Land North of Broadbridge, West Sussex

Agricultural Land Quality

Prepared for:

Heaver Homes Ltd

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Our interpretation of the site characteristics is based on available data made during our desktop study and soil survey on site. This desktop study and soil survey has assessed the characteristics of the site in relation to the assessment of its Agricultural Land Classification and soil resources. It should not be relied on for alternative end-uses or for other schemes. This report has been prepared solely for the benefit of King & Co. No warranty is provided to any third party and no responsibility or liability will be accepted for any loss or damage in the event that this report is relied upon by a third party or is used in circumstances for which it was not originally intended.

Version Control Record

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Appendices

1 Introduction

1.1 Background to the Report

This report has been prepared by Tim O'Hare Associates LLP for Heaver Homes Ltd to determine the quality of agricultural land at an approximately 120 hectare (ha) study area proposed for the location of new residential development to the north of Broadbridge, West Sussex ('the Study Area'). The Study Area is located to the north of Broadbridge, near Bosham, West Sussex. It is bordered by the A27 to the north and by the West Coastway Line (Brighton to Southampton) and Bosham Station to the south. The Study Area is divided into two parts located to the east and west of Bosham Stream and Ratham Lane (B2146). The Study Area is located at British National Grid (BNG) refence SP 9283 9204. The boundary of the Study Area is shown on **Appendix 1**.

1.2 Methodology

This assessment of agricultural land quality has followed the approach of the Ministry of Agriculture, Fisheries and Food (MAFF)[1] 'Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land', October, 1988 (henceforth referred to as the 'the ALC Guidelines').

The ALC system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The ALC system divides agricultural land into five grades (Grade 1 'Excellent' to Grade 5 'Very Poor), with Grade 3 subdivided into Subgrade 3a 'Good' and Subgrade 3b 'Moderate'. Agricultural land classified as Grade 1, 2 and Subgrade 3a falls in the 'best and most versatile' category, as set out in the National Planning Policy Framework (see Section 2.0 for further details on the relevant planning policy framework). Further details of the ALC system and national planning policy implications are set out by Natural England in its Technical Information Note 049, given as **Appendix 2**.

This assessment is based upon the findings of a study of published information on topography, geology, climate and soil and MAFF ALC information. The work has been carried out by a Chartered Scientist, who is a Member of the Institute of Professional Soil Scientists (IPSS). The IPSS is the chartered and professional body of the British Society of Soil Science (BSSS). The author meets the requirements of the IPSS Professional Competency Scheme for ALC (see IPSS PCSS Document 2 'Agricultural Land Classification of England and Wales', given as **Appendix 3**). The IPSS Professional Competency Scheme is endorsed, amongst others, by the Department for Environment, Food and Rural Affairs (Defra), Natural England, the Science Council, and the Institute of Environmental Assessment and Management (IEMA) (see Appendix 3 also).

1.3 Structure of the Remainder of this Report

The remainder of this report is structured as follows:

- Section 2 – National Planning Policy Framework;
- Section 3 – Agricultural Land Quality;
  - General
  - Climate;
  - The Site (Gradient, Micro-relief, Risk of Flooding);

[1] The Ministry of Agriculture, Fisheries and Food (MAFF) was incorporated within the Department for Environment, Food and Rural Affairs (Defra) in June 2001

  - Geology and Soil;
  - Interactive Limitations (Soil Droughtiness and / or Soil Wetness);
  - Prediction of ALC within the Study Area
- Section 4 – ALC within the Study Area in Wider Geographical Context
- Section 5 – Summary and Conclusion.

2 Planning Policy Framework

2.1 Background

This section of the report sets out the national planning policy framework in which to assess the opportunities and constraints to development at the Site in agricultural land quality terms.

2.2 National Planning Policy

National planning policy guidance on development involving agricultural land is set out in National Planning Policy Framework (NPPF), which was revised on the 24th July 2018. The NPPF aims to provide a simplified planning framework which sets out the Government's economic, environmental and social planning policies for England. The NPPF includes policy guidance on '*Conserving and Enhancing the Natural Environment*' (Section 15). Paragraph 170 (a and b) (page 49) are of relevance to this assessment of agricultural land quality and soil and state that:

'170…Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;…'

2.3 Local Plan

Adopted Local Plan: Chichester Local Plan Key Policies 2014-2019

The Study Area falls in the Chichester District local plan area. Chichester District Council (CDC) adopted its current local plan on at a meeting on 14 July 2015 (Chichester local plan: key policies 2014-2029). Of most relevance to this assessment, the adopted local plan contains Item 4 of Policy 48, which states that:

'Policy 48 Natural Environment

Planning permission will be granted where it can be demonstrated that all the following criteria have been met: …

4. Development of poorer quality agricultural land has been fully considered in preference to best and most versatile land…'

Under Policy 32 and Section 21 of the Policies Map, the adopted local plan also identifies four Horticultural Development Areas (HDA), as follows:

- Tangmere
- Runcton;
- Sidlesham and Highleigh; and
- Almodington.

The Study Area to the north of Broadbridge is not within a designated HDA.

Chichester Local Plan Review 2035: Preferred Approach - December 2018

A review of the Chichester local plan to 2035 (Preferred Approach – December 2018) requires consideration of the best and most versatile agricultural land under the fourth bullet point of Policy S26 as follows:

'Policy S26: Natural Environment

The Council will continue to work with partner authorities and organisations to protect and enhance the natural environment of the Plan Area. In relation to development proposals this will include:

- *Considering the quality of the agricultural land, with the development of poorer quality agricultural land being preferred to the best and most versatile land.'*

The Chichester Local Plan Review 2035 determined that the existing HDAs at Tangmere, Runcton, Sidlesham and Almodington should be retained.

2.4 Best Practice Guidance

The Department for Environment, Food and Rural Affairs (Defra) has published 'Safeguarding our Soils – A Strategy for England' (24th September 2009). The Soil Strategy was published in tandem with a 'Code of Practice for the Sustainable Use of Soils on Construction Sites'.

The Soil Strategy for England, which builds on Defra's 'Soil Action Plan for England (2004-2006), sets out an ambitious vision to protect and improve soil to meet an increased global demand for food and to help combat the adverse effects of climate change.

3 Agricultural Land Quality within the Study Area

3.1 General

This section of the report sets out the findings of a study of published information on topography, geology, climate and soil and MAFF ALC information, as follows:

(i) topography (re Ordnance Survey contour information);

(ii) geology (re British Geological Survey information);

(iii) climate and soil (re Soil Survey of England and Wales (SSEW) provisional soil information given in '*Soils and their use in South East England*' (SSEW Bulletin No.15, 1984) and accompanying soil map at a scale of 1:250,000;

(iv) Soil Survey of England and Wales (SSEW) 'Soils of the West Sussex Coastal Plain' and accompanying soil map of Chichester (1:25,000) (SSEW, Harpenden, 1967); and

(v) ALC information produced by MAFF and ALC maps provided Natural England, where available.

As described in the ALC Guidelines, the main physical factors influencing agricultural land quality are:

- climate;
- site;
- soil; and
- interactive limitations.

These factors are considered in turn below.

3.2 Climate

Climate data relevant to the determination of the ALC grade of land at the Study Area is given in Table 3.1 below.

Table 3.1: Climate Data for Land North of Broadbridge, West Sussex

Climate Parameter	**Grid Ref: SU 8125 0582**
Average Altitude (mAOD)	7
Average Annual Rainfall (mm)	778
Median Accumulated Temperature above 0˚C (January – June)	1543
Moisture Deficit for Wheat (mm)	116
Moisture Deficit for Potatoes (mm)	112
Mean Field Capacity Days (FCD)	161
Best Grade According to Climate	1

With reference to Table 3.1, 'Grade according to climate' on page 6 of the ALC Guidelines, there is no overall climatic limitation to the quality of agricultural land at the Site. This means that agricultural land

at the Site could be graded as ALC Grade 1 in overall climatic terms, in the absence of any other limiting factor (i.e. site, soil and/or interactive limitations).

Climate interacts with soil to cause certain 'interactive limitations', namely soil wetness, i.e. where the soil moisture regime adversely affects plant growth/seed germination, and/or imposes restrictions to cultivations or grazing by livestock, and soil droughtiness, i.e. a shortage of water stored in the soil that is available for plant uptake during the growing season. Interactive limitations to agricultural land quality at the Site are considered further in Section 3.5.

3.3 The Study Area

With regard to the ALC Guidelines, agricultural land quality can be limited by one or more of three main site factors as follows:

- gradient;
- micro-relief (i.e. complex change in slope angle over short distances); and
- risk of flooding.

Gradient and Micro-Relief

The land within the Study Area is broadly flat at an elevation of approximately 7 metres (m) Above Ordnance Datum (AOD). The quality of agricultural land within the Study Area is not limited by gradient as the angle of slope does not exceed 7°.

From Ordnance Survey maps and aerial images online[2], the quality of agricultural land within the Study Area is not limited by micro-relief, i.e. where there are complex changes in slope angle over short distances.

Risk of Flooding

From a Government Flood Map for Planning[3], land flanking the Bosham Stream, orientated north to south through the middle of the Study Area, is located in Flood Zones 2 and 3 with a high probability of flooding. However, without more detailed flood data, it is not possible to determine if the quality of agricultural land within the Study Area is limited by a risk of flooding in terms of Table 2 'Grade according to flood risk in Summer' and Table 3 'Grade according to flood risk in Winter' of the ALC Guidelines (1988). The land flanking the Bosham Stream is likely to be wet (see soil wetness below).

3.4 Geology and Soil

Geology/Soil Parent Material

British Geological Survey (BGS)[4] information available online has been utilised to show the bedrock underlying the Study Area and any superficial deposits (Drift) covering the bedrock.

The entire Study Area is underlain by London Clay Formation (Clay, Silt And Sand), with a band of Lambeth Group (Clay, Silt And Sand) present from the north-west corner to the south-east.

The Study Area is mainly covered by River Terrace Deposits (undifferentiated Sand, Silt And Clay), with sections of Alluvial Fan Deposits (Gravel, Sand, Silt And Clay and Head - Clay And Gravel) flanking the Bosham Stream.

[2] Google Earth. Available online @ https://www.google.co.uk/intl/en_uk/earth/

[3] Government Flood Risk Map for Planning. Available online @ https://flood-map-for-planning.service.gov.uk/confirm-location?easting=481085&northing=105146&placeOrPostcode=Broadbridge

[4] British Geological Survey 'Geology of Britain Viewer'. Available online @ http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.

Published Soil Information

The Soil Survey of England and Wales (SSEW) soil map of South East England (Sheet 5) at a scale of 1:250,000 and accompanying Bulletin No. 15 '*Soils and their Use in South East England*' (M. G. Jarvis et al, Harpenden, 1984) reports that most of the Study Area is covered by soils grouped in Park Gate association.

The SSEW describes soils in the Park Gate Association mainly consist of seasonally waterlogged, brownish, deep, stoneless, silty soils formed in aeolian (i.e. glacial wind-blown) silty drift mainly over fluvial (river) and marine gravel. A typical profile consists of a brown, stoneless silty clay loam over a brown or greyish brown, mottled, stoneless silty clay loam. The Park Gate soils are affected by a seasonally high groundwater table (Wetness Class III or IV), but agricultural drainage ditches can lower the water-table locally to Wetness Class II.

Within the SSEW's 'Soils of the West Sussex Coastal Plain (Harpenden, 1967)', a more detailed soil map of Chichester (1:25,000) indicates the Study Area comprises soils in the Titchfield, Wickham and Hook series, with some areas with soils in Park Gate, Hamble, Binsted and Gade series.

3.5 Interactive Limitations

From the published information above, it is predicted that agricultural land quality within the Study Area will be limited by soil droughtiness during the growing season (January to June) and by soil wetness over the wetter autumn and winter months.

It is predicted that silty soil profiles in this climate area will be limited by soil droughtiness during the growing season to Grade 2 and possible Subgrade 3a, where the soils are stony.

Soil Wetness

From the ALC Guidelines, a soil wetness limitation exists where 'the soil water regime adversely affects plant growth or imposes restrictions on cultivations or grazing by livestock'.

The ALC grade according to soil wetness at the Site is given in Table 3.2 below (based on Table 6 'Grade According to Soil Wetness – Mineral Soils' in the ALC Guidelines):

Table 3.2: ALC Grade According to Soil Wetness

Wetness Class	Texture of the Top 25 cm	151-175 Field Capacity Days
I	Sandy Silt Loam/Sandy Loam Silt Loam/Medium Silty Clay Loam/Medium Clay Loam* Heavy Silty Clay Loam/Heavy Clay Loam** Silty Clay/Clay	1 1 2 3a
II	Sandy Silt Loam/Sandy Loam Silt Loam/Medium Silty Clay Loam/Medium Clay Loam* Heavy Silty Clay Loam/Heavy Clay Loam** Silty Clay/Clay	1 2 3a 3b
III	Sandy Silt Loam/Sandy Loam Silt Loam/Medium Silty Clay Loam/Medium Clay Loam*	2 3a 3b

	Heavy Silty Clay Loam/Heavy Clay Loam** Silty Clay/Clay	3b
IV	Sandy Silt Loam/Sandy Loam Silt Loam/Medium Silty Clay Loam/Medium Clay Loam* Heavy Silty Clay Loam/Heavy Clay Loam** Silty Clay/Clay	2 3a 3b 3b (3a)
Key * <27% clay; and ** >27% clay Brackets denotes grade for naturally calcareous soils (more than 1% $CaCO_3$) with between 18% and 50% clay content.		

