

AGRICULTURAL LAND CLASSIFICATION  
AND STATEMENT OF PHYSICAL CHARACTERISTICS

BURRADON FARM, BURRADON, TYNE & WEAR  
PROPOSED OPENCAST COAL SITE

MAFF  
Leeds Regional Office

January 1992  
File Ref: 2FCS <sup>5897</sup>~~5679~~  
Project No: 127/91

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AGRICULTURAL LAND CLASSIFICATION REPORT,

1.0 Introduction and Site Characteristics

1.1 Location

National Grid Reference:-

NZ280 730

Location Details:-

8km north of Newcastle  
on the west of the A19  
and adjoining the A190

Site Size:-

74 ha

1.2 Survey Methods

Date Surveyed:-

19th December 1991

Boring Density and Spacing Basis:-

At 100 metre intervals  
on a grid pattern  
predetermined by the  
National Grid

Sampling Method:-

Hand auger boring to a  
depth of 1 metre

Number of Borings:-

74

Number of Soil Pits (used for):-

Three soil pits were  
dug to examine soil  
structure and take  
samples for analysis

All land quality assessments were made 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)".

This detailed survey supersedes the previous "1" to one mile" survey of the area.

1.3 Land Use:-

At the time of survey, land was predominantly under arable use (winter cereals). A smaller area was under permanent grazing and a further 2 small areas were non-agricultural

1.4 Climate and Relief

Average Annual Rainfall (AAR):-

665 mm

Accumulated Temperature above 0°C (January-June):-

2228 day °C

Field Capacity Days:-

166 days

Moisture Deficit:

wheat:-

92 mm

potatoes:-

78 mm

Altitude average:-

55 m a.o.d.

maximum:-

m a.o.d.

minimum:-

m a.o.d.

Climatic limitation (based on interaction of rainfall and temperature values:-

ALC Grade 2

Relief:-

In the east, the site slopes gently eastwards, whilst in the north it has a northern aspect

Slopes (° ):-

0-4°

Gradient Limitations:-

None

## 1.5 Geology and Soil

Solid Strata:-

Coal Measures

Depth of solid rock from surface:-

Greater than 1 metre

Drift types:-

Boulder clay

Thickness of drift  
and distribution:-

Greater than 1 metre  
over the whole of the  
site except in the area  
of restored land in the  
south

Soil Types and Distribution:-

Poorly drained medium  
to heavy boulder clay  
soils cover the whole  
site

Soil Textures (topsoils and subsoils):-

Soil Series/Associations:-

On 1/250000 map:-

Dunkeswick

Identified on site:-

Soil Limitations and type:-

Heavy topsoils and lack  
of soil depth on  
restored soils

## 1.6 Drainage

Soil type and Wetness Class:-

Medium soils - Wetness  
Class III  
Medium/heavy soils -  
Wetness Classes III and  
IV

Drainage Limitations:-

Slowly permeable  
subsoils

## 2.0 Agricultural Land Classification Grades

The ALC grades occurring on the site are as follows:-

<u>Grade/Subgrade</u>	<u>Hectares</u>	<u>Percentage of Total Area</u>
1		
2		
3a	8.14	11%
3b	52.84	71%
4	12.83	17%
5		
Non Agricultural	0.34	0.5%
Agricultural Buildings		
Urban		
Other	_____	_____
Total	74.15	100
	_____	_____

Subgrade 3a

Distribution on site:-

One area in the north west

Soil Type(s) and Texture(s):-

Medium silty clay loam topsoils over heavy clay loam and clay subsoils

Depth to Slowly Permeable Layers:-

45 cm to 75 cm

Wetness and Drainage Class:-

Wetness Class III, imperfectly drained

Stone Percentage and Type:-

Stoneless

Grade Limiting Factors:-

Soil wetness due to slowly permeable subsoils between 45 cm and 75 cm

Subgrade 3b

Distribution on site:-

The whole of the eastern and central areas, along with a small area in the north and north west

Soil Type(s) and Texture(s):-

Medium and heavy clay loam topsoils over similar or heavier subsoils

Depth to Slowly Permeable Layers:-

20 cm to 40 cm

Wetness and Drainage Class:-

Wetness Class IV, poorly drained

Stone Percentage and Type:-

0-5% hardstones and sandstones

Grade Limiting Factors:-

Soil wetness due to slowly permeable layers at depths of 20 cm to 45 cm



**Grade 4**

**Distribution on site:-**

One area of restored land in the south

**Soil Type(s) and Texture(s):-**

Medium clay loam and heavy clay loam topsoils above heavy clay loam and clay subsoils passing to landfill material at depth

**Depth to Slowly Permeable Layers:-**

20 cm to 40 cm

**Wetness and Drainage Class:-**

Wetness Classes II to IV, imperfectly to poorly drained

**Stone Percentage and Type:-**

0-5% hardstones in topsoils  
0-20% hardstones and sandstones in subsoils

**Grade Limiting Factors:-**

On the stonier soils, soil droughtiness and shallow soil depth are the main limiting factor. On the heavier textures, soil wetness is a limiting factor due to compaction and poor drainage

**Other Limiting Factors:-**

The presence close to the surface of landfill materials, especially large stones, house bricks and concrete posts along with possible toxicity problems are additional factor limiting this area to Grade 4

Non Agricultural

Type and location of land included:-

Two small areas of woodland towards the south eastern corner of the site

### 3.0 STATEMENT OF PHYSICAL CHARACTERISTICS (SOIL PROPERTIES AND RESOURCES)

#### 3.1 Soil Properties

3 soil types occur on the site. Their distribution along with soil depth and quantity information are shown on the accompanying maps.

