STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION JACKS LAW WEST, BERWICK UPON TWEED, NORTHUMBERLAND PROPOSED OPEN CAST COAL SITE MARCH 1993

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SUMMARY

A Statement of Physical Characteristics (Soil Survey) and Agricultural Land Classification Survey of 25.1 ha of land at Jacks Law was carried out in March 1993.

At the time of survey 22.2 ha of this was in agricultural use of which 18.6 ha falls within Subgrade 3a. In the north soils within this subgrade are deep, light textured and well drained (Wetness Class I) and are limited by droughtiness. In the south they are medium to heavy textured and imperfectly drained (Wetness Class III) and limited to Subgrade 3a by soil wetness.

3.6 ha falls within Subgrade 3b. Soils are poorly drained (Wetness Class IV) and consist of medium textured topsoils over slowly permeable heavy textured subsoils. This land is limited to Subgrade 3b by wetness and workability problems which are more restricting than on the adjoining Subgrade 3a land. The small area of Subgrade 3b in the north is limited by gradients of 8-10°.

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STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION REPORT ON THE PROPOSED OPEN CAST COAL SITE AT JACKS LAW WEST, BERWICK UPON TWEED

1. INTRODUCTION AND STATEMENT OF PHYSICAL CHARACTERISTICS

1.1 Location and Survey Methods

The site is located 2 km east of Duddo around National Grid Reference NT 957422. It covers a total area of 25.1 ha. Survey work was carried out in March 1993 when soils were examined by hand auger borings at intervals predetermined by the national grid. Overall boring density was approximately one per hectare with extra borings made where necessary to refine grade boundaries. Three soil inspection pits were dug to allow detailed description of soil structure 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, most of the site was in arable use. The remainder consisted of commercial woodland or non agricultural use. Site altitude is 90m AOD. The land is level to moderately sloping with a small area of strongly sloping land in the north (gradient of 8 to 11°).

1.3 Climate

Grid Reference	: NT 957422
Altitude (m)	: 90
Accumulated Temperature above 0°C (January-June)	: 1232 day°C
Average Annual Rainfall (mm)	: 648
Climatic Grade	: 2
Field Capacity Days	: 164
Moisture Deficit (mm) Wheat	: 89
Moisture Deficit (mm) Potatoes	: 73

1.4 Geology, Soils and Drainage

Lower Carboniferous rocks of the Scremerston Coal and Lower Limestone Groups underlie the site which has a thick cover of boulder clay and alluvium containing lenses and seams of sand. The resulting soils are predominantly medium and heavy in texture in the south and light textured in the north. Subsoil textures largely reflect those found in the topsoil except along the boundary between the two soil types where some light topsoils overlie heavy subsoils and vice versa. All soils are very slightly stony or stoneless throughout. The light soils are well drained (Wetness Class I) and the medium to heavy soils imperfectly or poorly drained (Wetness Classes III and IV).

1.5 Soil Properties

Two main soil types occur on this site, descriptions of which are given below. Topsoil and subsoil resources are also shown on the accompanying maps along with soil thickness and volume information.

(a) Soil Type 1:- light textured soils (Unit T1/S1)
Full Profile Description, Table 1)

This soil formed on light drift occurs in the north of the site. It is characterised by well drained medium sandy loam or loamy medium sand topsoils overlying loose loamy sand or sand subsoils.

(b) Soil Type 2:- medium over heavy textured soils (Unit T2/S2)
(Full Profile Description, Table 2)

This soil formed on till occurs in the southern part of the site. It is characterised by poorly or imperfectly drained medium textured topsoils overlying coarse structured heavy subsoils.

1.6 Soil Resources

(i) Topsoils

Unit T1 occurs in the north of the site. It is light textured and consists typically of medium sandy loam or loamy medium sand. It is very slightly stony, containing 0-3% medium and large subangular hard stones. This soil has a moderately developed coarse subangular blocky or granular structure. Median thickness is 30cm.

Unit T2 occurs in the southern part of the site. It is medium textured and consists mainly of medium clay loam which is very slightly stony, containing 0-2% medium and large hard stones. This soil has a moderately developed coarse angular blocky structure and a median thickness of 35cm.

