

STATEMENT OF PHYSICAL CHARACTERISTICS  
AND  
AGRICULTURAL LAND CLASSIFICATION  
HASWELL MOOR QUARRY  
CO DURHAM  
PROPOSED EXTENSION OF LIMESTONE QUARRY  
FEBRUARY 1993

ADAS  
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## SUMMARY

A Statement of Physical Characteristics and Agricultural Land Classification survey of 6.7 ha of land at Haswell Moor was carried out in January 1993.

At the time of survey, 5.4ha of the site was in agricultural use. 0.9ha of this falls within Subgrade 3a. Topsoils are medium textured (medium clay loam) and overlie heavy textured subsoils (consisting of heavy clay loam and clay). Profiles are imperfectly drained with slowly permeable layers starting at between 50cm and 60cm depth. Soil wetness and workability are the factors limiting the ALC grade of the land.

3.7ha of the site falls in Subgrade 3b. Profiles are poorly drained and typically consist of medium clay loam topsoils overlying slowly permeable heavy clay loam or clay subsoils at around 35cm depth. Soil wetness and workability limitations are again the factors limiting the ALC grade of the land.

The remainder of the agricultural land on the site (0.8ha) falls within Grade 4. These soils have been disturbed and typically consist of heavy clay loam topsoils overlying slowly permeable heavy clay loam or clay subsoils. Again soil wetness and workability are the limiting factors which restrict the ALC grade of this land.

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STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION REPORT ON THE PROPOSED QUARRY EXTENSION AT HASWELL MOOR, COUNTY DURHAM.

1. INTRODUCTION AND STATEMENT OF PHYSICAL CHARACTERISTICS

1.1 Location and Survey Methods

The site lies 8Km east of Durham City Centre, around Grid Reference NZ 349426. It covers a total of 6.7ha. Survey work was carried out in January 1993 when soils were examined by hand auger borings at points predetermined by the National Grid. Overall boring density was two per hectare and two soil inspection pits were dug to allow full profile descriptions to be made and samples to be taken for laboratory analysis. 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, 80% of the site was in ley grass. The remainder consists of an area of disturbed land in the west, alongside the existing quarry.

The site lies at an altitude of 140m AOD and is slightly to moderately sloping (typically 1.5°) with a south westerly aspect.

1.3 Climate

Grid Reference	: NZ 349426
Altitude (m)	: 140
Accumulated Temperature above 0°C (January-June)	: 1210 day°C
Average Annual Rainfall (mm)	: 693
Climatic Grade	: 2
Field Capacity Days	: 176
Moisture Deficit (mm) Wheat	: 84
Moisture Deficit (mm) Potatoes	: 68

#### 1.4 Geology, Soils and Drainage

The site is underlain by deposits of Magnesian Limestone over which there is a covering of boulder clay. There is also an area of disturbed soils in the north-west of the site alongside the existing quarry void. The undisturbed soils on the site typically consist of medium clay loam topsoils overlying heavy clay loam or clay subsoils. Profiles are poorly drained, falling in Wetness Class IV. These soils correspond to the Dunkeswick series as mapped by the Soil Survey and Land Research Centre. The disturbed soils vary from well-drained (Wetness Class I) to poorly drained (Wetness Class IV), with medium or heavy clay loam topsoils overlying similarly textured subsoils.

#### 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:- Medium to heavy textured soils (Unit T1/S1)  
(Full Profile Description, Table 1)

This soil formed on boulder clay occurs over most of the site. It is characterised by heavy textured poorly drained subsoil.

- (b) Soil Type 2:- Disturbed soils (Unit T2/S2)  
(Full Profile Description, Table 2)

This soil formed on disturbed boulder clay occurs in the north west of the site. It is characterised by a thin medium to heavy textured topsoil and variability of texture and structure over short distances.

#### 1.6 Soil Resources

- (i) Topsoils

Unit T1 occurs over most of the site. It is medium textured, typically consisting of medium clay loam which is very slightly stony (containing around 2% small and medium subangular and subrounded hard stones).

This topsoil has a weakly developed coarse subangular blocky structure and a median thickness of 30cm.

Unit T2 occurs in the west of the site. It is medium to heavy textured, typically consisting of medium or heavy clay loam, and stoneless to very slightly stony (containing 0-2% small and medium subangular and subrounded hard stones). Topsoil structure varies according to texture but is typically weakly developed coarse subangular. Median unit thickness is 20cm.

(ii) Subsoils

Unit S1 occurs over most of the site. It is heavy textured (heavy clay loam or clay) and very slightly stony (containing approximately 2% small and medium sized hard stones). This subsoil has a moderately developed coarse prismatic structure and a mean thickness of 65cm.