Therefore, it is predicted that soil profiles with silt loam topsoil will be limited by soil wetness to a mixture of Grade 2 (where the profiles are in Wetness Class II) or Subgrade 3a (where the soil profiles are in Wetness Class III or IV).

3.6 Prediction of Agricultural Land Quality within the Study Area

From the published information on climate geology and soil above, it is predicted that the quality of agricultural land within the Study Area will be limited to a mixture of Grade 2 (very good quality) and Subgrade 3a (good quality) due to soil droughtiness during the growing season (January to June) and / or by soil wetness during the autumn and winter months. It is likely that wet ground flanking the Bosham Stream will be limited by soil wetness and / or flood risk to Subgrade 3b (moderate quality) or Grade 4 (poor quality).

4 ALC within the Study Area in a Wider Geographical Context

4.1 Background

The aim of this section is to examine agricultural land quality within the Study Area in a national, regional, county and local context.

4.2 Pre-1988 ALC Information

As described above and in Appendix 1, during the 1960's and 1970's MAFF produced a series of maps to show the provisional ALC grade of agricultural land over the whole of England and Wales at a scale of 1:250,000. These provisional ALC maps are suitable for strategic land use planning only, i.e. they appropriate for land areas greater than 80 ha.

As shown on an extract given as **Appendix 4**, the MAFF provisional (Pre 1988) ALC map of South East England (1:250,000) indicates that agricultural land within the Study Area contains some Grade 1 to the east of Ratham Lane, with the remainder being a mixture of Grade 2 and Grade 3a (not differentiated between Subgrade 3a or Subgrade 3b). Most of the Grade 3 is located in the vicinity of Bosham Stream.

The proportion of agricultural land in each of the ALC grades (derived from MAFF provisional or pre-1988 ALC information) in England, South East Region, West Sussex County, and Chichester District is shown for comparison in Table 4.1 below.

Table 4.1: Provisional ALC – National, Regional and Local Context (Proportion of ALC Grades as % of Total Land Area)[5]

ALC Grade	England	South East Government Office	West Sussex County	Chichester District
1 (excellent)	2.7	2.5	3.1	4.1
2 (very good)	14.2	10.4	7.0	10.2
3 (good to moderate)	48.2	52.4	50.9	49.0
4 (poor)	14.1	16.1	21.1	15.2
5 (very poor)	8.4	1.3	0.4	0.6
Non-Agricultural	5.0	9.6	11.5	19.1
Urban	7.3	7.7	6.0	1.7

From the MAFF Provisional ALC information in Table 4.1, Chichester District is well supplied with high quality agricultural land, with high proportions in Grade 1 and Grade 2. As shown on the Pre 1988 ALC map given as **Appendix 4**, the West Sussex Coastal Plain to the south of Broadbridge has a high proportion of Grade 1 and Grade 2. Therefore, the occurrence of some high quality agricultural land within the Study Area to be expected, as Grade 1 and Grade 2 agricultural land is widespread around

[5] Ministry of Agriculture, Fisheries and Food, Land and Water Service, Technical Notes, Resource Planning (February 1983) 'Agricultural Land Classification of England and Wales – The Distribution of the Grades' (TN/RP/01 TFS 846)

Broadbridge. The occurrence of some Grade 3 within the Study Area represents some of the lowest quality agricultural land in the area.

4.3 Pre-1988 ALC Information

As described in Natural England Technical Information Note 049 (see Appendix 2), a definitive ALC grading of agricultural land at a specific site can only be achieved by a detailed soil survey in accordance with the MAFF ALC Guidelines (October 1988).

As shown on map given as **Appendix 5**, MAFF has not carried out a detailed (Post 1988) ALC survey of agricultural land within the Study Area but has carried out Post 1998 ALC surveys at Highgrove Farm, Broadbridge (see **Appendix 6**) and at Bethwines Farm, Fishbourne (see **Appendix 7**).

MAFF Post 1988 ALC at Highgrove Farm, Broadbridge (**Appendix 6**) determined that:

The agricultural land at this site has been classified as Grade 2 (very good quality) and Subgrade 3a (good quality). Principal limitations to land quality include soil wetness and soil droughtiness. The soils in this area comprise very slightly stony, light and medium silty topsoil over medium silty subsoil. In the local climatic regime, soils of this nature slightly reduce profile available water. As such, there is a slight risk of drought stress affecting plant growth and yield. The lower subsoils were found to be slowly permeable. This causes a slight to moderate drainage impedance and leads to a soil wetness limitation. Soil wetness affects plant growth and yield and reduces the opportunities for cultivations and/or grazing without causing structural damage to the soil.'

MAFF Post 1988 ALC at Bethwines Farm (**Appendix 7**) determined that:

'The majority of the land on the site has been classified as Subgrade 3a, good quality land, with soil wetness as the main limitation. Soil profiles typically comprise stoneless medium silty clay loam topsoils and upper subsoils which rest upon heavy silty clay loam lower subsoils. Profiles show evidence of a soil wetness problem in the form of gleying from the topsoil. The heavy silty clay loam lower subsoil is poorly structured and slowly permeable, causing a drainage impedance. Such drainage characteristics mean that these soils have a resultant classification of Subgrade 3a. Towards the south of the site, soils tend to comprise heavy silty clay loam topsoils resting directly upon a slowly permeable clay subsoil. The shallower depth to the slowly permeable clay means that drainage is worsened such that a classification of Subgrade 3b, moderate quality land, is appropriate.'

5 Summary and Conclusion

This report has been prepared by Tim O'Hare Associates LLP for King & Co to determine the quality of agricultural land at an approximately 120 hectare (ha) study area proposed for the location of new residential development to the north of Broadbridge, West Sussex ('the Study Area').). The Study Area is located to the north of Broadbridge, near Bosham, West Sussex. It is bordered by the A27 to the north and by the West Coastway Line (Brighton to Southampton) and Bosham Station to the south. The Study Area is divided into two parts located to the east and west of Bosham Stream and Ratham Lane (B2146). The Study Area is located at British National Grid (BNG) refence SP 9283 9204. The boundary of the Study Area is shown on **Appendix 1**.

From published information on climate geology and soil above, it is predicted that the quality of agricultural land within the Study Area is a mixture of Grade 2 (very good quality) and Subgrade 3a (good quality) due to soil droughtiness during the growing season (January to June) and / or by soil wetness during the autumn and winter months. It is likely that wet ground flanking the Bosham Stream will be limited by soil wetness and / or flood risk to Subgrade 3b (moderate quality) or Grade 4 (poor quality).

As shown on map given as **Appendix 5**, MAFF has not carried out a detailed (Post 1988) ALC survey of agricultural land within the Study Area but has carried out Post 1998 ALC surveys at Highgrove Farm, Broadbridge (see **Appendix 6**) and at Bethwines Farm, Fishbourne (see **Appendix 7**). The MAFF Post 1988 ALC information in the Broadbridge area substantiates the prediction made in this desktop study, i.e. that the quality of agricultural land within the Study Area is likely to be a mixture of Grade 2 and Subgrade 3a. Wetter ground flanking the Bosham Stream is likely to be of Subgrade 3b quality or below.

From MAFF Provisional (Pre 1988) ALC information in Table 4.1, Chichester District is well supplied with high quality agricultural land, with high proportions in Grade 1 and Grade 2. As shown on the Pre 1988 ALC map given as **Appendix 4**, the West Sussex Coastal Plain to the south of Broadbridge has a high proportion of Grade 1 and Grade 2. Therefore, the occurrence of some high-quality agricultural land within the Study Area to be expected, as Grade 1 and Grade 2 agricultural land is widespread around Broadbridge. The occurrence of some Grade 3 within the Study Area represents some of the lowest quality agricultural land in the area.

Therefore, the development of agricultural land within Study Area to the north of Broadbridge, West Sussex, would not significantly harm national agricultural interests in terms of paragraph 170 of the National Planning Policy Framework (NPPF) (2018) or adopted Chichester Local Plan Policy 48, or Chichester Local Plan Review (2035) Policy S28. The high likelihood of Grade 3 agricultural land within the Study Area represents some of the lowest quality agricultural land in the Broadbridge/Bosham area. In this regard, the Study Area would be suitable for allocating as a site for residential development in the Chichester Local Plan.

Appendix 1: Study Area

Appendix 2:
Natural England Technical Information Note 049 – Agricultural Land Classification

Appendix 3:
IPSS Professional Competency Scheme Document 2
Agricultural Land Classification

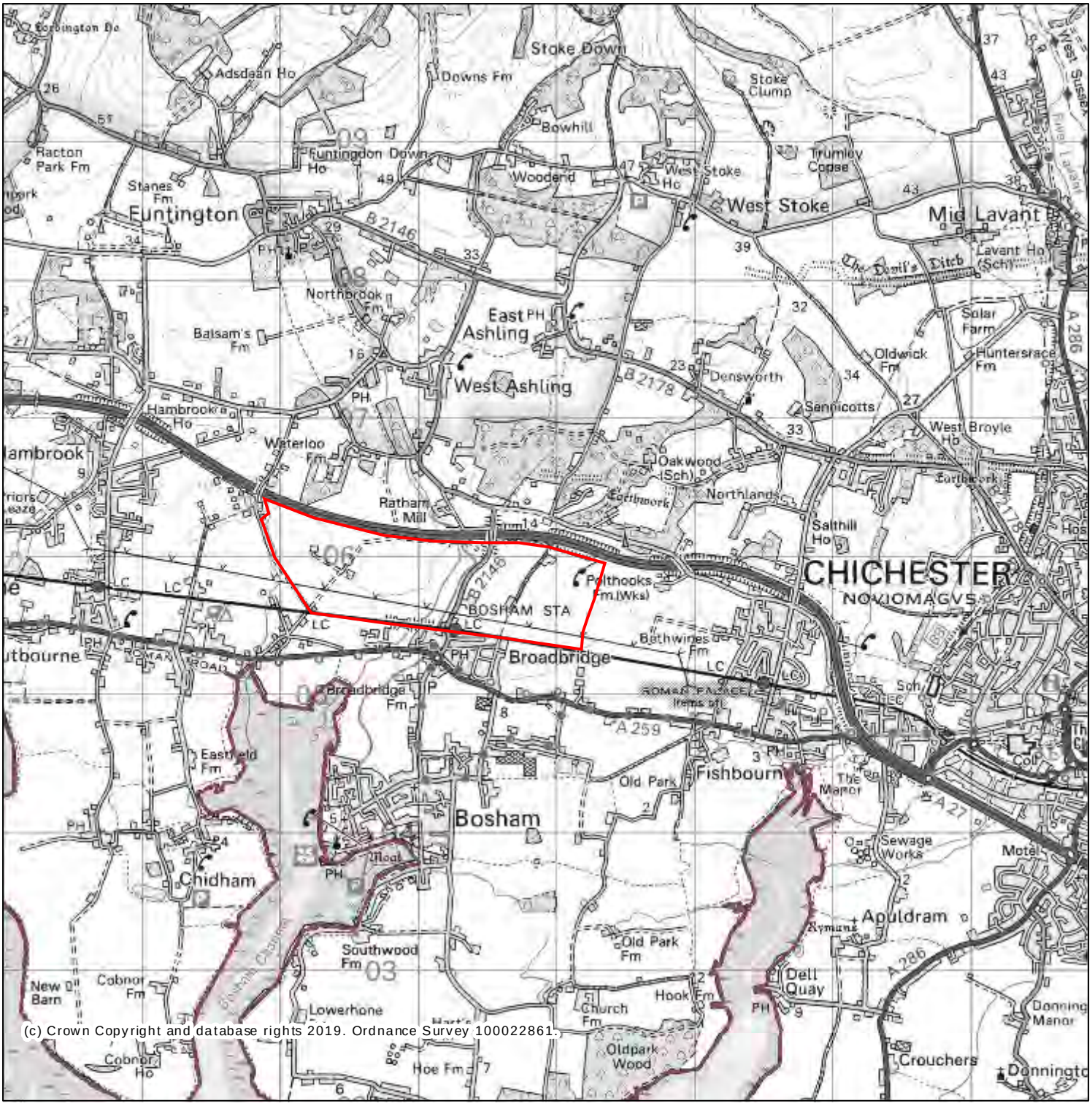
Appendix 4:
Pre 1988 ALC Map of Broadbridge Area

