

**LAND EAST
OF WESTERGATE**

**AGRICULTURAL LAND
CLASSIFICATION AND
CONSIDERATIONS**

September 2023





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Greenacres Barn, Stoke Common Lane, Burton Stoke, Swindon SN15 4JJ

*Directors - Tony Kernon BSc(Hons), MRAC, MRICS, FBIAC Sarah Kernon
Consultants - Ellie Chew BSc(Hons), Amy Curtis BSc(Hons)*

CONTENTS

- 1 Introduction
- 2 Relevant Policy and Guidance
- 3 Agricultural Land Quality of the Site
- 4 Policy Assessment
- 5 Summary and Conclusions

Appendices

- KCC1 Natural England's Technical Information Note (TIN049)
- KCC2 Agricultural Land Classification Report
- KCC3 Extracts from John Nix Pocketbook for Farm Management (53rd Ed.)
- KCC4 Guide to Assessing Development Proposals on Agricultural Land (Natural England. 2021)
- KCC5 Arun Soils Assessment

Plans

- 1 Provisional Agricultural Land Classification Map (1983)
- 3 Agricultural land Classification around Westgate. Site edged red (extract from www.magic.gov.uk)
- 4 Extract from Provisional Agricultural Land Classification map - Arun District edged Black

1 INTRODUCTION

1.1 This report considers the agricultural land quality of a site extending to approximately 19.4ha east of Westergate.

1.2 The site comprises of six land parcels, shown outlined in red on the arial image below. The land is in a mixture of grassland and arable use,

Insert 1. The Site (Boundary Approx.)



1.3 A detailed Agricultural Land Classification (ALC) has been carried out over the site. The site has been graded as Grade 2 and Subgrade 3a quality.

1.4 This report:

- (i) reviews the relevant planning policy in section 2;
- (ii) describes the site and the ALC survey and findings in section 3;
- (iii) assesses the findings against policy in section 4; and
- (iv) provides a summary and conclusions in section 5.

1.5 This report has been prepared by Keron Countryside Consultants Ltd. We specialise in assessing the effects of development proposals on agricultural land and businesses.

2 RELEVANT POLICY AND GUIDANCE

National Planning Policy

- 2.1 The National Planning Policy Framework (NPPF) (2023), Paragraph 174 notes that planning policies and decision should contribute to enhance the natural an local environment by, inter alia, recognising **“the wider benefits from the natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land”**.
- 2.2 The best and most versatile (BMV) agricultural land is defined in Annex 2 of the NPPF as land which is of Grade 1, 2 and Subgrade 3a of the Agricultural Land Classification.
- 2.3 Paragraph 175 of the NPPF discusses plan making. It requires plans to, inter alia, allocate land with the least environmental or amenity value, where consistent with other policies in the Framework. Footnote 58 of the NPPF identifies that **“where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality”**.
- 2.4 There is no definition of what constitutes as “significant” development. However, the “Guide to assessing development proposals on agricultural land” (Natural England, February 2021) advises local planning authorities to **“take account of smaller losses (under 20ha) if they’re significant when making your decision”**, suggesting that 20ha is a suitable threshold for defining “significant” in many cases.

Local Plan

- 2.5 Th Arun District Local Plan 2011 – 2031 (Adopted July 2018), refers to development of best and most versatile land under Policy SO DM1 (Soils), which states the following:
- “Unless designated by this Plan or a Neighbourhood Development Plan, the use of Grades 1, 2 and 3a of the Agricultural Land Classification for any form of development not associated with agriculture, horticulture or forestry will not be permitted unless need for the development outweighs the need to protect such land in the long term.**
- The requirement to protect the best and most versatile land can be outweighed if it is demonstrated through sustainability and options appraisals that:
- a. **Preservation of land of lower agricultural quality has greater benefits in terms of ecosystem services (for example carbon storage, flood water retention, support of biodiversity);**
 - b. **That any site preferred for development is demonstrated to be the best and most sustainable option, including but not limited to the terms of land quality, ecosystem services, infrastructure and proven need; and**

- c. The proposed development meets the requirements of the countryside policy and/or equine development policy.

Where development is permitted it should, as far as possible, use the lowest grade of land suitable for that development. Development will not be permitted unless:

- d. The applicant has submitted sustainability and options appraisals, mitigation measures, and a soil resource plan for the development site;
- e. Site appraisal documents submitted by the applicant must demonstrate that consideration has been given to DEFRA's Soil Strategy for England;
- f. The productivity of the land is demonstrated using a methodology for assessing gross margins as contained in the Arun Soils and Agricultural Land Assessment Report; and
- g. The applicant has submitted a comprehensive soil resource plan for the development site which demonstrates that care will be taken to preserve the soil resource, such that it can be incorporated into a Productive Green Environment following development.

Development shall also be consistent with all other Local Plan Policies”.

Guidance

- 2.6 Natural England's "Guide to Assessing Development Proposals on Agricultural Land" (February 2021) describes the ALC process and sets out guidance on managing soils. It advises on the consultation process where more than 20ha of BMV land is involved.
- 2.7 The Institute of Environmental Management and Assessment (IEMA) produced a Guide "A New Perspective on Land and Soil in Environmental Impact Assessment" in February 2022. Whilst that refers to EA development, it identified in table 3 (page 49) the magnitude of impacts on soil resources. The permanent irreversible loss of between 5ha and 20ha is defined in table 2 as a **"moderate magnitude of impact"**.

3 AGRICULTURAL LAND QUALITY OF THE SITE

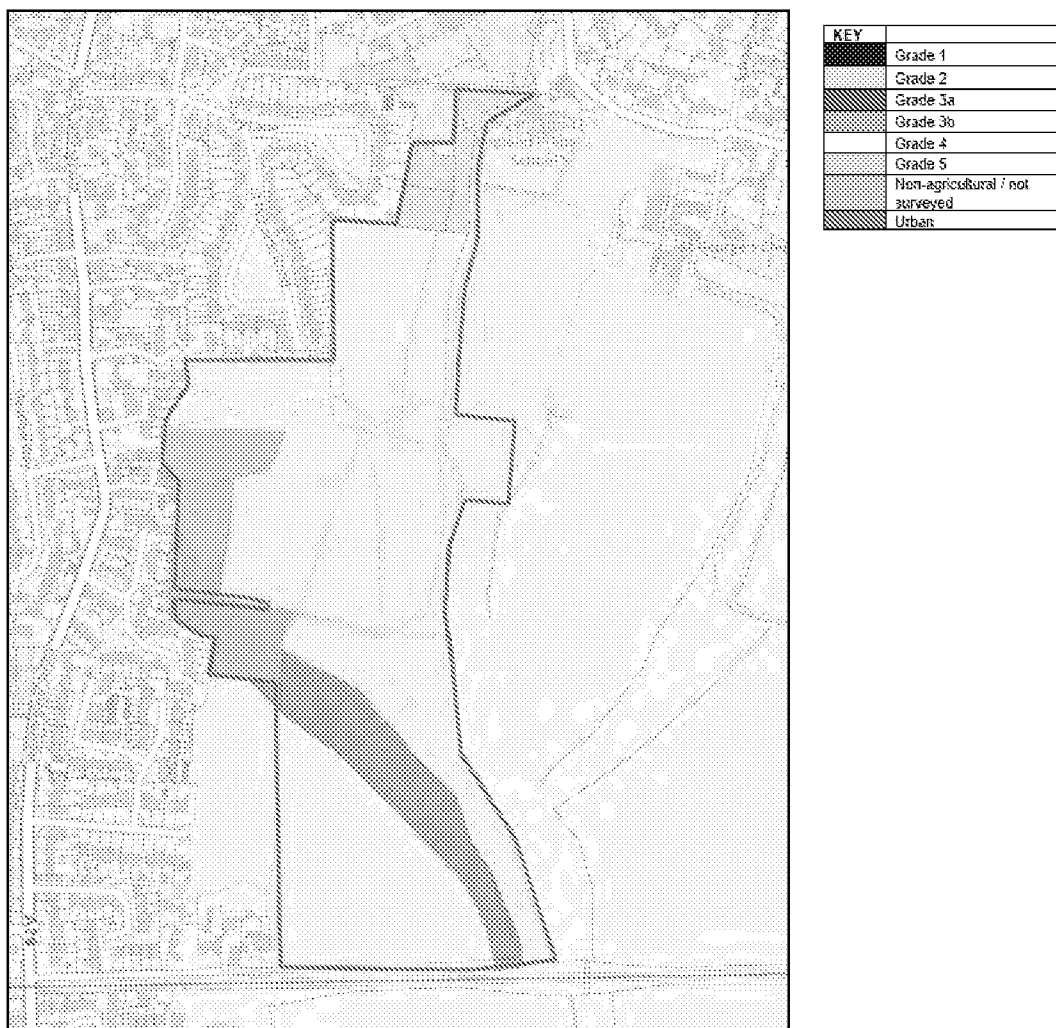
The ALC System

- 3.1 The Agricultural Land Classification (ALC) system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long term limitations on the agricultural use of the site. The ALC system divides agricultural land into five grades. Grade 1 of the ALC is described as being of excellent quality and Grade 5, at the other end of the scale, is described as being of very poor quality. The current guidelines and criteria for ALC were published by the Ministry of Agriculture, Fisheries and Food (MAFF) in 1988.
- 3.2 The ALC system is further described in Natural England's Technical Information Note TIN049 which can be found reproduced in **Appendix KCC1**.

Detailed ALC Survey Results

- 3.3 The majority of the Site has been subject to a detailed ALC survey since the ALC Guidelines were most recently updated. An area extending to 19.8 ha was surveyed on behalf of MAFF in March 1997. The ALC report and map published by MAFF are at **Appendix KCC2**.
- 3.4 Agricultural land quality at the Site is limited primarily by a drought limitation to varying degrees due to the relatively dry climate in combination with soil properties and stone content. Soil wetness is less limiting over the Site, except in the south-east where the soils are described as 'distinctly different' and poorly drained.
- 3.5 The ALC results from the survey and other surveys have been digitised by MAFF onto the www.magic.gov.uk information website. The ALC for the area is shown below. The Site is shown as a mixture of Grades 2, 3a and 3b, with the boundary of the site shown on the www.magic.gov.uk base below, and the results set out in the table.

Insert 2: ALC Results, Site Boundary Shown



3.6 The results are as follows:

Table 1. ALC Results

ALC Grade	Area (Ha)	Area (%)
Grade 2 (Very Good)	6.2	32
Subgrade 3a (Good)	1.8	9
Subgrade 3b (Moderate)	8.7	46
Non- Agricultural / Not surveyed	2.7	13
Total	19.4	100

3.7 The ALC survey has determined that agricultural land across the Site is of variable quality. Two areas of 'very good' Grade 2 quality land are located to the south and north of the Site, Subgrade 3a 'good' quality land forms a narrow strip between an area of Grade 2 and the block of Subgrade 3b 'moderate' quality agricultural land which dominates the centre and east of the Site.

4 POLICY ASSESSMENT

- 4.1 The NPPF (2021) identifies that land of Grades 1, 2 and 3a as the best and most versatile agricultural land and requires, that the economic and other benefits of BMV land be recognised.
- 4.2 In the context of plan making, the NPPF sets out that where significant development of such land is demonstrated to be necessary, poorer quality land is to be used in preference.