(ii) Subsoils

Unit S1 occurs in the north of the site. It is light textured and consists usually of loamy medium sand or medium sand. It is very slightly stony, containing 0-2% small and medium angular hard stones and soft sandstones. This soil has a weakly developed medium angular blocky structure. It is subdivided into Unit S1a which has a mean thickness of 90cm and S1b where the mean thickness is 85cm.

Unit S2 occurs in the south. It is medium to heavy textured and typically consists of stoneless heavy clay loam. This soil has a moderately developed coarse to very coarse angular blocky structure. It is subdivided into Unit S2a which has a mean thickness of 90cm and S2b with a mean thickness of 85cm.

2. SOIL PROFILE DESCRIPTIONS

Table 1 Light textured soil, T1/S1

Profile Pit 1 (near auger boring 8)

Slope:-	0°
Land Use:-	Cereals
Weather:-	Fine

Depth cm	Horizon Description
0-40	Very dark greyish brown (10YR3/2) loamy medium sand; very slightly stony (approximately 1% medium and large subangular hard stones); moist; weakly developed coarse and very coarse subangular blocky structure; very friable; extremely porous; many fine and medium fibrous roots; non sticky; non plastic; non calcareous; gradual smooth boundary.
40-120	Light brownish grey (10YR6/2) medium sand; common, prominent, clear brown/dark brown mottles; very slightly stony (approximately 1% small and medium soft sandstones); moist; weakly developed medium angular blocky structure; very friable to loose, extremely porous; few fine fibrous roots; non sticky; non plastic; non calcareous.

2. SOIL PROFILE DESCRIPTIONS

Table 2 medium over heavy textured soil, T2/S2

Profile Pit 1 (at auger boring 22)

Slope:-	0
Land Use:-	Cereals
Weather:-	Fine

Depth cm	*Horizon Description*
0-30	Dark greyish brown (10YR4/2) medium clay loam; very slightly stony (approximately 1% medium to very large hard stones, various shapes); moist; moderately developed coarse, angular blocky structure; firm soil strength; many fine and medium fibrous roots; slightly sticky; slightly plastic; non calcareous; abrupt smooth boundary.
30-120	Grey (10YR5/1) heavy clay loam; common prominent clear strong brown (75YR5/8) mottles; very slightly stony (approximately 1% small and medium soft sandstones); moist; moderately developed coarse to very coarse angular blocky structure; firm; very slightly porous; few fine fibrous roots; moderately sticky; moderately 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	18.6	74.1
3b	3.6	14.3
4		
5		
(Subtotal)	(22.2)	(88.4)
Urban		
Non Agricultural	0.4	1.6
Woodland - Farm		
- Commercial	2.5	10.0
Agricultural Buildings		
Open Water		
Land not surveyed		
(Subtotal)	(2.9)	(11.6)
TOTAL	25.1	100

3.1 Subgrade 3a

Subgrade 3a land covers most of the site. Two soil types occur within this area. In the north profiles are well drained (Wetness Class I) and consist of medium sandy loam or loamy medium sand topsoils over loamy medium sand to medium sand subsoils. This land is limited to Subgrade 3a by droughtiness. In the south soils are imperfectly drained (Wetness Class III) and consist of medium clay loam topsoils over heavy clay loam subsoils which are slowly permeable below 45cm. This land is limited to Subgrade 3a by soil wetness. (Land on the adjoining site immediately to the east was placed within Subgrade 3b when classified in May 1988 using the earlier, pre October 1988, ALC system. This system used slightly different grading criteria which, in this case, have resulted in a difference of grade across the boundary).

3.2 Subgrade 3b

There are two areas of Subgrade 3b land. The northern area occurs on strongly sloping land which is limited to this subgrade by gradients of 8-10°). In the southern area soils are poorly drained (Wetness Class IV) and consist of medium clay loam topsoils over slowly permeable heavy clay loam subsoils. This land is limited to Subgrade 3b by soil wetness.

3.3 Non Agricultural

This consists of a small area of land which has been fenced off because of subsidence.

3.4 Commercial Woodland

This consists of the two areas of woodland on the site.

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MAPS