Project Atlantis, Leicestershire

Agricultural Land Quality

Prepared for:

Gazeley UK 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. It should not be relied on for alternative end-uses or for other schemes. This report has been prepared solely for the benefit of Gazeley UK Ltd. 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.

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1 Introduction

1.1 Background to the Report

This report has been prepared by Tim O'Hare Associates LLP for Gazeley UK Ltd, to determine the quality of agricultural land for Project Atlantis, Lutterworth, Leicestershire ('the Site'). The assessment has been carried out in accordance with the Agricultural Land Classification (ALC) system for England and Wales (see 'Methodology' below).

In particular, this report considers the quality of agricultural land at the Site in a national, regional and local context, and provides an assessment of likely 'opportunities and constraints' associated with proposed new residential development in terms of agricultural land quality and soil resources.

The Site is located just to the northwest of Magna Park Industrial Estate, Lutterworth, Leicestershire. A detailed description of the Site is provided in Section 3.3.

1.2 Methodology

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). In addition, this ALC survey has been carried out by a soil scientist who 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 1**). 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 1 also).

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**.

A detailed ALC survey of approximately 218 ha of agricultural land at the Site was completed on the 29th and 30th October 2014. The ALC survey involved examination of the soil's physical properties at seventy-two sample locations, as shown on Figure 1. The soil survey was carried out in two tranches: (i) in the first instance, a semi-detailed survey was carried out by examining soil profiles at fifty-four locations on a 200m by 200m grid pattern; and (ii) subsequently, where variations in soil type and ALC grading occurred on the 200m grid, an additional eighteen sample locations were located on 100m by 100m grid to cover points to the north, east, south and west of the 200m-grid locations where variation in soil type/ALC grade occurred. In this way, all variations in soil type and ALC grading over the Site have been examined and mapped at a detailed level. The sample locations were located using a hand-

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

held Garmin E-Trec Geographic Information System (GIS) to enable the sample locations to be relocated for verification, if necessary.

The soil profile was examined at each sample location at the Site to a maximum depth of approximately 1.2 m by hand with the use of a 5 cm diameter Dutch (Edleman) soil auger. The soil profile at each sample location was described using the 'Soil Survey Field Handbook: Describing and Sampling Soil Profiles' (Ed. J.M. Hodgson, Cranfield University, 1997). Each soil profile was ascribed an Agricultural Land Classification (ALC) grade following the MAFF ALC Guidelines.

1.3 Structure of the Remainder of this Report

The remainder of this report is structured as follows:

- Section 2 Planning Policy Framework;
- Section 3 The Site;
 - Climate;
 - Site (Gradient, Micro-relief, Risk of Flooding);
 - Soil (Geology, Soil Properties);
 - Interactive Limitations (Soil Droughtiness, Soil Wetness);
 - Pre-1988 ALC Information;
 - Post-1988 ALC Information;
 - ALC Grading at the Site.
- Section 4 ALC at the Site in a Wider Geographical Context; and
- Section 5 Summary and Conclusion.

2 Planning Policy Framework

2.1 Background

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

2.2 National Planning Policy Framework

National planning policy guidance on development involving agricultural land was previously set out in paragraphs 28 and 29 of Planning Policy Statement (PPS) No. 7 '*Sustainable Development in Rural Areas (2004)*'. This document has, amongst others, been revoked and replaced by the Coalition Government's National Planning Policy Framework (NPPF) published on 27th March 2012. The NPPF aims to provide a simplified planning framework which sets out the Government's economic, environmental and social planning policies for England. One of the NPPF's 'Core Planning Principles' is (Para. 17, eighth bullet point):

"...encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value...'

The NPPF includes policy guidance on '*Conserving and Enhancing the Natural Environment*' (Section 11). Paragraphs 109 (page 25) and 112 (page 26) is of relevance to this assessment of agricultural land quality and soil and state *inter alia* that:

- '109. The planning system should contribute to and enhance the natural and local environment by:
 - protecting and enhancing valued landscapes, geological conservation interests and soils...; and
- 112. Local planning authorities 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 a higher quality.'