Land Quality in the Area Generally and Whether Poorer Quality Land is Available

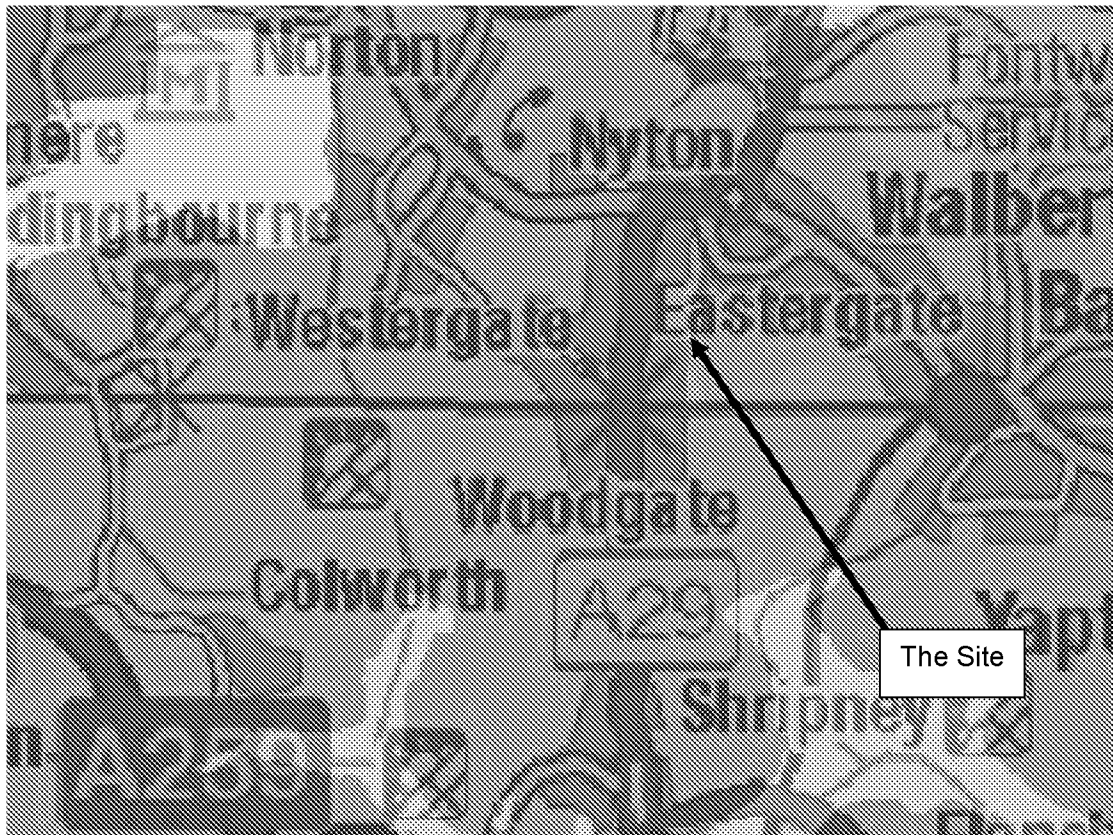
- 4.3 The significance of the development involving agricultural land needs to be considered in context. Across England it is estimated that 42% of farmland is of Grade 1, 2 and 3a quality (see TIN049, **Appendix KCC1**).
- 4.4 The MAFF statistics from the “provisional” ALC in the 1970’s provide provisional grading for 11,433,000ha. 42% of that land would be 4.8 million hectares.
- 4.5 The Utilised Agricultural Area (UAA) of England, which is less than the total amount of agricultural land, was 8.9 million hectares in 2022 (Agricultural Land Use in England at 1 June 2022, DEFRA, 29 September 2022). This suggests that 3.7 million hectares of BMV land is in active agricultural use.
- 4.6 Statistically about 40% of Grade 3 land falls within Subgrade 3a. However, in parts of the country the proportion of Subgrade 3a is expected to be much higher.
- 4.7 Therefore, it is not considered that BMV quality land is a rare resource.
- 4.8 On the published “provisional” ALC maps from the 1970’s that land is shown as undifferentiated Grade 3 with Grade 2, as can be seen on the map below. These maps were digitised in 2020.

Insert 3. Provisional ALC Map



- 4.9 Around Westergate, as can be seen, the Grade 3 is the poorest quality available. The rest of the settlement is shown as Grade 2 or Grade 1 quality. This site includes the poorest quality land available, from the provisional maps.
- 4.10 There are limitations with the “provisional” maps, which are described in TIN049 (**Appendix KCC1**). In 2017 Natural England produced predictive likelihood of best and most versatile maps. These estimate the proportion of land within an area that is of BMV quality. There are three categories which are low (<20% area BMV), moderate (20-60% area BMV) and high (>60% area BMV). For this area the map shows that the site has a high likelihood of BMV in addition to land around the site.

Insert 4. Predictive BMV Map



- 4.10 With the exception of areas associated with watercourses, the land in the wider area is all shown as falling within the high likelihood of BMV.
- 4.11 Based on this, it can be concluded that, in terms of land quality in the local area, that there are no obvious areas of lower quality available.

Economic Benefits

- 4.12 There is no research that we are aware of that seeks to analyse the productive economic advantages of BMV to non-BMV land. Grade 2 land is described in the ALC as capable of growing moderate to high yields of a narrow range of crops, or a moderate yield from a wider range of crops. Subgrade 3a is described as producing a moderate yield of a narrow range of crops, principally cereals or grass, or lower yields of a wider range of crops.
- 4.13 In the absence of any empirical data, any economic assessment is inevitably crude. Taking standard budgeting textbooks, such as the John Nix Pocketbook for Farm Management (extract which have been reproduced in **Appendix KCC3**) it is possible to show the difference between moderate and high yields, as an illustration between crops.
- 4.14 Taking that crude measure and applying it to winter wheat and oilseed rape, the differences are shown below:

Table 2. Assessment of Economics of Farmed Land

Item	Winter Wheat		Oilseed Rape	
	Average	High	Average	High
Yield (t/ha)	8.6t/ha	10.0t/ha	3.5t/ha	4.0t/ha
Output (£)	£2,108/ha	£2,423/ha	£1,803/ha	£2,060/ha
Gross Margin (£)	£1,200/ha	£1,515/ha	£1,066/ha	£1,363/ha
Uplift (£)	-	£315/ha	-	£257/ha

John Nix Pocketbook for Farm Management, September 2022

- 4.15 The site is partially grassland. However, if it was all to be cropped, the economic benefit of BMV to non-BMV land would be less than £2,500 (£2,030 - £2,489 on 2022 budgets). Hence the economic benefits on a land parcel of this size are fairly limited.
- 4.16 The Proposed Development will not have a significant adverse impact on a full-time business, nor will it result in any agricultural land being impacted or becoming unfarmable as a result of severance. Other farmland can continue to be managed as it is now.

Whether this is “Significant” Development

- 4.17 This proposal should not be considered to be “**significant development of agricultural land**” in the context of the NPPF.
- 4.18 Paragraphs 174 and 175 of the NPPF consider whether poorer quality land is available with the trigger for an assessment being that the proposal involved “**significant development of agricultural land**”. “**Significant development**” is not defined in the NPPF. One threshold for determination of what is significant is the threshold for consultation with Natural England, which is set at the loss of 20ha or more of BMV land (as can be seen in the TIN049 in **Appendix KCC1**). This has been the threshold for consultation with MAFF since 1987.
- 4.19 At 7.9ha, the quantum of BMV is less than 40% of the threshold for consultation with Natural England. Therefore, this quantum is not “significant development”.
- 4.20 The “Guide to assessing development proposals on agricultural land” (Natural England, 5th February 2021) (**Appendix KCC4**) does not define a threshold but does provide some guidance. This adds to our view that 20ha is a reasonable threshold for the definition of what is significant development:
- Paragraph 6 states “**you should take account of smaller losses (under 20ha if they are significant when making your decision)**”, which suggests that losses of under 20ha would not be significant unless there are particular local circumstances. What those particular local circumstances area, is not defined, but it would be reasonable to

consider that the loss of 20ha may be significant in an area where BMV land is rare, for example.

- Paragraph 7.1 states that you can use Natural England's chargeable discretionary advice system "**if your proposal is large, for example 20ha or more, and requires more detailed advice**". The definition of large as being more than 20ha suggests that a site under 20ha is considered small, and hence, not significant.

4.21 Policy SO DM1 criteria d) to g) require documents to demonstrate that soil resources have been considered carefully in the development proposals. A separate Soil Resource Plan is provided to address criteria d), e) and G.

4.22 Criterion f) requires an analysis using the Council's gross margin assessment. This is set out in **Appendix KCC5**.

5 SUMMARY AND CONCLUSIONS

- 5.1 The proposed site extends to 19.4 ha.
- 5.2 Almost all of the site has been surveyed for ALC. It has been found to comprise a mix of Grade 2, subgrade 3a and subgrade 3b. The site is, therefore, partially of the Best and Most Versatile agricultural land quality.
- 5.3 The NPPF requires the economic benefits and other benefits of BMV land to be considered and assessed. Based on the assessment, the economic benefits of the site are less than £2,500 per annum. This is a minimal return for a site of this size.
- 5.4 The site contains approximately 7.9 ha of BMV. In terms of the NPPF this is not considered “significant” development of agricultural land. Accordingly, poorer quality land does not need to be considered in preference.
- 5.5 It is clear from provisional and predictive mapping that there is very little poorer quality land within the area. Provisional maps show that this is the area expected to be the poorest in the general area. Therefore, it is considered that this is likely to be the poorest quality land available.
- 5.6 Based on the above, we consider that only limited weight should be given to the loss of BMV land at this site.

Appendix KCC1
Natural England
Technical Information Note 049 –
Agricultural Land Classification
(December 2012)

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.

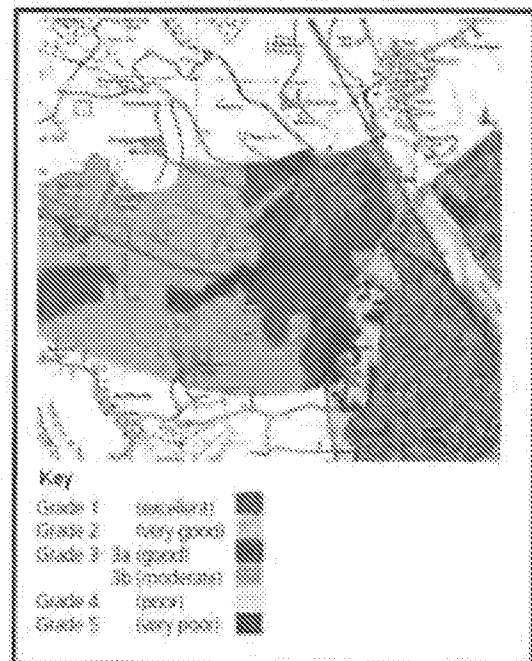
Policy to protect agricultural land

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 10 December 2012

www.naturalengland.org.uk



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 affenuse is for agriculture or where the loss of best and most versatile agricultural land agricultural land will be 20 ha or more. Non-agricultural affenuse, 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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**Appendix KCC2
ALC Report and Sample
Point Map (MAFF 1997)**

A1

ARUN DISTRICT LOCAL PLAN REVIEW
Objector Sites 5 & 12
Land East of Westergate,
West Sussex
Agricultural Land Classification
ALC Map and Report

March / April 1997

Resource Planning Team
Eastern Region
FRCA Reading

RPT Job Number 4202/031/97
FRCA Reference EL 42/00460
LURET Job Number 03050

AGRICULTURAL LAND CLASSIFICATION REPORT
ARUN DISTRICT LOCAL PLAN REVIEW
SITES 5 AND 12 LAND EAST OF WESTERGATE, WEST SUSSEX

INTRODUCTION

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 19.8 hectares of land located to the east of the village of Westergate and south of Eastergate near Bognor Regis in West Sussex. The survey was carried out during March 1997.

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

3 Prior to 1 April 1997 the work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. After this date the work was completed by the same team as part of the Farming and Rural Conservation Agency (FRCA, Reading). 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 agricultural land at this site was either permanent grazing, unmanaged grassland or in arable use. The areas mapped as Other Land are located towards the west of the site and comprise impenetrable scrub and public open space.

SUMMARY

5 The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. 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 below.

Table 1. Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	8.0	45.2	40.4
3a	1.9	10.7	9.6
3b	7.8	44.1	39.4
Other land	2.1	N/A	10.6
Total surveyed area	17.7	100	89.4
Total site area	19.8		100

7 The fieldwork was conducted at an average density of slightly more than 1 boring per hectare of agricultural land. A total of 23 borings and three soil pits were described.

8 The agricultural land on this site has been classified in the range Grade 2 (very good quality) to Subgrade 3b (moderate quality) including some Subgrade 3a (good quality). The limitations to land quality include soil droughtiness and soil wetness.

9 The areas of Grade 2 and Subgrade 3a within the site are principally limited by soil droughtiness. The soils comprise medium silty textures, occasionally overlying light loams at depth or occasionally becoming moderately to very stony in the lower subsoil. Soil droughtiness may affect plant growth, as the supply of available water may be deficient especially in drier years. A few individual observations are also limited by soil wetness.

