P12- MINERALS PLAN
COGENHOE, NORTHAMPTONSHIRE
Agricultural Land Classification
Reconnaissance Survey
September 1996

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AGRICULTURAL LAND CLASSIFICATION REPORT

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Introduction

1. This report presents the findings of a reconnaissance Agricultural Land Classification (ALC) survey of 371.9 ha of land at Cogenhoe, Northamptonshire. The survey was carried out during September 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Cambridge in connection with environmental data required prior to the inclusion of the site in the Northamptonshire Minerals Plan.

3. The work was conducted by members of the Resource Planning Team in the Huntingdon 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 use on the site was either post harvest (cereals, oil seed rape, peas) or recently cultivated. Land bordering both sides of the river was under grass.

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: Areas of grades and other land

Grade/Other land	Area (hectares)	% surveyed
2	35.0	15.2
3a	42.2	18.3
3b	149.9	65.1
Other land	3.2	1.4
Total agricultural land	227.1	98.6
Total survey area	230.3	100.0
Unsurveyed	141.6	

7. The fieldwork was conducted at an average density of 1 boring per 3 hectares. A total of 79 borings and 5 soil pits were described. As the survey was carried out at reconnaissance level the grade boundaries are not definitive. A detailed survey would need to be conducted to ascertain their more precise location.

8. Land mapped as grade 2 (very good agricultural quality) is confined to the northern part of the site and is restricted to this grade due to a slight droughtiness limitation. Land mapped as subgrade 3a occurs in both the north and south of the site. To the north of the River Nene land is restricted to this subgrade due to a moderate droughtiness limitation whilst to the south, land is restricted by a moderate wetness and workability limitation. Limited information supplied by the Environmental Agency suggests that land between the river and the dismantled railway line is restricted to this grade on flood risk. The remainder of the land is mapped as subgrade 3b (moderate agricultural quality), due to a combination of topsoil texture and slowly permeable subsoils, giving rise to a moderately severe wetness and workability limitation.

9. Other land includes a small wood, two grass fields which appear to be in domestic use, and the course of the River Nene. The large area in the north western part of the site has not been surveyed on advice from the Local Water Authority. Sewage from the adjacent works has been spread on this land for approximately the past eighty years. The land is cropped on a rotational basis but the build up of heavy metals and other toxic elements should be investigated.

Factors Influencing ALC Grade

Climate

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

11. 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

Parameter	Value
Grid reference	SP850615
Altitude (m, AOD)	48
Accumulated Temperature (day °C, Jan.–June)	1427
Average Annual Rainfall (mm)	575
Field Capacity Days	121
Moisture Deficit, Wheat (mm)	115
Moisture Deficit, Potatoes (mm)	109
Overall Climatic Grade	1

12. 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.

13. 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.

14. The combination of rainfall and temperature at this site mean there no overriding climatic limitations, and therefore the climatic grade 1 is assigned.

Site

15. The site lies in the flat valley bottom of the River Nene. Typically the land lies at just under 50m AOD, but to the north of the A45 rises to a maximum altitude of approximately 59m AOD.

Geology and soils

16. The published 1:50 000 scale geology maps (Geol. Survey. 1974 + 1980) shows the area south of the river to comprise alluvium. North of the river moving in a northerly direction, alluvium, 1st and 2nd terrace river gravels and Upper Lias Clay are mapped.

17. The 1:250 000 reconnaissance soil survey map for the area (SSEW, 1983) shows the site to comprise soils of the Fladbury 1, and Waterstock associations. Soils of the Fladbury 1 association are briefly described as stoneless clayey soils, in places calcareous, variably affected by groundwater, and are mapped on all the land to the south of the river, and a narrow strip to the north. Those of the Waterstock association as deep fine loamy soils variably affected by groundwater, and are mapped on the remaining land to the north of the river.

18. During the current reconnaissance survey four main soil types were encountered.

Soil Type I

19. Soil Type I predominates on the site and occurs over much of the land to the south of the river. Profiles typically comprise stoneless, non calcareous heavy clay loam/clay topsoil over slowly permeable, stoneless non-calcareous clay subsoil. Gleying occurs at 30/35cm and soils are assessed as Wetness Class III (q.v. Appendix II).

Soil Type II

20. Soil Type II occurs in small discrete areas in the south of the site. Profiles typically comprise stoneless, non-calcareous heavy clay loam (occasionally medium clay loam) topsoil over a stoneless, non-calcareous permeable clay (occasionally heavy clay loam) upper subsoil. Lower subsoil comprises stoneless, slowly permeable clay, with gleying occuring at 50/65cm. These soils are assessed as Wetness Class II.

Soil Type III

21. Soil Type III occurs in the northern part of the site. Profiles typically comprise very slightly stony, non-calcareous medium clay loam topsoil, over stoneless, non-calcareous medium clay loam (occasionally heavy clay loam) upper subsoil. Lower subsoil comprises heavy clay loam (occasionally sandy clay loam) with the occurrence of gravel at 80/100cm. The soils are well drained and are assessed as Wetness Class I.

Soil Type IV

22. Soil Type IV occurs in a small discrete area in the northern part of the site. Profiles typically comprise non-calcareous, very slightly stony sandy clay loam (occasionally medium clay loam) topsoil over a non-calcareous, very stony sandy clay loam upper subsoil. Lower subsoil comprises slightly stony medium sand. The soils are free draining and are assessed as Wetness Class I.

Agricultural Land Classification

23. 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.

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

Grade 2

25. Land mapped as grade 2 occurs on the northern boundaries of the site, and corresponds to the soils described in paragraph 21. The fine loamy soils over gravel at depth are free draining and are subject to a slight droughtiness limitation thus restricting the land to grade 2.

Subgrade 3a

26. Land mapped as subgrade 3a occurs in the north and south of the site. In the north it corresponds to the soils described in paragraph 22. The fine loamy soils over very stony upper subsoil are subject to a moderate droughtiness limitation limiting the land to subgrade 3a.
In the south it corresponds to the soils described in paragraph 19, and land is limited to this grade due to moderate wetness and workability restriction.

Subgrade 3b

27. Land mapped as subgrade 3b corresponds to the soils described in paragraph 19, and is limited to this subgrade due to a more severe wetness and workability restriction.With clay or clay loam topsoils and slowly permeable subsoils care and timeliness with cultivations are required to avoid damage to soil structure.

28. N.B. Due to the nature of the survey the grade boundaries are not definitive.

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SOURCES OF REFERENCE

British Geological Survey
(1980) *Sheet No.185, Northampton, Solid and Drift, Scale 1:50 000*
(1974) *Sheet No.186, Wellingborough, Solid and Drift Scale 1:50 000*
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 4, 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

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.