2.3 Environment White Paper

The NPPF was preceded and informed by the first White Paper on the Environment in twenty years. Entitled 'The Natural Choice: Securing the Value of Nature' (June 2011), the White Paper sets out, in part, the importance that the Coalition Government places on the soil's ability to support vital ecosystem services such as flood mitigation, carbon storage and nutrient cycling.

2.4 Local Planning Policy

Policy RM/6 'Agricultural Land' of the Harborough District Local Plan 2001 was not saved by the secretary of state in 2007 and is therefore not relevant for the purposes of planning policy. In the absence of local policy the national guidelines should be considered.

2.5 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 at the Site

3.1 General

This section of the report sets out the findings of the desktop study and the ALC survey carried out by a Chartered Scientist on 29th and 30th October 2014 (see 'Methodology' at Section 1.2 earlier).

The desktop study is based upon 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; and
- (iv) 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 Site is given in Table 3.1 below.

Table 3.1: Climate Data for Project Atlantis, Leicestershire (National Crid Reference SR 501 860)			
Climate Parameter	Data		
Average Altitude (mAOD)	118		
Median Accumulated Temperature above 0°C (January – June)	1344		
Average Annual Rainfall (mm)	670		
Mean Field Capacity Days (FCD)	155		
Moisture Deficit for Wheat (mm)	96		
Moisture Deficit for Potatoes (mm)	85		

With reference to Figure 1 'Grade according to climate' on page 6 of the ALC Guidelines, there are no overall climatic limitations to the quality of agricultural land at the Site so the Agricultural land may be

classes as high as Grade 1. However, climate can interact 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). Interactive limitations to agricultural land quality at the Site are considered further in Section 3.5.

3.3 The Site

As shown on Figure 1, the approximately 218 ha (538.7 acres), roughly triangular Site is bordered by the A5 to the south west, Magna Park Industrial Estate to the southeast and agricultural land bordering to the north. Bittesby House lies in the south of the Site, with a dismantled railway running through the center of the Site, from north to south. The site comprises of mainly agricultural fields with some woodland, as well as some watercourses and a man-made lake. The Site is centered at National Grid Reference SP 501 860.

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 Site is gently undulating and slopes towards the northern and middle of the Site. The elevation of the Site ranges from between 125 m Above Ordnance Datum (AOD) in the highest parts of the Site in the south, northeast and northwest to 105 m AOD in the north. Agricultural land at the Site is not limited by gradient or micro-relief (i.e. where there are complex changes in slope angle over short distances).

Risk of Flooding

From an EA Flood Risk Map², a portion of the Site (i.e. on low lying ground which broadly flanks the route of the dismantled railway from north to south through the centre of the Site) is predicted to be at risk of flooding by rivers or the sea (EA Flood Zone 3). However, there is no evidence that agricultural land quality at the Site is limited by the risk of flooding, specifically in terms of Table 2 and Table 3 of the ALC Guidelines.

3.4 Geology and Soil

Geology/Soil Parent Material

British Geological Survey (BGS) information available online has been utilised to show the Superficial Deposits (Drift) and Bedrock underlying the Site.³

The northwest third of the Site is underlain by mudstone of the Mercia Mudstone Group with mudstone and limestone (interbedded) of the Blue Lias Formation present in the south-eastern third. The middle third of the Site is underlain by mudstone of the Penarth Group.

The majority of the Site is shown to be covered by superficial deposits described as diamicton till of the Oadby Member. A band of Alluvium comprising of clay, silt, sand and gravel runs from along the watercourses in the Site, mainly in the center from north to south. Flanking this, sand and gravel of the

² Environment Agency Flood Risk Map. Available online @. http://maps.environment-

agency.gov.uk/wiyby/wiybyController?value=LE17+4JH&submit.x=17&submit.y=8&submit=Search%09&lang=_e&ep=map&topic=floodmap&layer Groups=default&scale=10&textonly=off#x=450388&y=287155&lg=1,2,&scale=8 Last viewed 19th December 2014.

³ British Geological Survey 'Geology of Britain Viewer'. Available online @ http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer. Last viewed 19th December 2014.

Wolston Sand and Gravel is present. In the north and south of the Site, two areas of Dunsmore Sand and Gravel comprising of sand and gravel are present.