**Soil Type 1:-** Imperfectly drained medium textured topsoils and upper subsoils over heavy lower subsoils

**Occurrence:-** This soil occurs in the north west on slopes with a northern aspect. It correlates with the area of subgrade 3a land

**Textures:-** Medium silty clay loam and medium clay loam topsoils and upper subsoils over heavy silty clay loam lower subsoils

**Stone content:-** Topsoils - stoneless  
Subsoils - few large angular sandstones

**Horizon thicknesses:-** Topsoils - 30 cm  
Upper Subsoils - 30 cm  
Lower Subsoils - 40 cm

**Soil Type 2:-** Poorly drained medium textured topsoils over heavy subsoils

**Occurrence:-** These occur over the whole of the central and eastern area, in addition to a small area in the north west and correlate with the area of subgrade 3b land

**Textures:-** Topsoils - medium and heavy clay loam  
Subsoils - heavy clay loam, clay or silty clay

<b>Stone content:-</b>	Topsoils - stoneless Subsoils - stoneless
<b>Horizon thicknesses:-</b>	Topsoils - 30 cm Subsoils - 70 cm
<b>Soil Type 3:-</b>	Heavy textured restored soil over waste material at depth
<b>Occurrence:-</b>	One area in the south
<b>Textures:-</b>	Restored heavy clay loam topsoils over heavy clay loam and clay subsoils passing to ash and debris at depth
<b>Stone content:-</b>	0-5% hardstones on topsoils 0-20% sandstones and rubble in subsoils
<b>Horizon thicknesses:-</b>	Topsoils - 10 - 30 cm Subsoils - 0 - 50 cm
<b>Profile pit features:-</b>	Compacted subsoil with massive structure containing, in places, rubble

### 3.2 Soil Resources

#### Topsoils

##### Unit T1

Texture/stone content:- Medium clay loam or medium silty clay loam; stoneless

Structure:- Moderately developed fine and medium sub-angular blocky

Occurrence:- All of the site except for the restored area

Thickness:- Mean thickness - 30 cm

##### Unit T2

Texture/stone content:- Heavy clay loam. 0-5% hardstones

Structure:- Moderately developed medium to coarse sub-angular blocky

Occurrence:- One area of restored land in the south

Thickness:- Mean thickness - 30 cm

## Subsoils

### Upper Subsoils

#### Unit U1

Texture/stone content:- Medium clay loam and medium silty clay loam

Structure:- Moderately developed fine and medium sub-angular blocky

Occurrence:- One area in the north west of the site

Thickness:- 30 cm

#### Unit U2

Texture/stone content:- Restored heavy clay loam or clay with patches of rubble.

Structure:- Massive, compacted

Occurrence:- Southern part of the site

Thickness:- 35 cm

Subsoils

Lower Subsoils

Unit S1 (S1A, S1B)

Texture/stone content:- Heavy silty clay loam and heavy clay loam.  
Few large angular sandstones

Structure:- Moderately developed medium to coarse sub-  
angular blocky

Occurrence:- S1A occurs beneath the upper subsoil U1  
S1B occurs immediately below the topsoil in  
the remainder of the site, except for the  
restored area

Thickness:- S1A : 40 cm  
S1B : 70 cm

#### 4.0 Soil Profile Descriptions

Soil Type 2:- Poorly drained medium textured topsoils over heavy subsoils (boulder clay)

Pit 1 (Adjacent to boring 2)

Weather : Cold, fine, snow on ground

Aspect :

Lands Use : Arable (winter cereals)

HORIZON	DEPTH	DESCRIPTION
1	30 cm	Very dark greyish brown (10YR 3/2) medium clay loam; no mottles; stoneless; moist; moderately developed fine sub-angular blocky structure; few fine pores and fissures; friable; slightly plastic; common fine fibrous roots; clear smooth boundary
2	30-100 cm	Grey (10 YR 5/1) heavy clay loam; many medium, distinct brownish yellow (10 YR 6/8) mottles; stoneless; moist; weakly developed coarse sub-angular blocky structure; few fine pores and fissures; firm; slightly sticky; slightly plastic; few fine fibrous roots

NB. Soil type 1 (imperfectly drained medium textured topsoils and upper subsoils over heavy lower subsoils) differs from the above only in having an intermediate medium textured upper subsoil between the topsoil and heavy subsoil.



Soil Type 3:- Heavy textured restored soil over colliery waste at depth

Pit 2 (Adjacent to boring 58)

Weather : Cold, fine, snow on ground

Aspect : 1° N.E

Land Use : Permanent grazing

HORIZON	DEPTH	DESCRIPTION
1	20 cm	Dark grey (10 YR 4/1) medium silty clay loam; no mottles; few small to medium sub-rounded hardstones, moderately developed medium to coarse sub-angular blocky structure. Moderately sticky; moderately plastic; non-calcareous; firm soil strength; common, fine, fibrous roots, few fine to medium pres; medium; packing density; smooth wavy boundary
2	45 cm	Yellowish brown (10 YR 5/4) clay with many medium distinct grey (10 YR 5/1) mottles. Few, small sub-rounded hardstones; moist; weakly developed massive adherent structure; high packing density; moderately sticky; very plastic; few fine fibrous roots; few fine pores and fissures; extremely firm soil strength, abrupt, irregular boundary
3	100 cm	Ash and Debris

MAP(S)