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# M40 Motorway Service Areas
# Site 8 Lower Farm Waterstock
# Agricultural Land Classification
# ALC Map and Summary Report
# October 1994

# AGRICULTURAL LAND CLASSIFICATION REPORT

## M40 MOTORWAY SERVICE AREAS
## SOUTH OXFORDSHIRE DISTRICT COUNCIL, LOWER FARM WATERSTOCK
## AGRICULTURAL LAND CLASSIFICATION


**Summary**

1 1 ADAS was commissioned by MAFF s Land Use Planning Unit to provide information on land quality on land at Lower Farm Waterstock This work was in connection with proposed M40 motorway service areas

1 2 Approximately 25 hectares of land relating to this area was surveyed in September 1994 The survey was undertaken at a detailed level of approximately one boring per hectare A total of 16 borings and 2 soil inspection pits were assessed in accordance with MAFF s revised guidelines and criteria for grading the quality of agricultural land (MAFF 1988) These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long term limitations on its use for agriculture

1 3 The work was carried out by members of the Resource Planning Team in the Huntingdon Statutory Group of ADAS

1 4 At the time of survey the agricultural land use was predominantly rough grassland with a small area of grass ley The Non agricultural area includes a scrambling track and steep wooded embankments The area of Urban includes the M40 other roads and a hard standing storage area to the west of Lower Farm

1 5 The distribution of the grades and subgrades is shown on the attached ALC map and the areas are given in the table below The map has been drawn at a scale of 1 10 000 It is accurate at this scale but any enlargement would be misleading This map supersedes any previous survey information for this site

**Table 1 Distribution of Grades and Subgrades**

| Grade | Area (ha) | % of Site | % of Agricultural Area |
|---|---|---|---|
| 3a | 1 1 | 4 4 | 13 0 |
| 3b Disturbed | 6 6 | 26 5 | 77 6 |
| 3b | 0 8 | 3 2 | 9 4 |
| Non Agricultural | 4 6 | 18 5 | |
| Woodland | 2 5 | 10 1 | |
| Urban | 9 3 | 37 3 | |
| **Total** | **24 9 ha** | **100%** | **100% (8 5 ha)** |

1 6 A general description of the grades subgrades and land use categories is provided in Appendix 1 The main classes are described in terms of the type of limitation that can occur the typical cropping range and the expected level and consistency of yield

1 7 The land quality on the site has been classified as predominantly subgrade 3b (moderate quality land) of which the majority is disturbed and a small area of subgrade 3a (good quality land) The agricultural land is limited by moderate or significant wetness and workability constraints depending upon location

1 8 The western part of the site is mapped as non agricultural land This area is currently used for scrambling and contains several old soil bunds A narrow band of woodland follows the line of the dismantled railway and motorway embankments Urban land includes the M40 and associated slip roads

## 2 0 Climate

2 1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions

2 2 The main parameters used in the assessment of on overall climatic limitation are average annual rainfall as a measure of overall wetness and accumulated temperature as a measure of the relative warmth of a locality The combination of rainfall and temperature at this site mean an overall climatic grade of 1

**Table 2 Climatic Interpolation**

| | |
|---|---|
| Grid Reference | SP623048 |
| Altitude (m AOD) | 65 |
| Accumulated Temperature ( days Jan June) | 1438 |
| Average Annual Rainfall (mm) | 634 |
| Field Capacity Days | 131 |
| Moisture Deficit wheat (mm) | 109 |
| Moisture Deficit potatoes (mm) | 102 |
| Overall Climatic Grade | 1 |

## 3 0 Relief

3 1 The land is situated between the M40 and M40 spur to Oxford and has largely been disturbed in the past The area between the dismantled railway and the northern M40 has been raised using material from the construction of the motorway In general the land slopes gently down to the west falling from approximately 80 m AOD on the top of the embankment in the south east of the site to 63 m AOD along the western boundary There are several steep man made slopes which include the old dismantled railway the edges of the raised land area and old soil bunds Slopes in excess of 20 were measured using a

hand held clinometer but these are all within areas of woodland or the area currently used for motor bike scrambling (i e classified as Non Agricultural) Neither gradient nor relief constitute a limitation to the ALC grade

