STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION THORPE THEWLES, CLEVELAND PROPOSED SAND & GRAVEL PLANT STORAGE AREA MAY 1993

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SUMMARY

A Statement of Physical Characteristics and Agricultural Land Classification survey of 11.1ha of land near Thorpe Thewles, Cleveland was carried out in May 1993.

At the time of the survey 10.8ha was in agricultural use of which 1.0ha falls within Subgrade 3a. Soils within this subgrade are deep and imperfectly drained (Wetness Class III) and consist of medium clay loam upper subsoils and slowly permeable heavy clay loam and clay lower subsoils. They are limited to Subgrade 3a by wetness.

Subgrade 3b land covers 9.8ha. Soils in the east and north west consist of medium and heavy clay loam topsoils over reddish poorly drained (Wetness Class IV) slowly permeable heavy clay loam and clay subsoils. These soils are limited to Subgrade 3b by wetness and workability problems.

The remaining land in Subgrade 3b, in the south western part of the site consists of medium and sandy clay loam topsoils over slowly permeable compacted, restored mixed heavy clay loam and clay. This overlies landfill material at varying depths. An area of steeply sloping non-agricultural land in the eastern part of the site consists of old mineral workings covered by grass and scrub.

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STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION REPORT ON THE PROPOSED PLANT STORAGE AREA AT THORPE THEWLES, CLEVELAND

1. INTRODUCTION AND STATEMENT OF PHYSICAL CHARACTERISTICS

1.1 Location and Survey Methods

The site lies approximately 5km north west of Stockton on Tees and 1½km north east of Thorpe Thewles, around National Grid Reference NZ 415 248. It covers a total of 11.1ha. Survey work was carried out in May 1993 when soils were examined by hand auger borings at intervals predetermined by the National Grid. Overall boring density was approximately two per hectare and extra borings were made, where necessary, to refine grade boundaries. Two soil inspection pits were dug to allow detailed descriptions of soil structure to be made. 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 the survey the eastern part of the site was in set aside and the western part in ley grassland. The remainder consists of a non-agricultural area of disturbed land covered by grass and scrub, on slopes of up to 20°. Site altitude varies from 20m AOD in the south to 40m in the north. The agricultural land slopes south eastwards towards the river with gradients varying from 0-9°. The steepest gradients occur on each side of the patch of non-agricultural scrubland in the south eastern part of the site.

1.3 Climate

Grid Reference	: NZ 415 248
Altitude (m)	: 30
Accumulated Temperature above 0°C (January-June)	: 1342 day °C
Average Annual Rainfall (mm)	: 617
Climatic Grade	: 1
Field Capacity Days	: 150
Moisture Deficit (mm) Wheat	: 102
Moisture Deficit (mm) Potatoes	: 93

1.4 Geology, Soils and Drainage

The site is underlain by Permian upper marl over which lies glacial sand and gravel, glacial clay and Head deposits Alluvial material occurs along the low lying strip of land adjoining the river. The western part of the site has been disturbed and landfilled. Soils in this area consist of medium textured topsoils over poorly drained (Wetness Class IV) compacted heavy clay loam and clay subsoils to 50-70cm depth. Landfill material occurs below this. Soils in the eastern and northern areas consist of medium and heavy textured topsoils over poorly drained (Wetness Class IV) clay subsoils. Sand occurs at depth in places, especially on the sloping land adjoining the old pit. Soils in the low lying alluvial area are of similar medium and heavy textures, but are somewhat better drained, falling mainly within Wetness Classes II and III.

The heavy reddish coloured soils on the higher parts of the site are similar to those mapped as the Crewe Series by the Soil Survey and Land Research Centre.

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 over heavy textured restored soils over landfill (Unit T1/S1) (Full Profile Description, Table 1)

This soil formed on restored land occurs in the western part of the site. It consists of medium textured topsoils over heavy poorly drained compacted subsoils which pass at 50-70cm depth into a mixture of soil and landfill material.

(b) Soil Type 2:- Medium/heavy over heavy textured soils (Unit T2/S2) (Full Profile Description, Table 2)

This soil formed mainly on glacial clay occurs in the eastern part of the site. It is characterised by reddish coloured slowly permeable heavy clay loam or clay subsoils.

1.6 Soil Resources

(i) Topsoils)

Unit T1 (Restored)

Unit T1 occurs in the west. It is medium textured and typically consists of medium clay loam or sandy clay loam which is very slightly stony, (containing 1-4% small to medium sub rounded and sub angular hard stones). This topsoil has a moderately developed medium sub angular blocky structure and a median thickness of 30cm.

Unit T2

Unit T2 occurs in the eastern and northern parts of the site. It is medium or heavy textured and typically consists of medium clay loam which is very slightly stony, (1-2% small to medium sub rounded hard stones). This topsoil has a moderately developed medium sub angular blocky structure and a median thickness of 25cm.

