THE LINGS QUARRY, STAINFORTH

**Agricultural Land Classification (ALC)
and Statement of Physical Characteristics
Map and Report**

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**Resource Planning Team
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AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF PHYSICAL CHARACTERISTICS REPORT

THE LINGS QUARRY, STAINFORTH

INTRODUCTION

1. This report presents the findings of a detailed Statement of Physical Characteristics and Agricultural Land Classification (ALC) survey of 67.5 ha of land south-west of the village of Stainforth in South Yorkshire. The survey was carried out in two stages, in October 1995 and April 1997.

2. The latest 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 proposal to extract sand, gravel and disaggregated sandstone from the site. Much of the south and south-east of the area had been subject to a detailed survey in 1995 (Job No. 214/95) which found all of the agricultural land to be Subgrade 3b.

3. The work was conducted by members of the Resource Planning Team in the Northern 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 the most recent survey the agricultural land on the site was sown to linseed or permanent grass (in the east) or had been recently harrowed (in the west). Other, non-agricultural, land on the site consists of a track in the centre and buildings, gardens and an existing quarry in the south-east.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC and soil resource maps. The maps have been drawn at a scale of 1:5,000. They are 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: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
1			
2			
3a	2.9	4.8	4.3
3b	57.3	95.2	84.9
4			
5			
Agricultural land not surveyed		N/A	
Other land	7.3	N/A	10.8
Total surveyed area	60.2	100	-
Total site area	67.5	-	100

7. The fieldwork was conducted at an average density of one boring per hectare. A total of fifty nine borings and three soil pits were described.

8. Subgrade 3a, good quality agricultural land, covers a small area in the north-west of the site. The soils are well or moderately well drained and typically consist of medium sandy loam or loamy medium sand topsoils and upper subsoils overlying either loamy medium sand or clay lower subsoils. The topsoils are slightly stony while the subsoils are very slightly to slightly stony. Soil droughtiness is the factor which limits this land to Subgrade 3a.

9. Subgrade 3b, moderate quality agricultural land, covers the remainder of the agricultural land on the site. The soils are well drained, with very slightly to slightly stony loamy medium sand topsoils overlying very slightly to moderately stony loamy medium sand or medium sand subsoils. These soils have a very low water-holding capacity and soil droughtiness is the factor which limits the land to Subgrade 3b.

10. Other, non-agricultural, land on the site consists of a track in the centre, buildings and gardens in the south, and the existing Lings Quarry in the south-east.

11. One main soil type was identified for the Statement of Physical Characteristics. This typically consists of a loamy medium sand topsoil (median thickness 35 cm) overlying a loamy medium sand or medium sand subsoil. The subsoil can be subdivided into a stoneless to moderately stony phase (Unit S1A, mean thickness 84 cm) and a moderately stony phase (Unit S1B, mean thickness 85 cm).

FACTORS INFLUENCING ALC GRADE

Climate

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

13. 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

Factor	Units	Values
Grid reference	N/A	SE 632104
Altitude	m, AOD	9
Accumulated Temperature	day°C (Jan-June)	1410
Average Annual Rainfall	mm	580
Field Capacity Days	days	118
Moisture Deficit, Wheat	mm	114
Moisture Deficit, Potatoes	mm	107
Overall climatic grade	N/A	Grade 1

14. 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.

15. 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.

16. The combination of rainfall and temperature at this site means that there is no overall limitation of ALC grade.

Site

17. The land on the site is generally level and as such gradient does not restrict the ALC grade at any point. Equally, neither microrelief nor flood risk are of any significance on this site.

Geology and soils

18. The site is underlain by Bunter Sandstone over which lie older river gravel deposits (BGS Sheet 88, Doncaster).

19. The soils on the site have been mapped as Blackwood association by the Soil Survey and Land Research Centre (Soils of England and Wales Sheet 1) but the field survey suggests the soils are in fact more akin to Newport 1 association soils which consist mainly of freely drained medium and occasionally coarse sandy soils formed in glaciofluvial sands and gravels and river terrace deposits.