4 0 **Geology and Soils**

4 1 The published geology map for the site area (BGS Sheet 13 1868 Oxford 1 63 360 Old Series) shows approximately 75% of the site to be underlain by Middle Oolite Upper or Lower Calcareous Grit with the remaining 25% mapped as Upper Oolite Kimmeridge Clay

4 2 The soils of the area have been mapped on two occasions firstly in 1980 at a scale of 1 25 000 (Sheet SP60 Tiddington Soil Survey Record No 98) This map shows the majority of the site to comprise fine loamy over slowly permeable clayey soils (i e Rowsham Series) Smaller areas of Waterstock and Shabbington Series soils also occur and are both described as loamy drift over Head or river terrace deposits with the former being more flinty

4 3 The reconnaissance scale but more recent 1 250 000 scale soil map (SSEW 1983 Sheet 6) shows the majority of the site to comprise the Wickham 2 Association (*1) with a small area of Shabbington Association (*2) This information broadly concurs with the soil data mapped on the more detailed map (paragraph 4 2)

5 0 **Agricultural Land Classification**

5 1 The ALC classification of the site is shown on the attached ALC map

5 2 The location of the soil observation points is shown on the attached sample point map

**Subgrade 3a**

5 3 A very small area of land has been graded 3a to the south east of the dismantled railway line Soils typically comprise very slightly stony sandy clay loam topsoils over similar or slightly heavier upper subsoils These horizons are sometimes calcareous however profiles are rarely calcareous throughout The

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(*1) Wickham 2 Association Slowly permeable seasonally waterlogged fine loamy over clayey fine silty over clayey and clayey soils Small areas of slowly permeable calcareous soils on steeper slopes

(*2) Shabbington Association Deep fine loamy and fine loamy over sandy soils variably affected by groundwater Some slowly permeable seasonally waterlogged fine loamy over clayey soils

lower subsoils comprise gleyed clays typically below 35 40 cm which become slowly permeable from 55 60 cm Wetness class has been assessed as III which combines with the fine topsoil textures to limit the land to subgrade 3a due to moderate wetness and workability imperfections

**Subgrade 3b (disturbed)**

5 4 Most of the land graded 3b has been disturbed and occurs to the north of the dismantled railway line Soils look mixed are heavy textured contain grit/sand lenses and are poorly drained Topsoils typically comprise heavy clay loam or sandy clay loams which occasionally become mixed with the underlying slowly permeable clay which typically occurs below 25 cms depth The clay subsoils are calcareous and contain occasional large limestone rocks The wetness class has been assessed as IV which combines with the relatively heavy topsoils to limit the land to 3b due to significant wetness and workability imperfections

**Subgrade 3b (undisturbed)**

5 5 A small area of undisturbed subgrade 3b land has been mapped to the south of the dismantled railway Topsoils typically comprise very slightly stony non calcareous heavy clay loams over slowly permeable calcareous clays below 25 30 cms Wetness class has been assessed as IV which together with heavy textured topsoils imposes significant wetness and workability limitations which restrict the land to subgrade 3b (moderate quality land)

**Non agricultural**

5 6 Land mapped as non agricultural comprises a motorcycle scrambling track which contains several soils bunds of varying size

**Woodland**

5 7 Woodland is mapped on the dismantled railway and along the steep slopes which surround the raised land area

**Urban**

5 8 The M40 and associated slip roads and embankments together with the hard standing storage area to the west of Lower Farm are mapped as Urban

## REFERENCES


GEOLOGICAL SURVEY OF ENGLAND AND WALES 1868 Oxford sheet 13 1 63 360 Old Series

MAFF 171 Agricultural Land Classification map sheet 158 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 Data extracted from the published agroclimatic dataset

SOIL SURVEY OF ENGLAND AND WALES 1980 Sheet SP60 Tiddington Soils in Oxfordshire II 1 25 000 scale

SOIL SURVEY OF ENGLAND AND WALES 1983 Sheet 6 South East England 1 250 000 scale

SOIL SURVEY OF ENGLAND AND WALES 1984 Soils and their use in South East England by M G Jarvis *et al* Harpenden

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 of 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 in 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 farmland predominates The remainder is very poor quality land in Grade 5 which most occurs in the uplands

