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Ministry of
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NORTH-WEST LEICESTERSHIRE
LOCAL PLAN
NEW VILLAGE SOUTH OF LOCKINGTON (Site No 7241)
Agricultural Land Classification
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Resource Planning Team
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AGRICULTURAL LAND CLASSIFICATION

NORTH-WEST LEICESTERSHIRE LOCAL PLAN
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INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 163.0 hectares south of the villages of Lockington and Hemington and to the north of East Midlands Airport. The survey was commissioned by the Land Use Planning Unit (LUPU) of the Ministry of Agriculture, Fisheries and Food (MAFF) in connection with the North West Leicestershire Local Plan (representation 7241). Most of the site was surveyed and mapped in detail in September 1995 (ADAS, 1995) and the additional survey work in the very south of the site to provide total cover was carried out in May 1996 by the Resource Planning Team (RPT) of the ADAS Huntingdon Statutory Group, Cambridge. The present report synthesises the results of these two surveys and now supersedes previous ALC surveys at the site. The provisional 1:63 360 scale ALC map (MAFF, 1971) showed most of the site to be Grade 3 but with a small area of Grade 2 in the north-east corner.

2. The site is bounded to the east by the A453 road and to the west by a small lane running due south from Hemington to the edge of the airport. The northern boundary is formed by The Dumps (woodland), Church Lane and open farmland while to the south of the site is a small area of open farmland with the perimeter fence of the airport beyond.

3. At the time of surveys the majority of the site was under arable cropping, principally winter cereals but with some oilseed rape and some grass leys. There is an area of permanent grass on the western edge of the site. Other, non-agricultural, land which was not surveyed includes several tracks and areas of woodland, the largest of which is King Street Plantation.

4. The land has been classified in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

SUMMARY

5. The land classification was established by a total of 157 soil auger borings (i.e. approximately 1 per hectare) to a depth of 120 cm or to impenetrable stony layers. Subsoil conditions were assessed from eight inspection pits. The location of the pits and the auger borings is shown on the accompanying Sample Point Map.

6. The results of the ALC survey are summarised in Table 1 and the distribution of the grades and subgrades is shown on the accompanying ALC map. The map is accurate at the scale of 1:10 000 but any enlargement would be misleading.

Table 1: Areas of grades and other land

Grade/Other land	Area (hectares)	% surveyed
2	52.0	32
3a	91.3	56
3b	9.7	6
5	3.1	2
Other land	7.0	4
Total agricultural land	156.0	96
Total survey area	163.0	100

7. Over half of the land is graded 3a (good quality agricultural land) with a further third graded 2 (very good quality agricultural land). These gradings are due primarily to moderate or minor wetness limitations (see Appendix II) but some land also suffers from a moderate droughtiness limitation. A small proportion of the site is of moderate (Subgrade 3b) or very poor (Grade 5) agricultural quality because of either moderately severe wetness, moderately severe droughtiness, steep slopes or uneven topography.

FACTORS INFLUENCING ALC GRADE

Climate

8. Climate criteria are considered first when classifying land because severe climatic limitations will restrict land to low grades irrespective of favourable site or soil conditions. The overall climate itself may affect grading, or grading may be affected through climatic factors interacting with soil properties to influence soil wetness and droughtiness.

9. The main parameters used in the assessment of the overall climate limitation for ALC purposes are average annual rainfall as a measure of wetness and accumulated temperature as a measure of the relative warmth of an area. Estimates of these variables were obtained from the published 5 km grid datasets using the standard interpolation methods (Met. Office, 1989). The results of this analysis are given in Table 2 and show that the combination of rainfall and temperature at the site present no limitation for agricultural use.

Table 2: Climatic and altitude data

Parameter	Value		
Grid reference	SK 472 275	SK 465 273	SK 457 274
Altitude (m, AOD)	45	60	70
Accumulated Temperature (day °C, Jan.–June)	1409	1393	1381
Average Annual Rainfall (mm)	627	637	643
Field Capacity Days	135	137	139
Moisture Deficit, Wheat (mm)	108	106	105
Moisture Deficit, Potatoes (mm)	100	98	96
Overall Climatic Grade	1	1	1