10 The area of Subgrade 3b land is located towards the centre and east of the site. To the north of the drainage channel running east-west across the site, soil droughtiness is the principal limitation. In this area the soils are of medium silty texture and are commonly very occasionally extremely stony. In the local climate, the droughtiness limitation that the high stone content causes will affect plant growth, development and yield potential especially in drier years. To the south of the drainage channel there is an abrupt change in soil type. Here the soils are predominantly clayey and they exhibit signs of a moderate soil wetness limitation which, in the local climate leads to Subgrade 3b being appropriate. Soil wetness restricts land utilisation by adversely affecting plant growth and restricting the timing of mechanised operations or stocking.

FACTORS INFLUENCING ALC GRADE

Climate

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

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

Table 2 Climate and altitude data

Factor	Units	Values	
Grid reference	N/A	SU 942 044	SU 942 050
Altitude	m AOD	5	10
Accumulated Temperature	day C (Jan-June)	1543	1537
Average Annual Rainfall	mm	769	775
Field Capacity Days	days	157	158
Moisture Deficit, Wheat	mm	118	117
Moisture Deficit, Potatoes	mm	115	114
Overall climatic grade	N/A	Grade 1	Grade 1

13 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

14 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

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

Site

16 The site lies at altitudes in the range 5-10m AOD. The highest land is towards the north west and south west of the site. From these points the land slopes gently towards the centre of the site where a drainage channel runs to the eastern boundary which is a stream. None of the slopes are steep enough to adversely affect agricultural land quality

Geology and soils

17 The published geological information for the site (BGS 1975) shows the site to be underlain by three deposits. To the north and north west valley gravels are shown. To the south west brickearth is indicated and in a narrow strip along the stream to the east of the site alluvium has been mapped

18 The most detailed published soils information for the site (SSGB 1967) shows this site to be underlain by a total of four soil series. Hook series soils are shown in the north of the site. These are commonly silty, moderately well drained and variably stony. Soils fitting this general description were found in this area of the site. Across the centre of the site soils of the Calcetto series and Gade and Titchfield complexes are mapped. These generally comprise variably stony and loamy soils which are variably affected by both groundwater and surface water and exhibit this in the form of extensive gleying. The soils encountered in this part of the site were variable, north of the drainage channel running to the east of the site the soils were loamy, rarely gleyed but very stony. To the south of the drainage channel the soils were clayey, gleyed and only occasionally stony in the lower subsoil. Towards the south west of the site Park Gate series soils are mapped. These are described as being typically silty and moderately well drained (SSGB 1967). Soils similar to this description were found in this area of the site

AGRICULTURAL LAND CLASSIFICATION

19 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

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

Grade 2

21 Land of very good quality has been mapped in two areas at this site to the north west and south west of the site

22 The land in this area is principally limited by soil droughtiness although soil wetness can be equally limiting at some locations. Soils commonly comprise a slightly stony medium silty clay loam topsoil passing to a similarly textured though commonly stone free and occasionally gleyed upper subsoil in some observations this extended to depth (120cm). However the lower subsoil in the majority of the profiles in this mapping unit was more variable. Occasionally it comprised a stone free permeable gleyed heavy silty clay loam which either occurred to depth (120cm) or was impenetrable to the soil auger due to stones between 80 and 85cm. In the remaining observed profiles the lower subsoil was gleyed and comprised either a heavy silty clay loam overlying medium silty clay loam and medium sandy loam or a medium silty clay loam overlying medium sandy loam and loamy medium sand horizons which were commonly stoneless. Such soils are permeable and allocated to Wetness Class I or II depending on the depth to gleying.

23 These soils are generally water retentive but in the locally relatively dry climate they have a tendency to be slightly restricted by soil droughtiness. This leads to the possibility of plant growth and yield being adversely affected especially in drier years. In addition the majority of the observed profiles exhibited signs of soil wetness in the form of gleying due to fluctuating groundwater. This will slightly restrict the versatility of the land by restricting the number of days when cultivations or stocking may occur without damaging the soil structure. However this does not affect the classification in the majority of cases.

Subgrade 3a

24 Land of good quality has been mapped in a single unit towards the south and west of the site. The principal limitation is soil droughtiness. The soil pit 3P is representative of the soil type found in these areas.

25 The soils in this area are essentially similar (Wetness Class I and II) in texture to those described above for Grade 2 except that overall the stone content is greater and as such in the local climate the water available to crops is slightly more restricted. Soils comprise a slightly stony (8% v/v total flints) medium silty clay loam topsoil overlying a moderately stony (up to 15% v/v total flints) medium silty clay loam upper subsoil. This passes to a moderately stony (25% v/v total flints) heavy silty clay loam horizon overlying a medium silty clay loam lower subsoil containing 35% v/v total flints. This was impenetrable to the soil auger and spade at 85cm. Other observations in this map unit were impenetrable to the soil auger at slightly shallower depths (65cm). The stone content of the soil profile is such that the water available to plants is restricted to the extent that moisture balances given local climatic factors are in the Subgrade 3a range. Soil droughtiness will restrict plant growth and yield especially in drier years.

Subgrade 3b

26 Land of moderate quality has been mapped in a single mapping unit. It is located towards the centre and east of the site. Principal limitations to land quality include soil

droughtiness to the north of the drain (located towards the centre of the site) and soil wetness to the south of this feature

27. Within the Subgrade 3b mapping unit two separate soil types were observed. To the north of the drain, the principal limitation is soil droughtiness. In this area the soils are well drained (Wetness Class I) and are characterised by the soil pit 1P (see Appendix II). They comprise a slightly to moderately stony (up to 37% v/v total flints including up to 17% > 2cm) medium silty clay loam topsoil overlying moderately to very stony (up to 65% v/v total flints including up to 50% > 2cm) medium and heavy silty clay loam subsoil horizons. These were commonly impenetrable to the soil auger between 25 and 45cm and to the spade at 55cm. Rooting was observed to extend to at least 55cm and assumed to penetrate further. The stone content of these profiles leads the available water to plants to be restricted to the extent that in the local climate Subgrade 3b is the appropriate classification. Plant growth and yield potential are likely to be significantly and adversely affected by this restriction.

28. To the south of the drain located towards the centre of the site the soils are distinctly different and principally limited by soil wetness. The pit observation 2P (see Appendix II) is representative of the soils observed here. They commonly comprise a stoneless medium or heavy silty clay loam or clay topsoil which may be gleyed. This passes to a stone free poorly structured gleyed and slowly permeable clay subsoil. The depth to the gleyed and slowly permeable horizons results in the soils being ascribed to Wetness Class IV. Given the local climate and topsoil textures Subgrade 3b is the appropriate classification for these wet soils. Soil wetness has the effect of restricting land utilisation by limiting the number of days when cultivation or grazing may occur without damaging the soil structure. It can also restrict crop yield, growth and rooting.

Matthew Larkin
Resource Planning Team
Eastern Region
FRCA Reading

SOURCES OF REFERENCE

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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 most climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 Very Poor Quality Agricultural Land

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

APPENDIX II

SOIL DATA

Contents

Sample location map

Soil abbreviations - explanatory note

Soil pit descriptions

Soil boring descriptions (boring and horizon levels)

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	OTH	Other
DCW	Deciduous woodland	BOG	Bog or marsh	SAS	Set Aside
HTH	Heathland	HRT	Horticultural crops	PLO	Ploughed
- 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 BRT 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	ST	Topsoil Stickiness
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
EX	Exposure				

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	FSST	soft fine grained sandstone
ZR	soft argillaceous or silty rocks	CH	chalk
MSST	soft medium grained sandstone	GS	gravel with porous (soft) stones
SI	soft weathered igneous/metamorphic rock	GH	gravel with non porous (hard) stones

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	MD	moderately developed
	ST	strongly developed		
Ped size	F	fine	M	medium
	C	coarse		
Ped shape	S	single grain	M	massive
	GR	granular	AB	angular blocky
	SAB	sub angular blocky	PR	prismatic
	PL	platy		

- 9 **CONSIST** Soil consistence is described using the following notation

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

- 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 unpenetrable 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 ARUN DLP SITES 5 & 12 Pit Number 1P
 Grid Reference SU54200470 Average Annual Rainfall 769 mm
 Accumulated Temperature 1543 degree days
 Field Capacity Level 157 days
 Land Use Permanent Grass
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOR	STONES %2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0-22	MZCL	10YR33 00	8	13	HR					
22-36	MZCL	10YR43 00	50	95	HR			FR	H	
36-45	MZCL	10YR43 00	40	61	HR			FR	H	
45-55	MZCL	10YR42 00	0	65	HR			FR	H	

Moisture Grade 1
 Moisture Class I
 Clayey 20
 SPL 20
 Drought Grade 4
 APN 60 mm MBN -50 mm
 APP 61 mm MBP -54 mm

FINAL ALC GRADE 38
 MAIN LIMITATION Droughtiness

SOIL PIT DESCRIPTION

Site Name ARUN DLP SITES 5 & 12 Pit Number 2P
 Grid Reference SU54200460 Average Annual Rainfall 769 mm
 Accumulated Temperature 1543 degree days
 Field Capacity Level 157 days
 Land Use Permanent Grass
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOR	STONES %2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0-25	MZCL	10YR42 43	0	0						
25-55	C	25 Y41 42	0	0		C	MOGAS	FR	P	

Moisture Grade 38
 Moisture Class IV
 Clayey 25 cm
 SPL 25 cm
 Drought Grade
 APN mm MBN 0 mm
 APP mm MBP 0 mm

FINAL ALC GRADE 38
 MAIN LIMITATION Moisture

SOIL PIT DESCRIPTION

Site Name ARUN DLP SITES 5 & 12 Pit Number 39
 Grid Reference SU94100460 Average Annual Rainfall 769 mm
 Accumulated Temperature 1543 degree days
 Field Capacity Level 157 days
 Land Use Wheat
 Slope and Aspect 2 degrees N

HORIZON	TEXTURE	COLOR	STONES %	TOY STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	MZCL	10YR4/3 5/3	1	8	HR					
28- 48	MZCL	10YR5/3 5/4	0	15	HR	F	MOCSA8	FR	H	
48- 83	MZCL	10YR5/3 5/0	0	25	HR	C	MOCSA8	FR	H	
83- 85	MZCL	10YR5/2 0/0	0	35	HR	H		FR	H	

Setness Grade 1 Setness Class 1
 Gleying 48 cm
 SPI
 Drought Grade 3A APW 105mm MSW -12 mm
 APP 105mm MSP -9 mm