Unit S2 occurs in the west of the site. This soil has been disturbed, probably as a result of past quarrying operations, and is medium to heavy textured (consisting of either medium clay loam, heavy clay loam or clay). This soil unit is compacted in places and stoneless to very slightly stony and contains 0-4% small, medium and large hard stones. Both soil structure and texture vary considerably over short distances with the heavy textured subsoils having a massive structure and the medium textured subsoils a moderately developed coarse subangular blocky structure. Mean unit thickness is 80cm.

## 2. SOIL PROFILE DESCRIPTIONS

Table 1 Medium to heavy textured soil. T1/S1  
Profile Pit 1 (Near auger boring 3)

Slope:- 1°W  
Land Use:- Ley grass  
Weather:- Cool and overcast

Depth cm	Horizon Description
0-35	Dark greyish brown (10YR4/2) medium clay loam; no mottles; very slightly stony (approximately 2% small and medium subangular and subrounded hard stones); moist; weakly developed coarse subangular blocky structure; firm soil strength; very slightly porous; common very fine and fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; abrupt wavy boundary.
35-100	Light grey (10YR7/2) clay; many fine and medium distinct reddish yellow (7.5YR6/8) mottles; very slightly stony (approximately 3% small and medium subangular sandstones and hard stones); moist; moderately developed coarse prismatic structure; extremely firm soil strength; very slightly porous (<0.5% pores <0.5mm); few fine fibrous roots; moderately sticky; moderately plastic; non-calcareous.

Table 2:- Disturbed soil T2/S2

Profile Pit 1 (Near auger boring 1)

Slope:- 0°  
 Land Use:- Scrub  
 Weather:- Cool and overcast

Depth cm	Horizon Description
0-20	Dark greyish brown (10YR4/2) medium clay loam; few fine and medium reddish yellow (7.5YR6/8) mottles; stoneless; moist; weakly developed coarse subangular blocky structure; firm soil strength; very slightly porous; many fine and very fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; clear smooth boundary.
20-55	Dark grey (7.5YR4/1) medium clay loam; common coarse indistinct brown (7.5YR4/2) mottles; stoneless; moist; moderately to well developed medium and coarse subangular blocky structure; firm soil strength; very slightly porous; common fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; clear wavy boundary.
55-100	Light yellowish brown (10YR6/4) heavy clay loam; few indistinct fine and medium brownish yellow (10YR6/6) mottles; very slightly stony (approximately 4% small, medium and large subrounded hard stones); moist; moderately developed coarse subangular blocky structure; very firm soil strength; compacted; common fine and very fine fibrous roots; moderately sticky; moderately plastic; non-calcareous



### 3. AGRICULTURAL LAND CLASSIFICATION

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

<u>Grade/Subgrade</u>	<u>Hectares</u>	<u>Percentage of Total Area</u>
1		
2		
3a	0.9	13.4
3b	3.7	55.2
4	0.8	12.0
5		
(Sub total)	(5.4)	(80.6)
Urban		
Non Agricultural	1.3	19.4
Woodland - Farm		
- Commercial		
Agricultural Buildings		
Open Water		
Land not surveyed		
(Sub total)	(1.3)	(19.4)
	_____	_____
TOTAL	6.7	100
	_____	_____

### 3.1 Subgrade 3a

A small area of Subgrade 3a land occurs in the south of the site. Profiles are imperfectly drained (falling in Wetness Class III) and typically consist of medium clay loam topsoils overlying heavy clay loam upper subsoils and clay lower subsoils. Slowly permeable layers generally begin at between 50 and 60cm depth and the land is, thus, limited to Subgrade 3a by soil wetness and workability restrictions.

### 3.2 Subgrade 3b

Most of the east of the site falls within Subgrade 3b. Profiles are poorly drained (Wetness Class IV) and typically consist of medium clay loam topsoils overlying slowly permeable heavy clay loam or clay subsoils at around 35cm depth. The ALC grade of this land is limited by soil wetness and workability restrictions which are more severe than on the adjoining Subgrade 3a land.

### 3.3 Grade 4

A band of Grade 4 land occurs in the north west of the site. This land has been disturbed and consists of heavy clay loam topsoils overlying heavy clay loam or clay subsoils. Profiles are poorly drained (Wetness Class IV) with slowly permeable layers generally beginning at about 35cm depth. This land is restricted to Grade 4 by severe soil wetness and workability limitations.

### 3.4 Non Agricultural

This category includes an area of scrubland in the west of the site where soils have been disturbed, probably as a result of previous quarrying operations.

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MAPS