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# ES Chapter 13 - Agricultural Land Use

Authored by Landscape

November 2025

**THE CROWN  
ESTATE**

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East Hemel

# 13. Agricultural Land Use

## 13.1 Introduction

13.1.1 This Chapter sets out the likely significant effects of the Development upon soils and agriculture. It has been prepared by Landscape Land and Property. This Chapter is supported by further detailed information contained within **ES Volume 3, Appendix 13.1** (a detailed Agricultural Land Classification Report) and also **Appendix 13.2** (an Outline Soil Resource Management Plan (SMP)).

13.1.2 This Chapter of the ES assesses the likely environmental effects of the Development with respect to loss of agricultural land and soils and describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been adopted.

## 13.2 Assessment Methodology and Significance Criteria

### Assessment Methodology

#### EIA Scoping

13.2.1 The need for an assessment of loss of agricultural land and soils was identified and agreed through the EIA Scoping process. A copy of the EIA Scoping Report is provided in **ES Volume 3, Appendix 2.1** and a copy of the EIA Scoping Opinions are provided in **Appendix 2.2** (DBC) and **Appendix 2.3** (SADC). The scope of work proposed in the EIA Scoping Report was agreed by SADC and DBC. DBC recommended that consideration be given to the preparation of a Soil Resource Management Plan (SRMP) and as such an outline SMP has been prepared and is included in **Appendix 13.2**.

#### Baseline Study Methodology

13.2.2 The collection of baseline information in this summary of agriculture and soil resources was undertaken as summarised below:

- Desktop study of published information;
- Agricultural Land Classification (ALC) and soil survey of the Development Area in 1996 and 2015;
- Liaison with the tenant farmers and agents regarding information on the affected agricultural holdings;
- Consultation with statutory organisations, relevant non-governmental organisations (NGOs); and
- The identification of the existing baseline conditions in relation to agriculture and soils has been undertaken in two stages comprising a desk top review of available published information and a comprehensive Site

survey. Both stages have focussed on soil types and patterns, agricultural land quality and the farming framework and activity across the Site. The study area for baseline data collection has included only land directly affected by the proposed construction area (e.g. the Site).

13.2.3 The information reviewed during the desktop study covers a range of factors in relation to soil types and the quality of the agricultural land.

13.2.4 The published and available data utilised to undertake a desktop appraisal is set out in **ES Volume 3, Appendix 13.1**.

13.2.5 The objective of the desktop analysis is to determine the likely ALC grade of the Site utilising the following information:

- Soil and climate data;
- Agricultural policy issues;
- Legislative environment;
- Land use and policy context (current and historical);
- Local and National designations affecting farming / land use and practice;
- Site based constraints; and
- Other ALC survey data locally.

## Assessment Approach

13.2.6 The assessment of agricultural land quality follows the approach of the 'Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land', 1988 ('the ALC Guidelines').

13.2.7 The ALC Guidelines 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'.

13.2.8 Agricultural land classified as Grade 1, 2 and Subgrade 3a falls within the 'Best and Most Versatile' (BMV) category in Paragraph 187 and Annex 2 of the NPPF of 2024. Further details of the ALC system and national planning policy implications are set out by Natural England in its Technical Information Note 049 (Second Edition, 19th December 2012).

13.2.9 An ALC survey was carried out by Wardell Armstrong (on behalf of the Applicant) in May 2015 and 2016 and involved the examination of soil profiles located on an approximate 100 m grid pattern covering 370 hectares of

agricultural land within the Site. The soil profiles were examined in accordance with the ALC Guidelines <sup>1(2)</sup> to describe soil texture, structure, colour, stone content and drainage status, etc, to a depth of 1.2m with the use of a hand-held Edelman (Dutch) soil auger and a spade. A number of trial pits were excavated utilising a hand spade and are also described. The findings are set out in the Baseline section below and the ALC report is found in **ES Volume 3, Appendix 13.1**.

13.2.10 Natural England, the Government's advisor maintains the national ALC database, which was accessed in order to determine what level of information is currently available in connection with agricultural land at the Site and in the vicinity. ALC information provided by Natural England has also been utilised in assessment of the baseline and impacts.

13.2.11 The scope of this Chapter has taken into consideration the Institute of Environmental Management and Assessment's (IEMA) 'A New Perspective on Land and Soil in Environmental Impact Assessment' (2022)<sup>2</sup> (the 'IEMA Guidance') which comprises best practice guidance for the assessment of the likely significant effects on soils and agricultural land from a proposed development.

13.2.12 The assessment process sets out the sensitivity and the magnitude in **Tables 13.1** and **13.2**, and then uses the matrix in **Table 13.3** to determine the resulting significance of the effects. The IEMA Guide identifies Grades 1 and 2 as of very high sensitivity, and Subgrade 3a as of high sensitivity. The definition of "Best and Most Versatile" agricultural land is Grades 1, 2 and 3a with no differentiation.

### Soils and Agricultural Land Quality

13.2.13 A series of Site inspections were undertaken during the summer of 2015 and summer 2025. During the Site inspections, a series of hand auger borings were made to examine soil profile physical characteristics and further trial pits were excavated.