Appendix 5:
Post 1988 ALC Map of Broadbridge Area

Appendix 6:
MAFF Post 1988 ALC of Broadbridge (Ref. 4203/140/95)

Appendix 7:
MAFF Post 1988 ALC of Land at Bethwines Farm, Fishbourne (Ref. 4203/168/95)

Broadbridge Study Area



0 1 2
km

Projection = OSGB36

xmin = 473500

ymin = 102000

xmax = 490300

ymax = 110000

Natural England Technical Information Note TIN049

Agricultural Land Classification: protecting the best and most versatile agricultural land

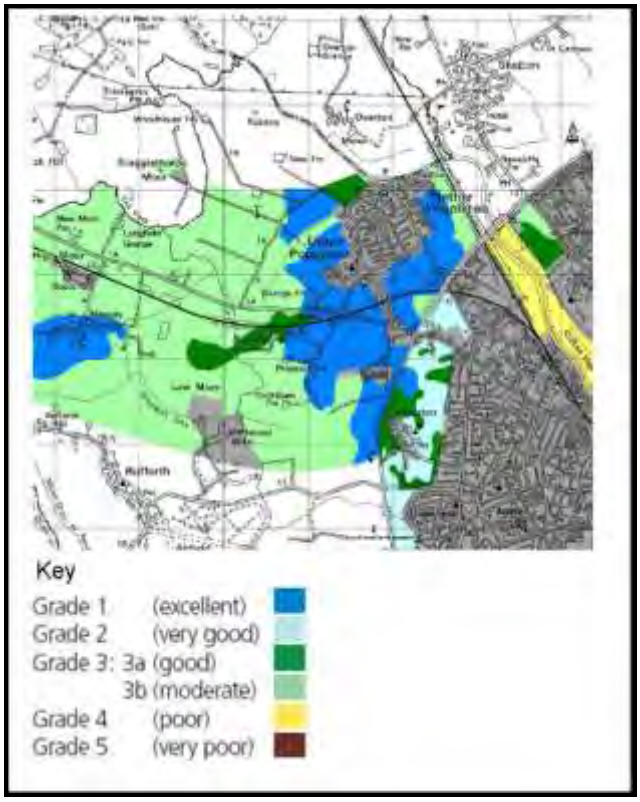
Most of our land area is in agricultural use. How this important natural resource is used is vital to sustainable development. This includes taking the right decisions about protecting it from inappropriate development.

Policy to protect agricultural land

Government policy for England is set out in the National Planning Policy Framework (NPPF) published in March 2012 (paragraph 112). Decisions rest with the relevant planning authorities who should take into account the economic and other benefits of the best and most versatile agricultural land. Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of higher quality. The Government has also re-affirmed the importance of protecting our soils and the services they provide in the Natural Environment White Paper The Natural Choice:securing the value of nature (June 2011), including the protection of best and most versatile agricultural land (paragraph 2.35).

The ALC system: purpose & uses

Land quality varies from place to place. The Agricultural Land Classification (ALC) provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system. It helps underpin the principles of sustainable development.



Agricultural Land Classification - map and key

Second edition 19 December 2012
www.naturalengland.org.uk

Agricultural Land Classification: protecting the best and most versatile agricultural land

The ALC system classifies land into five grades, with Grade 3 subdivided into Subgrades 3a and 3b. The best and most versatile land is defined as Grades 1, 2 and 3a by policy guidance (see Annex 2 of NPPF). This is the land which is most flexible, productive and efficient in response to inputs and which can best deliver future crops for food and non food uses such as biomass, fibres and pharmaceuticals. Current estimates are that Grades 1 and 2 together form about 21% of all farmland in England; Subgrade 3a also covers about 21%.

The ALC system is used by Natural England and others to give advice to planning authorities, developers and the public if development is proposed on agricultural land or other greenfield sites that could potentially grow crops. The Town and Country Planning (Development Management Procedure) (England) Order 2010 (as amended) refers to the best and most versatile land policy in requiring statutory consultations with Natural England. Natural England is also responsible for Minerals and Waste Consultations where reclamation to agriculture is proposed under Schedule 5 of the Town and Country Planning Act 1990 (as amended). The ALC grading system is also used by commercial consultants to advise clients on land uses and planning issues.

Criteria and guidelines

The Classification is based on the long term physical limitations of land for agricultural use. Factors affecting the grade are climate, site and soil characteristics, and the important interactions between them. Detailed guidance for classifying land can be found in: *Agricultural Land Classification of England and Wales: revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988):

- **Climate:** temperature and rainfall, aspect, exposure and frost risk.
- **Site:** gradient, micro-relief and flood risk.
- **Soil:** texture, structure, depth and stoniness, chemical properties which cannot be corrected.

The combination of climate and soil factors determines soil wetness and droughtiness. Wetness and droughtiness influence the choice of crops grown and the level and consistency of yields, as well as use of land for grazing livestock. The Classification is concerned with the inherent potential of land under a range of farming systems. The current agricultural use, or intensity of use, does not affect the ALC grade.

Versatility and yield

The physical limitations of land have four main effects on the way land is farmed. These are:

- the range of crops which can be grown;
- the level of yield;
- the consistency of yield; and
- the cost of obtaining the crop.

The ALC gives a high grading to land which allows more flexibility in the range of crops that can be grown (its 'versatility') and which requires lower inputs, but also takes into account ability to produce consistently high yields of a narrower range of crops.

Availability of ALC information

After the introduction of the ALC system in 1966 the whole of England and Wales was mapped from reconnaissance field surveys, to provide general strategic guidance on land quality for planners. This Provisional Series of maps was published on an Ordnance Survey base at a scale of One Inch to One Mile in the period 1967 to 1974. These maps are not sufficiently accurate for use in assessment of individual fields or development sites, and should not be used other than as general guidance. They show only five grades: their preparation preceded the subdivision of Grade 3 and the refinement of criteria, which occurred after 1976. They have not been updated and are out of print. A 1:250 000 scale map series based on the same information is available. These are more appropriate for the strategic use originally intended and can be downloaded from the Natural England **website**. This data is also available on ‘Magic’, an interactive, geographical information website **http://magic.defra.gov.uk/**.

Since 1976, selected areas have been re-surveyed in greater detail and to revised

guidelines and criteria. Information based on detailed ALC field surveys in accordance with current guidelines (MAFF, 1988) is the most definitive source. Data from the former Ministry of Agriculture, Fisheries and Food (MAFF) archive of more detailed ALC survey information (from 1988) is also available on **http://magic.defra.gov.uk/**. Revisions to the ALC guidelines and criteria have been limited and kept to the original principles, but some assessments made prior to the most recent revision in 1988 need to be checked against current criteria. More recently, strategic scale maps showing the likely occurrence of best and most versatile land have been prepared. Mapped information of all types is available from Natural England (see *Further information* below).

New field survey

Digital mapping and geographical information systems have been introduced to facilitate the provision of up-to-date information. ALC surveys are undertaken, according to the published Guidelines, by field surveyors using handheld augers to examine soils to a depth of 1.2 metres, at a frequency of one boring per hectare for a detailed assessment. This is usually supplemented by digging occasional small pits (usually by hand) to inspect the soil profile. Information obtained by these methods is combined with climatic and other data to produce an ALC map and report. ALC maps are normally produced on an Ordnance Survey base at varying scales from 1:10,000 for detailed work to 1:50 000 for reconnaissance survey

There is no comprehensive programme to survey all areas in detail. Private consultants may survey land where it is under consideration for development, especially around the edge of towns, to allow comparisons between areas and to inform environmental assessments. ALC field surveys are usually time consuming and should be initiated well in advance of planning decisions. Planning authorities should ensure that sufficient detailed site specific ALC survey data is available to inform decision making.

Consultations

Natural England is consulted by planning authorities on the preparation of all development plans as part of its remit for the natural environment. For planning applications, specific consultations with Natural England are required under the Development Management Procedure Order in relation to best and most versatile agricultural land. These are for non agricultural development proposals that are not consistent with an adopted local plan and involve the loss of twenty hectares or more of the best and most versatile land. The land protection policy is relevant to all planning applications, including those on smaller areas, but it is for the planning authority to decide how significant the agricultural land issues are, and the need for field information. The planning authority may contact Natural England if it needs technical information or advice.

Consultations with Natural England are required on all applications for mineral working or waste disposal if the proposed afteruse is for agriculture or where the loss of best and most versatile agricultural land agricultural land will be 20 ha or more. Non-agricultural afteruse, for example for nature conservation or amenity, can be acceptable even on better quality land if soil resources are conserved and the long term potential of best and most versatile land is safeguarded by careful land restoration and aftercare.

Other factors

The ALC is a basis for assessing how development proposals affect agricultural land within the planning system, but it is not the sole consideration. Planning authorities are guided by the National Planning Policy Framework to protect and enhance soils more widely. This could include, for example, conserving soil resources during mineral working or construction, not granting permission for peat extraction from new or extended mineral sites, or preventing soil from being adversely affected by pollution. For information on the application of ALC in Wales, please see below.

Further information

Details of the system of grading can be found in: *Agricultural Land Classification of England and Wales: revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

Please note that planning authorities should send all planning related consultations and enquiries to Natural England by e-mail to **consultations@naturalengland.org.uk**. If it is not possible to consult us electronically then consultations should be sent to the following postal address:

Natural England
Consultation Service
Hornbeam House
Electra Way
Crewe Business Park
CREWE
Cheshire
CW1 6GJ

ALC information for Wales is held by Welsh Government. Detailed information and advice is available on request from Ian Rugg (**ian.rugg@wales.gsi.gov.uk**) or David Martyn (**david.martyn@wales.gsi.gov.uk**). If it is not possible to consult us electronically then consultations should be sent to the following postal address:

Welsh Government
Rhodfa Padarn
Llanbadarn Fawr
Aberystwyth
Ceredigion
SY23 3UR

Natural England publications are available to download from the Natural England website: **www.naturalengland.org.uk**.

For further information contact the Natural England Enquiry Service on 0300 060 0863 or e-mail **enquiries@naturalengland.org.uk**.

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DOCUMENT 2

Agricultural Land Classification (England and Wales)

Background

The evaluation of land for its agricultural potential in England and Wales[1] is accomplished by application of the Agricultural Land Classification[2] (ALC). Professional competence in Agricultural Land Classification builds upon foundation skills in field soil investigation, description and interpretation (IPSS PCSS Document 1). This system of professional competence is based upon a detailed written procedures document developed by the Farming and Rural Conservation Agency[3].

Qualifications

Professional soil scientists with competence in Agricultural Land Classification will have graduated in a relevant science subject. They will also have a number of years of relevant field experience and will have, or be adequately qualified for, membership of a relevant professional body such as the Institute of Professional Soil Scientists.

Minimum competencies

Skills and Knowledge:

These are described under a number of subheadings that relate to different tasks. A professionally competent contractor should have the skills and knowledge identified under the **General heading** and **all other headings that are relevant** to the tasks required.

General

1. A general knowledge and understanding of natural soil development and of world, European and national soil taxonomy
2. A detailed knowledge and understanding of the Agricultural Land Classification system relevant to the site and of the classification of land according to the current published Guidelines and other documents[1,2,] and the ability to apply it accurately and consistently in the classification of an area of land

[1] Similar systems are employed in Scotland and Northern Ireland

[2] ALC Revised Guidelines and Criteria for the Grading the Quality of Agricultural Land (MAFF, 1988) and Climatological Datasets for ALC (Met. Office, 1989)

[3] A former Executive Agency of the Ministry of Agriculture , Fisheries and Food (now Defra)

DOCUMENT 2

Agricultural Land classification (England and Wales)

Institute of Professional Soil Scientists

3. An awareness and knowledge of existing published and unpublished, paper-based and digital ALC information and sources
4. A knowledge of paper and digital topographic, geology and soil maps, mineral assessment reports and memoirs and other technical sources of reference; and of their role in ALC work
5. An understanding of map scales and of the Ordnance Survey National Grid
6. The ability to investigate, sample, describe and interpret soils in the field in a consistent manner and to professional standards (IPSS PCSS Document 1)
7. Knowledge of relevant European and national regulations and policies including national and local land use planning policy and guidance, and soil protection policy
8. The ability to effectively communicate soil information in a simple and relevant form to developers, planners and other relevant professionals with clear statements as to the reliability and certainty of the results
9. The ability to write accurate, concise reports in clear English and in line with best practice examples of ALC survey that communicate the relevant information to all relevant communicants
10. An awareness of the importance of systems of quality assurance and control in all aspects of professional work

