

**WANLIP SEWAGE WORKS -
OPTIONS,
LEICESTERSHIRE**

**Agricultural Land Classification
ALC Map and Report**

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**Resource Planning Team
Eastern Region
FRCA Cambridge**

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AGRICULTURAL LAND CLASSIFICATION REPORT

WANLIP SEWAGE WORKS -OPTIONS, LEICESTERSHIRE

INTRODUCTION

1. This report presents the findings of detailed Agricultural Land Classification (ALC) surveys of three small adjacent sites, with a combined area of 23.5 ha, situated to the north and west of Wanlip Sewage Works in Leicestershire. The survey work was carried out in December 1998.
2. The survey was undertaken by members of the Farming and Rural Conservation Agency (FRCA) for the Ministry of Agriculture, Fisheries and Food (MAFF). The work was carried out in connection with proposals to expand the existing sewage works. This survey supersedes previous ALC information for this land.
3. 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 the current survey land north of the sewage works (corresponding to sites 5 and 6) was under cereals and land to the west of the sewage works (site 1) was under grass. The areas of 'Other land' on sites 5 and 6 correspond with a tree lined bank which slopes steeply down to the River Soar at the eastern boundary. In the north-east of site 6 the area widens to form a small wood. No 'Other land' has been mapped on site 1.

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 at each of the three sites is summarised in Tables 1, 2 and 3.

Table 1: Site 1. Area of each grade

Grade/Other land	Area (hectares)	% site area
2	4.0	63
3a	2.3	37
Total site area	6.3	100

Table 2: Site 5. Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	3.6	43	43
3a	3.5	42	41
3b	1.2	15	14
Other land	0.2	N/A	2
Total surveyed area	8.3	100	98
Total site area	8.5	-	100

Table 3: Site 6. Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	5.8	70	67
3a	1.2	15	14
3b	1.2	15	14
Other land	0.5	N/A	5
Total surveyed area	8.2	100	95
Total site area	8.7	-	100

7. The fieldwork was conducted at an average density of 1 auger boring per hectare. A total of 22 auger borings and 3 soil pits was described.

8. Land of grade 2 (very good quality agricultural land) occurs on all three sites, predominating on sites 1 and 6. In all cases the grade 2 land is restricted by minor droughtiness imperfections. Land graded 3a, (good quality agricultural land) also occurs on all the sites. On sites 1 and 5 it is restricted by moderate wetness and workability constraints, whilst the small area of subgrade 3a land on site 6 is limited by moderate droughtiness. Land graded 3b (moderate quality agricultural land) is confined to the eastern end of sites 5 and 6. In both cases significant wetness and workability constraints preclude the land from a higher grade.

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 4 (page 3) and were obtained from the published 5 km grid datasets using the standard interpolation procedures (Met. Office, 1989).

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.

Table 4: Climatic and altitude data

Factor	Units	Values		
		Site 1	Site 5	Site 6
Grid reference	N/A	SK 594 115	SK 593 118	SK 594 121
Altitude	m, AOD	60	55	55
Accumulated Temperature	day°C (Jan-June)	1397	1403	1402
Average Annual Rainfall	mm	655	653	653
Field Capacity Days	days	149	149	150
Moisture Deficit, Wheat	mm	107	107	107
Moisture Deficit, Potatoes	mm	98	99	99
		Grade 1	Grade 1	Grade 1

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

13. The combination of rainfall and temperature at the three sites are such that they do not impose a limitation. All the sites are therefore of climatic grade 1.

The three sites are described individually.

SITE 1

14. The site lies to the immediate west of the sewage works, adjoining open fields to the north, west and south. The land slopes gently from approximately 65 m AOD in the south to 55 m AOD in the north. Neither altitude or gradient impose any limitation to the agricultural quality of the land.

Geology and soils

15. The published 1:50 000 scale solid and drift edition geology map, sheet 156 (Geological Survey of Great Britain [England and Wales], 1975) maps the whole area as glacial sand and gravel.