### 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 include 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 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 levels of yields It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yield of which are variable In most 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 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 (e g polythene tunnels erected for lambing) may be ignored

**Open water**

Includes lakes ponds and rivers as map scale permits

**Land not surveyed**

Where the land use includes more than one of the above land cover types e g 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

Appendix 2

## FIELD ASSESSMENT OF SOIL WETNESS CLASS

### 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

Appendix 3

# SOIL BORING AND SOIL PIT DESCRIPTIONS

Contents

| SAMPLE | DEPTH | TEXTURE | COLOUR | MOTTLES COL | ABUN | CONT | PED COL | GLEY | STONES 2 | 6 | LITH | TOT | STRUCT/ CONSIST | SUBS STR | POR | IMP | SPL | CALC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 0 25 | mcl | 10YR43 00 | | | | | | 1 | 0 | HR | 1 | | | | | | |
| | 25 120 | c | 10YR53 54 | 10YR58 00 | C | | | Y | 0 | 0 | HR | 3 | | P | Y | | Y | |
| 5 | 0 30 | cl | 10YR43 00 | | | | | | 2 | 0 | HR | 2 | | | | | | |
| | 30 45 | l | 10YR55 00 | | | | | | 0 | 0 | HR | 1 | | M | | | | |
| | 45 50 | scl | 10YR55 00 | 10YR58 00 | C | | | S | 0 | 0 | HR | 2 | | M | | | | |
| | 50 120 | c | 10YR55 00 | 10YR58 00 | C | | | S | 0 | 0 | HR | 2 | | P | Y | | Y | |
| 6 | 0 20 | scl | 10YR43 00 | | | | | | 5 | 0 | HR | 5 | | | | | | |
| | 20 120 | c | 10YR41 00 | 10YR58 00 | C | | | Y | 0 | 0 | HR | 10 | | P | Y | | Y | Y |
| 9 | 0 30 | scl | 10YR43 00 | | | | | | 5 | 0 | HR | 5 | | | | | | |
| | 30 45 | scl | 10YR54 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 45 75 | scl | 10YR56 00 | | | | | | 0 | 0 | HR | 8 | | M | | | | |
| | 75 90 | lcs | 10YR56 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | Y |
| | 90 120 | c | 10YR51 00 | 10YR58 00 | C | | | Y | 0 | 0 | | 0 | | P | Y | | | Y |
| 9P | 0 25 | scl | 10YR43 00 | | | | | | 3 | 0 | HR | 3 | | | | | | Y |
| | 25 50 | scl | 10YR55 00 | | | | | | 0 | 0 | HR | 5 | MDCSAB FR | M | | | | Y |
| | 50 65 | scl | 10YR55 00 | | | | | | 0 | 0 | HR | 11 | WKMSAB FR | G | | | | Y |
| | 65 120 | c | 10YR55 00 | 10YR58 00 | C | | 25Y 53 00 | S | 0 | 0 | HR | 5 | WKVCSB FM | P | Y | | Y | Y |
| 10 | 0 20 | scl | 10YR43 00 | | | | | | 3 | 0 | HR | 4 | | | | | | |
| | 20 30 | c | 10YR43 00 | 10YR51 00 | C | | | S | 0 | 0 | HR | 10 | | M | | | | Y |
| | 30 40 | c | 10YR43 00 | 10YR51 00 | C | | | S | 0 | 0 | HR | 20 | | M | | | | Y |
| | 40 50 | scl | 10YR54 00 | | | | | | 0 | 0 | HR | 20 | | M | | | | Y |
| | 50 120 | c | 10YR51 00 | 10YR58 00 | C | | | Y | 0 | 0 | HR | 30 | | P | | | Y | Y |
| 11 | 0 20 | scl | 10YR43 00 | | | | | | 5 | 0 | HR | 5 | | | | | | |
| | 20 35 | c | 10YR51 00 | 10YR58 00 | C | | | Y | 0 | 0 | HR | 5 | | P | Y | | Y | Y |
| | 35 120 | c | 10YR42 00 | 10YR58 00 | C | | | Y | 0 | 0 | HR | 8 | | P | Y | | Y | Y |
| 12 | 0 25 | hcl | 10YR43 00 | | | | | | 5 | 0 | HR | 5 | | | | | | |
| | 25 120 | c | 25Y 41 00 | 10YR58 00 | C | | | Y | 0 | 0 | HR | 5 | | P | Y | | Y | Y |
| 13 | 0 20 | hcl | 10YR43 00 | | | | | | 3 | 0 | HR | 3 | | | | | | |
| | 20 120 | c | 10YR42 00 | 10YR58 00 | C | | | Y | 0 | 0 | HR | 10 | | P | Y | | Y | Y |
| 14 | 0 20 | scl | 10YR42 00 | | | | | | 5 | 0 | HR | 5 | | | | | | Y |
| | 20 120 | c | 10YR41 00 | 10YR58 00 | C | | | Y | 0 | 0 | HR | 10 | | P | Y | | Y | Y |
| 16 | 0 25 | hcl | 10YR43 00 | | | | | | 4 | 0 | HR | 5 | | | | | | |
| | 25 35 | hcl | 10YR54 00 | 10YR58 00 | F | | | | 0 | 0 | HR | 10 | | M | | | | |
| | 35 50 | scl | 10YR56 00 | | | | | | 0 | 0 | HR | 15 | | M | | | | |
| | 50 120 | | 10YR51 00 | 10YR58 00 | C | | | Y | 0 | 0 | HR | 1 | | P | | | Y | |
| 17 | 0 25 | hcl | 10YR43 00 | | | | | | 1 | 0 | HR | 1 | | | | | | |
| | 25 45 | c | 10YR52 54 | 75YR58 00 | C | | | Y | 0 | 0 | | 0 | | P | Y | | Y | |
| | 45 65 | c | 10YR64 63 | 75YR58 00 | C | | | Y | 0 | 0 | HR | 3 | | P | Y | | Y | |
| | 65 120 | | 25Y 51 52 | 75YR58 00 | C | | | Y | 0 | 0 | | 0 | | P | Y | | Y | |