Site

10. The site is undulating with a general northerly aspect. A small valley runs due north across the middle of the site and the western boundary forms the side slope of a second north-south valley. Slopes are generally in the order of 3-5°, although steeper slopes occur on the west facing sides at the northern ends of the two valley features. Here, slopes exceed 7° and the land cannot be classified higher than Subgrade 3b, reflecting an increasing risk to the safe and efficient operation of certain farm machinery. At the north-western corner of the site is a small area where previous quarrying operations have left a series of small pits and mounds which have subsequently become vegetated. In addition, the remainder of this field shows pronounced ridge and furrow microtopography. The valley floor south of The Dumps is also very uneven. The altitude of the site ranges from a high point of 80 m AOD along the south-western edge of the site falling to approximately 40 m AOD in the north-east corner.

Geology and soils

11. The published 1:50 000 scale geology map (Geol. Survey, 1976) shows the majority of the site to be underlain by Keuper Red Marl with beds of sandstone and bands of gypsum. The north-western quadrant of the site, however, is shown to be underlain by Keuper Sandstone with bands of Marl and a small area of Boulder Clay. The lower lying land at the north-east corner of the site has been mapped as River Terrace Drift.

12. There is no detailed published soils information for the site. The relevant reconnaissance soil map and legend (Soil Survey, 1983) shows the occurrence of three soil associations. Most of the site has soils of the Hodnet association (reddish, loamy soils with a slowly permeable subsoil). Bromsgrove association (well-drained, reddish, coarse loamy soils overlying sandstone) has been mapped in the north-west corner of the site and the low-lying land at the north-east of the site is included in the Wick 1 association (well-drained coarse loamy and sandy soils).

13. The detailed surveys carried out on the site have identified four distinct soil types correlating with the underlying geology of the area. The most extensive soil type, occurring widely over the eastern, central, northern and south-western parts of the site comprises

reddish fine loamy over clayey soils overlying red Keuper Marl. These soils typically have a dark reddish brown medium clay loam topsoil with few small and medium rounded stones, overlying a red or reddish brown heavy clay loam or clay upper subsoil which invariably becomes a redder clay within 60 cm depth. In the subsoil, mottling is generally not evident but the ped faces are typically gleyed. The underlying mudstone or marl is encountered at varying depths across the site but where it occurs at shallow depths, especially in the south-west corner of the site, roots tend to penetrate the rock to considerable depth. The soils have been assessed as Wetness Class III.

13. Over the central part of the site to the south of The Dumps, a heavier textured variant of the above soil type has been mapped. These soils are similar in most respects but have a heavy clay loam topsoil texture.

14. The second soil type is generally associated with the lower lying land and valley features and comprises deep fine loamy soils over red clay and/or mudstone at depth. The soils typically contain a high percentage of fine sands and silts. A typical profile has a dark reddish brown medium clay loam or fine sandy silt loam topsoil with few hard rounded stones, overlying a reddish brown, medium or heavy clay loam, or fine sandy clay loam upper subsoil. Below 60-70 cm depth, poorly structured red clay and/or reddish mudstone is encountered. These soils are typically assessed as Wetness Class II.

15. The third soil type occurs in the north-west corner of the site and comprises a variable thickness of fine loamy soil over relatively hard, fine grained Keuper sandstone. These soils have a dark reddish brown medium clay loam topsoil with few small and medium hard pebbles, overlying a reddish brown medium or heavy clay loam subsoil. These soils are free-draining where the underlying sandstone is at a shallow depth (adjacent to the old workings) or moderately well drained in the case of the deeper variants and they have been assessed as Wetness Class I/II.

16. On the lower lying land at the extreme north-east of the site, loamy soils overlying river terrace sands and gravels have been identified. These soils have a medium sandy loam or occasionally sandy clay loam topsoil with common small and medium rounded hard pebbles overlying a medium sandy loam or sandy clay loam upper subsoil with common stones. Below 50/70 cm depth the soils are moderately stony (25-35%) loamy medium sand or medium sand. Further to the south as the land rises, the soils are underlain by Keuper Marls at depth and display ochreous mottling in the subsoil horizons. These soils are assessed as Wetness Class I-III depending on the character of the underlying material.

AGRICULTURAL LAND CLASSIFICATION

Grades, Subgrades

17. The Agricultural Land Classification of the land is shown on the attached ALC Map and the areas of each grade and subgrade have been given in Table 1. Within any grade or subgrade small areas of land of better or poorer quality may occur but cannot be delineated separately at the scale of survey.

