NORTHAMPTONSHIRE STRUCTURE PLAN
LAND EAST OF WELLINGBOROUGH, NORTHAMPTONSHIRE.

Agricultural Land Classification
ALC map and report.

April 1999

Resource Planning Team
Eastern Region
FRCA Cambridge

RPT Job Number: 17/99
MAFF Reference: EL29/01602
LURET Job Number: MLAG01602A

AGRICULTURAL LAND CLASSIFICATION REPORT

NORTHAMPTONSHIRE STRUCTURE PLAN, LAND EAST OF WELLINGBOROUGH, NORTHAMPTONSHIRE.

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 385 ha of land located to the east of Wellingborough in Northamptonshire. The survey was carried out during February, March and April 1999.

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 the review of the Northamptonshire Structure Plan. 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 agricultural land on site was under a mix of uses including cereals, oilseed rape and linseed, with smaller areas of grassland, stubble and cultivated land. The areas mapped as 'Other land' comprise part of the quarry in the south of the site, the sewage lagoons at South View Farm, various farms with associated buildings and yards throughout the site and roads and tracks. The area of 'Unsurveyed' land in the south-east was not surveyed because it had recently received applications of sewage sludge and abattoir waste.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:20 000 in order to fit it on one page. It is however accurate at a scale of 1:10 000, but any further enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1, page 2.

7. The fieldwork was conducted at an average density of one auger boring per hectare. A total of 333 auger borings and 11 pits was described.

8. Over one third of the agricultural land on site has been graded 2 (very good quality agricultural land). This land is limited by minor droughtiness imperfections and/or minor wetness and workability constraints. Land of subgrade 3a (good quality agricultural land) is mostly limited by moderate droughtiness constraints or occasionally by a moderate wetness and workability limitation. Less than a quarter of the agricultural land on site is graded 3b (moderate quality agricultural land). This land is either limited by significant droughtiness or wetness and workability constraints, or in places by a gradient limitation. Occasionally, the

areas affected by a gradient limitation are equally limited by droughtiness or wetness and workability.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	128.7	39	33
3a	121.6	37	32
3b	80.0	24	21
Agricultural land not surveyed	9.0	N/A	2
Other land	45.7	N/A	12
Total surveyed area	330.3	100	86
Total site area	385.0	-	100

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 range of key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5 km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values		
Grid reference	N/A	SP 915 697	SP 923 686	SP 915 681
Altitude	m, AOD	70	50	50
Accumulated Temperature	day°C (Jan-June)	1397	1419	1420
Average Annual Rainfall	mm	595	588	589
Field Capacity Days	days	121	119	119
Moisture Deficit, Wheat	mm	113	116	116
Moisture Deficit, Potatoes	mm	105	110	109
Overall climatic grade	N/A	Grade 1	Grade 1	Grade 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 that it is relatively warm and dry during the critical growing season, therefore imposing no overall limitation to land quality. As a result the site has a climatic grade of 1.

Site

14. The site lies east of Wellingborough on the south and south-east facing slopes of the River Nene valley and on the west facing slopes of the River Ise valley. The northern boundary is formed by a track which runs from Ryebury Hill to the River Ise passing just south of Hillside Farm. To the east the site abuts Wellingborough Road (A510), Sidegate Lane, Mill Road and Ditchford Road and in the south adjoins a dismantled railway which now lies within a working quarry. The western side of the site adjoins open fields and in the extreme north-west the River Ise.

15. The highest points on site occur in the east adjacent to Sidegate Lane (87 m AOD) and at Stone Cross Farm (82 m AOD). South of Irthlingborough Road and Mill Road the land slopes at gently to moderate gradients in a southerly/south-easterly direction, reaching a minimum altitude of 40 m AOD adjacent to the quarry. North of Irthlingborough Road the land slopes gently to moderately (occasionally strongly) in a generally westerly direction, and is dissected by three tributary valleys. In places, particularly on the sides of the tributary valleys, gradients of 7.5–9.5° were measured. Such gradients impose a significant limitation to the agricultural land quality, restricting it to subgrade 3b. Nowhere else on site does altitude or gradient impose a limitation to the land quality.