Preparations prior to field survey

1. The ability to compile background site physical data (e.g. relief, geology, soils, climate, flood-risk, exposure and grade from published and unpublished sources) and understanding of the limitations of the data obtained
2. An understanding of scale and of how different survey sampling densities may impact on the certainty of results obtained. A knowledge of how to tailor survey density appropriately to the requirements of the client, and understanding of the limitations that might impose
3. The ability to compute gradients from map contours
4. A thorough knowledge of climatic data interpolation procedures (and any available associated bespoke computer software), and the ability to obtain representative site values
5. An understanding of soil maps, the concepts of soil associations and soil series and their limitations as a background to ALC grading
6. A knowledge of GPS and data logger technology and its uses and limitations for field survey work
7. A knowledge and understanding of relevant Health and Safety legislation requirements for work in the field
8. An understanding of basic biosecurity requirements and any animal or plant health restrictions which may be in force

Field survey for Agricultural Land Classification

1. The ability to determine, lay out and work to a relevant sampling strategy
2. Competency in the Foundation Skills (field soil investigation, sampling, description and interpretation) as per IPSS PCSS Document 1
3. The ability to accurately and consistently apply the ALC system to soil and other data collected during the field survey

Reporting

1. The knowledge and ability to compile an ALC map from background information and data collected during the field survey
2. The ability to write an ALC survey report according to an agreed format
3. Understanding of the principles of quality assurance and the ability to apply these as required by the client
4. The ability to convey the findings of the survey verbally such that they are understood by the client

SUPPORTING ORGANISATIONS

The following organisations have given their support to the Institute of Professional Soil Scientist's Working with Soils Professional Competency Initiative:

iPSS
Institute of Professional Soil Scientists

'Defra welcomes initiatives, such as the IPSS Working with Soils Competency Statements, that aim to improve the quality of professional soils advice'

ADAS

afbi Agri-Food and Biosciences Institute

AHDB Agriculture & Horticulture Development Board

AICC Association of Independent Crop Consultants

National Parks Britain's breathing spaces

BALI British Association of Landscape Industries

BIAC

CEH Centre for Ecology & Hydrology Natural Environment Research Council

CIWEM

The co-operative farms

CPRE Campaign to Protect Rural England Standing up for your countryside

Cresswell a Hyder Consulting group company

Earthcare Technical

Asiantaeth yr Amgylchedd Cymru Environment Agency Wales

ENPAA English National Park Authorities Association

FWAG Farming & Wildlife Advisory Group

Comisiwn Coedwigaeth Cymru Forestry Commission Wales

Game & Wildlife Conservation Trust

Greenvale AP Natural choice for fresh potatoes

IAgrE

iema Institute of Environmental Management & Assessment

The James Hutton Institute

Landscape Institute Inspiring great places

Land Research Associates

defra Department for Environment Food and Rural Affairs

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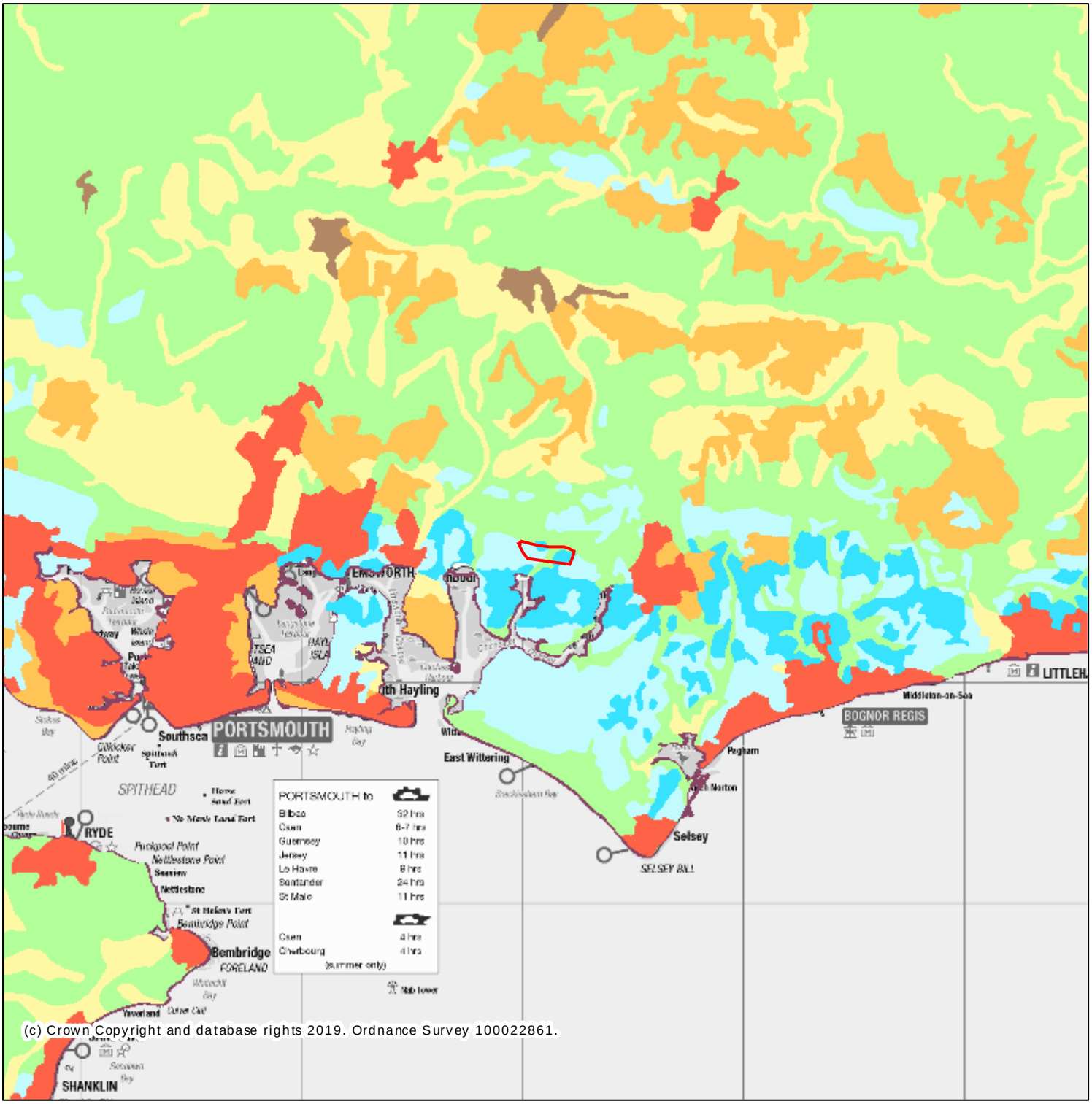
LEAF – Linking Environment and Farming – Integrated Farm Management
NIAB TAG
NFU
National Trust
Natural England
Produce World – Growing Trust
Rothamsted Research
Royal Agricultural College
Royal Agricultural Society of England
SAC
Sainsbury's
Salmon & Trout Association
SEPA – Scottish Environment Protection Agency
Society of Biology
Soil Association
SNIFFER – Scotland & Northern Ireland Forum for Environmental Research
The Scottish Government
the Science council
The Wildlife Trusts
Tim O'Hare Associates – Soil & Landscape Consultancy
Topsoil – The Sustainable Choice
Unilever
Llywodraeth Cymru – Welsh Assembly Government
Waitrose
wrap – Working together for a world without waste

Pre 1988 ALC



Legend

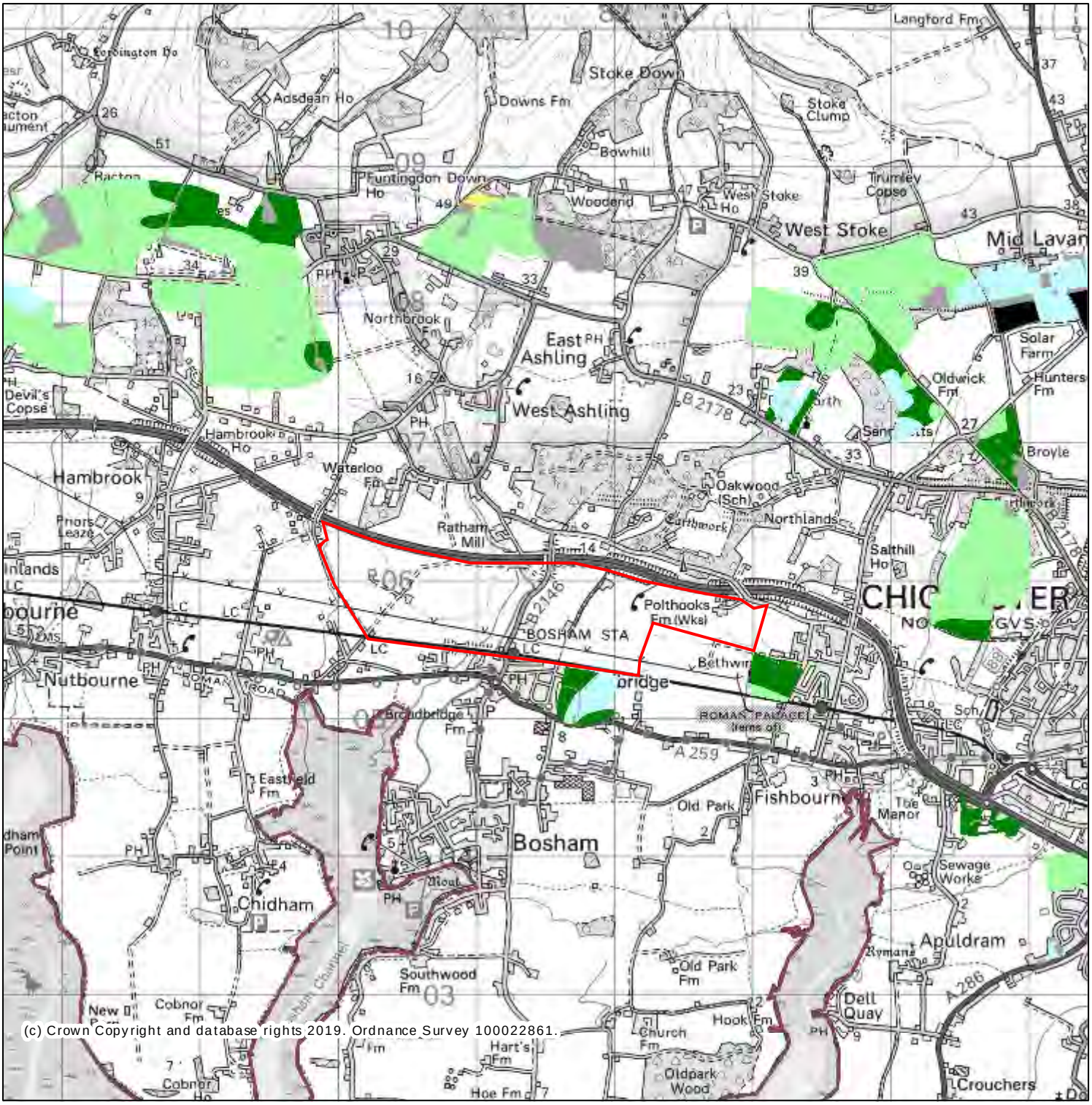
Agricultural Land Classification - Provisional (England)

- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Non Agricultural
- Urban

0 7.5 15
km

Projection = OSGB36
xmin = 428700
ymin = 80840
xmax = 533400
ymax = 131000

C651 Bosham, W Sussex



Legend

Post 1988 Agricultural Land Classification (England)

- Grade 1
- Grade 2
- Grade 3a
- Grade 3b
- Grade 4
- Grade 5
- Not Surveyed
- Other

0 1 2
km

Projection = OSGB36
xmin = 471400
ymin = 101100
xmax = 491600
ymax = 111300

Map produced by MAGIC on 31 January, 2019.

Some information in MAGIC is a snapshot of the information that is being maintained or continually updated by the originating organisation. Please refer to the metadata for details as information may be illustrative or representative rather than definitive at this stage.

Chichester District Local Plan
Objector Sites
OSH 1 Land at Broadbridge, West Sussex
Agricultural Land Classification
August 1995

Resource Planning Team
Guildford Statutory Group
ADAS Reading

ADAS Reference: 4203/140/95
MAFF Reference: EL 42/00739
LUPU Commission: 2118

AGRICULTURAL LAND CLASSIFICATION REPORT

CHICHESTER DISTRICT LOCAL PLAN
OSH 1: LAND AT BROADBRIDGE

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 14.7 ha of land at Broadbridge, near Chichester, West Sussex. The survey was carried out during August 1995.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Reading in connection with the Chichester District Local Plan, Objector Sites. The results of this survey supersede previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group in ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey landcover on the site was ploughed bare soil having recently had a pea crop harvested. The Urban area comprises a dwelling and outbuildings. The Non-agricultural area is a track.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10000; it is accurate at this scale but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% agricultural area
2	7.6	51.7	53.1
3a	6.7	45.6	46.9
Urban	0.1	0.7	
Non - Agricultural	0.3	2.0	
Total survey area	14.3		100.0
Total site area	14.7	100.0	

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 16 borings and one soil pit were described.