| | | | | MOTTLES | | | PED | | STONES | | | | STRUCT/ | SUBS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE | DEPTH | TEXTURE | COLOUR | COL | ABUN | CONT | COL | GLEY | 2 | 6 | LITH | TOT | CONSIST | STR | POR | IMP | SPL | CALC | |
| 18 | 0 25 | hcl | 10YR43 52 | | | | | | 1 | 0 | HR | 1 | | | | | | | |
| | 25 40 | c | 10YR52 53 | 10YR58 | 00 | C | | Y | 0 | 0 | HR | 10 | | P | Y | | Y | Y | |
| | 40 120 | c | 25Y 41 51 | 10YR58 | 00 | C | | Y | 0 | 0 | HR | 1 | | P | Y | | Y | | |
| 19 | 0 30 | hcl | 10YR42 43 | 10YR58 | 00 | F | | | 2 | 0 | HR | 2 | | | | | | | |
| | 30 45 | c | 25Y 51 61 | 10YR58 | 00 | C | 25Y 62 | 00 Y | 0 | 0 | HR | 5 | | P | Y | | Y | Y | |
| | 45 120 | c | 05Y 51 00 | 10YR58 | 00 | C | | Y | 0 | 0 | | 0 | | P | Y | | Y | Y | |
| 19P | 0 20 | hcl | 10YR43 42 | 10YR58 | 00 | F | | | 2 | 0 | HR | 3 | | | | | | | MIXED SOIL |
| | 20 120 | c | 25Y 52 51 | 10YR58 | 00 | C | | Y | 0 | 0 | HR | 8 | WKVCAB FM | P | Y | | Y | Y | MIXED SOIL |
| 20 | 0 20 | hcl | 10YR43 51 | | | | | | 2 | 0 | HR | 2 | | | | | | | |
| | 20 120 | c | 10YR51 00 | 10YR58 | 00 | C | | Y | 0 | 0 | HR | 5 | | P | Y | | Y | Y | |
| 22 | 0 25 | scl | 10YR43 00 | | | | | | 2 | 0 | HR | 2 | | | | | | Y | |
| | 25 40 | scl | 10YR55 00 | 10YR56 | 00 | F | | | 0 | 0 | HR | 2 | | M | | | | | |
| | 40 55 | c | 10YR53 00 | 10YR56 | 00 | C | | Y | 0 | 0 | HR | 2 | | M | | | | Y | |
| | 55 120 | c | 10YR51 00 | 10YR58 | 00 | C | | Y | 0 | 0 | | 0 | | P | Y | | Y | Y | |
| 23 | 0 25 | scl | 10YR43 00 | | | | | | 2 | 0 | HR | 2 | | | | | | | |
| | 25 35 | scl | 10YR54 55 | 10YR58 | 00 | F | | | 0 | 0 | HR | 5 | | M | | | | | |
| | 35 40 | sc | 10YR53 54 | 10YR58 | 00 | C | | Y | 0 | 0 | HR | 5 | | M | | | | | |
| | 40 60 | c | 10YR53 54 | 10YR58 | 00 | C | | Y | 0 | 0 | HR | 5 | | M | | | | Y | |
| | 60 120 | | 10YR51 00 | 10YR58 | 00 | C | | Y | 0 | 0 | | 0 | | P | Y | | Y | Y | |