(ii) Subsoils

Unit S1 (Restored)

Unit S1 occurs in the western part of the site. It is heavy textured consisting of heavy clay loam or clay and is very slightly stony, (0-4% of small to medium sub rounded and sub angular hard stones). Structure varies from strongly developed medium to very coarse platy to weakly developed adherent coarse platy. Mean thickness is 20cm. Below this is a mixture of soil and landfill material.

Unit S2

Unit S2 covers the remainder of the site. It is heavy textured consisting of heavy clay loam or clay and stoneless to very slightly stony, (0-2% of small to medium sub rounded hard stones). It has a moderately developed coarse angular blocky to prismatic structure and a mean thickness of 95cm. Sand may occur at depth in places, especially on the strongly sloping land on either side of the old pit. Also included within Unit S2 is the heavy alluvial subsoil material adjoining the river.

2. SOIL PROFILE DESCRIPTION

Table 1 Restored. Medium over heavy textured soil over landfill. T1/S1

Profile Pit 1 (Near auger boring 41)

Slope:- 2°

Land use:- Ley Grass

Weather:- Overcast

Depth cm	Horizon Description
0-25	Brown (10YR4/3) sandy clay loam; unmottled; very slightly stony (approximately 3% small and medium sub rounded and sub angular hard stones); moist; moderately developed medium sub angular blocky structure; moderately firm; medium packing density; moderately porous; many fine fibrous roots; moderately sticky; moderately plastic; non calcareous; clear wavy boundary.
25-70	Yellowish brown (10YR5/4) and reddish brown (5YR4/3) mixed lenses of heavy clay loam and clay; very slightly stony (approximately 3% small and medium sub rounded and sub angular hard stones); moist; interbedded compacted strongly developed medium to very coarse platy and weakly developed adherent coarse platy structures; high packing density; very firm soil strength; slight to very slightly porous; many fine roots on peds faces and few roots with peds; moderately sticky; moderately plastic; non calcareous; clear irregular boundary.
70 +	Mainly landfill material and rubble with a sandy clay loam matrix.

SOIL PROFILE DESCRIPTION

Table 2 Medium or heavy over heavy textured soil T2/S2
Profile Pit 2 (Near auger boring 12)
Slope:- 0°
Land use:- Set aside
Weather:- Overcast

Depth cm	Horizon Description
0-25	Dark brown (10YR3/3) heavy clay loam; no mottles; stoneless; moist; moderately developed medium sub angular blocky structure; firm soil strength; medium packing density; moderately porous; many fine and medium fibrous roots; moderately sticky; slightly plastic; non calcareous; clear abrupt boundary.
25-120	Reddish brown (5YR4/4) and grey (10YR5/1) clay, with common fine clear brown (75YR4/4) mottles; moist; strongly developed medium to coarse angular blocky to prismatic structure; high packing density; very firm soil strength; very slightly porous; moderately sticky; moderately plastic; common fine and medium fibrous roots; non calcareous.

3. AGRICULTURAL LAND CLASSIFICATION

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

Grade/Subgrade	Hectares	Percentage of Total Area
1		
2		
3a	1.0	9.0
3b	9.8	88.3
4		
5		
(Subtotal)	(10.8)	(97.3)
Urban		
Non Agricultural	0.3	2.7
Woodland - Farm		
- Commercial		
Agricultural Buildings		
Open Water		
Land not surveyed		
(Sub total)	(0.3)	(2.7)
TOTAL	11.1	100

3.1 Subgrade 3a

Subgrade 3a land occurs along the south eastern edge of the site adjoining the river. Soils consist of imperfectly drained (Wetness Class III), very slightly stony medium clay loam topsoils overlying permeable medium and heavy clay loam upper subsoils which in turn pass into stoneless slowly permeable clay lower subsoils. These soils are limited to Subgrade 3a by slight wetness.

3.2 Subgrade 3b

Subgrade 3b land occurs over the remainder of the agricultural land. Soils in the east and north west of the site consist of poorly drained (Wetness Class IV) very slightly stony medium and heavy clay loam topsoils overlying very slightly stony gleyed slowly permeable often reddish heavy clay loam or clay subsoils. These soils are limited to Subgrade 3b by wetness and workability problems. Soils in the west consist of poorly drained (Wetness Class IV) very slightly stony medium and sandy clay loam topsoils overlying compacted mixed heavy clay loam and clay upper subsoils. These overlie at variable depth (usually not less than 50cm depth) landfill material consisting of rubble and plastic with a sandy clay loam matrix. These soils are limited to Subgrade 3b mainly by wetness.

3.3 Non-agricultural

The non-agricultural land in the eastern part of the site, consists of a disused sand pit with slopes up to 20°. The area is covered by grass and scrub. There are no appreciable topsoil resources but variable subsoil resources consisting of mixed very light and heavy material.

MAPS