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AGRICULTURAL LAND CLASSIFICATION
ELLERTON ON SWALE
NORTH YORKSHIRE
PROPOSED SAND GRAVEL QUARRY
NOVEMBER 1992

ADAS
Leeds Statutory Group

Job No:- 102/92
MAFF Ref:-

ELLERTON.AL7/MT

SUMMARY

An Agricultural Land Classifcation survey of approximately 95 ha of land adjoining the river at Ellerton-on-Swale was carried out in September 1992. The survey included soil analyses carried out to determine the amounts, if any, and their effect on land quality, of toxic metals eroded from old lead mine workings upstream and deposited on this area during floods.

82.5 ha of the site is in agricultural use, of which 13.8 ha falls within Subgrade 3a. Soil profiles are well drained (Wetness Class I or II) and consist of stoneless or slightly stony medium clay loam or sandy clay loam topsoils and upper subsoils. Sand and gravel deposits occur at depths of between 50 cm and 65 cm. Land of this type is limited to Subgrade 3a by droughtiness. Subgrade 3b land totalling 34.9 ha ocurs in two areas.. In the east profiles consist mainly of well drained slightly to moderately stony medium textured top and upper subsoils which overlie gravel at depths of between 30 and 45 cm. Stoniness and droughtiness are the main limitations on this land. The remaining Subgrade 3b land meets the physical requirements of Grade 1 and Subgrade 3a, but is downgraded by heavy metal toxicity. Grade 4 land (33.8 ha) adjoining the river in the west and south meets the physical requirements of Grades 1, 2 and Subgrades 3a and 3b, but is limited to Grade 4 by very high levels of toxic heavy metals deposited by flooding of the River Swale. Non agricultural land (11.3 ha) consists largely of woodland and scrub.

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1. INTRODUCTION AND SITE CHARACTERISTICS

1.1 Location and Survey Methods.

The site is located around National Grid reference SE 265975 approximately 2 km east of Catterick and 1 km south east of the village of Ellerton-on-Swale. It covers a total of 94.7 ha.

Survey work was carried out in September 1992 when soils were examined by hand auger borings at points predetermined by the National Grid. Overall boring density was approximately 1 per hectare. A representative number of soil samples were taken and analysed for possible heavy metal contamination of the river floodplain from lead mine waste derived from old workings in Upper Swaledale. Three soil inspection pits were also dug to allow detailed soil descriptions. All assessments of land quality were made using the methods described in 'Agricultural Land Classification of England and Wales' (MAFF 1988).

1.2 Land Use and Relief

At the time of the survey land in the southern part of the site between the River Swale and woodland to the north, was in rough grazing. The remainder of the site was in arable production.

The site is generally level to moderately sloping, with small undulating areas in the south west corner adjoining the river.

1.3 Climate

Grid Reference	: SE265975
Altitude (m)	: 40
Accumulated Temperature above 0°C (January-June)	: 1345
Average Annual Rainfall (mm)	: 665
Climatic Grade	: 1
Field Capacity Days	: 167
Moisture Deficit (mm) Wheat	: 102
Moisture Deficit (mm) Potatoes	: 91

1.4 Geology, Soils and Drainage

The site is underlain by Carboniferous Millstone Grit and Permian Marls and limestones over which there is a thick cover of drift deposits consisting of sand and gravel and alluvium. Soils in the north and east are typically well drained (Wetness Class I) with medium textured topsoils, varying from very slightly to moderately stony (1-20%), overlying sand and gravel at depths of between 35 and 45 cm. The majority of soils in the northern and central areas are also well drained (Wetness Class I), medium textured and stoneless or very slightly stony, but overlie sand and gravel at greater depths (50 - 65 cm). Soils in the south west corner are well drained and consist of moderately stony sandy loam topsoils (20%) overlying sand and gravel at between 35 and 45 cm depth. The central part of the site south east of Manor House contains well drained (Wetness Class I) stoneless unmottled medium silty clay loam or medium sandy loam topsoils over similar subsoils which extend in many places to a depth of more than 1 m.

2. *AGRICULTURAL LAND CLASSIFICATION*

The ALC grades occurring on this site are as follows:

Grade/Subgrade	Hectares	Percentage of Total Area
1		
2		
3a	13.80	14.6
3b	34.90	36.8
4	33.80	35.7
5		
(Sub total)	(82.50)	(87.1)
Urban	0.90	0.9
Non Agricultural	11.37	12.0
Woodland - Farm		
- Commercial		
Agricultural Buildings		
Open Water		
Land not surveyed		
(Sub total)		
TOTAL	94.77	100

2.1 Subgrade 3a

Land in this subgrade occurs in the upper central part of the site. Profiles are well or moderately well drained (Wetness Classes I and II) and consist of stoneless or very slightly stony unmottled medium clay loam and sandy clay loam topsoils, over stoneless or very slightly stony, occasionally mottled medium clay loam and sandy clay loam upper subsoils. Gravel forms a lower subsoil, usually occurring at depths of between 50 and 65 cm. This land is limited to Subgrade 3a by droughtiness.

Subgrade 3b

Subgrade 3b land occurs in two separate areas; in the east (north of the woodland) and in a band running from the centre to the north west corner of the site. Land in the east of the site consists of very slightly to moderately stony, unmottled sandy clay loam, medium clay loam or occasionally heavy clay loam topsoils, overlying unmottled moderately to very stony sandy clay loam or medium clay loam upper subsoils. Gravel occurs at between 30 and 45 cm depth. Topsoil stoniness and droughtiness due to subsoil stone content limits this area to Subgrade 3b. The remaining Subgrade 3b land although satisfying the physical requirements of Subgrade 3a and Grade 1 is downgraded to Subgrade 3b due to the high levels of toxic elements, principally lead.

Grade 4

All agricultural land in the western and southern parts of the site is restricted to this grade because of heavy metal toxicity. This area consists of well drained medium clay loam and sandy loam soils which meet the physical requirements of Grades 1, 2 and Subgrades 3a and 3b. Flooding from the River Swale, however, has resulted in pollution of these soils, principally by lead, zinc and cadmium. Some high levels of fluoride also occur. The heavy metals are derived from disused mine workings within the Swaledale and Arkengarthdale areas further upstream.

Analyses indicate that metal concentrations exceed DoE toxic threshold levels throughout this area, often by a considerable margin. Expert advice indicates that zootoxic (cadmium and lead) and phytoxic (zinc) problems are likely. It is therefore suitable only for carefully controlled grassland use and limited to Grade 4 for this reason.

Urban

This category consists of access roads and paths.

Non-Agricultural

This category includes a mixture of woodland, scrub and overgrown land.

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