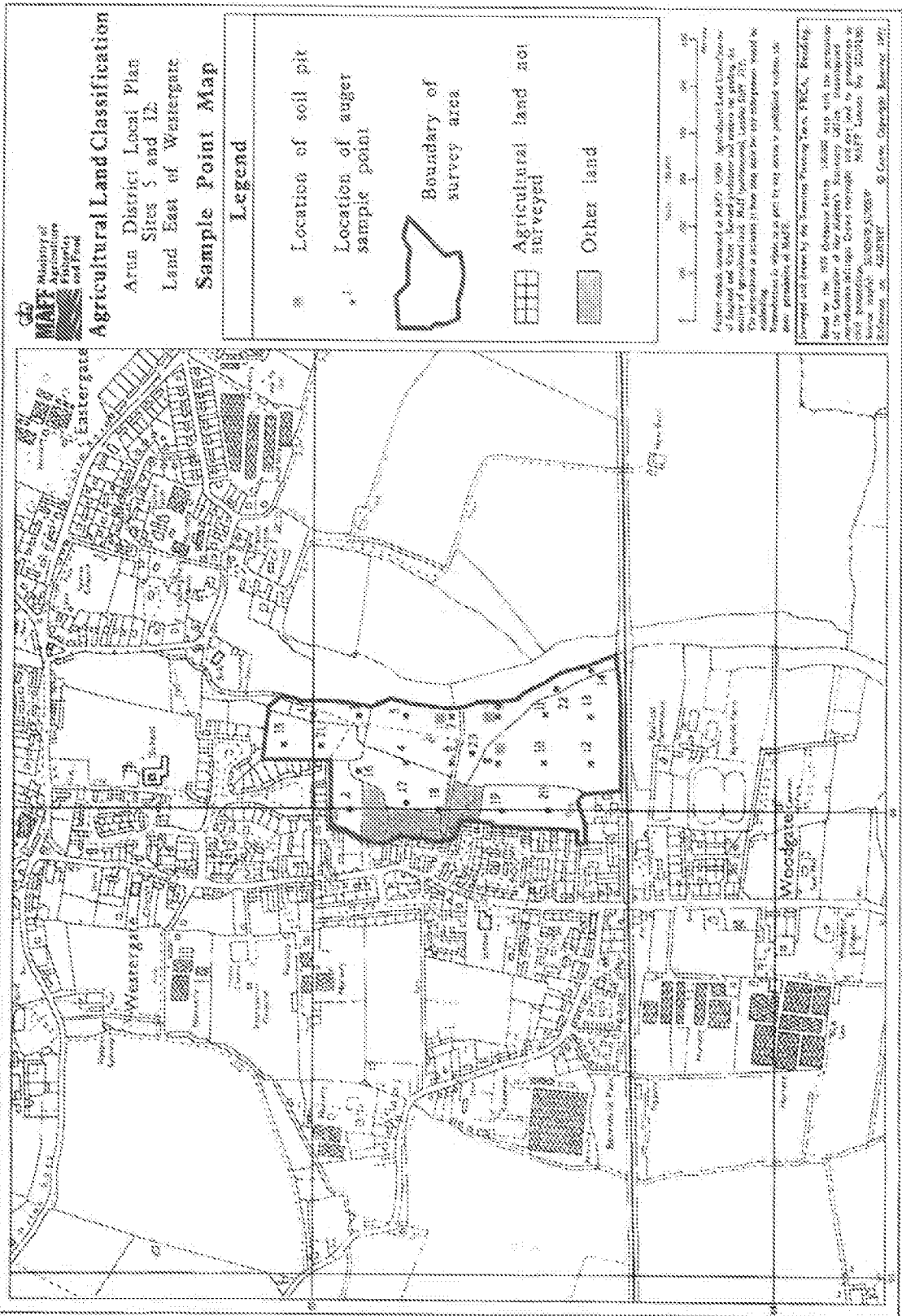
FINAL ALC GRADE 3A
 MAIN LIMITATION Droughtiness

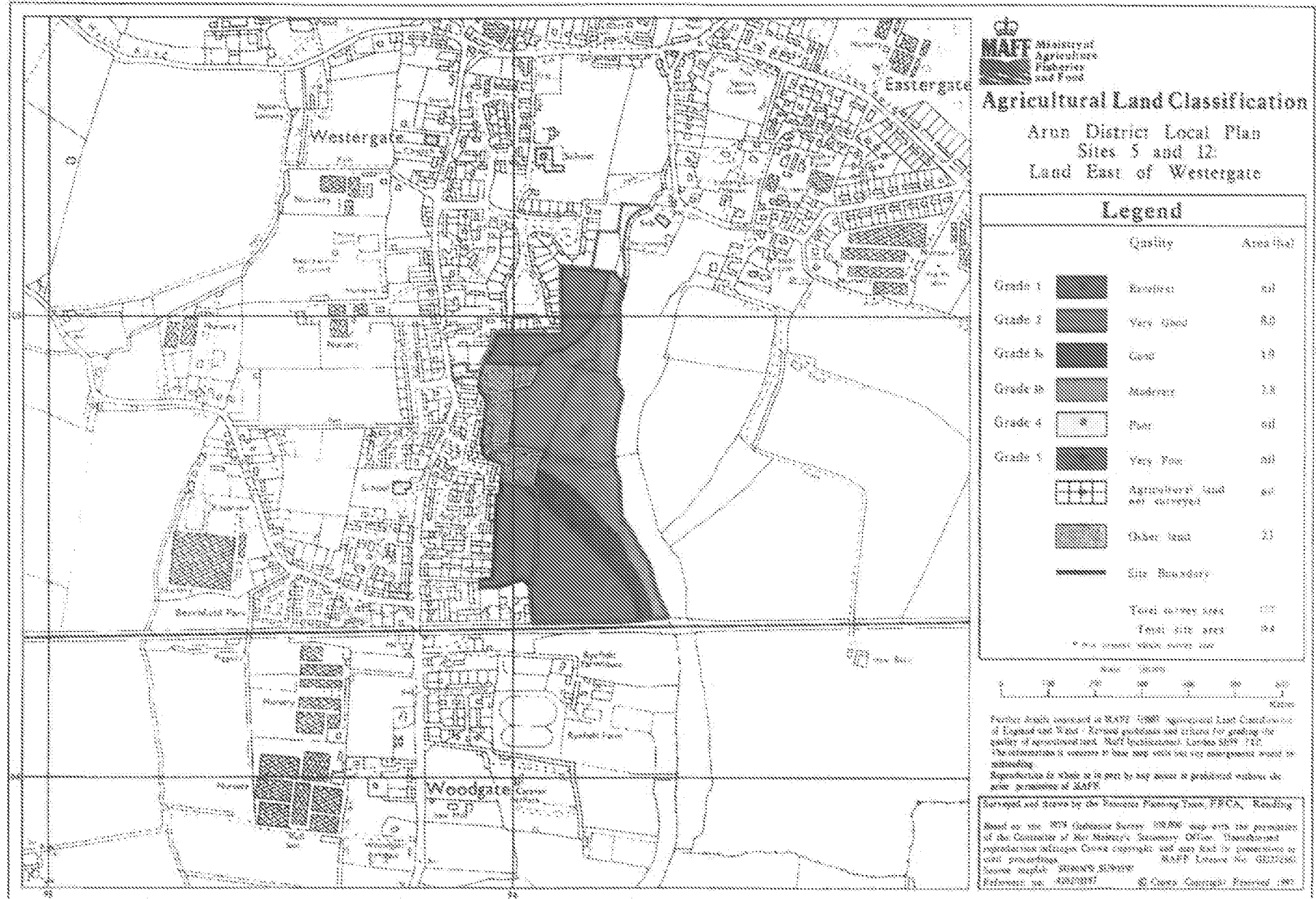
SAMPLE NO	GRID REF	USE	ASPECT	GRONT	OLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	H DEL	FLOOD	EROSN	FROST	CHSH	ALC	COMMENTS
1	SU94200500	PGR	E	3			1	1	31	-87	31	-84	4					DR 38	SEE 1P
1P	SU94200470	PGR					1	1	60	-58	61	-54	4					DR 38	IMP 55 38-120
2	SU94000490	PGR			65		1	1	106	-12	119	4	3A					DR 3A	IMP 70 SEE 3P
2P	SU94200460	PGR			25	25	4	38	0	0	0	0						WE 38	PIT 55
3	SU94200480	PGR	E	2	22	32	2	3A	53	-85	53	-62	4					TS 38	IMP 45 SEE 1P
3P	SU94100460	WHT	N	2	48		1	1	106	-12	106	-9	3A					DR 3A	PIT IMP 85
4	SU94100480	PGR					1	1	56	-62	55	-59	4					DR 38	IMP 32 SEE 1P
5	SU94200480	PGR					1	1	49	-69	49	-66	4					DR 38	IMP 30 SEE 1P
6	SU94100470	PGR					1	1	59	-59	59	-56	4					DR 38	IMP 35 SEE 1P
7	SU94200470	PGR					1	1	49	-69	49	-66	4					DR 38	IMP 30 SEE 1P
8	SU94100450	WHT	N	2	28		2	2	97	-21	105	-10	38					DR 3A	IMP 65 SEE 3P
9	SU94200480	PGR			38	28	4	38	0	0	0	0						WE 38	SEE 2P
10	SU94100450	WHT			28		2	2	156	38	122	7	2					WD 2	
11	SU94200450	WHT	NE	2			1	1	54	-64	54	-61	4					DR 3A	IMP 30 SEE 1P/3P
12	SU94100440	WHT			65		1	1	157	39	121	6	2					DR 2	
13	SU94200440	WHT	E	4	35		2	2	125	8	125	10	2					WD 2	
14	SU94300440	PGR	E	2	0	25	4	38	0	0	0	0						WE 38	SEE 2P
15	SU94140507	PGR					1	1	158	40	123	8	2					DR 2	
16	SU94090480	PGR			22		2	2	48	-70	48	-67	4					DR 38	IMP 30 SEE 1P
17	SU94020480	PGR			0		2	2	82	-36	82	-33	38					DR 38	IMP 50 SEE 3P
18	SU94010474	PGR	S	1	0	20	4	38	0	0	0	0						WE 38	SEE 2P
19	SU94050460	PGR			55		1	1	152	34	124	9	2					DR 2	
20	SU94080450	PGR			30		2	2	159	41	123	8	2					WD 2	
21	SU94140499	PGR			48		1	1	118	0	123	8	3A					DR 2	IMP 50 SEE 3P
22	SU94260447	PGR			10	10	4	38	0	0	0	0						WE 38	IMP 55 SEE 2P
23	SU94130465	PGR			25	25	4	38	0	0	0	0						WE 38	IMP 55 SEE 2P

KCC2243 ALC&C Sept 23

SAMPLE	DEPTH	TEXTURE	COLOUR	-----HOTTLERS-----			PED	-----STONES-----			STRUCT/	SUBS						
				COL	ARUN	CONT		COL	GLE	>2			>8	LITH	TOT	CONSIST	STR	FOR
11	0-25	med	10YR4/3 00								0	0	HR	5				
	25-30	med	10YR5/4 00								0	0	HR	2	M		IMP FLINTS	30
12	0-30	med	10YR4/3 53								1	0	HR	5				
	30-65	med	10YR5/4 00 10YR5/6 00 F								0	0	HR	2	M			
	65-120	med	10YR5/2 53 10YR5/8 00 C					00YR5/2 00 Y			0	0		0	M			
13	0-35	med	10YR4/3 00								0	0	HR	2				
	35-85	med	10YR4/3 00 75YR5/6 00 C					00YR5/2 00 Y			0	0		0	M			
	85-85	med	10YR5/2 00 10YR5/8 00 M					Y			0	0		0	M		IMP FLINTS	85
14	0-25	med	10YR4/2 00 75YR4/6 00 C					Y			0	0	HR	2				
	25-45	med	10YR5/3 51 75YR4/6 00 M					Y			0	0	HR	2	P		Y	
	45-85	c	05 Y5/1 00 75YR5/8 00 M					Y			0	0	HR	5	P		Y	
15	0-30	med	10YR4/3 53 10YR4/6 00 F								0	0	HR	2				
	30-50	med	10YR5/3 00								0	0	HR	2	M			
	50-120	med	75YR5/4 00 10YR5/6 00 F								0	0	HR	2	M			
16	0-22	med	10YR4/2 52								0	0	HR	10				
	22-30	med	10YR5/2 00 10YR5/6 00 C					Y			0	0	HR	30	M		IMP FLINTS	30
17	0-25	med	10YR4/2 52 10YR4/6 00 C					Y			0	0	HR	5				
	25-45	med	25Y 5/2 62 10YR5/8 00 C					Y			0	0	HR	10	M			
	45-50	med	25Y 6/3 00 10YR5/8 00 C					Y			0	0	HR	30	M		IMP FLINTS	50
18	0-20	c	25Y 4/2 00 10YR5/8 68 C					Y			0	0	HR	5				
	20-70	c	25Y 5/3 00 10YR6/8 00 M					00YR5/2 00 Y			0	0	HR	10	P		Y	
19	0-30	med	10YR4/2 00								0	0	HR	2				
	30-55	med	10YR5/4 00 10YR5/6 00 F								0	0		0	M			
	55-75	med	10YR5/3 62 10YR5/8 00 C					00YR5/2 00 Y			0	0		0	M			
	75-100	med	25Y 6/2 00 10YR5/6 00 M					Y			0	0		0	M			
	100-120	med	25Y 6/2 00 10YR5/8 00 M					Y			0	0		0	M			
20	0-30	med	10YR4/2 00								0	0	HR	3				
	30-55	med	10YR5/4 64 10YR5/6 00 C					Y			0	0		0	M			
	55-120	med	25Y 6/2 00 75YR5/8 00 M					00YR5/2 00 Y			0	0		0	M			
21	0-30	med	10YR4/2 00								0	0	HR	2				
	30-45	med	10YR4/4 54 00YR5/2 00 F								0	0		0	M			
	45-75	med	10YR5/4 00 10YR5/6 00 C					00YR5/2 00 Y			0	0	HR	3	M			
	75-80	med	10YR5/4 00 10YR5/6 00 C					00YR5/2 00 S			0	0	HR	30	M			
22	0-10	med	10YR3/1 41								0	0		0				
	10-55	c	25Y 4/2 00 75YR5/8 00 M					00YR5/2 00 Y			0	0		0	P		Y	IMP FLINTS 55
23	0-25	med	10YR4/2 00 10YR4/6 00 F								0	0	HR	2				
	25-55	c	25Y 4/1 51 75YR5/8 00 C					Y			0	0		0	P		Y	IMP FLINTS 55

