

AGRICULTURAL LAND CLASSIFICATION
AND STATEMENT OF PHYSICAL CHARACTERISTICS

DALE PIT FARM, HATFIELD WOODHOUSE
PROPOSED EXTRACTION OF SAND AND GRAVEL

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AGRICULTURAL LAND CLASSIFICATION

**1. AGRICULTURAL LAND CLASSIFICATION REPORT ON THE PROPOSED SAND AND GRAVEL
EXTRACTION SITE AT DALE PIT FARM, HATFIELD WOODHOUSE**

A. GENERAL SITE INFORMATION

INTRODUCTION

The site is located around grid reference SE680077 approximately 12 km north east of Doncaster. It covers a total area of 97.2 hectares of which 98 per cent is classified as agricultural.

Survey work was carried out in March 1989 when soils were examined by hand auger borings at points pre-determined by the National Grid. The overall survey density was approximately one boring per hectare.

Detailed soil descriptions and sampling for laboratory analyses were carried out in inspection pits located at representative points in each of the three main soil types occurring on the site.

All assessments of agricultural land quality were made using the methods described in **Agricultural Land Classification of England and Wales** (MAFF, October 1988).

CLIMATE AND RELIEF

Average Annual Rainfall in the area is approximately 573 mm. Accumulated temperature above 0°C (January to June) is approximately 1416 day degrees C and the Mean Duration of Field Capacity is approximately 118 field capacity days. These characteristics indicate that there is no overall climatic limitation on ALC grade. Summer Moisture Deficits of 115 mm for winter wheat and 109 mm for potatoes, however, mean that soil droughtiness will be moderately limiting on the sandy and coarse loamy soils prevalent in the area.

GEOLOGY

Drift deposits cover the entire site which is underlain at depth by reddish Triassic Sherwood Sandstone. East of the A614 the drift consists mainly of almost stoneless sands, except to the south of Remple Common, where clay lenses also occur within the sands in a number of places. Along the western boundary, near Hale Hill Lane, clayey deposits are more common, but usually pass into stoneless sand within one metre of the surface. The previous widespread occurrence of peat in this part of south Yorkshire is reflected in the high organic content of the topsoil in the area adjoining the old airfield north of Woodhouse Grange.

LAND USE

All agricultural areas are in arable use. Non Agricultural land includes Moor Dyke Road in the north east and a British Gas installation adjoining the A614.

B. AGRICULTURAL LAND CLASSIFICATION GRADES

The ALC grades occurring on the site are as follows:

Table 1

Grade or Subgrade	Hectares	Percentage of total site area	Percentage of total agricultural land
2	12.2	12.6	12.8
3a	27.7	28.5	28.9
3b	55.8	57.4	58.3
Urban	<u>1.5</u>	<u>1.5</u>	<u>-</u>
Total	97.2	100%	100%

Grade 2

Land in this grade occurs in 3 distinct areas; west of Clownes Bridge, adjacent to the existing sand extraction site, near Woodhouse Grange and in the extreme south west by Hale Hill Lane.

Soils consist mainly of sandy loam topsoils over similar, or slightly lighter, subsoils which commonly contain thin clay or sandy clay lenses. Adjoining the sand extraction site near Woodhouse Grange, however, soils are lighter and consist of deep organic loamy sand topsoils over loamy sands and sands. Soil droughtiness is slightly limiting for both soil types and is the chief limitation on ALC grade.

Grade 3a

The western quarter of the site near Hale Hill Lane, and the extreme south east near Moor Dyke Road contain soils which consist mainly of medium clay loam topsoils over gleyed and slowly permeable clay or heavy clay loam upper subsoils. Loamy sand or sand is common in the lower subsoil below about 50 cm depth. These soils fall into wetness Class III and are limited to subgrade 3a by a combination of soil wetness and topsoil workability limitations.

Land in this subgrade also occurs east of Clownes Bridge and along the northern boundary, near Moor Dyke Road. Soils here are somewhat lighter and consist largely of medium sandy loam or fine loamy sand topsoils over loamy sand and sand. Soil droughtiness is limiting for potatoes and is the main grading restriction.

Subgrade 3b

Land in this subgrade occurs over most of the site. Loamy medium sand or sandy loam are the predominant topsoil textures which usually overlies loamy sand and sand subsoils some of which contain thin clay lenses at depth.