| SAMPLE NO | GRID REF | USE | ASPECT | GRDNT | GLEY | SPL | WETNESS CLASS | WHEAT GRADE | POTS AP | POTS MB | M REL AP | M REL MB | DRT | FLOOD | EROSN EXP | FROST DIST | CHEM LIMIT | ALC | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | SP62100490 | OTH | SW | 01 | 025 | 025 | 4 | 3B | 124 | 15 | 101 | 2 | 2 | | | | WE | 3B | NON AG |
| 5 | SP62200490 | OTH | SW | 03 | | 050 | 2 | 2 | 128 | 19 | 105 | 2 | 2 | | | | WD | 2 | NONAG SLGLEY |
| 6 | SP62500490 | RGR | NW | 02 | 020 | 020 | 4 | 3B | 112 | 3 | 91 | 12 | 3A | | | Y | WE | 3B | DISTURBED |
| 9 | SP62100480 | OTH | W | 02 | 090 | 090 | 1 | 1 | 128 | 19 | 105 | 2 | 2 | | | | DR | 2 | NON AG |
| 9P | SP62100480 | OTH | W | 01 | | 065 | 2 | 2 | 127 | 18 | 103 | 0 | 2 | | | | WD | 2 | NONAG SLGLEY |
| 10 | SP62200480 | OTH | W | 03 | | 050 | 2 | 2 | 108 | 1 | 91 | 12 | 3A | | | Y | DR | 3A | NONAG SLGLEY |
| 11 | SP62300480 | OTH | W | 02 | 020 | 020 | 4 | 3B | 114 | 5 | 93 | 10 | 2 | | | Y | WE | 3B | DISTURBED |
| 12 | SP62400480 | RGR | NW | 03 | 025 | 025 | 4 | 3B | 121 | 12 | 99 | 4 | 2 | | | Y | WE | 3B | DISTURBED |
| 13 | SP62500480 | RGR | NW | 03 | 020 | 020 | 4 | 3B | 115 | 6 | 94 | 9 | 2 | | | Y | WE | 3B | DISTURBED |
| 14 | SP62600480 | RGR | NW | 02 | 020 | 020 | 4 | 3B | 112 | 3 | 91 | 12 | 3A | | | Y | WE | 3B | DISTURBED |
| 16 | SP62300470 | OTH | W | 03 | 050 | 050 | 2 | 2 | 125 | 16 | 102 | 1 | 2 | | | Y | WD | 2 | NON AG |
| 17 | SP62400470 | LEY | W | 01 | 025 | 025 | 4 | 3B | 126 | 17 | 102 | 1 | 2 | | | | WE | 3B | |
| 18 | SP62500470 | RGR | SW | 04 | 025 | 025 | 4 | 3B | 124 | 15 | 101 | 2 | 2 | | | Y | WE | 3B | DISTURBED |
| 19 | SP62600470 | RGR | SW | 03 | 030 | 030 | 4 | 3B | 127 | 18 | 104 | 1 | 2 | | | Y | WE | 3B | DISTURBED |
| 19P | SP62600470 | RGR | NW | 01 | 020 | 020 | 4 | 3B | 116 | 7 | 95 | 8 | 2 | | | Y | WE | 3B | DISTURBED |
| 20 | SP62700470 | RGR | SW | 05 | 020 | 020 | 4 | 3B | 119 | 10 | 97 | 6 | 2 | | | Y | WE | 3B | DISTURBED |
| 22 | SP62600460 | LEY | SW | 02 | 040 | 055 | 2 | 2 | 129 | 20 | 107 | 4 | 2 | | | | WD | 2 | |
| 23 | SP62500465 | LEY | SW | 03 | 035 | 060 | 3 | 3A | 128 | 19 | 107 | 4 | 2 | | | | WE | 3A | |