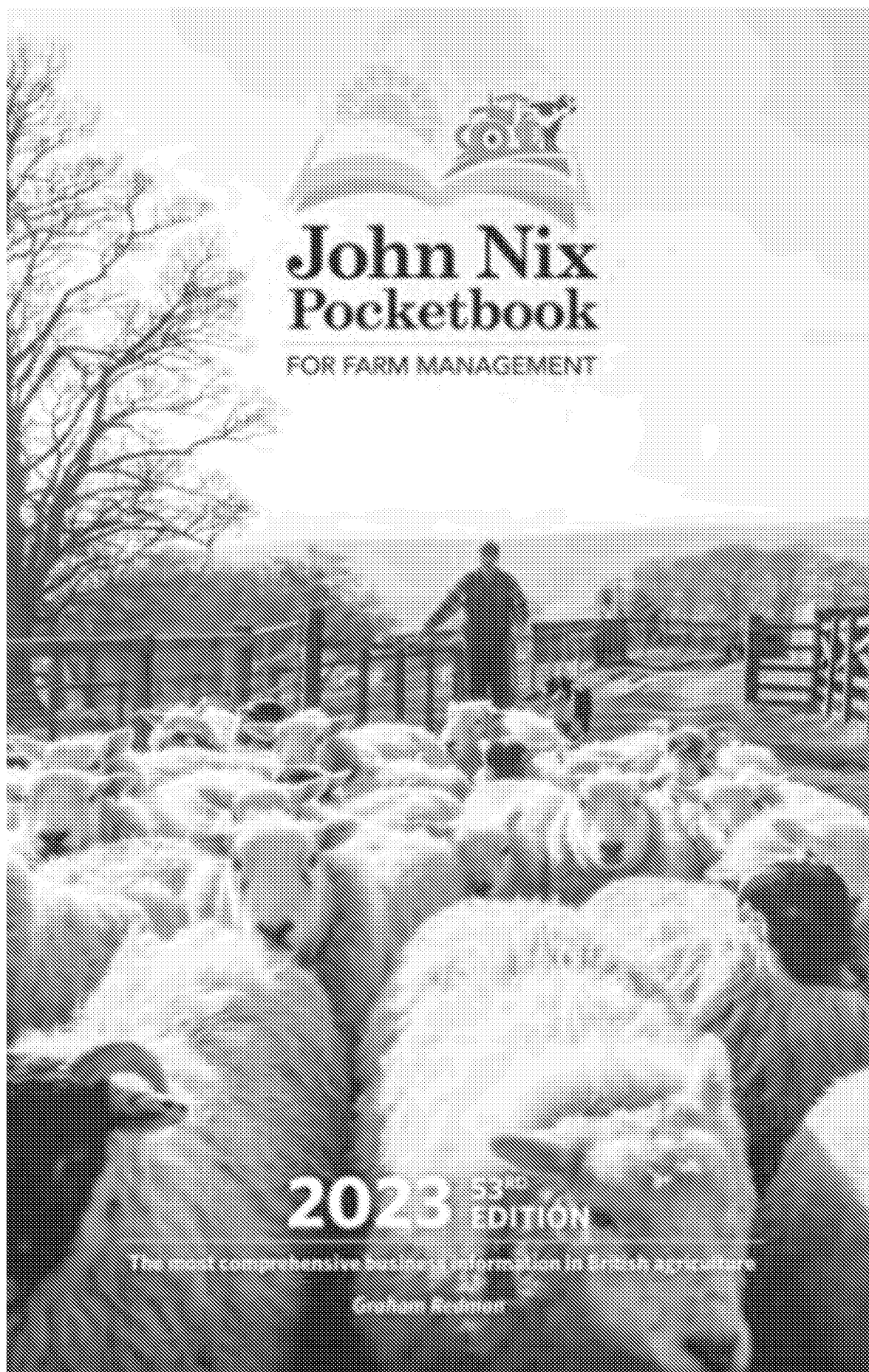
SAMPLE	DEPTH	TEXTURE	COLOUR	-----HOTTLERS-----		PED	-----STONES-----		STRUCT/	SUBS	STR	FOR	IMP	SPR	CALC
				COL	ARUN	CONT	COL	GLE	>2	>8	LITH	TOT	CONSIST		
11	0-25	med	10YR4/3 00						0	0	HR	5			
	25-30	med	10YR5/4 00						0	0	HR	2		M	IMP FLINTS 30
12	0-30	med	10YR4/3 53						1	0	HR	5			
	30-65	med	10YR5/4 00 10YR5/6 00 F						0	0	HR	2		M	
	65-120	med	10YR5/2 53 10YR5/8 00 C			00YR5/2 00 Y			0	0		0		M	
13	0-35	med	10YR4/3 00						0	0	HR	3			
	35-85	med	10YR4/3 00 75YR5/6 00 C			00YR5/2 00 Y			0	0		0		M	
	85-85	med	10YR5/2 00 10YR5/8 00 M					Y	0	0		0		M	IMP FLINTS 85
14	0-25	med	10YR4/2 00 75YR4/6 00 C					Y	0	0	HR	2			
	25-45	25	10YR5/3 51 75YR4/6 00 M					Y	0	0	HR	2		P	Y
	45-85	c	05 Y5/1 00 75YR5/8 00 M					Y	0	0	HR	5		P	Y
15	0-30	med	10YR4/3 53 10YR4/6 00 F						0	0	HR	2			
	30-50	med	10YR5/3 00						0	0	HR	2		M	
	50-120	med	75YR5/4 00 10YR5/6 00 F						0	0	HR	2		M	
16	0-22	med	10YR4/2 52						0	0	HR	10			
	22-30	med	10YR5/2 00 10YR5/6 00 C					Y	0	0	HR	30		M	IMP FLINTS 30
17	0-25	med	10YR4/2 52 10YR4/6 00 C					Y	0	0	HR	5			
	25-45	med	25Y 5/2 62 10YR5/8 00 C					Y	0	0	HR	10		M	
	45-50	med	25Y 6/3 00 10YR5/8 00 C					Y	0	0	HR	30		M	IMP FLINTS 50
18	0-20	c	25Y 4/2 00 10YR5/8 68 C					Y	0	0	HR	5			
	20-70	c	25Y 5/3 00 10YR6/8 00 M			00YR5/2 00 Y			0	0	HR	10		P	Y
19	0-30	med	10YR4/2 00						0	0	HR	2			
	30-55	med	10YR5/4 00 10YR5/6 00 F						0	0		0		M	
	55-75	med	10YR5/3 62 10YR5/8 00 C			00YR5/2 00 Y			0	0		0		M	
	75-100	med	25Y 6/2 00 10YR5/6 00 M					Y	0	0		0		M	
	100-120	med	25Y 6/2 00 10YR5/8 00 M					Y	0	0		0		M	
20	0-30	med	10YR4/2 00						0	0	HR	3			
	30-55	med	10YR5/4 64 10YR5/6 00 C					Y	0	0		0		M	
	55-120	med	25Y 6/2 00 75YR5/8 00 M			00YR5/2 00 Y			0	0		0		M	
21	0-30	med	10YR4/2 00						0	0	HR	2			
	30-45	med	10YR4/4 54 00YR5/2 00 F						0	0		0		M	
	45-75	med	10YR5/4 00 10YR5/6 00 C			00YR5/2 00 Y			0	0	HR	3		M	
	75-80	med	10YR5/4 00 10YR5/6 00 C			00YR5/2 00 S			0	0	HR	30		M	
22	0-10	med	10YR3/1 41						0	0		0			
	10-55	c	25Y 4/2 00 75YR5/8 00 M			00YR5/2 00 Y			0	0		0		P	Y IMP FLINTS 55
23	0-25	med	10YR4/2 00 10YR4/6 00 F						0	0	HR	2			
	25-55	c	25Y 4/1 51 75YR5/8 00 C					Y	0	0		0		P	Y IMP FLINTS 55





Appendix KCC3

Extracts from the Pocketbook for Farm Management



II. ENTERPRISE DATA

1. CROPS

WHEAT

Feed Winter Wheat

Production level	Low	Average	High	
Yield: t/ha (t/ac)	7.25 (2.9)	8.60 (3.5)	10.00 (4.1)	
	£	£	£	£/t
Grain at £225/t	1,631	1,935 (784)	2,250 (911)	
Straw in Swath	173 (70)	173 (70)	173 (70)	
Total Output	1,804 (731)	2,108 (854)	2,423 (981)	245
Variable Costs £/ha (£/ac):				
Seed.....		97 (39)		11
Fertiliser.....		533 (216)		62
Sprays.....		276 (113)		32
Total Variable Costs		906 (368)		105
Gross Margin £/ha (ac)	896 (363)	1200 (486)	1,515 (613)	140

Fertiliser Basis 8.6t/ha				Seed:	Sprays £/ha:		
Nutrient	Kg/t	Kg/Ha	£/Ha	£/t C2	£605	Herbicides	£121
N	22	190	£358	Kg/Ha	175	Fungicides	£110
P	7.0	60	£85	% HSS	30%	Insecticides	£9
K	10.5	90	£90	£/t HSS	£435	PGRs	£17
						Other	£28

1. Yields. The average yield is for all winter feed wheat, i.e. all varieties and 1st and subsequent wheats. See over for First and Second Wheats. The yield used for feed and milling wheats including spring varieties is 8.4t/ha.

The table below offers a weighted estimate of yield variations according to wheat type based on a national yield of 8.41t/ha. Percentages compare yield categories with 'all wheat'. These yields are used in the gross margins.

Calculation of spread of 'average' yields depending on wheat type –

	Winter	1st WW	2nd WW	spring	Total
t/ha	101%	102%	93%	85%	
Total	100%	8.49	8.63	7.82	8.41
Feed	101%	8.58	8.71	7.90	8.49
Bread	93%	7.90	8.02	7.27	7.82
Biscuit	99%	8.41	8.54	7.74	8.32

2. Straw is sold in the swath. Fertiliser accounts for mineral depletion.
3. Seed is coated with a single purpose dressing. Up to a third of growers require additional seed treatments, specifically to suppress BYDV. This can add £150/t of seed (£26.50/ha). This has not been added in the gross margins so should be considered.
4. This schedule does not account for severe grass weed infestations such as Black Grass or Sterile Brome. Costs associated with managing such problems can amount to up to £175/hectare additional agrochemical costs. Yield losses increase as infestation rises:

OILSEED RAPE

Winter Oilseed Rape

Production level	Low	Average	High	
Yield: t/ha (t/ac)	3.00 (1.2)	3.50 (1.4)	4.00 (1.6)	
	£	£	£	£/t
Output at £515/t	1545 (626)	1,803 (730)	2,060 (834)	515
Variable Costs £/ha (£/ac):				
Seed.....		74 (30)		21
Fertiliser.....		410 (166)		117
Sprays.....		253 (102)		72
Total Variable Costs		737 (298)		210
Gross Margin £/ha (ac)	808 (327)	1066 (432)	1,323 (536)	305

Fertiliser Basis 3.5t/ha				Seed:		Sprays:	
Nutrient	Kg/t	Kg/ha	£/ha	£/ha C	45	Herbicides	£125
N	46	160	£301	£/ha Hy	90	Fungicides	£68
P	14	49	£69	£/ha HSS	30	Insecticides	£16
K	11	39	£39	C:Hy:HSS	20:20:60	PGRs	£0
Seed write-off			7%	Kg/ha	5.5	Other	£44

1. **Prices.** The price used for the 2023 crop is £484/t plus oil bonuses at 44% oil content. The bonus is paid on the percentage of oil over 40%, at 1.5 times the sale value of the crop and an equal but opposite penalty below 40%. For example, in this case, the bonus is on 4% oil x £484 x 1.5 = £29. (Figures are rounded to the nearest £5.00 in the margin)

Spring Oilseed Rape

Production level	Low	Average	High	
Yield: t/ha (t/ac)	2.00 (0.8)	2.28 (0.9)	2.50 (1.0)	
	£	£	£	£/t
Output at £515/t	1030 (417)	1,172 (475)	1,288 (522)	515
Variable Costs £/ha (£/ac):				
Seed.....		71 (29)		31
Fertiliser.....		202 (82)		89
Sprays.....		132 (53)		58
Total Variable Costs		405 (164)		178
Gross Margin £/ha (ac)	625 (253)	767 (311)	883 (358)	337

2. **Inputs.** Seed as per WOSR, but 45% conventional, 5% HSS, 50% hybrid. Fertiliser: N/P/K at 80/32/25 kg/ha. Sprays, Herbicides, £51, Fungicides, £41, Insecticides £13, and Others £28/ha
3. **Winter Versus Spring:** As little as 8,000 hectares of spring OSR are grown in the UK which is 2.5% of the entire crop. As can be seen, the financial reward is slim compared with other combinable crops.

