

PHYSICAL CHARACTERISTICS REPORT INCORPORATING
AGRICULTURAL LAND CLASSIFICATION

DOG FARM, WILLINGTON, BEDFORDSHIRE

1.0 INTRODUCTION

1.1 A survey was carried out over 16.6 ha of land at Dog Farm, Willington, Bedfordshire in connection with a planning application by Redland Aggregates Ltd for sand and gravel extraction. The site lies immediately to the east of a previous application site which was surveyed by MAFF in February 1991.

1.2 The site lies to the south of the A603 road and is bounded to the north by Redland Aggregates Willington Pit and to the west by its access road. On the eastern side of the site is a farm track across which is open farm land.

1.3 A total of 16 observations were made using a spade and dutch auger to a depth of 1.2 m unless prevented by stones. In addition two soil pits were dug to assess subsoil conditions and to assist in determining the depth of rooting.

1.4 The site comprises two fields which at the time of survey were both under grass.

2.0 SITE PHYSICAL CHARACTERISTICS

2.1 Climate

Site specific climate data has been obtained by interpolating information contained in the 5 km grid data set produced by the Meteorological Office (Met Office, 1989).

2.2 The average annual rainfall for the site is approximately 571 mm which is low by national standards. Soils are likely to be at field capacity for a relatively short period of approximately 97 days.

2.3 The accumulated temperature for this site is approximately 1452 degrees Celsius. This parameter indicates the cumulative build up of warmth available for crop growth, and in conjunction with rainfall has an influence on the development of soil moisture deficits and susceptibility to drought. The moisture deficits for wheat and potatoes on this site are 119mm and 115mm respectively.

2.4 There is no overall climatic limitation to the agricultural use of the land, although soils with low available water capacities will be highly susceptible to drought.

2.5 Relief

The site slopes gently from the north and south towards the Elstow Brook which traverses the middle of the site from west to east. The altitude of the site is approximately 25m AOD. Gradient and altitude therefore do not impose any limitation on the ALC grading.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The land has been classified in accordance with the guidelines of the Agricultural Land Classification of England and Wales (MAFF 1988). A breakdown of the individual grades and areas is given below:

ALC grade	Area (ha)	%
2	5.1	30.7
3a	8.9	53.6
3b	2.6	15.7
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TOTAL	16.6	100

3.2 Grade 2

The grade 2 land is associated with the deep loamy soils of Soil Type B (described in paragraph 4.5) which occur in the middle of the site. These soils are slightly droughty which imposes a minor limitation on the agricultural potential of this land.

3.3 Subgrade 3a

The land to the north and south of the site has been mapped as subgrade 3a. Both these areas are associated with the stonier soils of Soil Type A (described in paragraph 4.4). These soils are slightly to moderately stony with the underlying sand and gravel or hoggin being encountered with 1 m depth. In this relatively low rainfall area the reduced water holding capacity of these soils results in a moderate droughtiness limitation.

3.4 Subgrade 3b

The area of land adjacent to the Elstow Brook has been mapped as subgrade 3b. Flooding information was obtained from the Ouse Drainage Board when the ALC report was produced by MAFF for the Willington Pit Extension site. This indicated that there is frequent flooding from this watercourse which can result in significant crop damage. Whilst the soils were predominately Soil Type A some localised clayey alluvial soils were found, consequently flooding is the overriding limitation to ALC grade.

4.0 SOIL PHYSICAL CHARACTERISTICS

4.1 Geology

Information on the geology of the area has been extrapolated from the adjacent published drift geology map (Geol Surv, 1976) which extends to within 1 km of the east of the site. This map shows that the area is likely to comprise First and Second Terrace River Gravels.

4.2 Soils

The Soil Survey of England and Wales have mapped the area on two occasions firstly in 1969 at a scale of one inch to one mile and secondly in 1983 at a reconnaissance scale of 1:250,000. These maps broadly correspond showing the site to comprise mainly the Efford 1 Association (*1) with the Thames Association (*2) occurring adjacent to the Elstow Brook.

4.3 During the current detailed survey two soil types were mapped which correlate with the soils contained within the Efford 1 Association. Whilst individual borings corresponding with the Thames Association were found it was not considered to be extensive enough to warrant a separate mapping unit alongside the Elstow Brook. The real extent of the two mapping units is shown on the accompanying soil type map.

(*1) EFFORD 1 ASSOCIATION. Well drained fine loamy soils often over gravel, associated with similar permeable soils variably affected by groundwater.

(*2) THAMES ASSOCIATION. Stoneless mainly calcareous clayey soils affected by groundwater.

4.4 SOIL TYPE A (11.5 ha)

Slightly stony brown sandy clay loam or medium sandy loam over slightly to moderately stony sandy clay loam or clay loam over hoggin/sand and gravel.

Topsoil	Texture	sandy clay loam or medium sandy loam
	CaCO ₃	non calcareous
	Colour	brown (10YR4/3 and 7.5YR4/3)
	Stone	typically 5-7% small and medium subangular flints
	Structure	cultivated
	Roots	many fine and very fine
	Boundary	abrupt smooth
	Depth	28/33 cm
Upper		
Subsoil	Texture	sandy clay loam or clay loam
	CaCO ₃	non calcareous
	Colour	brown or yellowish brown (7.5YR 5/4 or 10YR5/5)
	Stone	typically 10-20% small and medium angular flints
	Structure	moderate medium and coarse subangular blocky
	Consistence	firm
	Porosity	moderate
	Roots	common fine and very fine
	Boundary	sharp smooth
	Depth	45/60 cm
Lower		
Subsoil	Gravelly material*	45/60 cm+

* Gravelly material typically constitutes 30-40% small and medium flints in clay loam or loamy sand matrix.

4.5 SOIL TYPE B (5.1 ha)

Brown very slightly stony medium clay loam or medium sandy loam over yellowish brown medium clay loam or medium sandy loam occasionally becoming loamy medium sand at depth.

Topsoil	Texture	medium clay loam or medium sandy loam
	CaCO ₃	non calcareous
	Colour	brown (10YR4/3)
	Stone	typically 2-3% small flints
	Structure	cultivated
	Roots	many fine and very fine
	Boundary	sharp smooth
	Depth	28/33 cm

Upper

Subsoil	Texture	medium clay loam or medium sandy loam
	CaCO ₃	occasionally slightly calcareous
	Colour	yellowish brown (10YR 5/6)
	Stone	typically 1-2% small flints
	Structure	moderate medium and coarse subangular blocky
	Consistence	friable
	Porosity	moderate
	Roots	many fine and very fine
	Boundary	clear smooth
	Depth	45-60 cm

Lower

Subsoil	Texture	medium sandy loam or loamy medium sand
	CaCO ₃	calcareous
	Colour	yellowish brown (10YR5/6)
	Stone	none
	Structure	weak medium subangular blocky
	Consistence	friable
	Porosity	moderate to very porous
	Roots	common becoming few fine and very fine
	Depth	120 cm+

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Resource Planning Group
Cambridge

References

Agricultural Research Council Soil Survey, 1969. Special Survey No 1 Soils of the Luton and Bedford District.

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

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