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Ministry of
Agriculture
Fisheries
and Food

STATEMENT OF PHYSICAL CHARACTERISTICS
AND
AGRICULTURAL LAND CLASSIFICATION
MARKS QUARRY, LEAMSIDE
COUNTY DURHAM
PROPOSED OPEN CAST COAL SITE
AUGUST 1994

ADAS
Leeds Statutory Group

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SUMMARY

A Statement of Physical Characteristics and Agricultural Land Classification survey of 9.0 ha of land at Marks Lane, Leamside was carried out in August 1994.

Of the total site, 7.8 ha falls in Subgrade 3b. Profiles are poorly drained with medium clay loam topsoils overlying gleyed and slowly permeable sandy clay loam, heavy clay loam, heavy silty clay loam or silty clay subsoils at around 30 cm depth. Soil wetness and topsoil workability limitations restrict this land to Subgrade 3b.

The remainder of the site (1.2 ha) has been provisionally placed in Grade 4. Variable depths of ash and slag have been dumped on the soil surface in these two areas and crop and weed growth is very poor, suggesting the presence of toxic elements. For this reason the land has been provisionally placed in Grade 4 until analysis has been carried out in order to determine the precise levels of any toxic elements.

CONTENTS

MAPS

AGRICULTURAL LAND CLASSIFICATION REPORT ON THE PROPOSED OPENCAST COAL SITE AT MARKS QUARRY, LEAMSIDE, COUNTY DURHAM

1. INTRODUCTION AND SITE CHARACTERISTICS

1.1 Location and Survey Methods

The land lies approximately 7 km north-east of Durham city centre (grid reference NZ 313 478) and covers a total area of 9.0 ha. Survey work was carried out in August 1994 when the soils were examined by hand auger borings at 100 m intervals predetermined by the National Grid. In addition, two soil pits were dug to allow full profile descriptions to be made. Land quality was assessed using the methods described in "Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land" (MAFF, 1988).

1.2 Land Use and Relief

At the time of survey all of the land on the site was agricultural, with one field in set-aside, one under wheat and one under ley grass.

Site altitude varies from 56 m AOD in the west to 63 m AOD in the centre, and the land is generally gently to moderately sloping (2-4°) with variable aspect.

1.3 Climate

Grid Reference	: NZ 313 478
Altitude (m)	: 60
Accumulated Temperature above 0°C (January - June)	: 1299 day °C
Average Annual Rainfall (mm)	: 653
Climatic Grade	: 2
Field Capacity Days	: 166
Moisture Deficit (mm) Wheat	: 93
Moisture Deficit (mm) Potatoes	: 80

1.4 Geology, Soils and Drainage

The site is underlain by Carboniferous Coal Measures consisting of interbedded sandstones and shales, over which lies a thin cover of boulder clay.

In most cases the soils are poorly drained (Wetness Class IV) with medium-textured topsoils overlying gleyed and slowly permeable medium to heavy-textured subsoils. In two areas, one in the north and one in the centre of the site, variable depths of slag and ash (possibly associated with the disused pit to the south) have been dumped. Crop and plant growth here is very poor and a sample has been taken for analysis in order to determine the levels of any toxic elements.

1.5 Soil Properties

One main soil type occurs on this site, a description of which is given below. Topsoil and subsoil resources are also shown on the accompanying maps along with soil thickness and volume information.

(a) Soil Type 1:- Medium to heavy-textured soils (unit T2/S1)
(Full Profile Description, Table 1)

This soil, formed over boulder clay, occurs over most of the site. It is characterised by being very slightly to slightly stony with a medium to coarse prismatic subsoil structure.

1.6 Soil Resources

(i) Topsoils

Unit T1 occurs in the north of the site and in a separate area in the centre. It is not a topsoil as such but rather consists of variable depths of ash and slag which, given the poor crop and weed growth, may contain toxic elements. Median unit depth is 50 cm.

Unit T2 occurs over the remainder of the site. It is medium-textured (generally medium clay loam) and very slightly stony, containing 2-3% soft sandstones. Unit T2 has a moderately developed medium and coarse subangular blocky structure and a median depth of 30 cm.

(ii) Subsoils

Unit S1A underlies T1. It is medium to heavy-textured, consisting of sandy clay loam, heavy clay loam, heavy silty clay loam or silty clay, and very slightly to slightly stony, containing between 2% and 12% soft sandstones and/or argillaceous stones. Unit S1A has a moderately developed medium and coarse prismatic structure and a mean depth of 70 cm.

Unit S1B underlies Unit T2. It differs from Unit S1A only in that its mean depth is 92 cm.

2. SOIL PROFILE DESCRIPTIONS

Table 1 Medium to heavy textured soil, T2/S1B

Profile Pit 1 (Near auger boring 9)

Slope:- 2° SW
Land Use:- Wheat
Weather:- Bright and warm

Depth cm	Horizon	Description
0-31		Very dark greyish brown (10YR 3/2) medium clay loam; no mottles; very slightly stony, containing approximately 3-4% very small and small, subangular and subrounded soft sandstones and angular fragments of coal ; slightly moist; moderately developed medium and coarse subangular blocky structure; very firm; moderately porous; many fine and very fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; clear smooth boundary.
31-89		Greyish brown (10YR 5/2) heavy clay loam; common indistinct light greyish brown (10YR 6/2) and distinct strong brown (7.5YR 5/8) mottles; slightly stony, containing approximately 12% very small to large subrounded soft sandstones and very small angular fragments of coal; dry; weakly to moderately developed coarse prismatic structure; extremely firm; common very fine fibrous roots; slightly porous (<0.5% pores > 0.5 mm);

moderately sticky; moderately plastic; non-calcareous; clear irregular boundary.

89-120 Light brownish grey (2.5YR 6/2) silty clay; many distinct reddish yellow (7.5YR 6/8) mottles; very slightly stony, containing approximately 2% small subangular shales; slightly moist; moderately developed medium prismatic structure; very firm; slightly porous (< 0.5% pores > 0.5 mm); few very fine fibrous roots; moderately sticky; very plastic; non-calcareous.

3. AGRICULTURAL LAND CLASSIFICATION

The ALC grades occurring on this site are as follows:

Grade/Subgrade	Hectares	Percentage of Total Area
1		
2		
3a		
3b	7.8	86.7
4	1.2	13.3
5		
(Sub total)	(9.0)	(100)
Urban		
Non Agricultural		
Woodland - Farm		
- Commercial		
Agricultural Buildings		
Open Water		
Land not surveyed		
(Sub total)		
TOTAL	9.0	100

3.1 Subgrade 3b

Most of the land on this site falls in Subgrade 3b. Profiles are generally poorly drained, (falling in Wetness Class IV) with medium clay loam topsoils overlying gleyed and slowly permeable sandy clay loam, heavy clay loam, heavy silty clay loam or silty clay subsoils at between 25 cm and 35 cm depth. Soil wetness and topsoil workability limitations are the factors which restrict this land to Subgrade 3b.

3.2 Grade 4

Two areas, one in the north and one in the centre of the site have been provisionally classified as Grade 4. Variable depths of slag and ash have been dumped in these areas and crop and weed growth is very poor, suggesting the presence of toxic elements in the soil. A sample has been taken for analysis in order to determine whether this is or is not the case.

MAPS