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STATEMENT OF PHYSICAL CHARACTERISTICS

MANOR FARM, PENNINGTON, HAMPSHIRE

Ministry of Agriculture Fisheries and Food

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1. BACKGROUND

1.1 The 5.07 ha site was inspected on June 19th 1990 in connection with proposals for mineral extraction. The site lies to the south-west of Lymington and Pennington in Hampshire, just to the south of the A337. It is bounded to the south by a track and to the west by Iley Lane. The remaining boundaries are marked by fences.

1.2 The site was surveyed using 100 cm and 120 cm Dutch soil augers with samples being taken at approximately 100 m intervals across the site. In addition one soil inspection pit was examined.

Land-Use

1.3 At the time of survey the site was under grassland.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

2.1 The site lies at approximately 10-15 m A.O.D., falling very gently towards the south. Gradient is not a significant limitation in terms of land quality at this locality.

Climate

2.2 Estimates of climatic variables were obtained by interpolation from a 5 km grid database, (Met. Office 1989), for a representative location in the survey area.

Table 1: Climatic Interpolation

Grid Ref	SZ 43130942
Altitude (m)	15
Accumulated Temperature (° days, Jan-June)	1550
Average Annual Rainfall (mm)	806
Field Capacity Days	167
Moisture Deficit, wheat (mm)	113
Moisture Deficit, potatoes (mm)	*109*

2.3 The important parameters in assessing an overall climatic limitation are, average annual rainfall, (a measure of overall wetness), and accumulated temperature, (a measure of the relative warmth of a locality). Accumulated temperature for this locality is moderately high in national terms, and there is no overall climatic limitation affecting the land quality of the site. However, climatic factors do affect interactive limitations between soil and climate, namely soil wetness and droughtiness.

Geology and Soils

2.4 British Geological Survey, Sheet 330, Lymington (1978) shows the site to be underlain by Pleistocene and Recent deposits of Plateau Gravel.

2.5 Soil Survey of England and Wales Sheet 6, Soils of South East England (1983) maps the Efford 1 Soil association across the area of the site. These are described as slightly to moderately stony, fine loamy typical argillic brown earths with gravelly subsoils.

2.6 Detailed field examination of the soils indicates the occurrence of one soil group across the site.

2.7 Profiles typically comprise non-calcareous medium clay loam, or occasionally medium silty clay loam or sandy clay loam topsoils which are commonly slightly stony, (i.e. containing between about 2 and 5% v/v of small and medium angular flints). These overlie

similar textures in the upper subsoil, but commonly pass to heavier textures with depth, such as heavy clay loam and medium clay. Profiles are slightly stony throughout, typically containing between 2 and 10% v/v of small and medium angular flints, and commonly becoming impenetrable (to soil auger), over gravel or gravelly horizons at variable depths greater than 45 cm. Drainage imperfections as evidenced by mottling and gleying in the subsoil, (typically from 28 to 55 cm depth), are common in these soils although occasional profiles are well-drained.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The ALC grading of the survey area is primarily determined by interactions between climate and soil factors, namely wetness and droughtiness. ALC grade 3a was mapped across the entire site as shown below.

Grade	ha	% of total agricultural land
3a	5.07	100
Total agricultural area	5.07	

3.2 Appendix 1 gives a generalised description of the sub-grade identified in this survey.

3.3 Grade 3a

Land of this quality extends across the entire area of the site. Profiles typically comprise non-calcareous medium clay loam, or occasionally medium silty clay loam or sandy clay loam topsoils which are commonly slightly stony, (i.e. c. 2-5% v/v of small and medium angular flints). The upper subsoils have similar textures but commonly pass to heavier textures with depth, such as heavy clay loam and medium clay. Profiles are slightly stony throughout, typically containing between 2 and 10% v/v of small and medium

angular flints. The presence of gravel or gravelly horizons at depths greater than 45 cm cause the soils to become impenetrable to soil auger, typically within 1 m.

Mottling and gleying, which is indicative of drainage imperfections, are common in the subsoil between about 28 and 55 cm depth. Such profiles are assigned to wetness class II or III. Occasional profiles do not show evidence of imperfect drainage and thereby fall into wetness class I.

Although the afore-mentioned drainage problems act as a limitation to the agricultural potential of these soils, the most significant limitation in terms of land quality at this locality is droughtiness. This results from the relatively shallow depth of soils over gravel or gravelly horizons. The effect of this is to reduce the amount of water available to crops thereby limiting the agricultural land quality to grade 3a.

4. SOIL RESOURCES

Soil Units: Consideration for Restoration

4.1 The description of soil units given below provides an indication of the pattern of soil resources on the site. It should be emphasised that this information should not be viewed in the context of soil stripping, but is merely an illustration of the soil resources available for restoration on the site. When considering these details it is important to remember that the maximum depth of soil sampling was 120 cm. In some cases soil forming materials extend below this depth.

Topsoil

4.2 One topsoil unit was identified across the site. It typically comprises an average 28.7 cm, (with a range of 20-32cm), of very dark or dark greyish brown, (10YR 3/2 and 4/2), medium clay loam, or occasionally medium silty clay loam or sandy clay loam. The soils are commonly slightly stony, containing about 2-5% v/v of medium angular flints, and non-calcareous.

Average depth (cm):		28.7
Area (ha)	:	5.07
Volume (m^3)	:	14550.9

Subsoil

4.3 One subsoil unit was identified, this having an average depth of 46.6 cm, although it should be noted that the range of depths is considerable, (i.e., between 15 and 90 cm) due to the variation in depth of soil over gravel or gravelly horizons. The unit commonly comprises dark greyish brown, greyish brown, brown or yellowish brown (10YR 4/2, 5/2, 5/3, 4/3 and 5/4) medium or heavy clay loam or occasionally sandy clay loam. Typically the soils become heavier at depth, sometimes passing to medium clay at variable depths.

These subsoils are characteristically slightly stony (i.e. containing between 2 and 10% v/v of small and medium angular flints) and become impenetrable, (to soil auger) over gravel or gravelly horizons at variable depths greater than 45 cm but usually within 1 m.

At the time of survey the dry weather and soil conditions, along with the slight stoniness of the profiles made it impossible to dig and examine the subsoils below 45 cm. It was therefore difficult to determine soil structure. However, the structure of the upper subsoil was found to be moderately well developed, and composed of medium to coarse angular blocky peds of friable consistence.

Average depth (cm)	:	46.6
Area (ha)	:	5.07
Volume (m^3)	:	23626.2

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SOURCES OF REFERENCE

BRITISH GEOLOGICAL SURVEY, (1978), Sheet 330, Lymington.

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

METEOROLOGICAL OFFICE (1989) Climatological Data-sets for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1983), Sheet 6, Soils of South-East England.

SOIL SURVEY OF ENGLAND AND WALES (1985) Bulletin 15 - Soils and their use in South-East England.

APPENDIX 1

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

Grade 1 – excellent quality agricultural land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

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 and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 – good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a – good quality agricultural land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

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.

Grade 4 – poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 – very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough *grazing, except for occasional pioneer forage crops.*

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: golf courses, private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six revised soil wetness classes (Hodgson, in preparation) are identified and are defined in Table 11.

Table 11 Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years[2].
II	The soil profile is wet within 70 cm depth for 31-90 days in most years *or*, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years *or*, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days,but only wet within 40 cm depth for between 31 and 90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years *or*, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

[1] The number of days specified is not necessarily a continuous period.

[2] 'In most years' is defined as more than 10 out of 20 years.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.