk.

22. The 1:250 000 scale reconnaissance soil map of the area (SSEW 1983) shows the site to comprise soils of the Wick 3 Association. These soils are briefly described as deep well drained coarse loamy often stoneless with some similar sandy soils. Complex patterns can occur locally.

23. During the current survey four main soil types were defined, mainly on the basis of texture and stone content.

Soil Type I

24. Soil Type I occurs in the east central part of the site. Profiles typically comprise slightly stony, medium sandy loam topsoils over very slightly stony, medium sandy loam upper subsoils. Mid subsoils comprise very slightly stony, loamy medium sand over stoneless sandy clay loam lower subsoils.

Soil Type II

25. Soil Type II occurs in the north east and south east of the site. Profiles typically comprise slightly stony, medium sandy loam topsoils over slightly stony, medium sandy loam upper subsoils. Mid subsoils comprise very slightly stony loamy medium sand over stoneless medium sand lower subsoils.

Soil Type III

26. Soil Type III occurs in the western part of the site. Profiles typically comprise moderately stony, medium sandy loam topsoils over moderately stony medium sandy loam upper subsoils. Mid subsoils comprise very stony loamy medium sand over very stony medium sand lower subsoils.

Soil Type IV

27. Soil Type IV occurs in a small area in the south west corner of the site. Profiles typically comprise moderately stony, medium sandy loam topsoils over very stony loamy medium sand upper subsoils. Lower subsoils comprise very stony coarse sand.

28. Profiles were variably calcareous and free draining throughout the site.

AGRICULTURAL LAND CLASSIFICATION

29. 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 2.

30. 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 II.

Grade 2

31. Land mapped as grade 2 occurs in the east central part of the site and corresponds to the soils described in paragraph 24. With coarse loamy over, at depth, fine loamy soils there are adequate reserves of available water for crop growth. A slight droughtiness limitation restricts this land to grade 2.

Subgrade 3a

32. Land mapped as subgrade 3a occurs in the north east and south east of the site and corresponds to the soils described in paragraph 25. With coarse loamy over sandy soils available water for crop growth is limited and a moderate droughtiness limitation restricts this land to subgrade 3a.

Subgrade 3b

33. Land mapped as subgrade 3b occurs in the western part of the site and corresponds to the soils described in paragraph 26. The coarse loamy over sandy soils are moderately stony in the topsoil and very stony in the subsoil. Stones act as an impediment to cultivation, harvesting, crop growth and yield, and can increase production costs by causing extra wear and tear to implements and tyres. This land is therefore restricted to subgrade 3b due to topsoil stone content. In addition a moderately severe droughtiness limitation restricts this land to this subgrade.

Grade 4

34. Land mapped as grade 4 occurs in a small area in the south west corner of the site and corresponds to the soils described in paragraph 27. The moderately stony coarse loamy over

very stony sandy subsoils (occurring quite high in the profile). have inadequate reserves of available water for crop growth. Hence a severe droughtiness restriction limits this land to grade 4.

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet No. 12, Drift Edition. Scale 1:253 440*
BGS: London.

Department of the Environment (1997) Planning Policy Guidance 7, *The Countryside-Environmental Quality and Economic and Social Development.*
HMSO: 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 4, Soils of Eastern England. Scale 1:250 000*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in Eastern 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 sandy loam
	Colour	:	10YR4/3
	Stone	:	3-6%, flints, round and angular
	Roots	:	many, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	35/40cm
	Boundary	:	smooth/abrupt
Upper subsoil	Texture	:	medium sandy loam
	Colour	:	10YR5/4,4/4
	Stone	:	3%, small flints
	Structure	:	weak dev. coarse subangular blocky
	Consistence	:	very friable
	Structural condition	:	good
	Roots	:	common, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	typically 65cm (range 65/80cm)
	Boundary	:	smooth/clear
Mid subsoil	Texture	:	loamy medium sand
	Colour	:	10YR5/4,6/6,5/8
	Stone	:	1% very small flints
	Structure	:	weak dev. medium subangular blocky
	Consistence	:	very friable
	Structural condition	:	moderate
	Roots	:	common/few, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	typically 85/90cm (occasionally 110cm)
	Boundary		smooth/clear
Lower subsoil	Texture	:	sandy clay loam
	Colour	:	10YR5/8,6/8 7.5YR5/8
	Stone	:	stoneless
	Structure	:	mod. dev.coarse subangular blocky
	Consistence	:	friable
	Structural condition	:	moderate
	Roots	:	common/few, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	120cm