Published Soil Information

Published information on soil (re Soil Survey of England and Wales provisional soil information from Sheet 3 'Midland and Westland England' at a scale of 1:250,000) indicates that land over the majority of Site is covered by soils grouped in the Beccles 3 Association, with soils in the Ragdale Asociation present in the north-west of the Site. The main physical characteristics of these soils are summarised below.

The Beccles 3 Association consists mainly of typical stagnogley soils of the Beccles series and similar stagnogleyic argillic brown earths of the Ashley series. Clayey and calcareous Hanslope series, typical calcareous pelosols, is a common associate locally. All three soils have slowly permeable subsoils and are extensive on chalky till in Eastern England and the Midlands. Clayey Ragdale soils have a limited distribution and coarse loamy Wick and Arrow soils are mainly asociated with sands and gravels in the Midlands. The main series are seasonally waterlogged (Wetness Class III) or waterlogged for long periods in winter (Wetness Class IV) and usually comprise of a dark greyish brown, slightly stony, sandy clay loam or clay loam topsoil. The subsoil consists of a greyish brown, mottled, slightly stony, clay.

The Ragdale Association is extensive on chalky till in Lincolnshire, Leicestershire and Northamptonshire. The Ragdale and Beccles soils are developed in till which has a grey clayey matrix containing chalk stones and some lenses of fine loamy material. A typical profile comprises of a dark greyish brown, mottled, slightly or moderately stony clay loam or clay topsoil. The subsoil is usually a greyish brown, mottled slightly stony clay over a grey, mottled, slightly stony, calcareous clay. The dense, clayey slowly permeable subsoils restrict vertical water movement causing Ragdale soils to be placed in wither Wetness Class III or IV.

Soil Survey

A detailed soil survey was carried out at the Site on the 29th and 30th October 2014 involving auger borings at 72 locations. From the survey it was determined that the soil is fairly uniform over the whole Site.

A typical profile at the Site consists of a dark greyish brown (Munsell colour 10YR 4/2) or brown (Munsell colour 10YR 4/3), very slightly stony (3% stones), heavy clay loam topsoil. The subsoil comprises of a greyish brown (Munsell colour 10YR 5/2) or yellowish brown (Munsell colour 10 YR 5/4), very slightly stony (3% stones), mottled, heavy clay loam over a light brownish grey (Munsell colour 10YR 6/2), very slightly stony (3% stones), mottled clay. The profiles are gleyed in the top 40cm and contain slowly permeable layers which cause the profiles to be placed in Wetness Class III or IV.

In the south of the Site, the profiles are similar but the topsoil is a sandy clay loam and also slightly stony (8%) due to the superficial deposits (Dunsmore Sand and Gravel). Some profiles at the Site (auger location 7 and 53) were similar to those above but have a clay topsoil.

In order to substantiate topsoil texture determined during the ALC survey by hand-texturing, ten samples of topsoil were collected over the Site (i.e. Auger Locations 9, 11A, 12, 23, 25, 31, 39, 46, 53A and 52A). The topsoil samples were sent to an accredited laboratory for analysis of particle size distribution (PSD), based on the British Standard Institution particle size grades. The certificate of analysis is provided as **Appendix 3**. The findings of the PSD analysis are shown in Table 3.2 below:

Table 3.2: Particle Size distribution						
Topsoil Sample Location (See Fig. 1)	% sand 0.063-2.0 mm	% silt 0.002- 0.063 mm	% clay <0.002 mm	ALC Soil Texture Class		
9	46	26	28	Heavy Clay Loam		
11A	53	23	24	Sandy Clay Loam		
12	49	23	28	Heavy Clay Loam		
23	47	26	27	Heavy Clay Loam		
25	47	24	29	Heavy Clay Loam		
31	53	22	25	Sandy Clay Loam		
39	47	26	27	Heavy Clay Loam		
46	57	21	22	Sandy Clay Loam		
53A	36	23	41	Clay		
52A	43	25	32	Heavy Clay Loam		

3.5 Interactive Limitations

From the published information above and the results of the Site visit, it has been determined that the quality of agricultural land at the Site is limited by both soil wetness limitations and soil droughtiness limitations.