8. The agricultural land at this site has been classified as Grade 2 (very good quality) and Subgrade 3a (good quality). Principal limitations to land quality include soil wetness and soil droughtiness. The soils in this area comprise very slightly stony, light and medium silty topsoils over medium silty subsoils. In the local climatic regime, soils of this nature slightly reduce profile available water. As such, there is a slight risk of drought stress affecting plant growth and yield. The lower subsoils were found to be slowly permeable. This causes a slight to moderate drainage impedance and leads to a soil wetness limitation. Soil wetness affects plant growth and yield and reduces the opportunities for cultivations and/or grazing without causing structural damage to the soil.

Climate

9. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SU 815 050
Altitude	m, AOD	8
Accumulated Temperature	day°C	1542
Average Annual Rainfall	mm	767
Field Capacity Days	days	157
Moisture Deficit, Wheat	mm	116
Moisture Deficit, Potatoes	mm	113

11. 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.

12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Local climatic factors such as exposure and frost risk are also believed not to affect the site. The site is climatically Grade 1.

Site

14. The site lies at an altitude of approximately 8 m AOD and is flat overall. Nowhere on the site does gradient, microrelief or flooding affect the agricultural land quality.

Geology and soils

15. The most detailed published geological information for the site (BGS, 1972), shows it to be underlain by brickearth as a drift deposit.

16. The most detailed published soils information for the site (SSGB, 1967) shows the majority of the site to be underlain by soils of the Park Gate Series. The north east and extreme south east of the site is mapped as Hook series. Park Gate series soils are described as 'deep stoneless silty soils variably affected by groundwater' (SSEW, 1983). Hook series soils are described as 'deep well drained often stoneless fine silty soils. Some similar soils affected by groundwater and fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some shallower soils over chalk. Slight risk of water erosion.' (SSEW, 1983). Soils of these broad types were found on the site.

Agricultural Land Classification

17. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

18. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III.

Grade 2

19. Land of very good quality has been mapped towards the east and centre of the site. The principal limitations include both soil wetness and soil droughtiness.

20. Soils in this area commonly comprise a very slightly stony (up to 4% total v/v flints) non-calcareous medium silty clay loam or, occasionally, silt loam topsoil. This passes to stoneless or very slightly stony (up to 5% total v/v flints) medium silty clay loam upper subsoil horizons, which were often gleyed or slightly gleyed. These pass to a gleyed and slowly permeable (see pit 1) stoneless heavy silty clay loam lower subsoil from between 60 and 80cm. In the local climate, soils of this nature are placed in Wetness Class II (see Appendix II) and, subsequently, Grade 2 is applied when the medium workability status of the topsoil is taken into account. Soil wetness slightly restricts land utilisation in terms of the number of days when machinery cultivations and grazing by livestock can occur without causing structural damage to the soil. Soil wetness also affects plant growth and yield.

21. Occasionally, the slowly permeable lower subsoil horizon was not present within 120cm; medium silty clay loam textures were recorded to 120cm. These soils are placed in Wetness Class II and Grade 2 because gleying was present within 40cm.

22. In virtually all the profiles recorded, the local climate leads the soils to be slightly drought prone as well as being affected by soil wetness. This is due to there being restricted amounts of water available in the profile for extraction by crops. The exception to this is where silt loam topsoils were recorded. In these cases, soil droughtiness was not a limitation; soil wetness alone restricts the land to Grade 2.

Subgrade 3a

23. Land of good quality has been mapped towards the north, west and south of the site, in a single unit, where soil wetness limitations predominate.

24. Soils in this area are essentially similar to those described above (see para. 20), except that the slowly permeable heavy silty clay loam lower subsoil horizon occurs at a shallower depth (45-65cm) and the medium silty clay loam upper subsoil is gleyed in virtually all cases above 40cm. This combination of factors causes these profiles to be placed in Wetness Class III (see Appendix II) and, subsequently, Subgrade 3a when the medium workability status of the topsoils is taken into account. Subgrade 3a soil wetness restricts land utilisation as detailed above (para. 20), but to a greater degree than land shown as Grade 2.

M Larkin
Resource Planning Team
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1972) *Sheet 317, Chichester. Drift Edition. 1:63 360.* BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South East England. 1:250 000.* SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England. Bulletin No. 15.* SSEW: Harpenden.

Soil Survey of Great Britain (1967) *Soils Maps of the West Sussex Coastal Plain. 1:25 000.* SSGB: Harpenden.

Soil Survey of Great Britain (1967) *Soils of the West Sussex Coastal Plain. Bulletin No. 3.* SSGB: Harpenden.

APPENDIX I

DESCRIPTIONS OF THE GRADES AND SUBGRADES

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 or horticultural crops can usually be grown but on some land of this 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 land.

Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the level of yields. It is mainly suited to grass with occasional arable crops (e.g. 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

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. 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

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, 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 be shown.

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

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 only wet within 40 cm depth for 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 present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present 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.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

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

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

APPENDIX III

SOIL DATA

Contents:

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF**: national 100 km grid square and 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	**FCD**:	Fodder Crops
LIN:	Linseed	**FRT**:	Soft and Top Fruit	**FLW**:	Fallow
PGR:	Permanent Pasture	**LEY**:	Ley Grass	**RGR**:	Rough Grazing
SCR:	Scrub	**CFW**:	Coniferous Woodland	**DCW**:	Deciduous Wood
HTH:	Heathland	**BOG**:	Bog or Marsh	**FLW**:	Fallow
PLO:	Ploughed	**SAS**:	Set aside	**OTH**:	Other
HRT:	Horticultural Crops				

3. **GRDNT**: Gradient as estimated or measured by a hand-held optical clinometer.

4. **GLEY/SPL**: Depth in centimetres (cm) to gleying and/or slowly permeable layers.

5. **AP (WHEAT/POTS)**: Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)**: Moisture Balance. (Crop adjusted AP - crop adjusted MD)

7. **DRT**: Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

MREL:	Microrelief limitation	**FLOOD**:	Flood risk	**EROSN**:	Soil erosion risk
EXP:	Exposure limitation	**FROST**:	Frost prone	**DIST**:	Disturbed land
CHEM:	Chemical limitation				

9. **LIMIT**: The main limitation to land quality. The following abbreviations are used.

OC:	Overall Climate	**AE**:	Aspect	**EX**:	Exposure
FR:	Frost Risk	**GR**:	Gradient	**MR**:	Microrelief
FL:	Flood Risk	**TX**:	Topsoil Texture	**DP**:	Soil Depth
CH:	Chemical	**WE**:	Wetness	**WK**:	Workability
DR:	Drought	**ER**:	Erosion Risk	**WD**:	Soil Wetness/Droughtiness
ST:	Topsoil Stoniness				

Soil Pits and Auger Borings

1. **TEXTURE**: soil texture classes are denoted by the following abbreviations.

S:	Sand	**LS**:	Loamy Sand	**SL**:	Sandy Loam
SZL:	Sandy Silt Loam	**CL**:	Clay Loam	**ZCL**:	Silty Clay Loam
ZL:	Silt Loam	**SCL**:	Sandy Clay Loam	**C**:	Clay
SC:	Sandy Clay	**ZC**:	Silty Clay	**OL**:	Organic Loam
P:	Peat	**SP**:	Sandy Peat	**LP**:	Loamy Peat
PL:	Peaty Loam	**PS**:	Peaty Sand	**MZ**:	Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:

F: Fine (more than 66% of the sand less than 0.2mm)
M: Medium (less than 66% fine sand and less than 33% coarse sand)
C: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (<27% clay) **H**: Heavy (27-35% clay)

2. **MOTTLE COL**: Mottle colour using Munsell notation.

3. **MOTTLE ABUN**: Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2-20% **M**: many 20-40% **VM**: very many 40% +

4. **MOTTLE CONT:** Mottle contrast

F: faint - indistinct mottles, evident only on close inspection
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 using Munsell notation.

6. **GLEY:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH**: Stone Lithology - One of the following is used.

HR:	all hard rocks and stones	**SLST**:	soft oolitic or dolimitic limestone
CH:	chalk	**FSST**:	soft, fine grained sandstone
ZR:	soft, argillaceous, or silty rocks	**GH**:	gravel with non-porous (hard) stones
MSST:	soft, medium grained sandstone	**GS**:	gravel with porous (soft) stones
SI:	soft weathered igneous/metamorphic rock		

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

8. **STRUCT**: the degree of development, size and shape of soil peds are described using the following notation:

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

9. **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

10. **SUBS STR**: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G**: good **M**: moderate **P**: poor

11. **POR**: Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP**: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

13. **SPL**: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC**: If the soil horizon is calcareous, a 'Y' will appear in this column.

15. 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

SOIL PIT DESCRIPTION

Site Name : CHICHESTER DLP OSH 1 Pit Number : 1P

Grid Reference: SU81700510 Average Annual Rainfall : 767 mm
Accumulated Temperature : 1542 degree days
Field Capacity Level : 157 days
Land Use : Ploughed
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MZCL	10YR42 52	1	3	HR					
30- 45	MZCL	10YR54 00	0	0		F	MDCSAB	FM	M	
45- 68	MZCL	10YR53 52	0	0		C	MDCSAB	FM	M	
68- 83	HZCL	25Y 62 63	0	0		C	MDCPR	FM	P	
83- 90	HZCL	10YR52 53	0	0		M	MDCPR	FM	P	

Wetness Grade : 2 Wetness Class : II
Gleying : 45 cm
SPL : 68 cm

Drought Grade : 2 APW : 121mm MBW : 5 mm
APP : 122mm MBP : 9 mm

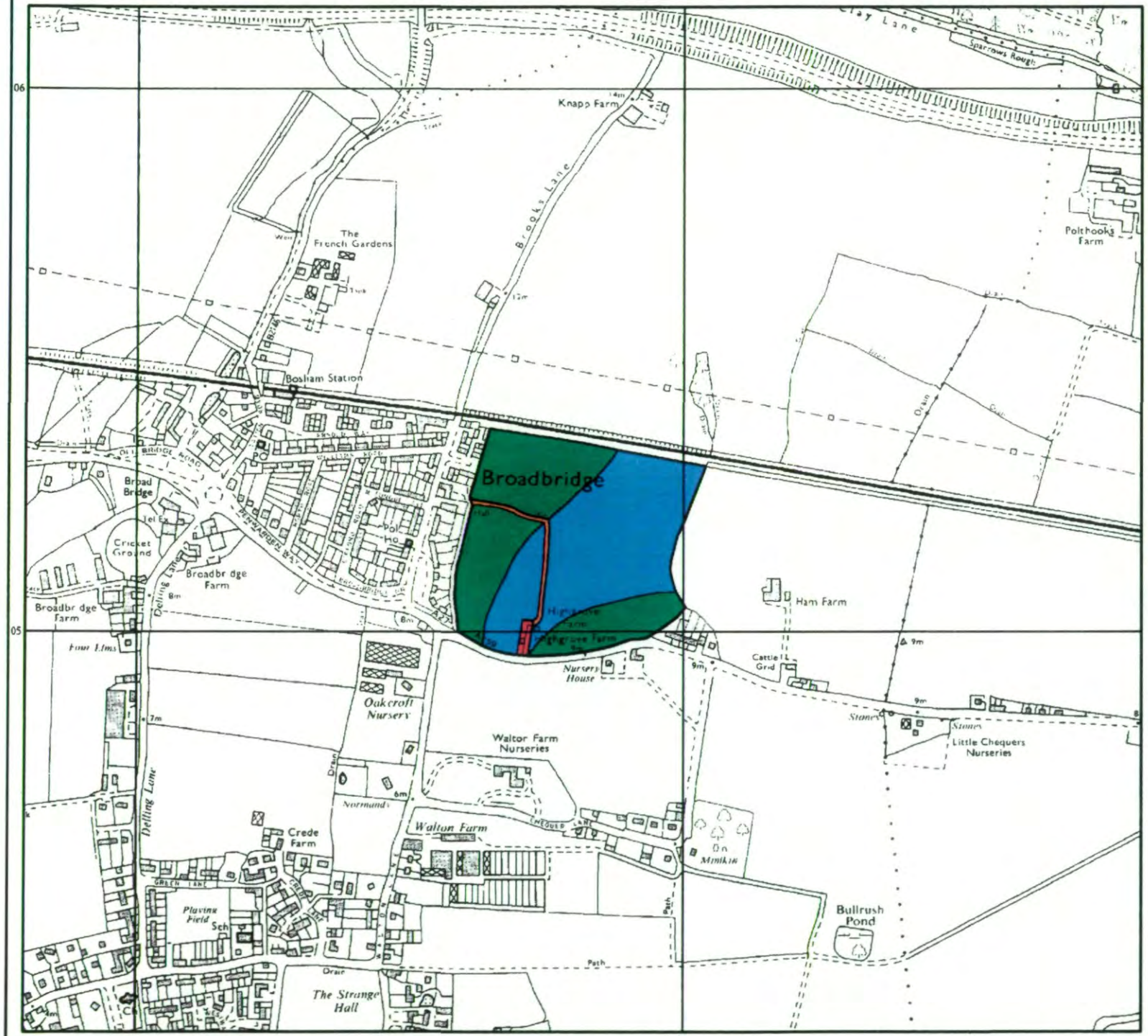
FINAL ALC GRADE : 2
MAIN LIMITATION : Soil Wetness/Droughtiness