16. At a reconnaissance scale of 1:250 000 the Soil Survey of England and Wales, (Sheet 3, Soils of Midland and Western England, 1983) maps the site as the Wick 1 Association. This soil association is briefly described as: 'Deep well drained coarse loamy and sandy soils, locally over gravel. Some similar soils affected by groundwater. Slight risk of water erosion.'

17. The current survey identified two main soil types.

18. The first soil type occurs in the south and north of the site. The topsoil comprises medium sandy loam (occasionally medium clay loam), is very slightly stony, non-calcareous and 30 cm deep. A similarly stony medium sandy loam upper subsoil extends to 50/70 cm depth where it merges into a loamy medium sand lower subsoil which can become clayey at depth. Profiles have been assessed as free draining.

19. The second soil type occupies the middle and north west of the site. Topsoils generally comprise medium clay loams or sandy clay loams, they are very slightly stony, non-calcareous and 30 cm deep. The topsoil typically overlies a thin upper subsoil of medium or heavy clay loam which merges into slowly permeable red clay. Profiles have been assessed as imperfectly to poorly drained.

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. The grade 2 land corresponds with the soils described in paragraph 18. The combination of textures and stone contents mean the soil has a slightly limited ability to retain water for crop growth. As a result this land suffers from a minor droughtiness constraint which restricts it to grade 2.

Subgrade 3a

23. Land mapped as subgrade 3a corresponds with the soils described in paragraph 19. The presence of slowly permeable clay at moderate depth or directly beneath the topsoil results in Wetness Class assessments of III and IV respectively. These wetness classes combine with the fine or occasionally coarse loamy topsoils to impose a moderate wetness and workability constraint to the land, thus precluding it from a higher grade.

SITE 5

24. The site lies to the immediate north of the sewage works. To the west and north it adjoins open fields, and to the east the River Soar. The site slopes gently from approximately 60 m AOD in the west to 50 m AOD in the east. Neither altitude or gradient impose any limitation to the agricultural quality of the land.

Geology and soils

25. The published 1:50 000 scale solid and drift edition geology map, sheet 156 (Geological Survey of Great Britain [England and Wales], 1975) maps the majority of the site as glacial sand and gravel. Keuper Red Marl is mapped along the southern boundary and a narrow band of alluvium in the east, adjacent to the River Soar.

26. At a reconnaissance scale of 1:250 000 the Soil Survey of England and Wales, (Sheet 3, Soils of Midland and Western England, 1983) maps the site as the Wick 1 Association. This soil association is briefly described as: 'Deep well drained coarse loamy and sandy soils, locally over gravel. Some similar soils affected by groundwater. Slight risk of water erosion.'

27. The current survey identified two main soil types.

28. The first soil type dominates the west and north of the site. The topsoil comprises medium sandy loam and is very slightly stony, non-calcareous and typically 30 cm deep. Upper subsoils mostly comprise medium sandy loams, they are non-calcareous and very slightly stony (occasionally slightly to moderately stony). The subsoil either continues unchanged to depth or merges into a moderately stony loamy medium sand lower subsoil. Occasionally profiles contain sandy clay loam bands or become gravely and impenetrable to auger. This soil type is free draining.

29. The second soil type occurs mainly in the east and in a small area in the south/centre of the site. Topsoils typically comprise sandy clay loams (occasionally medium sandy loams) and are very slightly to slightly stony, non-calcareous and 30 cm deep. The topsoil typically directly overlies slowly permeable red clay, but is occasionally separated from it by a thin upper subsoil of sandy clay loam. Profiles have been assessed as imperfectly to poorly drained.

AGRICULTURAL LAND CLASSIFICATION

30. 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 2, page 2.

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

Grade 2

32. The grade 2 land corresponds with the better bodied less stony soils described in paragraph 28. The combination of textures and stone contents mean the soil has a slightly limited ability to retain water for crop growth. As a result this land suffers from a minor droughtiness constraint which restricts it to grade 2.