Geology and soils

16. At a scale of 1:50 000 the geology map, sheet 186 (Geological Survey of Great Britain [England and Wales], 1974) maps the following geological sequence. On the lowest ground, in the south and north-west alluvium is mapped. On the lower slopes, particularly in the south, 1st terrace river gravels are mapped. On the midslopes, mainly in the south and within the tributary valleys in the north, Upper Lias Clay outcrops. The upper slopes and highest ground throughout the site are mapped as Northampton Sand with Ironstone, much of which is shown to have been opencasted in the past. Adjacent to Sidegate Lane, to the north-east of Finedon Hill Farm, a small area of Great Oolite Limestone and Upper Estuarine Clays and Silts outcrops.

17. At the reconnaissance scale of 1:250 000 the Soil Survey of England and Wales (Sheet 4, 1983) maps most of the site as the Banbury Association, with small areas in the extreme west mapped as the Fladbury 1 Association. These soil associations are briefly described as follows:

- Banbury: Well drained brashy fine and coarse loamy ferruginous soils over ironstone. Some deep fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging
- Fladbury 1: Stoneless clayey soils, in places calcareous, variably affected by groundwater. Flat land. Risk of flooding

18. During the current survey four main soil types where identified, all of which correspond well with the underlying geology.

19. The main soil type has been sub-divided into three variants, differentiated on the basis of stone content. This soil type corresponds with the Northampton Sandstone with Ironstone geology and generally occurs on the higher ground. All variants of this soil type are non-calcareous throughout and have been assessed as well drained.

20. The first variant is the least stony. Topsoils are very slightly to slightly stony, typically 30 cm deep (ranging from 25 to 35 cm) and typically comprise medium clay loam texture (occasionally medium sandy loam or medium sandy silt loam). The upper subsoil typically comprises medium clay loam (occasionally heavy clay loam or medium sandy loam) and extends to 50/80 cm (occasionally to depth). This horizon is typically slightly stony (occasionally very slightly or moderately stony). Lower subsoil textures are variable, but most commonly comprise medium clay loam. Heavy clay loam, medium sandy loam, sandy clay loam and clay occurs to a lesser extent. The lower subsoil is typically slightly to moderately stony and extends to depth, but profiles occasionally become impenetrable to auger at 70/90 cm.

21. The second variant contains intermediate stone contents. Topsoils are similar in texture and depth to those found in the first variant, and are typically slightly stony (occasionally very slightly or moderately stony). Subsoils typically comprise moderately stony medium clay loam (occasionally medium sandy loam or heavy clay loam) which typically becomes impenetrable to auger at 45/70 cm depth.

22. The third variant is the most stony. Topsoils comprise slightly to moderately stony, medium clay loam (occasionally medium sandy loam) and extend to 25/30 cm depth. Subsoils comprise similar textures and are moderately to very stony, typically becoming impenetrable to auger at 35/50 cm depth. Pit information confirms that the subsoil comprises similar textures and stone contents to depth.

23. The second main soil type mostly occurs on the lower slopes of the river valley sides (in the south and west) and corresponds with the terrace river gravel geology. Profiles are typically non-calcareous throughout. Topsoils most commonly comprise medium clay loam, with medium sandy silt loam and medium sandy loam occurring to a lesser extent. Topsoils are typically very slightly stony and 30 cm deep (ranging from 25 to 35 cm). Upper subsoils comprise medium clay loam (occasionally heavy clay loam or medium sandy loam) and are typically very slightly stony and extend to 50/80 cm or occasionally to depth. Lower subsoil textures are variable, medium sandy loam, followed by medium clay loam and heavy clay loam predominating. Lower subsoils range from very slightly to moderately stony and typically continue to depth. Profiles have been assessed as well drained.

24. The third main soil type occurs on the midslopes in the south and west of the site, where it corresponds with the Lias Clay outcrop, and on the flat alluvial flood plain adjacent to the River Ise in the north-west. This soil type has two variants, differentiated on the basis of depth to slowly permeable clay.

25. The first variant corresponds with the whole of the alluvial area and the areas where the soils are developed directly from the Lias Clay or where there is only a very thin covering of drift material. Topsoils are typically very slightly stony or stoneless (occasionally slightly stony), comprise heavy clay loams, clays or medium clay loams and extend to 25/35 cm depth. Typically, slowly permeable stoneless clay occurs immediately beneath the topsoil and extends

to depth. Occasionally, a thin upper subsoil of very slightly to slightly stony medium or heavy clay loam occurs and extends to 35/50 cm where it merges into the slowly permeable clay. Profiles are non-calcareous throughout and have been assessed as imperfectly drained.