Soil droughtiness is particularly limiting for potatoes and is again the main restriction on ALC grade.

Urban

Land in this category consists of a British Gas installation adjoining the A614 and a hard surfaced access road (Moor Dyke Road) in the north east.

2. STATEMENT OF PHYSICAL CHARACTERISTICS

Three major soil types occur on the site. Their distribution, along with soil depth information, is shown on the accompanying maps.

1. Very Light Textured Soils

This soil type is widespread east of the A614. Topsoils consist mainly of stoneless loamy medium sand with an optimum thickness of 35 cm (**Unit T1**). The exception is a narrow area adjoining the existing sand extraction site where marginally deeper, stoneless, organic loamy medium sands with an optimum depth of 40 cm, occur (**unit T1A**).

Subsoils are split into 4 sub units (S1, S1A, S1B, S1C).

Sub units S1 and S1A have similar textures and consist mainly of stoneless very light textured material to depth. These sub units are separated on the basis of thickness differences of 60 cm and 65 cm respectively.

Sub units S1B and S1C consist of very light textured material containing variable thin lenses of sandy clay or clay. Both units are stoneless to very slightly stony and have a median thickness of 65 cm. Clay lenses are generally thicker and more common in sub unit S1B which is the reason for distinguishing two units in this material.

A representative soil pit (soil profile pit A) showed a topsoil with a weakly developed medium and fine subangular blocky structure which passed into a weakly developed medium angular blocky upper subsoil. Below 49 cm loose sand occurred.

2. Light Textured Soils Containing Heavy Subsoil Lenses

These soils occur in 3 distinct areas; west of the A614, east of Clownes Bridge and along the northern site boundary east of Remple Common.

Topsoils (Unit T2) consist of stoneless medium sandy loams or loamy sands about 30 cm thick over similar or lighter subsoils which often contain thick clay or sandy clay lenses. Subsoils are generally stoneless except for the area west of the A614 where sporadic moderately stony lower subsoil horizons often occur.

Sub unit S2 consists mainly of loamy sand and sandy loam textures to depth. S2A, however is a marginally heavier resource and consists of sandy clay loams containing heavy clay lenses. Both units have a median thickness of 70 cm.

A representative profile pit (profile pit B) showed a moderately developed coarse sub angular blocky structure passing into moderately developed coarse angular blocky sandy clay between 54 to 70 cm. Below this, sandy loam with a moderately developed coarse angular blocky structure occurred.

3. Medium to Heavy Textured Soils, with Very Light Lower Subsoils

These soils occur in the north west corner of the site. Topsoil units **T3** and **T3A** are similar and consist mainly of stoneless medium clay loams with optimum depths of 30 cm and 25 cm respectively. These overlie variable stoneless subsoils which consist mainly of sandy clay or clay passing into light and very light textured material with depth.

Subsoils fall into two types. Unit **S3** predominates and consists largely of stoneless very light and light textured material with a median thickness of 70 cm. This sub unit is similar to sub unit **S1C** and may be combined if required.

The subsoils underlying topsoil unit **T3A** are heavier and have been split into an upper and lower subsoil resource.

Unit **U3A** is a relatively pure deposit of stoneless heavy textured clay with a median thickness of 25 cm. Stoneless sands become increasingly common at variable depths below this so that underlying lower subsoil unit **S3A** consists predominantly of heavy textured clay containing horizons of loamy sand and sand. The median thickness of sub unit **S3A** is 50 cm.

A representative inspection pit (profile pit C) showed a moderately developed coarse angular blocky topsoil structure which passed into a similarly structured upper subsoil. Medium sand with weakly developed medium angular blocky features occurred as a lower subsoil below 50 cm depth.

