STATEMENT OF PHYSICAL CHARACTERISTICS
AND
AGRICULTURAL LAND CLASSIFICATION

HARE PARK, CROFTON, NEAR WAKEFIELD

PROPOSED OPEN CAST COAL SITE

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SECTION 1: STATEMENT OF PHYSICAL CHARACTERISTICS
HARE PARK, CROFTON
PROPOSED OPEN CAST COAL SITE

1. INTRODUCTION AND SITE CHARACTERISTICS

The site is located around National grid reference SE 371167, approximately 4 km south east of Wakefield city centre. It covers 33.9 hectares, all of which is in agricultural use.

Survey work was carried out in March 1990 when soils were examined by hand auger borings at 100 metre intervals at points pre-determined by the national grid.

Detailed soil descriptions and sampling for laboratory analysis were also carried out in soil profile pits located in each of the two main soil types occurring on the site.

All land quality assessments were made using the methods described in "Revised Guidelines and Criteria for grading the quality of agricultural land" (MAFF 1988).

1.1 LAND USE

Most of the site was in a grass ley at the time of survey. Arable land was confined to the northern most field near Thorntree Hill

RELIEF

Altitude on the site varies between 42 and 55 metres above Ordnance Datum and the relief is gently undulating. Slopes rarely exceed 3-4° except along the extreme northern boundary where gradients in excess of 7° occasionally occur. Such gradients impose a restriction on the use of some agricultural machinery and are a limitation on ALC grade in these areas.

CLIMATE

Average annual rainfall (AAR) is approximately 633 mm. Accumulated temperature above 0°C (ATO) between January and June is 1367 day °C and the land is at field capacity for about 141 days a year. The combination of these rainfall and accumulated temperature values indicate that there is no overall climatic limitation on ALC grade.

Summer moisture deficits of 102 mm for winter wheat and 92 mm for potatoes, however, indicate a moderate to severe droughtiness limitation on the shallow coarse loamy soils formed over weathering sandstone near Thorntree Hill. Other soils on the site are not significantly limited by soil droughtiness.

GEOLOGY

Carboniferous Coal Measures consisting of shales, sandstones and weathering coal deposits underlie the whole site.

2. SOIL RESOURCES

The two main soil types occurring on the site are as follows:

SOIL TYPE 1: FINE LOAMY TO CLAYEY SOIL

This soil covers most of the site and typically consists of heavy clay loam or clay topsoils, about 30 cm thick, over gleyed and slowly permeable clay. All profiles are non-calcareous and vary from stoneless to very slightly stony.

Close examination in a soil pit (Soil Pit A) showed the topsoil to have a compacted, moderately developed coarse subangular blocky structure with a moderately strong ped strength. Topsoil compaction is a feature of the site and is largely the result of management practice. Underlying subsoils, although less compact, are poorly structured. They display a weakly developed coarse prismatic to massive structure with a moderately firm ped strength.

The topsoil and subsoil resources associated with this soil type are shown on the accompanying resource maps. They are as follows:

TOPSOIL RESOURCES

Only one topsoil resource unit occurs within this soil type (Unit T1). It consists of stoneless to very slightly stony heavy textured material with a median thickness of 30 cm.

SUBSOIL RESOURCES

The subsoil resources for this soil type are divided into 2 sub units. Unit S1 consists of stoneless heavy textured material with a median thickness of 70 cm. Unit S1A is the thinner resource and consists of similar subsoil material but with a median thickness of only 20 cm, over weathering coal and shale.

SOIL TYPE II: FREELY DRAINED COARSE LOAMY SOIL OVER SANDSTONE

This soil overlies an area of flaggy weathering sandstone around Thorntree Hill. Profiles typically consist of slightly stony sandy clay loam medium clay loam or sandy loam topsoils, about 30 cm thick, over moderately stony subsoils with similar or slightly lighter textural characteristics.

Flaggy weathering sandstone is usually encountered between 40 and 60 cm depth, although deeper profiles occasionally occur on lower slopes near the margins of the soil type.