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 3.3 below (based on Table 6 'Grade According to Soil Wetness – Mineral Soils' in the ALC Guidelines):

Table 3.3: ALC Grade According to Soil Wetness					
Wetness Class	Texture of the Top 25 cm	151-175			
		Field Capacity Days			
III	Sandy Clay Loam, Medium Clay Loam*	3a			
	Heavy Silty Clay Loam, Heavy Clay Loam**	3b			

	Clay, Silty Clay	3b
IV	Sandy Clay Loam, Medium Clay Loam*	3b
	Heavy Silty Clay Loam, Heavy Clay Loam**	3b
	Clay, Silty Clay	3b
Key		
* <27% clay; and **	^r >27% clay	

Therefore, soil profiles which are seasonally waterlogged (Wetness Class III) and comprises of a sandy clay loam topsoil are limited by soil wetness to Subgrade 3a in this climate area (151-175 field capacity days).

Soil profiles with a heavy clay loam or clay topsoil which are placed in Wetness Class III are limited by soil wetness to Subgrade 3b.

Soil profiles at the Site with a sandy clay loam, heavy clay loam or clay topsoil which are waterlogged for long periods in winter (Wetness Class IV) are limited to soil wetness to Subgrade 3b in this climate area (151-175 field capacity days).

3.6 ALC at the Site

The majority of the agricultural land at the Site has been graded as Subgrade 3b due to the heavy clay loam topsoil over slowly permeable and seasonally waterlogged subsoil (i.e. Wetness Class III or IV). A few isolated sol profiles had sandy clay loam topsoil over slowly permeable and seasonally waterlogged subsoil (Wetness Class III) which are limited by soil wetness to Subgrade 3a. However, as these profiles are isolated and are encompassed by agricultural land in Subgrade 3b at sample points to the north, east, south and west, they are encompassed in Subgrade 3b mapping unit, following best practice for ALC.

The woodland, dismantled railway and the buildings around Bittesby House have all been graded as non-agricultural/other land.

A small area in the north of the Site has been described as Grade 4 due to waterlogged soil profiles (Wetness Class V).

The proportion of the agricultural land in the different ALC grades has been measured from Figure 2, at the back of this report, and are given in the Table 3.4 below.

Table 3.4: Agricultural Land Classification Project Atlantis, Leicestershire				
ALC Grade	Area (Ha)	Area (% of Total Site)		
Grade 1 (Excellent)	0	0		
Grade 2 (Very Good)	0	0		
Subgrade 3a (Good)	0	0		
Subgrade 3b (Moderate)	170.2	78.1		
Grade 4 (Poor)	2.5	1.1		
Grade 5 (Very Poor)	0	0		
Other / Non-agricultural	45.3	20.8		
Total	218	100.0		

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4 ALC at the Site in a Wider Geographical Context

Background 4.1

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

Pre-1988 ALC Information 4.2

As described above and in Appendix 2, 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.

The MAFF provisional ALC map of South Eastern England (1:250,000) indicates that land at the Site is Grade 3 (not differentiated between Subgrade 3a and 3b).

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

Grades as % of lotal Land Area)*						
ALC Grade	England	East Midlands Government Office	Leicestershire County	Harborough District		
1 (excellent)	2.7	4.9	0	0		
2 (very good)	14.2	18.5	11.1	4.6		
3 (good to moderate)	48.2	56.7	78.0	91.2		
4 (poor)	14.1	9.9	6.7	2.9		
5 (very poor)	8.4	2.9	0	0		
Non-Agricultural	5.0	2.8	0.6	0.2		
Urban	7.3	4.3	3.6	1.1		

Table 4.1: Provisional ALC – National, Regional and Local Context (Proportion of ALC

From the MAFF Provisional ALC information in Table 4.1, Harborough District contains a very high percentage of Grade 3 land (91.2% in total) compared to the rest of England (48.2% in total). The occurrence of the majority Subgrade 3b land at the Site unsurprising and represents some of the poorest agricultural land in the District. The loss of it would not be detrimental in national planning policy terms (re paragraph 112 of the NPPF, see Section 2.0).