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.

Subgrade 3a

21. Subgrade 3a, good quality agricultural land, covers 2.9 ha in the north-west of the site. The soils are well or moderately well drained, falling in Wetness Classes I and II. The topsoils and upper subsoils consist of medium sandy loam or loamy medium sand while the lower subsoils consist of either loamy medium sand or clay. The topsoils are slightly stony (typically containing around 8% hard stones) while the subsoils are very slightly to slightly stony, with between 5% and 10% hard stones. A soil droughtiness restriction is the factor which limits this land to Subgrade 3a.

Subgrade 3b

22. Subgrade 3b, moderate quality agricultural land, covers most of the site. The soils are well drained, falling in Wetness Class I, and typically consist of loamy medium sand topsoils overlying loamy medium sand or medium sand subsoils. The topsoils are very slightly to slightly stony, containing between 3% and 15% very small to medium hard stones while the subsoils are very slightly to moderately stony, with between 3% and 35% hard stones. The ALC grade of the land is restricted by a significant soil droughtiness limitation.

Other land

23. Other, non-agricultural, land on this site consists of a track in the centre, gardens and buildings in the south, and the existing Lings Quarry in the south-east.

Statement of Physical Characteristics

One main soil type was identified on the site, a description of which is given below. Topsoil and subsoil resources are shown on the accompanying maps along with soil thickness and volume information. A representative pit description is given in Appendix II.

a. Soil Type 1 (T1/S1), Very light-textured soils (For full profile description see Appendix II).

   This soil, formed on river gravel deposits, occurs over the whole site with the exception of the existing quarry workings. In some areas adjoining the existing workings the topsoil has been removed, but the subsoil remains. This soil type is characterised by its very light texture, consisting of loamy medium sand or medium sand.

Soil Resources

(i) Topsoils

Unit T1 occurs over the whole site with the exception of the existing quarry workings and some adjoining areas. It is very light-textured, usually consisting of loamy medium sand, and is generally very slightly to slightly stony, with between 3% and 15% very small to medium hard stones. Unit T1 has a weakly developed medium angular and subangular blocky structure and a median unit thickness of 35 cm.

(ii) Subsoils

There is one main subsoil type on this site, Unit S1, which has been subdivided into Unit S1A and Unit S1B. Unit S1A occurs over most of the site whilst S1B occurs to the west and south-west of the existing quarry. Both of these units are very light-textured, consisting of medium sand or loamy medium sand, and both have a weakly developed medium angular blocky to single grain structure. The main difference between units S1A and S1B is the stone content - Unit S1A is stoneless to moderately stony, containing up to 25% very small to medium hard stones, while Unit S1B is moderately stony, with between 20% and 35% very small to medium hard stones. Unit S1A has a mean thickness of 84 cm and Unit S1B has a mean thickness of 85 cm, with the exception of those areas where the topsoil has already been removed, where Unit S1B extends from the soil surface to 120 cm depth.

SOURCES OF REFERENCE

British Geological Survey (1969) *Sheet No.88, Doncaster (1:63,360 scale).*
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 1, Soils of Northern England, 1:250,000 scale.*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in Northern 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 PROFILE DESCRIPTION

Soil Type 1:	Very light-textured soil (T1/S1A)
Location:	Grid Reference: SE 6310 1040
Land Use:	Potatoes (1995)
Slope:	0°
Recent Weather:	Cool and overcast

Depth (cm)	Horizon Description
0-37	Brown (10YR4/3) loamy medium sand; no mottles; very slightly stony; with around 3% small and medium hard stones (2% >2cm); moist; weakly developed medium subangular blocky structure; very friable; extremely porous; common medium fleshy and fine fibrous roots; non-sticky; non-plastic; non-calcareous; abrupt smooth boundary.
37-120	Yellowish red (5YR5/8) medium sand; no mottles; stoneless; moist; weakly developed medium angular blocky structure; very friable; extremely porous; few very fine fibrous roots; non-sticky; non-plastic; non-calcareous.