BURNTSTUMP EXTENSION, NEAR CALVERTON, NOTTS.

Agricultural Land Classification Report & Statement of Soil Physical Characteristics

May 1999

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RPT Job Number: 44/99
MAFF Reference: EL32/02776
LURET Job Number: MLEG02776A

AGRICULTURAL LAND CLASSIFICATION REPORT & STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

BURNTSTUMP EXTENSION, NEAR CALVERTON, NOTTS

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 23.3 ha of land near Calverton in Nottinghamshire. The survey was carried out during May 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 an application by Tarmac Roadstone to extract sand and gravel from the site, landfill the resultant void then restore the area to agricultural land. The current survey was carried out to validate the findings of a survey undertaken for the applicant by Reading Agricultural Consultants in 1990. The findings of this survey supersede 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 whole site was under a crop of winter barley. No 'Other land' has been mapped at this site.

Irrigation

5. The site has access to irrigation which is considered to come from an adequate and sufficiently reliable source to enhance the productive capability and flexibility of the agricultural land. In accordance with Planning Policy Guidance Note 7 (PPG7, February 1997) the site has been graded without reference to the availability of irrigation. Annex B, paragraph B11 of PPG7 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 site relative to comparable but non-irrigated land in the locality.

SUMMARY

6. 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.

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

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% site area
3a	4.2	18
3b	19.1	82
Total surveyed area	23.3	100

8. 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. In addition, at each auger boring, the percentage of topsoil volume occupied by stones greater than 2 cm was assessed by riddling.

9. Most of the site has been graded 3b (moderate quality agricultural land) and is restricted to this subgrade by a significant droughtiness limitation. The remainder of the site, corresponding to the lower slopes in the south-east, has been assessed as moderately droughty and therefore mapped as subgrade 3a (good quality agricultural land).

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 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	SK 587 496
Altitude	m, AOD	100
Accumulated Temperature	day°C (Jan-June)	1335
Average Annual Rainfall	mm	720
Field Capacity Days	days	154
Moisture Deficit, Wheat	mm	96
Moisture Deficit, Potatoes	mm	84
Overall climatic grade	N/A	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 that it is relatively warm and dry. Climatic factors do not therefore impose a limitation, accordingly, the site is of climatic grade 1.

Site

15. The site is situated about 2 km west of Calverton. To the west it is bounded by the A614(T), and to the south-east by the B6386. To the north-east the site adjoins the existing landfill site. The site slopes at gentle to moderate gradients from 110 m AOD in the north-west to 90 m AOD in the east adjacent to Ramsdale Cottages. Neither gradient nor altitude impose a limitation to the agricultural land quality on site.

Geology and soils

16. At a scale of 1:50 000 the geology map, sheet 126, Nottingham (Geological Survey of Great Britain [England and Wales], 1972) maps the site as pebble beds of soft sandstone with pebbles.

17. 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 entire site as the Cuckney 1 Association. This association is described as: well drained sandy and coarse loamy soils, often over sandstone.

18. The current detailed survey identified two main soil types.

Soil Type I (19.1 ha)

19. Soil Type I covers most of the site. Topsoils typically comprise loamy medium sand (very occasionally medium sandy loam) textures, they are slightly to moderately stony and 30/35 deep. The upper subsoil comprises loamy medium sand (occasionally medium sand) and is typically very stony. Profiles typically become impenetrable to auger at 45/60 cm depth. Pit information indicates that the very stony loamy medium sand lower subsoil typically merges into medium sand at depth which is occasionally only very slightly stony. Profiles are free draining and non-calcareous throughout.

Soil Type II (ha)

20. Soil Type II occurs in a narrow band corresponding with the lower slopes in the south-east. Topsoils comprise slightly to moderately stony loamy medium sands and extend to 35 cm depth. The upper subsoil is very slightly stony, comprising loamy medium sand (occasionally medium sand) and extends to 50/80 cm. Lower subsoils consist of very slightly stony medium sand which continues to depth. Profiles are non-calcareous throughout and free draining.

AGRICULTURAL LAND CLASSIFICATION

21. 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.

22. 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.

Subgrade 3a

23. Land graded 3a corresponds with Soil Type II (described in paragraph 20). The combination of medium sandy textures with the profile stone contents mean that in the prevailing local climatic conditions the soils ability to retain water for crop growth is moderately limiting. The resultant moderate droughtiness constraint restricts the land to subgrade 3a.

Subgrade 3b

24. Most of the site has been assessed as subgrade 3b and corresponds with Soil Type I (described in paragraph 19). These slightly to very stony, typically medium sandy soils have a significantly limited ability to retain water for crop growth. Moisture balance calculations confirm that this land is significantly droughty and therefore precluded from a higher grade.

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SOURCES OF REFERENCE

British Geological Survey (1972) *Sheet No. 126, Nottingham.* 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, 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.

APPENDIX II

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

Soil Type I

Topsoil	Texture	loamy medium sand (very occasionally medium sandy loam)
	Colour	typically 10YR 3/3
	Stone content	slightly to moderately stony
	Roots	abundant very fine and fine
	Calcium carbonate	non-calcareous
	Boundary form	abrupt, wavy
	Depth	*30/35 cm*
Upper subsoil	Texture	loamy medium sand (occasionally medium sand)
	Colour	10YR 4/6 and 5/6
	Stone content	typically very stony
	Structure	moderately developed medium and coarse angular blocky or single grain (there is local variation)
	Consistence	very friable/loose
	Porosity	>0.5%
	Roots	abundant/many very fine and fine
	Calcium carbonate	non-calcareous
	Concretions	none
	Boundary form	clear/gradual, wavy
	Depth	45/60 cm (becomes impenetrable to auger at this depth)
Lower subsoil (information from pits only)	Texture	loamy medium sand, becoming medium sand at depth
	Colour	7.5YR 4/6, 5/6 becoming 10YR 5/8 at depth
	Stoniness	typically very stony, occasionally becoming very slightly stony at depth
	Structure	single grain
	Consistence	loose
	Porosity	>0.5%
	Roots	typically common, becoming few at depth
	Calcium carbonate	non-calcareous
	Concretions	none
	Depth	120 cm

Notes: Profiles have typically been assessed as Wetness Class I

Soil Type II

Topsoil	Texture	loamy medium sand
	Colour	typically 10YR 3/3
	Stone content	slightly to moderately stony
	Roots	abundant very fine and fine
	Calcium carbonate	non-calcareous
	Boundary form	abrupt, wavy
	Depth	35 cm
Upper subsoil	Texture	loamy medium sand (occasionally medium sand)
	Colour	10YR 4/6, 5/6 and 6/6
	Stone content	very slightly stony
	Structure	moderately developed medium and coarse angular blocky
	Consistence	very friable
	Porosity	>0.5%
	Roots	many very fine and fine
	Calcium carbonate	non-calcareous
	Concretions	none
	Boundary form	abrupt, irregular
	Depth	50/80 cm
Lower subsoil	Texture	medium sand
	Colour	initially 10YR 5/6, typically becoming 5Y 7/2, 7/3 or 2.5Y 7/4 at depth
	Stoniness	very slightly stony
	Structure	single grain
	Consistence	loose
	Porosity	>0.5%
	Roots	few very fine
	Calcium carbonate	non-calcareous
	Concretions	none
	Depth	120 cm

Notes: Profiles have typically been assessed as Wetness Class I