⁴ 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)

4.3 Post-1988 ALC Information

As described in Section 1.2 'Methodology' (above), and more detail in Appendix 2, the ALC system was revised in October 1988. Therefore, a definitive ALC grading of land can only be determined by undertaking a soil survey in accordance with the Revised ALC Guidelines (October 1988). Natural England, i.e. the Government organization which currently maintains the national ALC database, has published all of the ALC surveys that the former MAFF carried out in accordance with the Revised ALC Guidelines (October 1988) online at the MAGIC website⁵.

From the MAGIC website, it has been determined that no post-1988 (i.e. current and definitive) ALC survey of agricultural land has been undertaken at the Site. However, post-1988 ALC data is available for land approximately 4.5km to the northeast of the Site which determined the agricultural land to be mainly Subgrade 3b with some Grade 2 land also present (see Figure 3 below).



Figure 3: MAFF Post-1988 ALC

⁵ Source: Multi Agency Geographic Information for the Countryside (MAGIC) website @ http://magic.defra.gov.uk/ Last viewed 19th December 2014

5 Summary and Conclusion

Tim O'Hare Associates LLP was commissioned by Gazeley UK Ltd, to determine the quality of agricultural land for Project Atlantis ('the Site') in accordance with the Agricultural Land Classification (ALC) system for England and Wales.

The approximately 218 ha (538.7 acres), roughly triangular Site is bordered by the A5 to the south west, Magna Park Industrial Estate to the southeast and agricultural land bordering to the north. Bittesby House lies in the south of the Site, with a dismantled railway running through the center of the Site from north to south. The site comprises of mainly agricultural fields with some woodland as well as some watercourses and a manmade lake. The Site is centered at National Grid Reference SP 501 860.

British Geological Survey (BGS) information determined that the north-west third of the Site is underlain by mudstone of the Mercia Mudstone Group, with mudstone and limestone (interbedded) of the Blue Lias Formation present in the south-eastern third. The middle third of the Site is underlain by mudstone of the Penarth Group.

The majority of the Site is shown to be covered by superficial deposits described as glacial till of the Oadby Member. A band of Alluvium comprising of clay, silt, sand and gravel runs from along the watercourses in the Site, mainly in the center from north to south. Flanking this, sand and gravel of the Wolston Sand and Gravel is present. In the north and south of the Site, two areas of Dunsmore Sand and Gravel comprising of sand and gravel are present.

A detailed soil survey was carried out at the Site on the 29th and 30th October 2014 involving auger borings at 72 locations. From the survey it was determined that the soil is fairly uniform over most of the Site.

A typical profile at the Site consists of a dark greyish brown (Munsell colour 10YR 4/2) or brown (Munsell colour 10YR 4/3), very slightly stony (3% stones), heavy clay loam topsoil. The subsoil comprises of a greyish brown (Munsell colour 10YR 5/2) or yellowish brown (Munsell colour 10 YR 5/4), very slightly stony (3% stones), mottled, heavy clay loam over a light brownish grey (Munsell colour 10YR 6/2), very slightly stony (3% stones), mottled clay. The profiles are gleyed in the top 40cm and contain slowly permeable layers which cause the profiles to be placed in Wetness Class III or IV.

In the south of the Site the profiles are similar but the topsoil is a sandy clay loam and also slightly stony (8%) due to the superficial deposits (Dunsmore Sand and Gravel). Some profiles at the Site (auger location 7 and 53) were similar to those above but consisted of a clay topsoil.

The majority of the agricultural land at the Site has been graded as Subgrade 3b due to the heavy clay loam topsoil and the Wetness Class III or IV. A few isolated areas of sandy clay loam and Wetness Class III fall into Subgrade 3a, but have been included in the Subgrade 3b mapping unit as they were single points surrounded by Subgrade 3b (following the best practice in the ALC Guidelines).

The woodland, dismantled railway and the buildings around Bittesby House have all been graded as non-agricultural/other.

A small area in the north of the Site has been described as Grade 4 due to the waterlogged (Wetness Class V) soil profiles.

From the MAFF Provisional ALC information in Table 4.1, Harborough District contains a very high percentage of Grade 3 land (91.2% in total) compared to the rest of England (48.2% in total). The occurrence of the majority Subgrade 3b land at the Site unsurprising and respresents some of the poorest agricultural land in the district. The loss of it would not be detrimental in national planning policy terms (re paragraph 112 of the NPPF, see Section 2.0).