program: ALC012 LIST OF BORINGS HEADERS 15/08/95 CHICHESTER DLP OSH 1 page 1

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS-- GRDNT	GLEY	SPL	CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SU81700530	PLO		30	55	3	3A	123	7	118	5	2				WE	3A	
1P	SU81700510	PLO		45	68	2	2	121	5	122	9	2				WD	2	PIT 90 DR 90
2	SU81800530	PLO		52	52	3	3A	122	6	116	3	2				WE	3A	SL GLEY 30
3	SU81900530	PLO		70	70	1	1	141	25	125	12	2				DR	2	SL GLEY 45
4	SU82000530	PLO		60	60	2	2	137	21	120	7	2				WD	2	
5	SU81700520	PLO		0	50	3	3A	134	18	114	1	2				WE	3A	
6	SU81800520	PLO		65	65	2	2	151	35	135	22	1				WE	2	SL GLEY 30
7	SU81900520	PLO				1	1	73	-43	73	-40	3B				DR	3B	QGDEIMP DRY 40
8	SU82000520	PLO		80	80	1	1	145	29	125	12	2				DR	2	
9	SU81600510	PLO		25	65	3	3A	135	19	118	5	2				WE	3A	
10	SU81700510	PLO		45	80	2	2	141	25	121	8	2				WD	2	
11	SU81800510	PLO		28		2	2	157	41	121	8	2				WD	2	
12	SU81900510	PLO		28		2	2	168	52	132	19	1				WE	2	
13	SU81600500	PLO		25	50	3	3A	129	13	112	-1	2				WE	3A	
14	SU81700500	PLO		50	80	2	2	140	24	120	7	2				WD	2	SL GLEY 25
15	SU81800500	PLO		45	45	3	3A	140	24	121	8	2				WE	3A	
16	SU81900500	PLO		25	55	3	3A	120	4	114	1	3A				WE	3A	IMPCH ORIFT 95

AMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PEO COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
1	0-30	mzcl	10YR52 00	10YR58 00	F				0	0		0							
	30-55	mzcl	10YR52 00	10YR58 61	C			Y	0	0		0		M					
	55-100	hzcl	10YR53 00	10YR68 71	C		00MN00 00	Y	0	0		0		P			Y		
1P	0-30	mzcl	10YR42 52						1	0	HR	3							
	30-45	mzcl	10YR54 00	10YR56 00	F		00MN00 00		0	0		0	MDCSAB	FM M					
	45-68	mzcl	10YR53 52	10YR56 00	C		00MN00 00	Y	0	0		0	MDCSAB	FM M					
	68-83	hzcl	25Y 62 63	10YR58 00	C		00MN00 00	Y	0	0		0	MDCPR	FM P		Y		Y	
	83-90	hzcl	10YR52 53	10YR58 61	M		00MN00 00	Y	0	0		0	MDCPR	FM P		Y		Y	
2	0-30	mzcl	10YR52 00	10YR56 00	F				0	0		0							
	30-52	mzcl	10YR54 00	10YR56 00	C			S	0	0		0		M					
	52-100	hzcl	75YR52 00	10YR68 00	C		00MN00 00	Y	0	0		0		P			Y		
3	0-30	mzcl	10YR52 53	10YR56 00	F				0	0		0							
	30-45	mzcl	10YR53 54						0	0		0		M					
	45-70	mzcl	10YR54 00	00MN00 00	C			S	0	0		0		M					
	70-120	hzcl	10YR53 00	10YR68 62	C		00MN00 00	Y	0	0		0		P			Y		
4	0-30	mzcl	10YR53 00						0	0		0							
	30-60	mzcl	10YR54 00						0	0		0		M					
	60-120	hzcl	75YR52 00	10YR68 00	C		00MN00 00	Y	0	0		0		P			Y		
5	0-26	mzcl	10YR52 00	10YR58 61	C			Y	0	0		0							
	26-50	mzcl	10YR63 53	10YR68 00	C			Y	0	0		0		M					
	50-100	hzcl	10YR53 00	10YR68 00	C		00MN00 00	Y	0	0		0		P			Y		
	100-120	c	10YR53 00	10YR68 00	C		00MN00 00	Y	0	0		0		P			Y		
6	0-30	zl	10YR52 00	10YR58 00	F				0	0		0							
	30-65	mzcl	10YR51 00	10YR58 00	C			S	0	0		0		M					
	65-120	hzcl	10YR53 00	10YR58 62	C		00MN00 00	Y	0	0		0		P			Y		
7	0-25	mzcl	10YR52 00	10YR58 00	F				0	0		0							
	25-40	mzcl	10YR54 00						0	0		0		M					IMP DRY SOIL 40
8	0-30	mzcl	10YR52 00	10YR56 00	F				0	0		0							
	30-80	mzcl	10YR54 00						0	0		0		M					
	80-120	hzcl	10YR53 00	10YR68 00	C			Y	0	0		0		P			Y		
9	0-25	mzcl	10YR43 00						0	0	HR	3							
	25-65	mzcl	10YR53 52	10YR58 00	C		00MN00 00	Y	0	0	HR	3		M					
	65-80	hzcl	25Y 63 00	10YR58 00	C		00MN00 00	Y	0	0	HR	3		P			Y		
	80-120	hzcl	25Y 63 71	10YR58 00	C			Y	0	0	CH	10		P			Y	Y	
10	0-30	mzcl	10YR42 00						0	0	HR	3							
	30-45	mzcl	10YR54 00						0	0	HR	5		M					
	45-65	mzcl	10YR52 00	10YR56 00	C		00MN00 00	Y	0	0	HR	3		M					
	65-80	mzcl	25Y 61 71	10YR68 00	M		00MN00 00	Y	0	0	HR	3		M					
	80-120	hzcl	25Y 62 00	10YR58 00	M		00MN00 00	Y	0	0		0		P			Y		

AMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
11	0-28	mzcl	10YR42 00						1	0	HR	4							
	28-70	mzcl	10YR53 52	10YR56 00	C		00MN00 00	Y	0	0	HR	3		M					
	70-120	mzcl	25Y 63 53	10YR58 00	M		00MN00 00	Y	0	0		0		M					
12	0-28	zl	10YR42 00						1	0	HR	4							
	28-50	mzcl	10YR63 00	10YR56 00	C			Y	0	0	HR	3		M					
	50-80	mzcl	10YR62 00	10YR58 00	M		00MN00 00	Y	0	0		0		M					
	80-120	mzcl	25Y 62 00	10YR58 00	M		00MN00 00	Y	0	0		0		M					
13	0-25	mzcl	10YR42 00						0	0	HR	3							
	25-50	mzcl	10YR62 00	10YR56 00	C		00MN00 00	Y	0	0		0		M					
	50-120	hzcl	25Y 53 52	10YR58 00	M		00MN00 00	Y	0	0	HR	5		P		Y			
14	0-25	mzcl	10YR42 00						1	0	HR	4							
	25-50	mzcl	10YR54 00	10YR56 00	C		00MN00 00	S	0	0	HR	5		M					
	50-80	mzcl	10YR53 52	10YR58 00	M		00MN00 00	Y	0	0		0		M					
	80-120	hzcl	25Y 62 63	10YR58 68	M		00MN00 00	Y	0	0		0		P		Y			
15	0-25	mzcl	10YR42 00						0	0	HR	3							
	25-45	mzcl	10YR53 54	10YR56 00	F		00MN00 00		0	0		0		M					
	45-75	hzcl	10YR52 62	10YR58 00	C		00MN00 00	Y	0	0	HR	3		M					
	75-120	mzcl	25Y 61 71	10YR68 00	M			Y	0	0	CH	10		P		Y	Y		
16	0-25	mzcl	10YR42 00						0	0	HR	3							
	25-55	mzcl	10YR53 00	10YR56 00	C		00MN00 00	Y	0	0		0		M					
	55-85	hzcl	10YR52 00	10YR58 00	M		00MN00 00	Y	0	0	HR	5		P		Y			
	85-95	mzcl	25Y 71 61	10YR68 00	M			Y	0	0	CH	30		M			Y		IMP CH DRIFT 95



MAFF Ministry of Agriculture Fisheries and Food

Agricultural Land Classification

Chichester District Local Plan

OSH1: Land at Broadbridge

Agricultural Land

Grade	Quality	Area (ha)
1	Excellent	nil
2	Very Good	7.6
3a	Good	6.7
3b	Moderate	nil
4	Poor	nil
5	Very Poor	nil

Other Land Categories

		Area (ha)
	Urban	0.1
	Non-Agricultural	0.3
*W	Woodland	nil
*	Agricultural Buildings	nil
*	Open Water	nil
*	Not Surveyed	nil

Total agricultural land area 14.3

Total survey area 14.7

* Grade/category not present within survey area

Scale - 1:10,000

0 100 200 300 400 500 600 Metres

Further details contained in MAFF (1988) Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land. MAFF (Publications), London SE99 7TP. The information is accurate at the base map scale but any enlargement would be misleading. Reproduction in whole or in part by any means is prohibited without the prior permission of MAFF.

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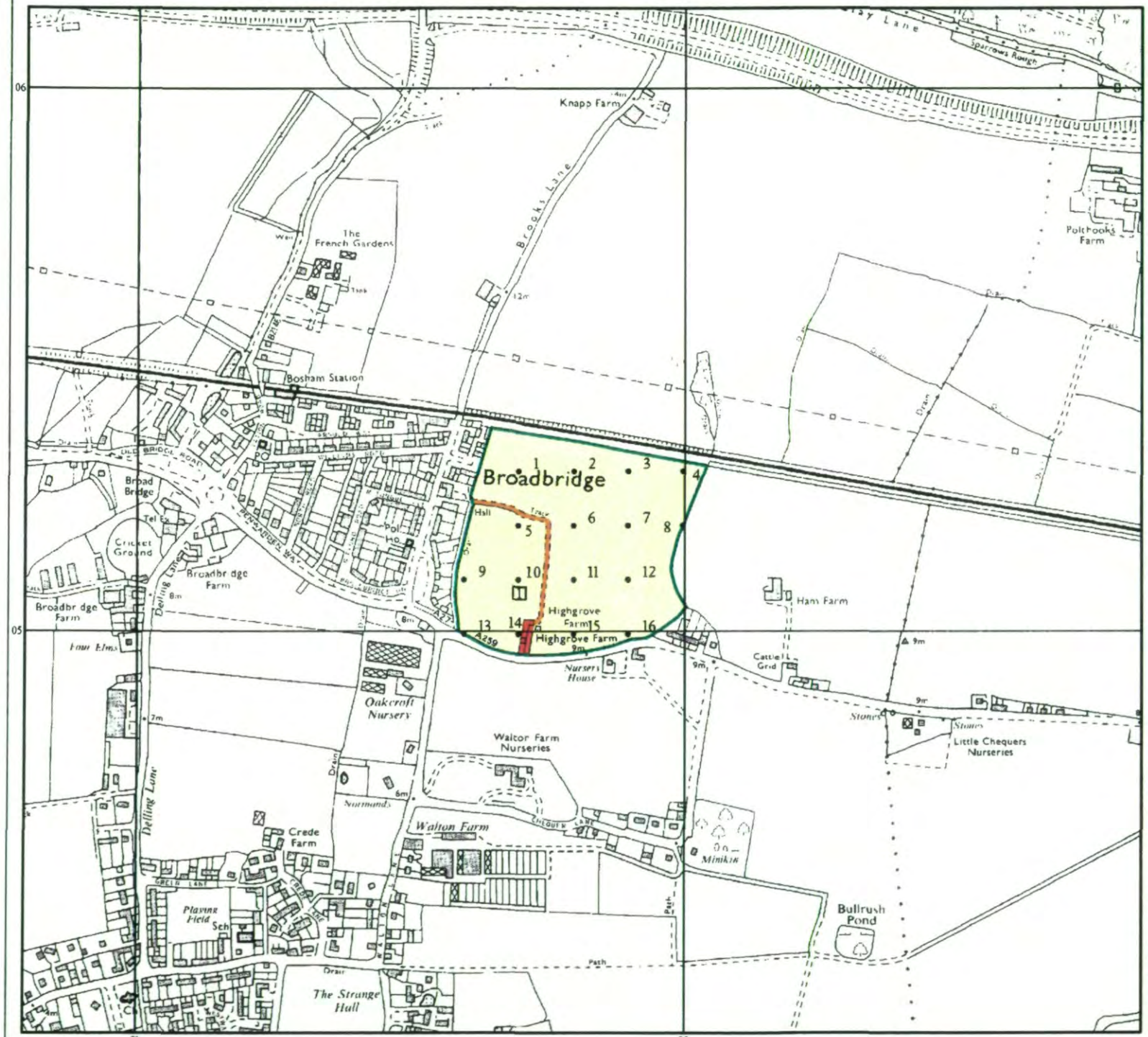

MAFF Ministry of Agriculture Fisheries and Food

Agricultural Land Classification

Chichester District Local Plan

OSH1: Land at Broadbridge

SAMPLE POINT MAP

LOCATION OF SOIL PIT

LOCATION OF AUGER SAMPLE POINT

AREA OF SURVEY

Other Land Categories

		Area (ha)
	Urban	0.1
	Non-Agricultural	0.3
*W	Woodland	nil
*	Agricultural Buildings	nil
*	Open Water	nil
*	Not Surveyed	nil
	Total agricultural land area	14.3
	Total survey area	14.7

* Grade/category not present within survey area

Scale - 1:10,000

0 100 200 300 400 500 600 Metres

Further details contained in MAFF (1988) Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land. MAFF (Publications), London SE99 7TP. The information is accurate at the base map scale but any enlargement would be misleading. Reproduction in whole or in part by any means is prohibited without the prior permission of MAFF.

