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MAFF Ministry of Agriculture Fisheries and Food

Land North East of Victoria Mills Wellingborough

AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS

LAND NORTH EAST OF VICTORIA MILLS, WELLINGBOROUGH, NORTHAMPTONSHIRE

1. BACKGROUND

1.1 The site, an area of 23.8 hectares, is the subject of an application by ARC as an extension to existing sand and gravel workings in the locality. MAFF carried out a detailed soil survey of the site in January 1992. Soil inspections using a Dutch soil auger were made on a 100 metre grid basis. Two soil inspection pits were also dug to assess subsoil conditions and supplement soil auger boring information.

1.2 On the published Agricultural Land Classification (ALC) Map, Sheet 133 (Provisional 1:63360 scale, MAFF 1974). The survey area is shown as grade 3 with an area of grade 4 in the floodplain on the western side of the disused railway line. At a reconnaissance level, the Draft Northamptonshire Sand and Gravel Local Plan Preliminary Agricultural Land Classification information (MAFF 1991) indicated that the likely grade of the site is mainly 3b with a smaller area of 3a upslope. The current survey was undertaken to provide more detailed information on land quality of the site.

2. SITE PHYSICAL CHARACTERISTICS

Altitude and Relief

2.1 The site area occupies part of the floodplain of the River Nene. The majority of the site is level and lies at an altitude of 40 metres AOD rising gently in the southwest to 45 metres AOD. Subdividing the area is a disused railway line on an embankment, which, although virtually level with the ground surface to the southwest lies 2 metres above the River Nene floodplain. Land adjacent to a lock lies approximately 1 to 2 metres above the floodplain where it is bordered by a concrete river wall. Gradient and altitude do not constitute limitations to the quality of the agricultural land.

Climate

2.2 Climate data for the site was obtained from the published agricultural climatic dataset produced by the Meteorological Office (Met Office, 1989). This indicates a site average annual rainfall of 587 mm (23.1 inches). Field capacity days are 119. This also indicates that the accumulated temperature for this area is approximately 1429 day degrees Celcius. Soil moisture deficits for wheat and potatoes are 117 mm and 111 mm respectively. These climatic characteristics do not impose any climatic limitation on the ALC grading of the survey site.

Flooding

2.3 The majority of the site is situated on low lying level land next to the river Nene and experiences seasonal flooding. The incidence of flooding is strongly influenced by topography and vicinity of the river. However, the extent, duration, frequency and timing of flooding can be difficult to establish precisely. For the floodplain area it was ascertained that the incidences of flooding are of a frequent nature and medium in duration (see Appendix 3). Consequently flooding restricts this low lying area to grade 3b. The higher land to the southwest is not prone to flooding.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The definitions of the Agricultural Land Classification (ALC) grades are included in Appendix 1.

3.2 The majority of the site is mapped as subgrade 3b with a smaller area of grade 2 to the southwest. The table below shows the breakdown of the grades in hectares and % terms for the survey area.

AGRICULTURAL LAND CLASSIFICATION

Grade	ha	%
2	3.2	13.4
3b	18.6	78.2
Non Agricultural	2.0	8.4
TOTAL	23.8	100.0

Grade 2

3.3 Land at the south western edge of the site, described in paragraph 4.4 has been graded 2 due to droughtiness constraints. The soils show no evidence of drainage impedance consequently they are freely draining with a wetness class of I. However the area is limited by minor droughtiness imperfections. The presence of fine loamy textures, small quantities of Limestone fragments and/or ironstones impose a slight limitation on the agricultural potential of the land. As a result crops experience some drought stress in drier periods and land is limited to grade 2.

Subgrade 3b

3.4 The majority of the site has been graded 3b due to the inherent wetness limitation and flood risk. The soils (described in paragraph 4.3) are slowly permeable and clayey in the subsoil. Wetness class has been assessed as III with smaller areas of wetness class IV where the water table lies close to the ground surface for a longer period of time (i.e. up to 7 months). The heavy textures combine with profile wetness to impose significant restrictions on the agricultural potential of this land. Consequently land is limited to subgrade 3b.

Non agricultural

3.5 The disused railway line and a farm track appear as land not in agricultural use.

4. SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 The published 1:50,000 scale solid and drift edition geology map sheet 168 Peterborough (Geological Survey 1974), shows the majority of the site to be Pleistocene and recent alluvium. The extreme southern boundary is shown as Jurassic Upper Lias Clay where the land rises in altitude. The Mineral Assessment Report 114 (IGS 1983) shows the site to comprise mainly the Quarternary First Terrace gravels and sands below the alluvium deposits.

Soils

4.2 No detailed soil map exists for the area. However the reconnaissance scale 1:250,000 soil map "Soils of Eastern England" (Soil Survey, 1983) shows the occurrence of the Fladbury 1 Association* over the majority of the site with the Moreton Association ** to the extreme southeast corner of the site. The current more detailed inspection of the soils shows the occurrence of two soil types.

