EXTENSION TO EXISTING MESSINGHAM SILICA SAND QUARRY MANTON, NORTH LINCOLNSHIRE

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

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

EXTENSION TO MESSINGHAM SILICA SAND QUARRY, MANTON

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 45.2 ha of land adjacent to Messingham Quarry. Information in this report has been collated from a soil and ALC report provided by the applicant and also survey work by FRCA which has validated the applicant's findings.

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 a proposal to extend the quarry into adjoining agricultural land.

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 survey the land on the site was in agricultural use, including ley grass, recently cultivated land awaiting spring sowing and land apparently in set aside. A small area of woodland occurs in the north

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 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	6.4	14.8	14.2
3b	36.8	85.2	81.4
4			
5			
Agricultural land not surveyed		N/A	
Other land	2.0	*N/A*	4.4
Total surveyed area	43.2	100	-
Total site area	45.2	-	100

7. The applicant surveyed the site at a density of one boring per hectare. This information was validated by an FRCA survey which examined soils at a density of about one boring per 2 hectares. The applicant examined 2 soil profile pits and the FRCA survey included an additional profile pit.

Subgrade 3a

8. This comprised a narrow strip of land which occurs to the east of the 25m contour line. Here topsoils are generally a medium sandy loam over a loamy medium sand or medium sand subsoil. Droughtiness limits the ALC grade of this land.

Subgrade 3b

9. All remaining land is classed as Subgrade 3b quality. Topsoils are mostly a loamy medium sand over a medium sand subsoil. A severe droughtiness problem limits the ALC grade of this 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	SE 929034
Altitude	m, AOD	22
Accumulated Temperature	day°C (Jan-June)	1392
Average Annual Rainfall	mm	615
Field Capacity Days	days	133
Moisture Deficit, Wheat	mm	106
Moisture Deficit, Potatoes	mm	98
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 (AT0, January to June), as a measure of the relative warmth of a locality.

14. The combination of rainfall and temperature at this site means there is no overall climatic limitation.

Site

15. The site has a gentle westerly aspect. Slopes are steeper in the extreme east of the site.

Geology and soils

16. The site is underlain by Coleby Mudstone which appears not to outcrop within the site boundary. These deposits are covered with a thick layer of sandy drift BGS Sheet 89 (1982). Soils reflect parent material and typically comprise a stoneless, loamy medium sand topsoil, over a stoneless medium sand subsoil. Topsoils tend to be a medium sandy loam in the extreme east of the site. All profiles were assessed as Soil Wetness Class I.

AGRICULTURAL LAND CLASSIFICATION

17. 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.

Subgrade 3a

18. This comprises a narrow strip of land which occurs to the east of the 25m contour line. Here topsoils are generally a medium sandy loam over a loamy medium sand or medium sand subsoil. Droughtiness limits the ALC grade of this land. The applicant also classed this land as Subgrade 3a.

Subgrade 3b

19. All remaining land is classed as Subgrade 3b quality. Topsoils are mostly a loamy medium sand, over a medium sand subsoil. A severe droughtiness problem limits the ALC grade of this land. The applicant's soils description of this land concurs with the FRCA findings. However, the applicant's droughtiness calculations suggest this land has a Subgrade 3a not 3b drought limitation. Without more details about the applicant's droughtiness calculations it is only possible to speculate why such a difference arises. Both the applicant and FRCA have used MAFF's ALC guidelines to make all calculations. It is possible that the applicant may have omitted to reduce his Available Profile (AP) water calculations by 20% for medium sand subsoils found on the site, as detailed in p20 of the ALC guidelines. This would have the effect of underestimating the drought limitation on this land, probably enough to give a 3a grading rather Subgrade 3b as found by FRCA.

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)

This soil type occurs across the whole site. It is very light textured and stoneless.

Topsoils

T1 a/b

Topsoil T1 covers the whole site. T1a is very light textured, typically a loamy medium sand, T1b is light textured - generally a medium sandy loam. Both sub units are stoneless with a weakly developed structure. Both sub units are 35cm thick.

Subsoil S1

This unit covers the whole site. It is typically a medium sand and is stoneless. It has a weak structure and 85cm thick.

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SOURCES OF REFERENCE

British Geological Survey (1982) *Sheet No. 89, Solid and Drift Geology, 1:50,000 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.

[ALC Map]

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:	T1/S1
Location:	SE 9290 0320
Land Use:	Cultivated soil. No crop growing
Slope:	1°W
Recent Weather:	Dry and mild

Depth (cm)	**Horizon**
0-34	Very dark greyish brown (10YR3/2); unmottled; loamy medium sand; stoneless; weakly developed coarse subangular blocky; loose; no roots; abrupt wavy boundary.
34-120	Light grey (10YR7/1) with common brownish yellow mottles (10YR6/8) below 60cm; medium sand; stoneless; weakly developed coarse angular blocky; loose; no roots.