# STATEMENT OF PHYSICAL CHARACTERISTICS

# AND

# AGRICULTURAL LAND CLASSIFICATION

## SUTTON QUARRY, SUTTON, SOUTH YORKSHIRE

## PROPOSED QUARRY EXTENSION

ADAS
Leeds Regional Office

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# 1. STATEMENT OF PHYSICAL CHARACTERISTICS

## A. GENERAL INTRODUCTION

This 6.1 hectare site adjoining the present quarry (grid reference SE543131) is located north of the village of Sutton, South Yorkshire between the A1 and the A19 about 9 km north of Doncaster.

The site was surveyed in June 1990 when soils were examined by hand auger at a density of a little over one boring per hectare at points predetermined by the National Grid. Detailed soil descriptions to provide information on soil structure were carried out at inspection pits located at representative points on the site.

### Land Use

The Agricultural land on the site is in arable use. The Crop in 1990 was potatoes.

### Climate and Relief

Mean annual rainfall is approximately 593 mm per year and the accumulated temperature above 0°C (January to June) is 1399 day 0°C. The site is at field capacity for 121 days a year. The temperature and rainfall figures indicate that there is no overall climatic limitation on agricultural land use.

The site is gently sloping and lies at an average altitude of 20 m aod.

### Geology

Permain Magnesian limestone, often interbedded with red clay or mudstone, underlies the whole site. There is very little superficial drift except for a thin surface layer of sandy loam or sandy clay loam.

Drainage

Soils are well drained (Wetness Class I) except in some areas underlain by red clay where there may be very slight drainage impedance in the lower subsoil (Wetness Class II).

B. SOIL PROPERTIES

Two soil types occur on the site.

1. Deep fine or coarse loamy over clay or heavy clay loam soils. (Full description in Table 1).

These occur over most of the site away from the western and southern boundaries. Topsoils consist of sandy clay loam or medium sandy loam over similar upper subsoils which often pass into reddish clay or heavy clay loam at depth. These soils are unmottled and only very slightly stony.

2. Shallow limestone soils. (Full description in Table 2).

These occur near the western and southern boundaries in areas underlain by hard limestone. Topsoils consist of stony sandy clay loam, medium clay loam or medium sandy loam lying directly over fragmented weathered limestone.

C. SOIL RESOURCES

The topsoil and subsoil resources on the site are shown on the accompanying map along with soil depth information.

1. TOPSOILS

Unit T1

This unit consists of medium or light material which is always unmottled and only very slightly stony. Optimum thickness is 30 cm. Structure is weakly developed subangular blocky.

Unit T2

Although similar in texture and structure to T1, this unit is separated because of its moderately stony nature. Optimum thickness is 30 cm.

## 2. SUBSOILS

These can be divided into upper and lower subsoils. (There are no subsoils in the south western part of the site where topsoil rests directly on weathered limestone bedrock).

### Upper Subsoil Unit U1

This unit is medium to light in texture with few stones and is unmottled. It occurs mainly in the central and northern area and is underlain by a reddish clay or heavy clay loam lower subsoil. Structure is usually weakly developed medium angular blocky and mean thickness is 30 cm.

### Lower Subsoil Unit S1

In most areas of the site, away from the southern and western boundaries, where the soils have developed over reddish clay or heavy clay loam, a lower subsoil unit can be identified. It is heavy in texture and although unmottled it does contain ferri maganiferous nodules indicating a slight drainage impedance. Structure is massive and the clay is only slowly permeable. Mean thickness is 45 cm. Except in a few localised patches where limestone occurs between 60 and 100 cm depth, this subsoil material extends to a depth of more than 1 metre from the surface.

## 2. AGRICULTURAL LAND CLASSIFICATION

The ALC grades on the site are as follows:

| GRADE | HECTARES | PERCENTAGE OF TOTAL AREA |
|---|---|---|
| 2 | 4.7 | 77 |
| 3b | 1.4 | 23 |
| | 6.1 | 100 |

Grade 2

These soils are well or moderately well drained (Wetness Class I and II) and only very slightly stony. Topsoils consist of medium sandy loam, sandy clay loam or medium clay loam. It is flexible easily worked land which will support a wide variety of crops. The only limitations are a few relatively shallower patches (60 cm depth) or, in areas underlay by clay and mudstone, very slight drainage impedance.

Subgrade 3b

Although these soils consist of well drained medium sandy loams or medium clay loams they are limited by droughtiness and/or stoniness to subgrade 3b.

TABLE 1 Coarse loamy over clayey soil (Pit 1)

SUTTON QUARRY

CROP: Potatoes
Slope: 2°E
Weather: Cloudy, slight rain

Depth cm

0-30 Brown (10 YR 4/4) unmottled medium sandy loam; very slightly stony; weakly developed medium subangular blocky structure; medium packing density; very porous; common fine pores and fissures and a few coarse pores; moderately firm soil strength; slightly sticky, non plastic; common fine fibrous roots; non calcareous; sharp smooth boundary.

30-60 Brown (7.5 YR 44) unmottled medium sandy loam; slightly stony; slightly moist; weakly developed coarse and medium angular blocky structure; medium packing density; very porous; common fine pores and fissures and few coarse pores; moderately weak soil strength; slightly sticky, slightly plastic; common fine fibrous roots; non calcareous; sharp smooth boundary.

60-100 Reddish brown (5 YR 4/3) unmottled clay; stoneless; slightly moist; massive; high packing density; very slightly porous; common pores and few fine fissures; very firm soil strength; moderately sticky; very plastic; few fine fibrous roots; common ferri manganiferous nodules.

TABLE 2 Shallow limestone soil (Pit 2)

SUTTON QUARRY

Crop: Potatoes
Slope: 2°E
Weather: Cloudy, slight rain

Depth (cm)

0-30 Dark greyish brown (10 YR 4/3) unmottled medium sandy loam; moderately stony with small to large subangular magnesian limestone fragments; moist; moderately developed medium subangular blocky structure; very many fine pores and fissures; medium packing density; slightly porous; moderately weak soil strength; slightly sticky, slightly plastic; common fine fibrous roots; calcareous; sharp irregular boundary to weathered bedrock.

30+ Weathered fragmented limestone with a matrix of brown (7.5 YR 4/4) medium sandy loam.