SOIL TYPE 1 (refer to Appendix 2 and Soil Types Map)

4.3 This soil covers the majority of the site and comprises clayey profiles. Profiles typically consist of heavy clay loam or clay topsoils over clay subsoils. Towards the base of the profile textures of sandy clay, or clay with medium sand lenses were often encountered. Profiles are typically non calcareous throughout.

SOIL TYPE 2 (refer to Appendix 2 and Soil Types Map)

4.4 The remainder of the site comprises lighter textured profiles. These typically consist of medium clay loam topsoils over medium clay loam or sandy clay loam upper subsoils. Lower subsoils are variable in texture, but typically comprise medium clay loam with medium sand lenses; medium sandy loam or occasionally clay. Profiles are porous and typically calcareous throughout although occasionally non calcareous variants occur too.

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* Fladbury 1 Association - Stoneless clayey soils, in places calcareous, variably affected by groundwater. Flat land. Risk of flooding.

** Moreton Association - Well drained calcareous clayey and fine loamy soils over Limestone, in places shallow and brashy. Some deeper slowly permeable calcareous clayey soils.

APPENDIX 1

DESCRIPTION OF ALC GRADE AND SUBGRADE

Grade 2 - very good quality agricultural land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables or arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Subgrade 3b - moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

APPENDIX 2

SOIL PHYSICAL CHARACTERISTICS

LAND NORTH EAST OF VICTORIA MILLS, WELLINGBOROUGH, NORTHANTS

SOIL TYPE 1 (20.6 ha)

Topsoil	Texture	:	heavy clay loam or clay
	$CaCO_3$	:	non calcareous
	Colour	:	dark greyish brown (10YR4/2)
	Stone	:	negligible
	Structure	:	cultivation zone - not applicable
	Boundary	:	Abrupt smooth
	Roots	:	many fine and very fine, few medium
	Depth	:	in the range 15/30 cm, typically 20/25 cm
Subsoil	Texture	:	clay (occasionally sandy clay or clay with medium sand lenses at depth)
	$CaCO_3$	:	non calcareous
	Colour	:	brown and yellowish brown (10YR5/3 and 5/4 respectively) becoming predominantly light brownish grey (10YR 6/2) and grey (5YR 6/1) 50-120 cm, typically 50-90 cm
	Stone	:	negligible
	Structure	:	strongly developed coarse prismatic
	Boundary	:	base of pit
	Roots	:	common fine and very fine, few medium
	Depth	:	120 cm

SOIL TYPE 2 (3.2 ha)

Topsoil	Texture	:	medium clay loam
	$CaCO_3$	:	occasionally calcareous
	Colour	:	yellowish brown (10YR 5/4), dark yellowish brown (10YR 4/4)
	Stone	:	negligible
	Structure	:	cultivated zone - not applicable
	Boundary	:	Abrupt smooth
	Roots	:	Common fine and very fine
	Depth	:	30/35 cm

Upper Subsoil	Texture	:	medium clay loam
	$CaCO_3$	:	occasionally calcareous
	Colour	:	dark yellowish brown (10YR 4/6), yellowish brown (10YR 5/6) and light grey (10YR 7/1)
	Stone	:	1-2% flints, or limestones or ironstones
	Structure	:	moderately developed coarse sub-angular blocky
	Boundary	:	abrupt smooth
	Roots	:	common fine and very fine
	Depth	:	in the range 90/100 cm
Lower subsoil	Texture	:	medium clay loam with medium sand lenses, medium sandy loam or occasionally clay
	$CaCO_3$	:	occasionally calcareous
	Colour	:	strong brown (7.5YR 5/8), rarely light brownish grey (2.5YR 6/2) (clay)
	Stone	:	1-2%, occasionally 15-20% gravel
	Structure	:	moderately developed coarse subangular blocky
	Boundary	:	abrupt smooth
	Roots	:	common fine and very fine
	Depth	:	up to 120 cm

APPENDIX 3

DESCRIPTION OF ALC GRADE ACCORDING TO FLOOD RISK IN WINTER (MAFF, 1988)

	Flood limits	
Grade/Subgrade	Frequency	duration
3b	frequent	medium

Frequency

Frequent - more than once in 3 years.

Duration

Medium - more than 2 days but not more than 4 days.

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1974. Solid and drift edition Geology Sheet 168 (Peterborough). 1:50,000 scale.

INSTITUTE OF GEOLOGICAL SCIENCES (NERC) 1983. Sand and gravel resources. Mineral Assessment Report 114. Kettering, Wellingborough, Northamptonshire. SP97, SP86 and 96.

MAFF, 1974. Agricultural Land Classification Map No 133. Provisional 1:63,360 scale.

MAFF, 1988. Agricultural Land Classification of England and Wales (Revised guidelines and criteria for grading the quality of Agricultural Land) Alnwick.

METEOROLOGICAL OFFICE, 1989. Published climatic data extracted from the agroclimatic dataset, compiled by the Meteorological Office.

SOIL SURVEY OF ENGLAND AND WALES, 1983. Soils of Eastern England. Sheet No. 4, 1:250,000 scale.

Land North East of Victoria Mills
Wellingborough

Map 1: Agricultural Land Classification

Map 2: Soil Types

Map 3: Location of auger borings and soil pits