3. SOIL PROFILE PIT DESCRIPTIONS

TABLE 2

SOIL PROFILE PIT A (NGR:- SE 698081) VERY LIGHT TEXTURED SOIL

LAND USE: ARABLE (EX CEREALS)

SLOPE: 0⁰

WETNESS CLASS: 1

HORIZONS	Depth (cm)	Description
1.	0-34	Dark greyish brown (10 YR 3/2) loamy medium sand; unmottled; stoneless, slightly moist; weakly developed medium and fine sub angular blocky structure; low packing density; extremely porous; no observable macropores or fissures; very weak soil strength; no sticky; non plastic; many very fine fibrous roots; non calcareous; sharp irregular boundary.
2.	34-49	Very pale brown (10 YR R7/4) medium sand with dark grey (10 YR 4/1) organic staining; few fine distinct clear light yellowish brown (10 YR 6/4) mottles; stoneless; moist; weakly developed medium angular blocky structure; medium packing density; extremely porous; no observable macropores or fissures; very weak soil strength; non-sticky; non plastic; few very fine fibrous roots; non calcareous; clear wavy boundary.
3.	49-135+ cm	Very pale brown (10 YR 7/3) medium sand; no mottles; stoneless , moist; single grain; low packing density extremely porous; loose soil consistency; non sticky; non plastic; no roots; non calcareous.

SOIL PROFILE PIT B (NGR SE 685076)

LIGHT TEXTURED SOIL CONTAINING HEAVY SUBSOIL LENSES

LAND USE: CEREALS

SLOPE: 0°

WETNESS CLASS: 3

HORIZON	Depth (cm)	Description
1.	0-24	Very dark greyish brown (10 YR 3/2) medium sandy loam; no mottles; stoneless moist; moderately developed coarse sub angular blocky structure; medium packing density; very porous; few fine macropores and fissures; very weak soil strength; slightly sticky; slightly plastic; many very fine fibrous roots; non calcareous; sharp smooth boundary.
2.	24-54	Light grey (10 YR 7/2) medium sand with irregular loamy medium sand inclusions; common medium distinct clear yellowish brown (10 YR 5/8) mottles; stoneless; moist weakly developed medium angular blocky structure; low packing density extremely porous; common fine macropores; very weak soil strength; non sticky; non plastic; few fine fibrous roots; non calcareous; clear smooth boundary.
3.	54-70 cm	Grey (5 YRS 5/1) sandy clay; common fine distinct sharp yellowish red (5 YR 5/8) root channel mottles; no stones; moist; moderately developed coarse and very coarse angular blocky structure; medium packing density slightly porous; moderately firm soil strength; very sticky; moderately plastic; few fine fibrous roots; non calcareous; clear wavy boundary.

4. 70-100+ Pale brown (10 YR 6/3) medium sandy loam; common
medium distinct clear strong brown (75 YR 5/8)
mottles; moderately stony; many medium and few
large and very large rounded quartzite pebbles;
moist; weakly to moderately developed medium sub
angular blocky structure; low packing density;
extremely porous; very weak soil strength; slightly
sticky; slightly plastic; no roots; non
calcareous.

TABLE 4

SOIL PROFILE PIT C (NGR SE 683078)

MEDIUM TO HEAVY TEXTURED SOIL, WITH VERY LIGHT LOWER SUBSOIL

LAND USE: OIL SEED RAPE
 SLOPE: 0°
 WETNESS CLASS: 3

Horizon	Depth (cm)	Description
1.	0-26	Very dark greyish brown (10 YR 3/2) medium clay loam; no mottles; stoneless; very moist; moderately developed coarse angular blocky structure; medium packing density; slightly porous; common fine macropores fissures; moderately firm soil strength; moderately sticky; moderately plastic; many fine and very fine fibrous roots; ploughed in cereal stubble; non calcareous; sharp smooth boundary.
2.	26-50	Light grey (10 YR 6/1) sandy clay with grey (N6) structure faces; many medium prominent clear strong brown (7.5 YR 5/6) mottles; stoneless; moist; moderately developed coarse angular, blocky structure; medium packing density; slightly porous; very sticky; moderately plastic; common fine fissures and very fine macropores; moderately firm soil strength; few fine fibrous roots; non calcareous; abrupt wavy boundary.

Horizon	Depth (cm)	Description
3.	50-150+	Very pale brown (10 YR 7/3) medium sand with irregular loamy medium sand inclusions; many medium distinct clear strong brown (75 YR 5/8) mottles; stoneless; moist; weakly developed medium and fine angular to subangular blocky structure; low packing density; extremely porous; very weak soil strength; non sticky; non plastic; no roots; non calcareous.

MAPS