33. Land mapped as subgrade 3a occurs in two situations. Firstly it corresponds with the soils described in paragraph 29. The presence of slowly permeable clay directly beneath the topsoil means profiles have been assessed as Wetness Class IV. This wetness class, combined with the coarse loamy topsoil, imposes a moderate wetness and workability constraint to the land. The remaining subgrade 3a land corresponds with the lighter textured, stonier profiles described in paragraph 28. These profiles have a limited ability to retain water for crop growth and are therefore moderately droughty. Each of the above limitations restrict the land to subgrade 3a.

Subgrade 3b

34. The subgrade 3b land corresponds with the soils described in paragraph 29. Profiles have typically been assessed as Wetness Class IV due to the occurrence of slowly permeable clay immediately beneath the topsoil. Combined with the fine loamy topsoil textures, this factor imposes a significant wetness and workability constraint to the land, thus precluding it from a higher grade.

SITE 6

35. The site is situated north of the sewage works. It adjoins the A6 to the west, open fields to the north and south (site 5), and the River Soar to the east. The site slopes gently from approximately 60 m AOD in the south-west to 50 m AOD in the north-east. Neither altitude or gradient impose any limitation to the agricultural quality of the land.

Geology and soils

36. The published 1:50 000 scale solid and drift edition geology map, sheet 156 (Geological Survey of Great Britain [England and Wales], 1975) maps the majority of the site as glacial sand and gravel. Keuper Red Marl is mapped in the north and alluvium along the eastern edge, adjacent to the River Soar.

37. At a reconnaissance scale of 1:250 000 the Soil Survey of England and Wales, (Sheet 3, Soils of Midland and Western England, 1983) maps the site as the Wick 1 Association. This soil association is briefly described as: Deep well drained coarse loamy and sandy soils, locally over gravel. Some similar soils affected by groundwater. Slight risk of water erosion.

38. The current survey identified two main soil types.

39. The predominant soil type occupies the western three quarters of the site. Topsoils are typically very slightly stony, non-calcareous, of medium sandy loam (occasionally sandy clay loam) texture and typically 30 cm deep. Subsoils are similar to the topsoil but are typically more stony, occasionally increasing to moderately stony at depth. Occasionally, a slightly stony loamy medium sand lower subsoil is encountered at 50/75 cm, and continuing to depth. These profiles are free draining.

40. The second soil type is confined to the eastern quarter of the site. Topsoils are very slightly stony, non-calcareous, of medium clay loam or sandy clay loam texture and 25 cm deep. Slowly permeable red clay is encountered immediately below the topsoil and extends to depth. These profiles have been assessed as poorly drained.

AGRICULTURAL LAND CLASSIFICATION

41. 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 3, page 2.

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

Grade 2

43. The grade 2 land corresponds with the better bodied less stony soils described in paragraph 39. The combination of textures and stone contents mean the soil has a slightly limited ability to retain water for crop growth. As a result this land suffers from a minor droughtiness constraint which restricts it to grade 2.

Subgrade 3a

44. Land mapped as subgrade 3a corresponds with the lighter textured, stonier profiles described in paragraph 39. These profiles have a limited ability to retain water for crop growth, they are therefore moderately droughty and thus restricted to subgrade 3a.

Subgrade 3b

45. The subgrade 3b land corresponds with the soils described in paragraph 40. Profiles have been assessed as Wetness Class IV due to the occurrence of slowly permeable clay immediately beneath the topsoil. Combined with the fine loamy topsoil textures, this factor imposes a significant wetness and workability constraint to the land, thus precluding it from a higher grade.

Adrian Rochford
Resource Planning Team
Eastern Region
FRCA Cambridge

SOURCES OF REFERENCE

Geological Survey of Great Britain [England and Wales] (1975) *Sheet No. 156, Leicester*.

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, Soils of Midland and Western England*.

SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in 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.