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Chichester District Local Plan
Objector Site OSH11
Land at Bethwines Farm, Fishbourne.
Agricultural Land Classification
ALC Map and Report
November 1995

Resource Planning Team
Guildford Statutory Group
ADAS Reading

ADAS Reference: 4203/168/95
MAFF Reference: EL 42/739
LUPU Commission: 02303

AGRICULTURAL LAND CLASSIFICATION REPORT

CHICHESTER DISTRICT LOCAL PLAN
OBJECTOR SITE OSH11: LAND AT BETHWINES FARM, FISHBOURNE.

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 10 ha of land to the south of Bethwines Farm at Fishbourne in West Sussex. The survey was carried out during November 1995.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) from its Land Use Planning Unit, Reading in connection with the preparation of the Chichester District Local Plan.

3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey, the land on the site comprised winter wheat and set-aside.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10000; it is accurate at this scale but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area
3a	8.0	80
3b	2.0	20
Total site area	10.0	100%

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 13 borings and two soil pits were described.

8. The majority of the land on the site has been classified as Subgrade 3a, good quality land, with soil wetness as the main limitation. Soil profiles typically comprise stoneless

medium silty clay loam topsoils and upper subsoils which rest upon heavy silty clay loam lower subsoils. Profiles show evidence of a soil wetness problem in the form of gleying from the topsoil. The heavy silty clay loam lower subsoil is poorly structured and slowly permeable, causing a drainage impedance. Such drainage characteristics mean that these soils have a resultant classification of Subgrade 3a. Towards the south of the site, soils tend to comprise heavy silty clay loam topsoils resting directly upon a slowly permeable clay subsoil. The shallower depth to the slowly permeable clay means that drainage is worsened such that a classification of Subgrade 3b, moderate quality land, is appropriate.

FACTORS INFLUENCING ALC GRADE

Climate

8. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

9. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SU 831 052
Altitude	m, AOD	9
Accumulated Temperature	day°C	1540
Average Annual Rainfall	mm	782
Field Capacity Days	days	161
Moisture Deficit, Wheat	mm	117
Moisture Deficit, Potatoes	mm	114

10. 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.

11. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (ATO, January to June), as a measure of the relative warmth of a locality.

12. The combination of rainfall and temperature at this site means that there is no overall climatic limitation. Local climatic factors such as exposure are also believed not to affect the site. The site is climatically Grade 1.

Site

13. The site is flat, lying at an altitude of approximately 9m AOD. Nowhere on the site does gradient affect land quality. No other site factors such as flooding or microrelief affect the survey area.

Geology and soils

14. The most detailed published geological information for the site (BGS, 1972) shows the entire site to be underlain by brickearth.

15. The most detailed published soils information (SSGB, 1967) shows all of the site to comprise soils of the deep phase Park Gate series. These are described as 'deep stoneless silty soils affected by groundwater' (SSEW, 1983).

AGRICULTURAL LAND CLASSIFICATION

16. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

17. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III.

Subgrade 3a

18. The majority of the agricultural land on the site has been classified as Subgrade 3a, good quality land, with soil wetness as the main limitation. Soil profiles typically comprise slightly stony (1-5% total flints v/v) medium silty clay loam topsoils resting upon similar textured upper subsoils which show signs of a wetness imperfection in the form of gleying or slight gleying. Lower subsoils within this mapping unit tend to comprise stoneless and gleyed heavy silty clay loams. A soil inspection pit (Pit 1) was dug to investigate the nature and cause of the drainage imperfection. At the location of the pit, the heavy silty clay loam lower subsoil was found to be poorly structured with low porosity, and is therefore termed as slowly permeable. Such drainage characteristics equate these soils with Wetness Class III, which in combination with the topsoil texture and the local climatic regime means that a resultant classification of Subgrade 3a is appropriate.

Subgrade 3b

19. Towards the southern edge of the site, soil profiles typically comprise heavy silty clay loam or medium silty clay loam topsoils which rest directly upon clay. On the evidence of a further soil inspection pit (pit 2), the clay was found to poorly structured with low porosity and therefore is slowly permeable. The shallower depth at which the slowly permeable horizon was observed means that drainage restrictions are exacerbated. Such drainage characteristics equate the soils in this area of the site to Wetness Class IV, with a resultant classification of Subgrade 3b due to a significant wetness limitation. Poorly drained wet soils can inhibit plant rooting and development, and may be susceptible to structural damage through trafficking by agricultural machinery or poaching by grazing livestock.

SOURCES OF REFERENCE

British Geological Survey (1972) *Sheet No.317, Chichester.*
BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.*
Met. Office: Bracknell.

Soil Survey of Great Britain (1967) *Sheets SU70 & SU80, Soils of the West Sussex Coastal Plain.* SSGB: Harpenden.

Soil Survey of England and Wales (1983) *Soils and their Use in South East England*
SSEW: Harpenden

APPENDIX I

DESCRIPTION OF THE GRADES AND SUBGRADES

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 or horticultural crops can usually be grown but on some land of this 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 land.

Grade 3 : Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

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. 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, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

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 soil wetness classes are identified and are defined in the table below.

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 only wet within 40 cm depth for 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 present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present 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.

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.

[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 III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF** : national 100 km grid square and 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	**FCD** : Fodder Crops
LIN : Linseed	**FRT** : Soft and Top Fruit	**FLW** : Fallow
PGR : Permanent Pasture	**LEY** : Ley Grass	**RGR** : Rough Grazing
SCR : Scrub	**CFW** : Coniferous Woodland	**DCW** : Deciduous Wood
HTH : Heathland	**BOG** : Bog or Marsh	**FLW** : Fallow
PLO : Ploughed	**SAS** : Set aside	**OTH** : Other
HRT : Horticultural Crops		

3. **GRDNT** : Gradient as estimated or measured by a hand-held optical clinometer.

4. **GLEY/SPL** : Depth in centimetres (cm) to gleying and/or slowly permeable layers.

5. **AP (WHEAT/POTS)** : Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)** : Moisture Balance. (Crop adjusted AP - crop adjusted MD)

7. **DRT** : Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

MREL : Microrelief limitation	**FLOOD** : Flood risk	**EROSN** : Soil erosion risk
EXP : Exposure limitation	**FROST** : Frost prone	**DIST** : Disturbed land
CHEM : Chemical limitation		

9. **LIMIT** : The main limitation to land quality. The following abbreviations are used.

OC : Overall Climate	**AE** : Aspect	**EX** : Exposure
FR : Frost Risk	**GR** : Gradient	**MR** : Microrelief
FL : Flood Risk	**TX** : Topsoil Texture	**DP** : Soil Depth
CH : Chemical	**WE** : Wetness	**WK** : Workability
DR : Drought	**ER** : Erosion Risk	**WD** : Soil Wetness/Droughtiness
ST : Topsoil Stoniness		

Soil Pits and Auger Borings

1. **TEXTURE** : soil texture classes are denoted by the following abbreviations.

S :	Sand	**LS** :	Loamy Sand	**SL** :	Sandy Loam
SZL :	Sandy Silt Loam	**CL** :	Clay Loam	**ZCL** :	Silty Clay Loam
ZL :	Silt Loam	**SCL** :	Sandy Clay Loam	**C** :	Clay
SC :	Sandy Clay	**ZC** :	Silty Clay	**OL** :	Organic Loam
P :	Peat	**SP** :	Sandy Peat	**LP** :	Loamy Peat
PL :	Peaty Loam	**PS** :	Peaty Sand	**MZ** :	Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:

F : Fine (more than 66% of the sand less than 0.2mm)
M : Medium (less than 66% fine sand and less than 33% coarse sand)
C : Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M** : Medium (<27% clay) **H** : Heavy (27-35% clay)

2. **MOTTLE COL** : Mottle colour using Munsell notation.

3. **MOTTLE ABUN** : Mottle abundance, expressed as a percentage of the matrix or surface described.

F : few <2% **C** : common 2-20% **M** : many 20-40% **VM** : very many 40% +

4. **MOTTLE CONT** : Mottle contrast

F : faint - indistinct mottles, evident only on close inspection
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 using Munsell notation.

6. **GLEY** : If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH** : Stone Lithology - One of the following is used.

HR :	all hard rocks and stones	**SLST** :	soft oolitic or dolimitic limestone
CH :	chalk	**FSST** :	soft, fine grained sandstone
ZR :	soft, argillaceous, or silty rocks	**GH** :	gravel with non-porous (hard) stones
MSST :	soft, medium grained sandstone	**GS** :	gravel with porous (soft) stones
SI :	soft weathered igneous/metamorphic rock		

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

8. **STRUCT** : the degree of development, size and shape of soil peds are described using the following notation:

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

9. **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

10. **SUBS STR** : Subsoil structural condition recorded for the purpose of calculating profile droughtiness : **G** : good **M** : moderate **P** : poor

11. **POR** : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP** : If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropiate horizon.

13. **SPL** : Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC** : If the soil horizon is calcareous, a 'Y' will appear in this column.

15. 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

SAMPLE NO.	GRID REF	ASPECT USE	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SU83000540	CER		050	050	3	3A		0		0					WE	3A	
1P	SU83200530	WHT		034	056	3	3A		0		0	2				WE	3A	
2	SU83100540	CER		036		2	2		0		0	1				WE	2	
2P	SU83000520	SAS		029	029	4	3B		0		0					WE	3B	
3	SU83200540	CER		035	065	3	3A		0		0					WE	3A	JUSTWC3
4	SU83300540	CER		030	050	3	3A		0		0					WE	3A	
5	SU83000530	CER		S40	040	3	3A		0		0					WE	3A	SL GLEY 40
6	SU83100530	CER		030	065	3	3A		0		0					WE	3A	
7	SU83200530	CER		026	050	3	3A		0		0					WE	3A	
8	SU83300530	CER		024	060	3	3A		0		0					WE	3A	
9	SU83000520	SAS		028	028	4	3B		0		0					WE	3B	
10	SU83100520	SAS		036	036	4	3B		0		0					WE	3B	
11	SU83200520	CER		030	050	3	3A		0		0					WE	3A	
12	SU82600523	SAS		030	030	4	3B		0		0					WE	3B	
13	SU83210517	SAS		030	030	4	3B		0		0					WE	3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PEO COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	STR	POR	IMP	SPL	CALC
1	0-33	mzcl	25Y 42 00						0	0	HR	1						
	33-50	hzcl	10YR54 00						0	0		0		M				
	50-120	hzcl	10YR63 00	10YR68 71	M		00MN00 00	Y	0	0		0		P				Y
1P	0-34	mzcl	25Y 42 00						0	0	HR	2						
	34-56	mzcl	10YR63 00	10YR68 71	C		00MN00 00	Y	0	0		0	MDCSAB	FR	M			
	56-100	hzcl	75YR52 53	75YR56 62	M		00MN00 00	Y	0	0		0	WKCPR	FM	P	Y		Y
2	0-36	mzcl	25Y 42 00						0	0	HR	1						
	36-60	mzcl	10YR63 00	10YR68 71	M			Y	0	0		0		M				
	60-120	mzcl	75YR53 00	75YR68 62	M		00MN00 00	Y	0	0		0		M				
2P	0-29	hzcl	25Y 53 00	10YR56 00	F		00MN00 00		4	0	HR	6						
	29-65	c	10YR52 00	10YR68 71	M		00MN00 00	Y	0	0	HR	7	WKMAB	FM	P	Y		Y
3	0-35	mzcl	25Y 42 00						0	0	HR	2						
	35-50	mzcl	10YR62 00	10YR68 71	C			Y	0	0		0		M				
	50-65	mzcl	75YR53 00	10YR68 71	C		00MN00 00	Y	0	0		0		M				
	65-100	hzcl	10YR52 63	10YR68 62	M		00MN00 00	Y	0	0		0		P				Y
4	0-30	mzcl	10YR43 00						0	0	HR	1						
	30-50	mzcl	10YR52 00	10YR68 71	M		00MN00 00	Y	0	0		0		M				
	50-120	hzcl	10YR63 73	10YR68 71	M			Y	0	0		0		P				Y
5	0-25	mzcl	25Y 43 00						0	0	HR	1						
	25-40	hzcl	10YR54 00	00MN00 00	F				0	0		0		M				
	40-70	hzcl	10YR54 00	10YR58 00	C		00MN00 00	S	0	0		0		P				Y
	70-120	hzcl	10YR62 00	10YR68 71	M		00MN00 00	Y	0	0		0		P				Y
6	0-30	mzcl	25Y 43 00						0	0	HR	2						
	30-65	mzcl	10YR62 00	10YR68 71	M			Y	0	0		0		M				
	65-100	hzcl	75YR53 00	75YR68 72	M		00MN00 00	Y	0	0		0		P				Y
7	0-32	mzcl	25Y 42 00						0	0		0						
	32-50	mzcl	10YR63 00	10YR68 71	M			Y	0	0		0		P				
	50-120	hzcl	10YR62 00	10YR58 61	M		00MN00 00	Y	0	0		0		P				Y
8	0-24	mzcl	25Y 43 00						0	0	HR	2						
	24-60	mzcl	75YR53 00	75YR56 62	M			Y	0	0	HR	2		M				
	60-120	hzcl	10YR63 00	10YR68 00	M		00MN00 00	Y	0	0		0		P				Y
9	0-28	hzcl	25Y 53 00	00MN00 00	F				3	0	HR	5						
	28-70	c	10YR52 63	10YR68 61	M			Y	0	0	HR	3		P				Y
10	0-36	mzcl	25Y 43 00						2	0	HR	4						
	36-70	c	10YR63 00	75YR56 71	M		00MN00 00	Y	0	0	HR	2		P				Y
11	0-30	mzcl	25Y 43 00						0	0	HR	2						
	30-50	mzcl	10YR52 00	10YR58 63	C			Y	0	0		0		M				
	50-80	hzcl	10YR63 00	10YR68 71	M		00MN00 00	Y	0	0		0		P				Y
	80-120	mzcl	75YR53 00	10YR56 61	C		00MN00 00	Y	0	0		0		M				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
12	0-30	hzcl	25Y 42 53						0	0	HR	3						
	30-65	c	10YR63 00	10YR68	71	M	00MN00	00 Y	0	0	HR	6		P			Y	
13	0-30	mzcl	25Y 53 00						0	0	HR	2						
	30-80	hzcl	10YR63 00	10YR68	71	M	00MN00	00 Y	0	0		0		P			Y	