Grade 2

18. The deep moderately well drained soils generally associated with the lower lying land of the valley features have been mapped as Grade 2. These soils (paragraph 14) have been restricted to this grade due to a minor wetness limitation. The soils are assessed as Wetness Class II and under the prevailing climatic conditions and due to the medium clay loam topsoil texture will have a minor workability limitation during the wetter periods of the year. In addition, some of the shallower variants will have a slight droughtiness limitation which may restrict crop yields during the drier years.

Subgrade 3a

19. A large proportion of the site has been mapped as Subgrade 3a due principally to a wetness and workability restriction, although some areas will also have droughtiness limitations. The fine loamy soils overlying the red clay (paragraph 13) which predominate over much of the site have a moderate wetness limitation and have been assessed as Wetness Class III. Under the prevailing climatic conditions and with medium clay loam topsoil textures the land having these soils will suffer from a moderate workability limitation. Cultivations and harvesting will need to be carefully controlled to avoid structural damage to the soils during the wetter periods of the year.

20. Shallow variants of the soils described above occur in the south-west corner of the site and suffer also from a droughtiness limitation. However, despite the presence of mudstone at relatively shallow depths (40 cm) roots penetrate deeply into the rock and consequently the soils are less droughty than may be anticipated. Moisture balance calculations indicate the area to be Subgrade 3a.

21. Droughtiness, resulting in a Subgrade 3a classification, is also a limitation for the deeper soils which are developed over the fine-grained Keuper sandstone (paragraph 15). Rooting depth is somewhat restricted and moisture balance calculations indicate that in this relatively low rainfall area and despite some rooting into the underlying sandstones, these soils will tend to be droughty for the deeper rooting crops restricting the land to Subgrade 3a.

22. The soils developed on the river terrace deposits at the north-east of the site (paragraph 16) have a similar droughtiness limitation to the soils over Keuper sandstone. Crop yields will be reduced during the drier years and the land is classified as Subgrade 3a.

Subgrade 3b

23. Three areas of Subgrade 3b land have been mapped. The largest area, south of The Dumps, comprises the heavier variant of the fine loamy soils overlying the red clays (paragraph 13). These soils have been assessed as Wetness Class III and have a heavy clay loam topsoil texture. Consequently, there is a moderately severe workability restriction which limits the land to Subgrade 3b.

24. Land in the north-west corner of the site has been restricted to Subgrade 3b because of a moderately severe droughtiness limitation. The land, under permanent grass and with pronounced ridge and furrow microtopography, has shallow (c. 40 cm deep), fine loamy soils overlying relatively hard, fine grained sandstone (paragraph 15). These soils have a moderately low available water capacity which, in this comparatively low rainfall area, will result in substantially reduced crop yields in dry years.

25. The remaining area mapped as Subgrade 3b is to the south-east of The Dumps. Here, slopes are 7-9° and these gradients may cause difficulties in operating some machinery safely and efficiently.

Grade 5

26. Two small areas have been mapped as Grade 5, poor quality land only suitable for grazing. Both areas have very uneven topography rendering the land unsuitable for any form of mechanised cultivation. The area close to the western end of the site comprises pits and mounds, probably the result of former quarrying activities, which have been grassed over and used for livestock grazing. The valley floor south of The Dumps is also uneven and broken and is likewise restricted to rough grazing.

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SOURCES OF REFERENCE

ADAS (1995) *Agricultural Land Classification: North West Leicestershire Local Plan; Site H4(y)*. Resource Planning Team, 77/95, ADAS Cambridge.

GEOLOGICAL SURVEY OF GREAT BRITAIN (1976) *Sheet 141, Loughborough, Solid and Drift edition, 1:50 000 scale.*

MAFF (1971) *Agricultural Land Classification Map, Sheet 121, Provisional, 1:63 360 scale.*

MAFF (1988) *Agricultural Land Classification of England and Wales. Revised Guidelines and Criteria for Grading the Quality of Agricultural Land.* MAFF: London.

METEOROLOGICAL OFFICE (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

SOIL SURVEY OF ENGLAND AND WALES (1983) *Soils of England and Wales, Sheet 3, Midland and Western England, 1:250 000 scale map and legend.* Soil Survey of England and Wales: 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.