Appendix KCC4
Guide to Assessing Development
Proposals on Agricultural Land (Natural
England. 2021)



(<https://www.gov.uk/government/organisations/natural-england>)

Guidance

Guide to assessing development proposals on agricultural land

Updated 5 February 2021

Applies to England

Contents

1. Policies to protect agricultural land and soil
2. LPAs: consult Natural England
3. LPAs: how to use agricultural land classification (ALC)
4. About ALC grades
5. LPAs: carry out ALC assessments to support your planning decisions
6. Use ALC to support your planning decisions
7. Developers: check if your proposal affects agricultural land



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This publication is available at <https://www.gov.uk/government/publications/agricultural-land-assess-proposals-for-development/guide-to-assessing-development-proposals-on-agricultural-land>

1. Policies to protect agricultural land and soil

Developers and local planning authorities (LPAs) should refer to the following government policies and legislation when considering development proposals that affect agricultural land and soils. They aim to protect:

- the best and most versatile (BMV) agricultural land from significant, inappropriate or unsustainable development proposals
- all soils by managing them in a sustainable way

Natural England uses these policies to advise on development proposals as a [statutory consultee \(https://www.gov.uk/guidance/consultation-and-pre-decision-matters#Statutory-consultees\)](https://www.gov.uk/guidance/consultation-and-pre-decision-matters#Statutory-consultees) in the planning process.

1.1 A Green Future: Our 25 Year Plan to improve the Environment 2018

[A Green Future: Our 25 Year Plan to Improve the Environment \(https://www.gov.uk/government/publications/25-year-environment-plan\)](https://www.gov.uk/government/publications/25-year-environment-plan) sets out the government's 25-year plan to improve the health of the environment by using natural resources more sustainably and efficiently. It plans to:

- protect the best agricultural land
- put a value on soils as part of our natural capital
- manage soils in a sustainable way by 2030
- restore and protect peatland

1.2 National Planning Policy Framework (NPPF)

LPAs should use the NPPF to make decisions about the natural and local environment to:

- protect and enhance landscapes, biodiversity, geology and soils
- recognise soils as a natural capital asset that provide important ecosystem services
- consider the economic and other benefits of BMV agricultural land, and try to use areas of poorer quality land instead of higher quality land
- prevent soil, air, water, or noise pollution, or land instability from new and existing development

Read [Chapter 15: Conserving and enhancing the natural environment](https://www.gov.uk/guidance/national-planning-policy-framework/15-conserving-and-enhancing-the-natural-environment) (<https://www.gov.uk/guidance/national-planning-policy-framework/15-conserving-and-enhancing-the-natural-environment>) for full details.

1.3 Town and Country Planning (Development Management Procedure (England) Order) (DMPO) 2015

Planning authorities must consult Natural England on all non-agricultural applications that result in the loss of more than 20 hectares (ha) of BMV land if the land is not included in a [development plan](https://www.gov.uk/guidance/national-planning-policy-framework/3-plan-making) (<https://www.gov.uk/guidance/national-planning-policy-framework/3-plan-making>). For example, this includes the likely cumulative loss of BMV land from the proposed development if it's part of a phased development.

This is required by [schedule 4\(y\) of the Order](http://www.legislation.gov.uk/uksl/2015/595/schedule/4/made) (<http://www.legislation.gov.uk/uksl/2015/595/schedule/4/made>).

1.4 Planning Practice Guidance for the Natural Environment

[Paragraphs 001 and 002: Planning Practice Guidance for the Natural Environment](https://www.gov.uk/guidance/natural-environment/brownfield-land-soils-and-agricultural-land) (<https://www.gov.uk/guidance/natural-environment/brownfield-land-soils-and-agricultural-land>) explain why planning decisions should take account of the value of soils and agricultural land classification (ALC) to enable informed choices on the future use of agricultural land within the planning system.

2. LPAs: consult Natural England

You must consult Natural England for development proposals that are both:

- likely to cause the loss (or likely cumulative loss) of 20ha or more of BMV land
- not in accordance with an approved development plan

Natural England will advise you on the level of impact the proposal may have on BMV agricultural land. Natural England will take into account the type of development and its likely long-term effects.

Email consultations@naturalengland.org.uk or write to:

Natural England consultation service
Hombeam House
Electra Way
Crewe Business Park
Crewe
Cheshire
CW1 6GJ

3. LPAs: how to use agricultural land classification (ALC)

You can use ALC to help inform decisions on the appropriate sustainable development of land.

ALC uses a grading system to enable you to assess and compare the quality of agricultural land in England and Wales.

A combination of climate, topography and soil characteristics and their unique interaction determines the limitation and grade of the land. These affect the:

- range of crops that can be grown
- yield of crop
- consistency of yield
- cost of producing the crop

4. About ALC grades

ALC is graded from 1 to 5.

The highest grade goes to land that:

- gives a high yield or output
- has the widest range and versatility of use
- produces the most consistent yield
- requires less input

BMV agricultural land is graded 1 to 3a.

4.1 Grade 1 – excellent quality agricultural land

Land with no or very minor limitations. A very wide range of agricultural and horticultural crops can be grown and commonly includes:

- top fruit, for example tree fruit such as apples and pears
- soft fruit, such as raspberries and blackberries
- salad crops
- winter harvested vegetables

Yields are high and less variable than on land of lower quality.

4.2 Grade 2 – very good quality agricultural land

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

4.3 Grade 3 – good to moderate quality agricultural land

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

4.4 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 crops including:

- cereals
- grass
- oilseed rape
- potatoes
- sugar beet
- less demanding horticultural crops

4.5 Subgrade 3b – moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops, principally:

- cereals and grass
- lower yields of a wider range of crops
- high yields of grass which can be grazed or harvested over most of the year

4.6 Grade 4 – poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops or level of yields. It is mainly suited to grass with occasional arable crops (for example 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 using the land. The grade also includes arable land that is very dry because of drought.

4.7 Grade 5 – very poor quality agricultural land

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

5. LPAs: carry out ALC assessments to support your planning decisions

For an overview of ALC use:

- 1:250,000 scale regional ALC maps
(<http://publications.naturalengland.org.uk/category/5954148537204736>) (grade 3 land is not divided into subgrades 3a and 3b)
- 1:250,000 scale regional maps predicting the likelihood of BMV agricultural land
(<http://publications.naturalengland.org.uk/category/5208993007403008>)

These maps are not at a scale suitable or accurate for assessment of individual fields or sites.

You can assess if a development proposal is likely to affect BMV agricultural land by using the post 1986 ALC Magic map (<http://magic.defra.gov.uk/MagicMap.aspx?chosenLayers=dudlevstampIndex,backdropIndex,backdropIndex,europeIndex,vmiBWIndex,25kBWIndex,50kBWIndex,250kBWIndex,miniscaleBWIndex,baseIndex&box=449447.459357,467834.470294&useDefaultbackgroundMapping=false>) and detailed site survey reports (<http://publications.naturalengland.org.uk/category/5249382855835648>).

If no site survey reports are available, a new detailed survey may be necessary.

6. Use ALC to support your planning decisions

Use ALC survey data to assess the loss of land or quality of land from a proposed development. You should take account of smaller losses (under 20ha) if they're significant when making your decision. Your decision should avoid unnecessary loss of BMV land.

6.1 Protect soil

You should make sure development proposals include plans to:

- manage soils in a sustainable way during construction
(<https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites>)

- avoid peat extraction
- protect soils from contamination
- reclaim land after mineral working or landfilling
(<https://www.gov.uk/government/publications/reclaim-minerals-extraction-and-landfill-sites-to-agriculture>)

6.2 Carry out new surveys

If there's not enough information from previous data, you may need to have a new field survey to plan for development or to inform a planning decision. You should use soil scientists or experienced soil specialists to carry out new surveys. They should be:

- members of the British Society of Soil Science, the British Institute of Agricultural Consultants or similar professional body
- knowledgeable about the ALC 1988 guidelines
(<http://publications.naturalengland.org.uk/publication/5257050620284448>)
- experienced in soil description and ALC assessments

6.3 Survey requirements

For a detailed ALC assessment, a soil specialist should normally make boreholes:

- every hectare on a regular grid on agricultural land in the proposed development area
- up to 1.2m deep using a hand-held auger

They should:

- dig small inspection pits by hand to a minimum depth of 1m to add supporting evidence to the borehole data
- dig pits where there's a change in main soil type and ALC grade to provide a good depiction of the site
- combine the survey results with local climate and site data to plot on an Ordnance Survey (OS) base map
- use a base map at an appropriate scale for detailed work, such as 1:10,000 scale

7. Developers: check if your proposal affects agricultural land

Use the post 1988 ALC Magic map (<http://magic.defra.gov.uk/MagicMap.aspx?chosenLayers=dudleystampindex,backdropDIndex,backdropIndex,europeindex,vmlBWIndex,25kBWIndex,50kBWIndex,250kBWIndex,miniscaleBWIndex,basemapindex&box=449447,459357,467634,470294&useDefaultbackgroundMapping=false>) and detailed site survey reports (<http://publications.naturalengland.org.uk/category/6249382855835548>) to help you assess whether a development proposal is likely to affect BMV agricultural land. If no suitable data exists, you may need to carry out a detailed survey to support your planning application.

7.1 Free and chargeable advice

Natural England offers advice for proposals. Some initial advice is free. More detailed advice is chargeable (<https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals#when-you-can-pay-for-agency-advice>), for example if your proposal is 20ha or more and requires more detailed advice.

Email: consultations@naturalengland.org.uk

[↑ Back to top](#)

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Appendix KCC4KCC5
Arun Soils Assessment

**WESTERGATE
ARUN SOILS ASSESSMENT**

September 2023

Purpose of this Document

- 1 Arun District Council Local Plan Policy DM1 part f states ***“the productivity of the land is demonstrated using a methodology for assessing gross margins as contained in the Arun Soils and Agricultural Land Assessment report”***.
- 2 There is no explanation in the policy or the supporting text about what policy judgement/planning weight arises from such an assessment.

The Arun Soils and Agricultural Land Assessment Study (2013)

- 3 Agricultural productivity is referred to in that study in section 5, which cross references Appendix 1, see **Attachment A**. The relevant text and the Annex are attached to this document.
- 4 The calculation came up with an Average Annual Gross Margin (AAGM) for comparative purposes. Paragraph 6.1.6 identified one hectare of high yielding land (Grades 1 and 2, see Appendix 1) as £750/ha, and average yielding land (Subgrades 3a and 3b, see Appendix 1) as £490/year.
- 5 The main report went on to compare the AAGM of four strategic development sites. The report did not provide any commentary about how to make a planning judgement from the results of the AAGM.