Figures

Site Boundary

Auger Location





Client:	Gazeley UK Ltd			
Project:	Project Atlantis, Lutterworth, Leice			
Job ref no.:	TOHA/14/6012/RWA			
Drawing no.:	TOHA/14/6012/1 Sample Locations			
Drawing title				
Date:	Dec '14 Scale: NTS			
Drawn by:	RWA Checked by: TOH			

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Appendix 1: IPSS Professional Competency Scheme Document 2 Agricultural Land Classification

Agricultural Land Classification (England and Wales)





Background

The evaluation of land for its agricultural potential in England and Wales¹ is accomplished by application of the Agricultural Land Classification² (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 Agency³.

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)





Working with Soil – The IPSS Professional Competency Scheme www.soilscientist.org/workingwithsoil

SUPPORTING ORGANISATIONS

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



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





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

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 guality 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



Natural England Technical Information Note TIN049 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 resurveyed 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.

Natural England Technical Information Note TIN049 Agricultural Land Classification: protecting the best and most versatile agricultural land

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 email **enquiries@naturalengland.org.uk**.

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Appendix 3: Topsoil Particle Size Analysis



ANALYTICAL REPORT											
Report Number51987-14Date Received12-NOV-2014Date Reported19-NOV-2014ProjectSOILSReferenceC314 PROJECTOrder Number		N717 Client PROJECT ATLANTIS LEICS									
Laboratory Reference		SOIL263702	SOIL263703	SOIL263704	SOIL263705	SOIL263706	SOIL263707	SOIL263708	SOIL263709	SOIL263710	SOIL263711
Sample Reference		9	11A	12	23	25	31	39	46	53A	52A
Determinand	Unit	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sand 2.00-0.063mm	% w/w	46	53	49	47	47	53	47	57	36	43
Silt 0.063-0.002mm	% w/w	26	23	23	26	24	22	26	21	23	25
Clay <0.002mm	% w/w	28	24	28	27	29	25	27	22	41	32
Textural Class **		1	17	1	1	1	17	1	17	7	1
Notes											
Document Control	The sample submitted was of adequate size to complete all analysis requested. The results as reported relate only to the item(s) submitted for testing. The results are presented on a dry matter basis unless otherwise stipulated. This test report shall not be reproduced, except in full, without the written approval of the laboratory.										
Reported by	** Please see the att Katie Dunn Natural Resource Ma Coopers Bridge, Bra Tel: 01344 886338 Fax: 01344 890972 email: enquiries@nn	tached documen L anagement, a tra Iziers Lane, Brac m.uk.com	t for the definitio ading division of knell, Berkshire,	n of textural clas Cawood Scientif RG42 6NS	ises. fic Ltd.						



Textural Class Definitions

Code

Textural Class

- 1 Clay Loam
- 2 Clay Loam/Sandy Clay Loam/Sandy Clay
- 3 Clay Loam/Sandy Clay
- 4 Clay Loam/Sandy Silt Loam
- 5 Clay Loam/Sandy Silt Loam/Sandy Loam/Sandy Clay Loam
- 6 Clay Loam/Silty Clay Loam
- 7 Clay
- 8 Clay/Clay Loam
- 9 Clay/Clay Loam/Sandy Clay
- 10 Clay/Sandy Clay
- 11 Clay/Silty Clay
- 12 Clay/Silty Clay/Silty Clay Loam/Clay Loam
- 13 Loamy Sand
- 14 Loamy Sand/Sandy Loam
- 15 Sand
- 16 Sand/Loamy Sand
- 17 Sandy Clay Loam
- 18 Sandy Clay Loam/Clay Loam
- 19 Sandy Clay Loam/Sandy Loam
- 20 Sandy Clay
- 21 Sandy Clay/Sandy Clay Loam
- 22 Sandy Loam
- 23 Sandy Silt Loam
- 24 Sandy Silt Loam/Sandy Loam
- 25 Sandy Silt Loam/Silt Loam
- 26 Silt Loam
- 27 Silty Clay Loam
- 28 Silty Clay Loam/Silt Loam
- 29 Silty Clay Loam/Silt Loam/Sandy Silt Loam/Clay Loam
- 30 Silty Clay
- 31 Silty Clay/Silty Clay Loam