SOIL PIT DESCRIPTION

Site Name M40 MSA LOWER FARM WTS P t N mbe 9P

Grid Reference SP62100480 Ave age A al Ra nfall 634 mm
Acc mulated Temperat re 1438 degree days
Field Capacity Level 131 days
Land Use
Slope and Aspect 01 degrees W

| HORIZON | TEXTURE | COLOUR | STONES 2 | TOT STONE | LITH | MOTTLES | STRUCTURE | CONSIST | SUBSTRUCTURE | CALC |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 25 | SCL | 10YR43 00 | 3 | 3 | HR | | | | | Y |
| 25 50 | SCL | 10YR55 00 | 0 | 5 | HR | | MDCSAB | FR | M | Y |
| 50 65 | SCL | 10YR55 00 | 0 | 11 | HR | | WKMSAB | FR | G | Y |
| 65 120 | C | 10YR55 00 | 0 | 5 | HR | C | WKVCSB | FM | P | Y |

Wetness Grade 2 Wetness Class II
Gleying cm
SPL 065 cm

Dro ght Grade 2 APW 127mm MBW 18 mm
APP 103mm MBP 0 mm

FINAL ALC GRADE 2
MAIN LIMITATION Soil Wetness/Dro ghtiness

SOIL PIT DESCRIPTION

Site Name M40 MSA LOWER FARM WTS Pit Number 19P

Grid Reference SP62600470 Average Annual Rainfall 634 mm
Accumulated Temperature 1438 degree days
Field Capacity Level 131 days
Land Use Rough Grazing
Slope and Aspect 01 degrees NW

| HORIZON | TEXTURE | COLOUR | STONES | 2 | TOT STONE | LITH | MOTTLES | STRUCTURE | CONSIST | SUBSTRUCTURE | CALC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 20 | HCL | 10YR43 42 | 2 | | 3 | HR | F | | | | |
| 20 120 | C | 25Y 52 51 | 0 | | 8 | HR | C | WKVCAB | FM | P | Y |

Wetness Grade 3B Wetness Class IV
Gleying 020 cm
SPL 020 cm

Drought Grade 2 APW 116mm MBW 7 mm
APP 95 mm MBP 8 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Wetness

Appendix 3 (Cont)

## SOIL PROFILE DESCRIPTIONS EXPLANATORY NOTE

Soil profile and pit information obtained during ALC surveys is held on a database This has commonly used notations and abbreviations as set out below

## BORING HEADERS

1 GRID REF National grid square followed by 8 figure grid reference

2 USE Land use at the time of survey
The following abbreviations are used

ARA arable
WHT wheat
BAR barley
CER cereals
OAT oats
MZE maize
OSR oilseed rape
BEN field beans
BRA brassicae
POT potatoes
SBT sugar beet
FDC fodder crops
FRT soft and top fruit
HOR/HRT horticultural crops
PAS/PGR permanent pasture
RGR rough grazing
LEY ley grassland
CFW coniferous woodland
DCW deciduous woodland
SCR scrub
HTH heathland
BOG bog or marsh
FLW fallow
PLO ploughed
SAS set aside
OTH other
LIN linseed

3 GRDNT Gradient as measured by optical reading clinometer

4 GLEY/SPL Depth in centimetres (cm) to gleyed and/or slowly permeable horizons

5 AP (WHEAT/POTS) Crop adjusted available water capacity The amount of soil water (in millimetres) held in the soil profile that is available to a growing crop (wheat and potatoes are used as reference crops)

6 MB (WHEAT/POTS) The moisture balance for wheat and potatoes obtained by subtracting the soil moisture deficit from the crop adjusted available water capacity