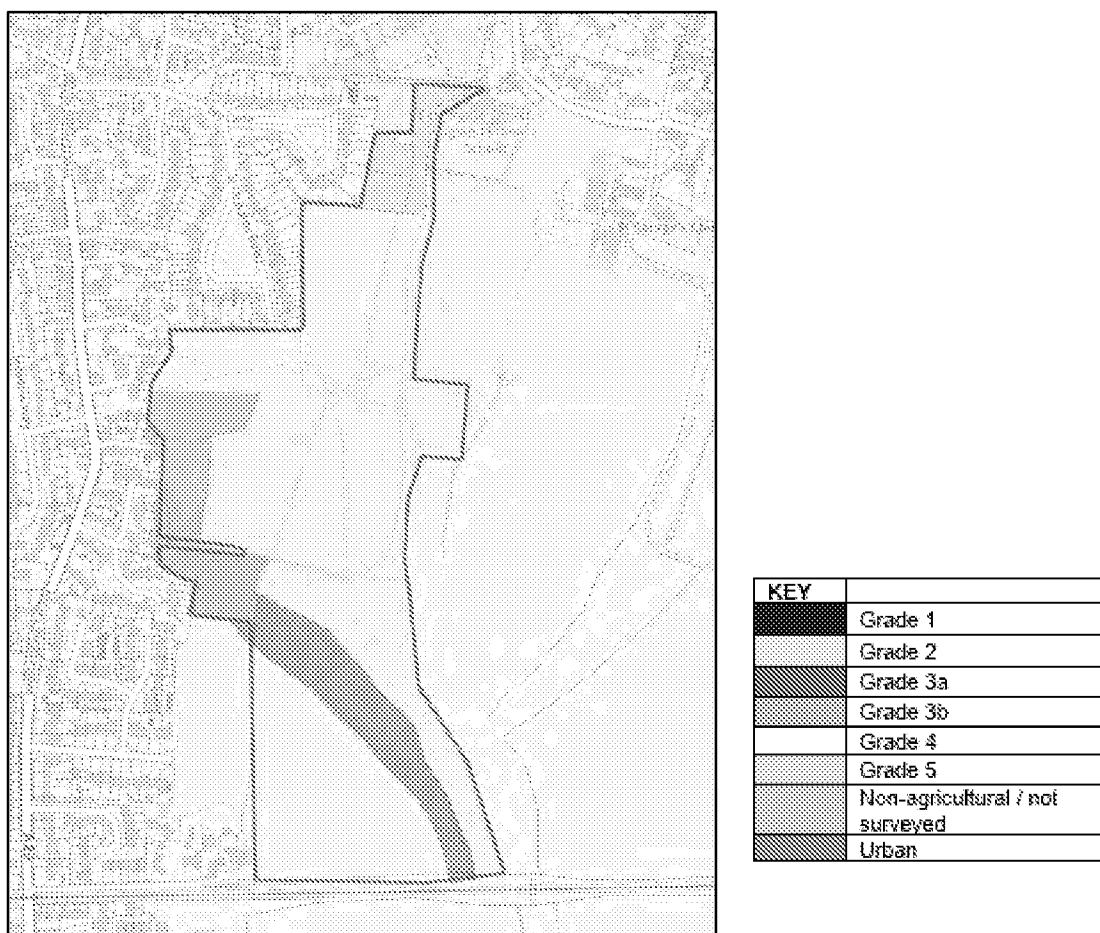
Calculating AAGM for this Site

- 6 The methodology is set out in Appendix 1 of the report, **Attachment A**.
- 7 To be able to assess this, there is a three part process:
 1. The total area of the crop ÷ total farmed area x 100 = % of the land covered by each crop;
 2. Gross Margin (taken from John Nix (53rd Ed.) x % of the land covered by each crop = the number of ha per 100ha which the crop would occupy given that crop mix; and
 3. The number of ha per 100ha which the crop would occupy given the crop mix ÷ 100 = the gross margin of the crop within 1 representative ha.

8 Within the report it explains that soils are graded Grades 1 and 22 and considered able to produce high yields. Soils which are of Grades 3a and 3b are considered to produce average yields.

9 The ALC of Westergate is a mixture of Grade 2, Subgrade 3a and Subgrade 3b. This is shown in the ALC map below.

Insert 1. Distribution of Grades



10 Accordingly:

- 6.2ha is high yielding; and
- 10.3ha is average yielding.

11 Part of the site that was not surveyed is expected to be similar quality, i.e. mostly a 3a/3b mix and hence average yielding. We assume a proportion of Grade 2 also.

12 Using the John Nix Pocketbook for Farm Management 2022 (53rd Ed.) the gross margin for each average yield is taken as part of the calculation.

13 We have used the crop data for West Sussex from the 2021 DEFRA statistics. Using the Gross Margins, the calculation table is at **Attachment B**.

- 14 The AAGM per hectare is £341.88..
- 15 The AAGM for the 10.5ha surveyed as 3a and 3b is £3,589.74.
- 16 If we take just the cereals, the GM for cereals (high yield) is £1,515/ha. For the 6.2ha of Grade 2 the GM would be £9,393. Not all crops have average and high yields in John Nix, so if we take the AAGM (average) at £341.88, that is 29% of the cereal GM. Multiplying the cereal (high) FM by 28% gives an AAGM estimate of £439.35.
- 17 Therefore, the AAGM for the 6.2ha of Grade 2 is £2,724.
- 18 To estimate the AAGM of the unsurveyed land we assume the average AAGM for the surveyed area being £439.35 plus £3,589.74 divided by 16.7 hectares, equals £241.26. For 2.4ha not surveyed the AAGM is £579.02. This reflects a similar mix of Grades 2, 3a and 3b.

Conclusion

- 19 Policy DO DM1 requires a productivity assessment.
- 20 The productivity assessment of the Westergate is as follows:

Table 1. ALC Grades

Area	Ha	GM (£)
Grade 2	6.2	2,724
Subgrade 3a and 3b	10.5	3,590
Non-agricultural / Unsurveyed	2.4	579
Total	19.1	6,893

Attachment A

**Extract Arun Soils
Report**



SOIL AND AGRICULTURAL LAND ASSESSMENT STUDY ARUN DISTRICT COUNCIL

March 2013



This project has been delivered by Reading Agricultural Consultants Ltd for Arun District Council

- 5.3. The remainder of land provisionally mapped as being of Subgrade 3b quality tends to occur in areas in which Park Gate soils are mapped. These soils are clayey or foamy in texture and are typically seasonally waterlogged.

Agricultural Productivity – Arun, Adur and Worthing Districts

- 5.4. The latest Defra statistics (2010) on agricultural land use in Arun are combined with those from the neighbouring districts of Adur and Worthing. In 2010, the total farmed area across the three districts was 13,738 hectares, which included:
- 4,300ha cereal crops;
 - 1,939ha other arable crops (excluding cereals);
 - 331ha of fruit and vegetables; and
 - 5,938ha grassland.
- 5.5. The distribution of four crop types across Arun District (outlined in blue) in 2010 are represented in Figure 6, and can be seen in the context of West Sussex (outlined in red) and the wider south east England region.
- 5.6. From these figures, it can be seen that cereal and oilseed rape crops do not make up as substantial a contribution to the overall agricultural output of Arun district, as they do in other areas of West Sussex and the south east. The difference may be attributed to the potential for the relatively high quality land of Arun District to produce good yields of higher value fruit and vegetable crops.
- 5.7. The productivity of crops in terms of economics across the Strategic Development Sites been estimated using crop statistics for West Sussex, obtained from Defra and standard gross margins for 2013 to produce an average annual gross margin (AAGM), expressed in terms of per unit area and across the whole site. The full methodology for assessing the AAGM of one hectare of land is given in **Appendix 1**. For the purpose of this assessment, it is assumed that land of Grades 1 and 2 will consistently produce high crop yields, and that land of Subgrades 3a and 3b will produce average crop yields. It is also assumed that fruit and vegetable crops are grown only on high quality land.

6.1.6. Economic Productivity

Based on the predicted land quality distribution, it is estimated that around 36ha is high yielding land. The AAGM of one hectare of high yielding land has been calculated at £750, and therefore the AAGM at the BREQ site is in the region of £27,000.

The remaining 98ha of the agricultural land of Subgrades 3a and 3b is considered to be capable of producing average crop yields. One hectare of average yields of crops, excluding fruit and vegetables, has an AAGM of around £490 per year. The AAGM of these crops on 98ha at the BREQ site is therefore estimated at around £48,000.

In total, agriculture at the BREQ site is estimated to have an AAGM of around **£75,000** per year.

6.1.7. Impact of Development

Most of the site is predicted to be of best and most versatile quality, with the exception of some Subgrade 3b quality land. In the national planning context, loss of Subgrade 3b land is not considered to be of as high significance as loss of best and most versatile land. Therefore, national planning policy states that Subgrade 3b should be used in preference of Grades 1, 2 and 3a.

The loss of the two northernmost fields would have the most significant impact in terms of loss of agricultural land and economic productivity, as they are of Grade 1 and 2 quality and have the most potential to support high value horticultural and field crops. As much of the remainder of the area is also of best and most versatile quality of Subgrade 3a, the resulting impact of development of the BREQ site is likely to be considered a major negative effect.

6.2. Barnham, Eastergate and Westergate (Three Villages)

6.2.1. Site Context

The Site is approximately 3km north of Bognor Regis and is largely enclosed by an arc formed by the villages of Barnham, Eastergate and Westergate. The Site is dissected from east to west by a railway line and in total is estimated at around 160ha.

Appendix 1: Methodology for assessing land gross margins

The value of agricultural land has been calculated on a per hectare basis, using two values: high and average, which refer to the potential crop yields obtainable from the land. It has been assumed in this study that land of agricultural land quality Grades 1 and 2 (excellent to very good quality land) will produce high crops yields, and that land of Subgrades 3a and 3b (good to moderate quality land) will produce average crop yields.

Using food and farming statistics obtained from Defra's June 2010 survey results, the cropping mix across the total farming area of West Sussex could be calculated. Values for horticultural crops were included in the assessment of high yielding land, but were replaced with an equivalent area of wheat crop for the average yielding land, as this is a more representative crop for the associated land capability.

The values of each crop within the cropping mix were derived from the John Nix Farm Management Handbook 43rd edition (2013), which gives gross margin values for high and average yields of crops per hectare grown.

The percentage of the total land area covered by each crop (CA%) was calculated by dividing the area of the crop (TCA) by the total farmed area (TA) of West Sussex, and multiplying by 100.

$$TCA/TA \times 100 = CA\%$$

The gross margin of one hectare (GMha) of a given crop (taken from Nix, 2013) was multiplied by the percentage of the total farmed area in West Sussex occupied by that crop (CA%). This figure represents the number of hectares out of 100 hectares (or 100%) which the crop would occupy given the crop mix of West Sussex. Dividing this by 100 gives the representative gross margin of the crop within one representative hectare (GMrep).

$$GMha \times (CA\%/100) = GMrep$$

Some cereal crop examples are given below:

	Farming Area West Sussex	Arable crops			
	TA (ha)	Wheat TCA (ha)	Winter barley TCA (ha)	Spring barley TCA (ha)	Oats TCA (ha)
	114228	17017	1545	3955	2991
Crop % of total area	TCA/TA*100	14.9	1.4	3.5	2.6
Crop GM per ha	GMha (high)	959.0	751.0	738.0	655.0
GM*CA%/100	GMrep (£)	142.9	10.2	25.6	17.2
Crop GM per ha	GMha (average)	743.0	606.0	500.0	515.0
GM*CA%/100	GMrep (£)	110.7	8.2	20.8	13.5

These GM per representative hectare were then multiplied across the number of hectares at each Strategic Development Site containing either Grade 1 or 2 land (high yield values), or Subgrades 3a or 3b land (average values) to give a total average annual gross margin per hectare.