26. The second variant of this soil type occurs where a moderate depth of drift material covers the Lias Clay. Topsoils typically comprise very slightly stony medium clay loam extending to 30 cm depth. Upper subsoils typically comprise heavy clay loam (occasionally medium clay loam) and extend to 50/75 cm (very occasionally to 80 cm). They are typically very slightly stony (occasionally slightly to moderately stony). The lower subsoil typically consists of slowly permeable stoneless clay. Profiles are non-calcareous and have been assessed as moderately well drained.

27. The fourth soil type occurs adjacent to Sidegate Lane north-east of Finedon Hill Farm and corresponds with the area of Oolitic Limestone and Upper Estuarine Clay and Silt geology. Topsoils typically comprise calcareous, very slightly to slightly stony medium clay loam (occasionally heavy clay loam) and extend to 20/35 cm depth. Upper subsoil textures are variable, ranging from fine sand to clay. They are typically calcareous, very slightly stony and continue to 30/60 cm (occasionally to depth). . The lower subsoil is also variable in texture, ranging from loamy medium sand to clay. It is typically non-calcareous, very slightly stony (occasionally slightly to moderately stony) and extends to depth. Occasionally profiles become impenetrable to auger at 50/70 cm. These profiles have been assessed as well drained.

AGRICULTURAL LAND CLASSIFICATION

28. 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.

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

Grade 2

30. The grade 2 land on site occurs in two situations. Firstly it corresponds with the soils described in paragraphs 20 and 23. Within these soil types the fine loamy or occasionally coarse loamy textures, in combination with profile stone contents, retain good reserves of water for crop growth. However, moisture balance calculations show that these soils will typically suffer from a minor droughtiness imperfection, which restricts them to grade 2.

31. Secondly, grade 2 land corresponds with the soils described in paragraph 26, where the moderately well drained profiles have been assessed as Wetness Class II. This factor, combined with the fine loamy topsoil textures imposes a minor wetness and workability constraint to the land. Due to the combination of textures, stone contents and subsoil structural conditions, these profiles are also typically slightly droughty. The above mentioned minor/slight imperfections are typically equally limiting, both precluding the land from a higher grade.

Subgrade 3a

32. Land assessed as subgrade 3a is mostly associated with a droughtiness limitation and corresponds mainly to the soils described in paragraph 21, and to occasional less droughty profiles within the soils described in paragraphs 22 and 27. In all cases, the combination of profile stone contents with fine and coarse loamy (very occasionally sandy) textures means the soils have a moderately limited water holding capacity. Moisture balance calculations show that this land therefore suffers from a moderate droughtiness constraint which restricts it to subgrade 3a.

33. Sporadically throughout the site subgrade 3a land corresponds to the soils described in paragraph 25. These imperfectly drained soils have been assessed as Wetness Class III. This factor, when combined with medium clay loam topsoils, imposes a moderate wetness and workability constraint to the land, thus precluding it from a higher grade.

Subgrade 3b

34. Land graded 3b occurs in three situations. Firstly it corresponds to the stony soils described in paragraph 22. The combination of fine or coarse loamy textures and high stone contents significantly restrict the amount of water this soil can retain for crop growth. The land is therefore significantly droughty and limited to subgrade 3b.

35. Secondly, 3b land corresponds to the imperfectly drained soils (assessed as Wetness Class III) described in paragraph 25. This Wetness Class, combined with the heavy clay loam or clay topsoil textures, imposes a significant wetness and workability constraint to the land, which precludes it from a higher grade.

36. Lastly, land is restricted to subgrade 3b by gradient limitations. In the northern half of the site, associated with the tributary valleys, some small areas of land slope strongly at gradients from 7.5 to 9.5°. Such gradients significantly affect the safe and efficient operation of some farm machinery and therefore impose a significant limitation which restricts the land to subgrade 3b. Very occasionally, gradient is equally limiting with either a droughtiness or wetness and workability constraint.

Adrian Rochford
Resource Planning Team
Eastern Region
FRCA Cambridge

SOURCES OF REFERENCE

Geological Survey of Great Britain (England and Wales), 1974, *sheet 186, Wellingborough.* 1:50 000 scale.

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.* 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.