SOIL PIT DESCRIPTION

Site Name : CHICH DLP OSH11 FISHBOUR Pit Number : 1P

Grid Reference: SU83200530 Average Annual Rainfall : 782 mm
Accumulated Temperature : 1540 degree days
Field Capacity Level : 161 days
Land Use : Wheat
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 34	MZCL	25Y 42 00	0	2	HR					
34- 56	MZCL	10YR63 00	0	0		C	MDCSAB	FR	M	
56-100	HZCL	75YR52 53	0	0		M	WKCPR	FM	P	

Wetness Grade : 3A Wetness Class : III
Gleying :034 cm
SPL :056 cm

Drought Grade : 2 APW : mm MBW : 0 mm
APP : mm MBP : 0 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : CHICH DLP OSH11 FISHBOUR Pit Number : 2P

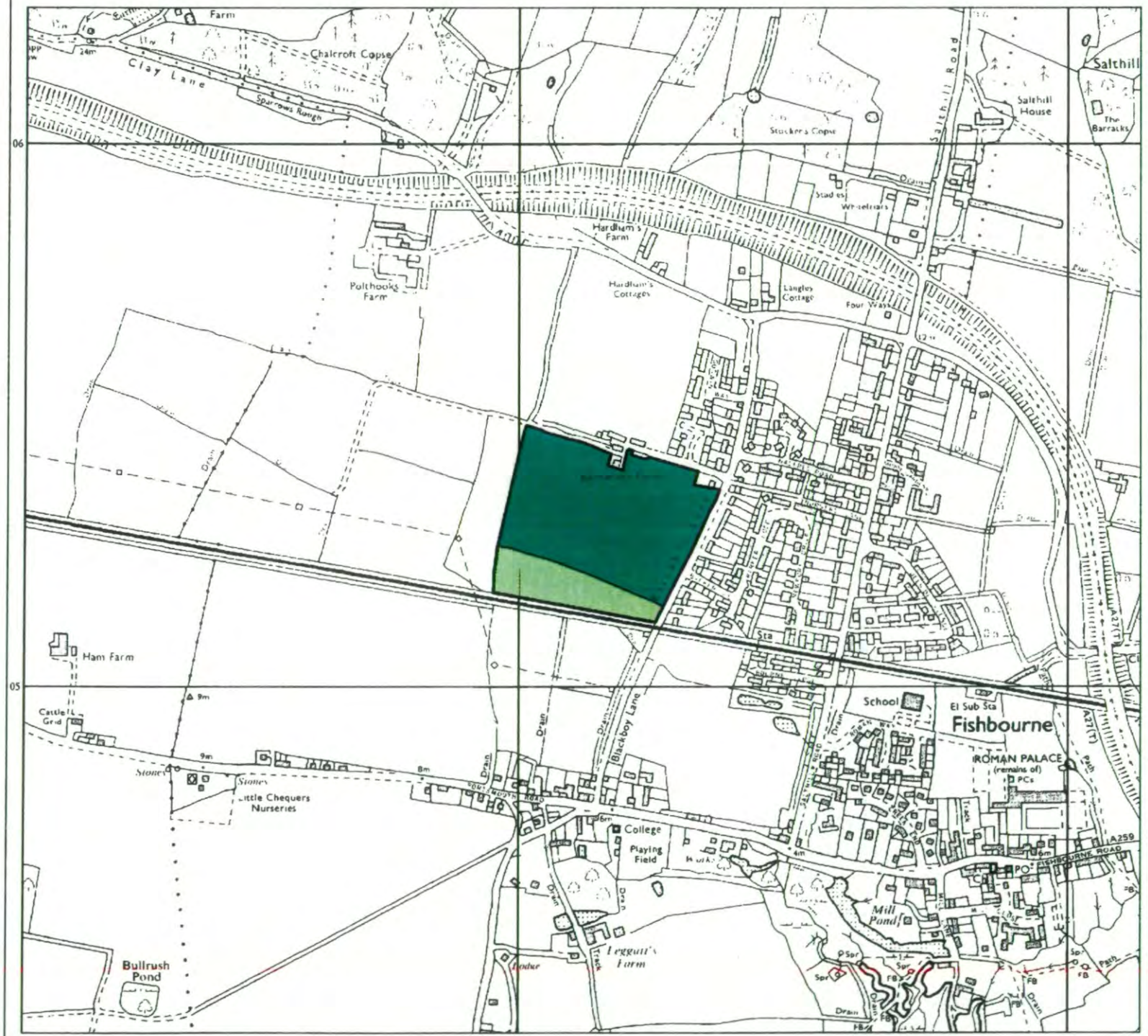
Grid Reference: SU83000520 Average Annual Rainfall : 782 mm
Accumulated Temperature : 1540 degree days
Field Capacity Level : 161 days
Land Use : Set-aside
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	HZCL	25Y 53 00	4	6	HR	F				
29- 65	C	10YR52 00	0	7	HR	M	WKMAB	FM	P	

Wetness Grade : 3B Wetness Class : IV
Gleying :029 cm
SPL :029 cm

Drought Grade : APW : mm MBW : 0 mm
APP : mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness



MAFF Ministry of Agriculture Fisheries and Food

Agricultural Land Classification

Chichester District Local Plan

OSH 11: Land at Bethwines Farm, Fishbourne

Legend

	Quality	Area (ha)
Grade 1	Excellent	nil
Grade 2	Very Good	nil
Grade 3a	Good	8.0
Grade 3b	Moderate	2.0
Grade 4	Poor	nil
Grade 5	Very Poor	nil
	Agricultural land not surveyed	nil
	Other land	nil
	Boundary of survey area	
	Total agricultural land area	10.0
	Total survey area	10.0

* Not present within survey area

Scale - 1:10,000

0 100 200 300 400 500 600 Metres

Further details contained in MAFF (1988) Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land. Maff (publications), London SE99 7TP.
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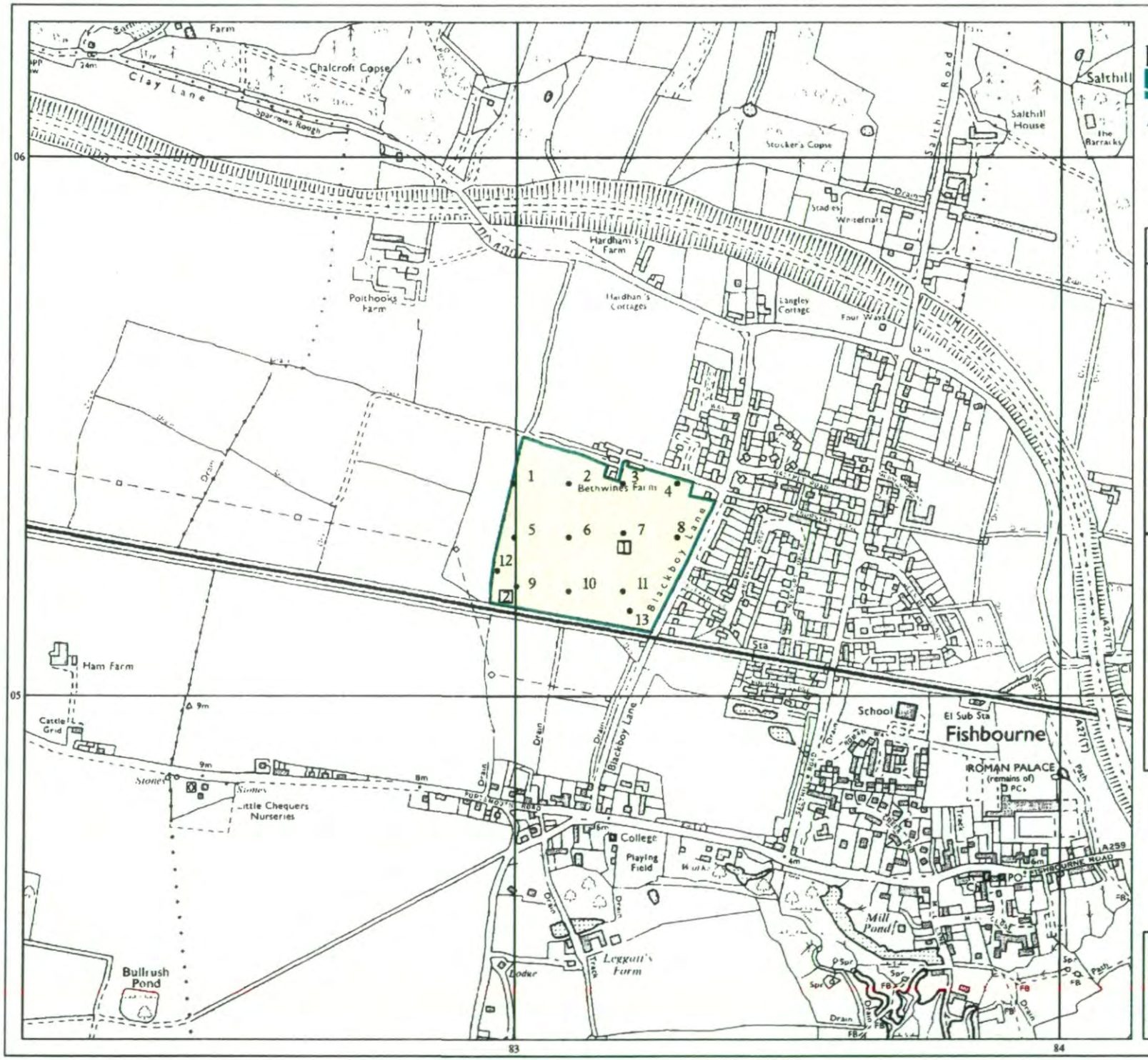

MAFF Ministry of Agriculture Fisheries and Food

Agricultural Land Classification

Chichester District Local Plan

OSH 11: Land at Bethwines Farm, Fishbourne

SAMPLE POINT MAP

LOCATION OF SOIL PIT

LOCATION OF AUGER SAMPLE POINT

AREA OF SURVEY

	Area (ha)
Agricultural land not surveyed	nil
Other land	nil
Total agricultural land area	10.0
Total survey area	10.0

* Not present within survey area

Scale - 1:10,000

0 100 200 300 400 500 600 Metres

Further details contained in MAFF (1988) Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land. Maff (publications), London SE99 7TP.
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