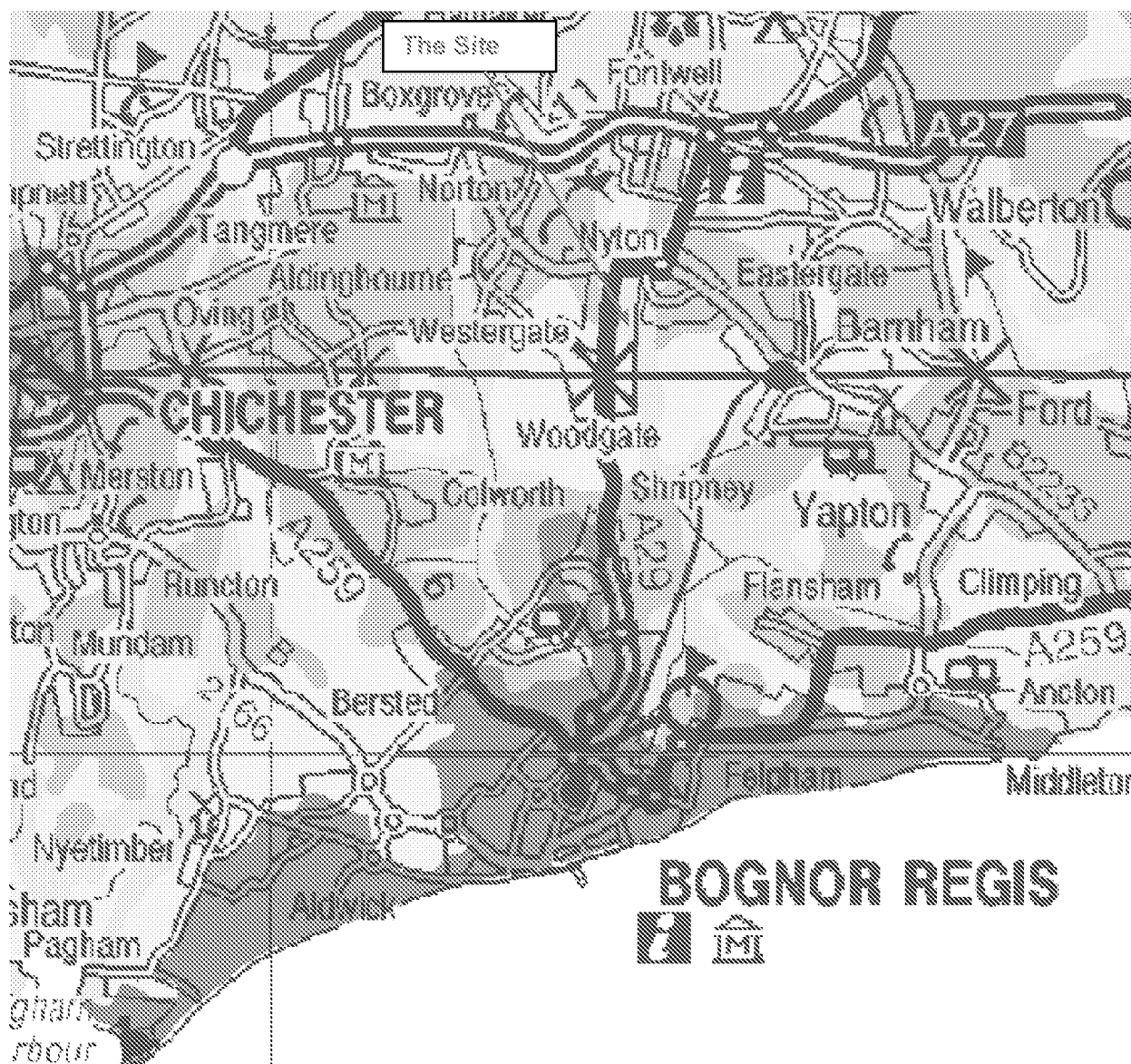
Attachment B

Arun Soils Assessment

Crop	Wheat	W Barley	S Barley	OSR	Field Beans	Other Cereals
Total area of crop	10,825	1,424	3,206	1,329	1,224	2,780
Total Farmed Area	64,610	64,610	64,610	64,610	64,610	64,610
% of land covered	17%	2%	5%	2%	2%	4%
Gross Margin (average)	1,200	899	951	917	771	938
Number of ha	20105.25	1981.39	4718.94	1886.23	1460.616	4035.97
Gross margin/ha (average)	201.05	19.81	47.19	18.86	14.61	40.36

Plan KCC1

**Provisional Agricultural
Land Classification Map
(1983)**



BOGNOR REGIS

Grade Description

- | | |
|---|------------------|
| 1 | Excellent |
| 2 | Very Good |
| 3 | Good to Moderate |
| 4 | Poor |
| 5 | Very Poor |

Non-Agricultural Land

- | | |
|--|--|
| | Other land primarily in non-agricultural use |
| | Land predominantly in urban use |

PLAN	KCC 1
TITLE	Extract from Provisional ALC Map
SITE	Land east of Westergate
CLIENT	Cala Homes (South Home Counties) Limited
NUMBER	KCC2243/01
SCALE	NTS

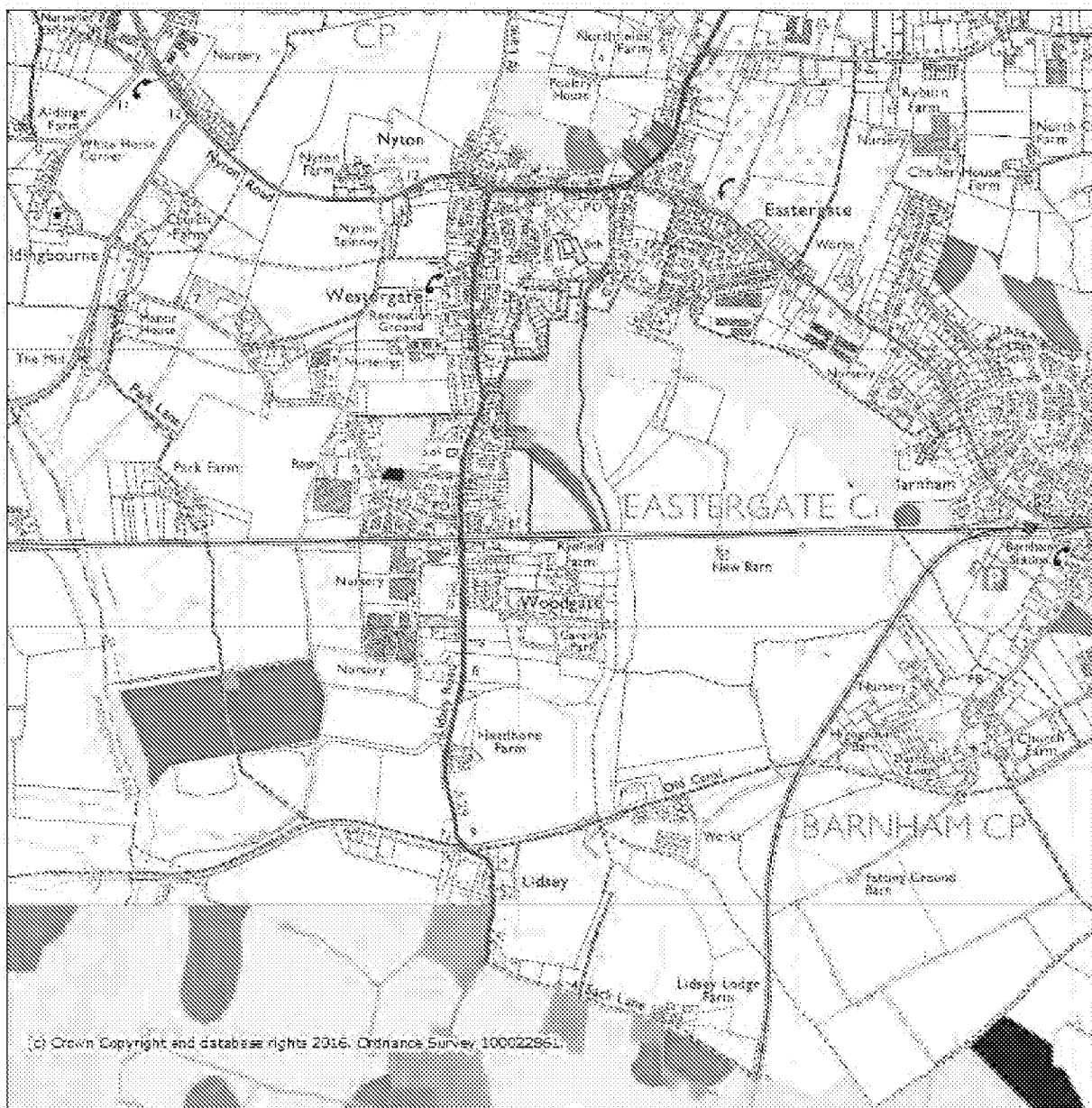
KERNON COUNTRYSIDE CONSULTANTS LIMITED
GREENACRES BARN, STOKE COMMON LANE, PURTON
STOKE, SWINDON, WILTSHIRE, SN5 4LL
Tel 01793 771333 Email: info@kernon.co.uk
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Plan KCC3

**Agricultural Land Classification
around Westergate**

Site edged red (extract from





Legend

Post 1988 Agricultural Land Classification (England)

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

Projection = OSGB36

xmin = 489100

ymin = 101700

xmax = 499200

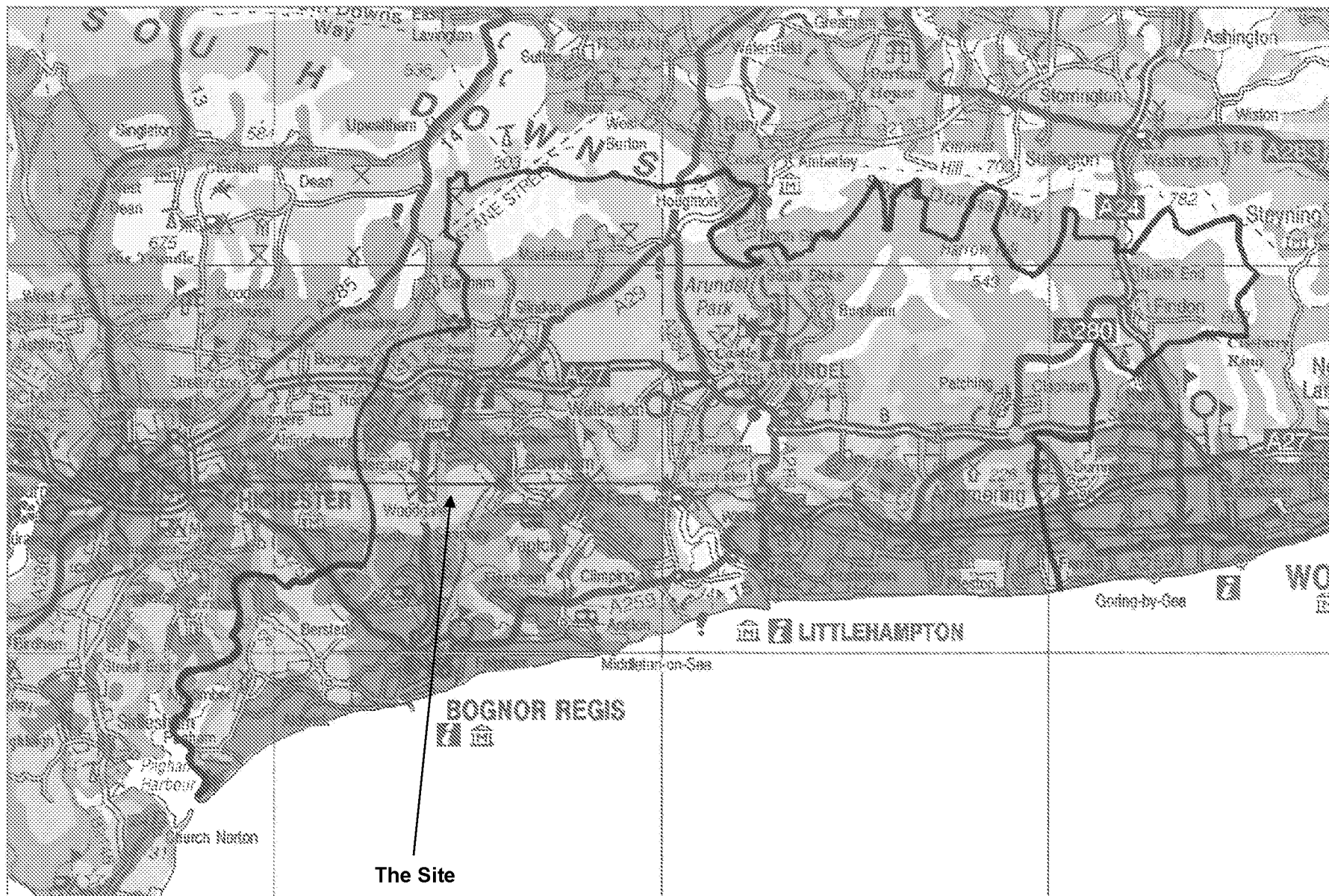
ymax = 106800

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Plan KCC4

**Extract from Provisional Agricultural
Land Classification map**

Arun District edged black



The Site