A soil inspection pit (Soil Pit B) showed the topsoil to have a moderately developed fine and medium subangular blocky structure with a moderately weak ped strength. Underlying subsoils are generally well structured but moderately stony. They display moderately developed fine and medium subangular blocky structural features with moderately weak ped strengths.

The topsoil and subsoil resources associated with this soil type are as follows.

TOPSOIL RESOURCES

Topsoil Unit T2 is slightly stony and consists of medium to light textured material with a median thickness of 30 cm.

SUBSOIL RESOURCES

Only one subsoil unit has been separated, although, atypical, thicker resources occasionally occur on the margins of the soil type.

Subsoil Unit S2 thus consists of moderately stony light to medium textured material with a median thickness of only 15 cm over weathering sandstone.

SECTION 2: AGRICULTURAL LAND CLASSIFICATION

The ALC grades occurring on this site are as follows.

Grade/Subgrade	Hectares	Percentage of Total site Area
3a	1.2	3.5
3b	32.7	96.5
Total	33.9	100%

SUBGRADE 3a

Land in this subgrade occurs in a small area near the northern site boundary. Soils fall within Wetness Class I and consist of clay loam to sandy loam topsoils and subsoils which pass into flaggy weathering sandstone at depth. Soil droughtiness is particularly limiting for winter cereals and is the overriding limitation on ALC grade.

SUBGRADE 3b

This is the predominant grade on the site.
Most soils consist of heavy clay loam topsoils over gleyed and slowly permeable clays that occasionally pass into carboniferous coal measures below about 50 cm depth. These profiles fall within wetness classes III or IV and are limited to subgrade 3b by a combination of soil wetness and workability problems.

Subgrade 3b land also occurs on the shallow soils along the northern site boundaries near Thorntree Hill. Profiles consist typically of sandy clay loam, medium clay loam or sandy loam topsoils and upper subsoils over weathering sandstone

Soil droughtiness is thus moderately to severely limiting and is the overriding restriction on ALC grade. Strongly sloping land also occurs in places in this area. Slopes in excess of 7° limit the use of some agricultural machinery and form an additional restriction on ALC grade.

SECTION 3. SOIL PROFILE DESCRIPTIONS

SOIL TYPE I: FINE LOAMY TO CLAYEY SOIL

SOIL PROFILE PIT A
LAND USE: GRASS LEY
SLOPE: 1°S

HORIZON	DEPTH	DESCRIPTION
1.	0-27	Dark greyish brown (10 YR 4/2) heavy clay loam; common very fine, distinct sharp strong brown (10 YR 5/4) mottles; stoneless; slightly moist; moderately developed coarse subangular blocky structure high packing density; very slightly porous; common medium macropores and fissures; moderately strong soil strength; very sticky moderately plastic; many fine fibrous roots; non calcareous; sharp wavy boundary.
2.	27-100	Grey (10 YR 6/1) clay. Many medium prominent sharp yellowish brown (10 YR 5.6) mottles; stoneless; moist; weakly developed, adherent very coarse prismatic to massive structure; high packing density. Very slightly porous; no observable macropores or fissures; moderately firm soil strength; very sticky; very plastic, few fibrous roots above 50 cm; non calcareous.

SOIL TYPE II: FREELY DRAINED COARSE LOAMY SOIL OVER SANDSTONE

SOIL PROFILE PIT B
LAND USE: WINTER CEREALS
SLOPE: 2°S

HORIZON	DEPTH	DESCRIPTION
1.	0-30	Brown (10 YR 3/3) fine sandy loam; unmottled; slightly stony (12%) with common small and medium angular sandstones; moist, moderately developed fine and medium subangular blocky structure, medium packing density; very porous; moderately weak soil strength; slightly sticky; slightly plastic; abundant very fine fibrous roots, especially from 0-10 cm; non calcareous abrupt smooth boundary.
2.	30-45	Dark yellowish brown (10YR 4/4) fine sandy loam; unmottled; moderately stony (20%) with many small and medium flat angular sandstones; moist, moderately developed fine and medium subangular blocky structure; medium packing density; very porous; moderately weak soil strength; slightly sticky; slightly plastic; many very fine fibrous roots; non calcareous; sharp irregular boundary.
3.	45+	Thinly bedded fine sandstone.

MAPS