Wetness Class I

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE II

Topsoil	Texture	:	medium sandy loam
	Colour	:	10YR4/3
	Stone	:	5-10% flints
	Roots	:	many, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	35cm
	Boundary	:	smooth/clear
Upper subsoil	Texture	:	medium sandy loam (occasionally loamy medium sand)
	Colour	:	10YR4/6
	Stone	:	3-10% flints(occasionally >20%)
	Structure	:	weak dev. coarse subangular blocky
	Consistence	:	very friable
	Structural condition	:	good
	Roots	:	common, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	typically 55/60cm
	Boundary	:	smooth/clear
Mid subsoil	Texture	:	loamy medium sand
	Colour	:	10YR5/6, 6/8, 5/4, 6/6.
	Stone	:	1-5%, flints
	Structure	:	weak dev. medium subangular blocky
	Consistence	:	very friable
	Structural condition	:	moderate
	Roots	:	few, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	typically 65/75cm (occasionally >95cm)
	Boundary		smooth/abrupt
Lower subsoil	Texture	:	medium sand
	Colour	:	10YR5/6, 6/6, 6/8, 5/8.
	Stone	:	stoneless
	Structure	:	apedal,single grain
	Consistence	:	loose
	Structural condition	:	moderate
	Roots	:	none visible below 90cm
	$CaCO^3$	:	variable
	Depth	:	120cm

Wetness Class: I

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE III

Topsoil	Texture	:	medium sandy loam
	Colour	:	10YR4/3, 7.5YR4/3
	Stone	:	18-25%, flints
	Roots	:	many, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	typically 35cm (range 30/40cm)
	Boundary	:	smooth/clear
Upper subsoil	Texture	:	medium sandy loam
	Colour	:	10YR4/4
	Stone	:	typically 35%, flints (range 20-40%)
	Structure	:	too stony to assess
	Consistence	:	very friable
	Roots	:	few, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	typically 60cm (range 55/75cm)
	Boundary	:	smooth/abrupt
Mid Subsoil	Texture	:	loamy medium sand
	Colour	:	10YR5/6, 5/8.
	Stone	:	40%, flints (occasionally less stony)
	Structure	:	too stony to assess
	Consistence	:	very friable
	Roots	:	few, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	typically 75cm (range 75/100cm)
	Boundary		smooth/abrupt
Lower Subsoil	Texture	:	medium sand
	Colour	:	7.5YR5/8
	Stone	:	40%, flints
	Structure	:	too stony to assess
	Consistence	:	loose
	Roots	:	none visible below 75/80cm
	$CaCO^3$	:	variable
	Depth	:	120cm

Wetness Class: I

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE IV

Topsoil	Texture	:	medium sandy loam
	Colour	:	10YR4/3, 7.5YR4/3
	Stone	:	30%, flints (25% >2cm)
	Roots	:	many, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	typically 35cm (range 30/40cm)
	Boundary	:	smooth/abrupt
Upper subsoil	Texture	:	loamy medium sand
	Colour	:	10YR5/4, 5/8.
	Stone	:	55%, flints
	Structure	:	too stony to assess
	Consistence	:	loose
	Roots	:	common, fine and very fine
	$CaCO^3$	:	variable
	Depth	:	55cm
	Boundary	:	wavy/clear
Lower subsoil	Texture	:	coarse sand
	Colour	:	7.5YR5/8
	Stone	:	60%, flints
	Structure	:	too stony to assess
	Consistence	:	loose
	Roots	:	none visible below 65cm
	$CaCO^3$	:	variable
	Depth	:	100cm

Wetness Class: I