7 DRT Grade according to soil droughtiness assessed against soil moisture balances

8

| | | |
|---|---|---|
| M REL | Micro relief | ) |
| FLOOD | Flood risk | ) If any of these factors are |
| EROSN | Soil erosion | ) considered significant in terms |
| of | | |
| EXP | Exposure | ) the assessment of agricultural |
| land | | |
| FROST | Frost prone | ) quality a y will be entered in the |
| DIST | Disturbed land | ) relevant column |
| CHEM | Chemical limitation | ) |

9 LIMIT Principal limitation to agricultural land quality
The following abbreviations are used

| | |
|---|---|
| OC overall climate | CH chemical limitations |
| AE aspect | WE wetness |
| EX exposure | WK workability |
| FR frost | DR drought |
| GR gradient | ER erosion |
| MR micro relief | WD combined soil wetness/soil droughtiness |
| TX soil texture | ST topsoil stoniness |
| DP soil depth | |

## PROFILES AND PITS

1 TEXTURE Soil texture classes are denoted by the following abbreviations

| | |
|---|---|
| S | sand |
| LS | loamy sand |
| SL | sandy loam |
| SZL | sandy silt loam |
| ZL | silt loam |
| MZCL | medium silty clay loam |
| MCL | medium clay loam |
| SCL | sandy clay loam |
| HZCL | heavy silty clay loam |
| HCL | heavy clay loam |
| SC | sandy clay |
| ZC | silty clay |
| C | clay |

For the sand loamy sand sandy loam and sandy silt loam classes the predominant size of sand fraction may be indicated by the use of prefixes

F fine (more than ⅔ of the sand less than 0 2 mm)
C coarse (more than ⅓ of sand greater than 0 6 mm)
M medium (less than ⅔ fine sand and less than ⅓ coarse sand)

The sub divisions of clay loam and silty clay loam classes according to clay content are indicated as follows

M medium (less than 27% clay)
H heavy (27 35% clay)

Other possible texture classes include

OL organic loam
P peat
SP sandy peat
LP loamy peat
PL peaty loam
PS peaty sand
MZ marine light silts

2 MOTTLE COL Mottle colour

3 MOTTLE ABUN Mottle abundance

F few less than 2% of matrix or surface described
C common 2 20% of the matrix
M many 20 40% of the matrix
VM very many 40% + of the matrix

4 MOTTLE CONT Mottle continuity

F faint indistinct mottles evident only on close examination
D distinct mottles are readily seen
P prominent mottling is conspicuous and one of the outstanding features of the horizon

5 PED COL Ped face colour

6 STONE LITH Stone lithology One of the following is used

HR all hard rocks or stones
MSST soft medium or coarse grained sandstone
SI soft weathered igneous or metamorphic
SLST soft oolitic or dolomitic limestone
FSST soft fine grained sandstone
ZR soft argillaceous or silty rocks
CH chalk
GH gravel with non porous (hard) stones
GS gravel with porous (soft) stones

Stone contents (>2 cm >6 cm and total) are given in percentages (by volume)

7 STRUCT the degree of development size and shape of soil peds are described using the following notation

| | |
|---|---|
| degree of development | WK weakly developed |
| | MD moderately developed |
| | ST strongly well developed |
| ped size | F fine |
| | M medium |
| | C coarse |
| | VC very coarse |
| ped shape | S single grain |
| | M massive |
| | GR granular |
| | SB/SAB sub angular blocky |
| | AB angular blocky |
| | PR prismatic |
| | PL platy |

8 CONSIST Soil consistence is described using the following notation

L loose
VF very friable
FR friable
FM firm
VM very firm
EM extremely firm
EH extremely hard

9 SUBS STR Subsoil structural condition recorded for the purpose of calculating profile droughtiness

G good
M moderate
P poor

10 POR Soil porosity If a soil horizon has less than 0 5% biopores >0 5 mm a y will appear in this column

11 IMP If the profile in impenetrable a y will appear in this column at the appropriate horizon

12 SPL slowly permeable layer If the soil horizon is slowly permeable a y will appear in this column

13 CALC If the soil horizon is calcareous a y will appear in this column

14 Other Notations

| | |
|---|---|
| APW | available water capacity (in mm) adjusted for wheat |
| APP | available water capacity (in mm) adjusted for potatoes |
| MBW | moisture balance wheat |
| MBP | moisture balance potatoes |