13.2.14 For each of the auger borings, the following standard soils data have been collected:

- Soil horizon depth;
- Soil texture of all horizons;
- Soil colour;
- Stone content estimated from augering confirmed by soil pit excavation and/or sample analysis;
- Presence and characteristics of mottling – a soil wetness indicator;
- Presence of iron or manganese concretions, also a soil wetness indicator;
- Identification of gleyed horizons;

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<sup>1</sup> Ministry of Agriculture, Fisheries and Food (MAFF) 1988 Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land, London

<sup>2</sup> Available at: <https://www.iema.net/resources/blog/2022/02/17/launch-of-new-eia-guidance-on-land-and-soils>

- Identification of slowly permeable layers; and
- Identification of impenetrable rock layers.

13.2.15 Soil wetness class (WC) was inferred from the matrix colour, presence or absence of and depth to greyish and ochreous gley mottling and / or poorly permeable subsoil layers at least 15cm thick. Nearly the entire Site was found to be WC III.

13.2.16 Soil droughtiness was investigated by the calculation of moisture balance equations. Crop adjusted available profile water (AP) is estimated from texture, stoniness and depth and then compared to a calculated moisture deficit (MD) for the standard crops wheat and potatoes. The MD is a function of potential evapotranspiration and rainfall. Grading of the land can be affected if the AP is insufficient to balance the MD and droughtiness occurs. When a profile is found with significant stoniness, sufficient to prevent penetration of a hand auger, then it is assumed for the purposes of calculating droughtiness that similar levels of stoniness continues to the full 1.2m depth considered.

13.2.17 The soil removed during the augering was examined in accordance with "Soil Survey Field Handbook Describing and Sampling Soil Profiles: Soil Survey of England and Wales, Technical Monograph No. 5" (2022) and "Soil Classification for Soil Survey, Monographs on Soil Survey" Butler, B E (1980).

## Assessment of Effects

13.2.18 The scope of the impacts to be assessed comprise:

- The quantity and quality of agricultural land that would be affected both temporarily and permanently; and
- The nature of the soil resource that would be affected.

13.2.19 The Design Manual for Roads and Bridges (DMRB) which draws on advice given in the 1992 version of PPG7 subsequently superseded by PPS7 and now the NPPF advises that there are 4 main areas that need to be covered in any assessment of the effects on agricultural land:

- Land take;
- Type of husbandry;
- Severance; and
- Major accommodation works for access, water supply and drainage.

## Receptor Sensitivity

13.2.20 The significance criteria used below have been devised based on professional judgement and taking full account of the IEMA Guidance'

13.2.21 With respect to value or sensitivity, a level has been assigned to the key receptors in the agricultural assessment, i.e. agricultural land quality and the farming framework. The criteria that have been used to assess this are

described in **Table 13.1**. Where a receptor could be placed within more than one category of value, conservative professional judgment has been applied to determine which category is appropriate.

**Table 13.1: Criteria for Determining Receptor Sensitivity**

Sensitivity	Criteria
High	Grade 1 agricultural activity and specialised horticultural / intensive agricultural unit.
Medium	Grade 2 and 3a agricultural land and annual horticultural cropping and High Level Stewardship Schemes.
Low	Grades 3b and lower quality land and arable and grassland areas and Environmental Stewardship Schemes.
Negligible	Grade 4 or 5 agricultural land and grassland / limited arable areas.

### Magnitude of Change / Impact

13.2.22 The magnitude of the impact on agricultural land use has also been considered with regard to the key factors in the agricultural assessment, i.e. agricultural land quality and the farming framework. There is no statutory guidance on the thresholds that should be applied for this topic area. However, land loss area thresholds, a criterion that is still applied by the Welsh Government in their consideration of Development proposals, have been considered in the development of the criteria used in this assessment.

13.2.23 The magnitude of an impact has been categorised as high, medium, low or very low as described in **Table 13.2**. Where an impact could be placed within more than one category of magnitude, conservative professional judgement has been applied to determine which category is appropriate.

13.2.24 The impact magnitude criteria are set out below. The IEMA Guidance is not based on a change of use, but on loss. Loss is defined in Table 3 of the IEMA Guidance as "*permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading)*". In respect of temporary developments, the footnote to Table 3 notes that "*temporary developments can result in a permanent impact if resulting disturbance of land use change causes permanent damage to soils*". For the assessment, therefore, the focus is on permanent, irreversible losses, not temporary land-use changes.

**Table 13.2: Criteria for Determining Magnitude of Change / Impact**

Magnitude	Criteria
High	The Development would directly lead to the loss (including permanent sealing or land quality downgrading) of one or more soil functions or soil volumes over an area of over 20 hectares ('ha') of soil-related features; or potential for improvement in one or more soil functions over an area of more than 20ha.
Medium	The Development would directly lead to the loss (including permanent sealing or land quality downgrading) of one or more soil functions or soil volumes over an area of between 5ha and 20ha of soil-related features; or potential for improvement in one or more soil functions over an area of between 5ha and 20ha.
Low	The Development would directly lead to loss (including permanent sealing or land quality downgrading) of one or more soil functions or soil volumes over an area of less than 5ha of soil-related functions; or temporary, reversible loss of soil-related features set out in the Guide (biomass production, ecological habitat, soil carbon etc) or potential for improvement in one or more soil functions over an area of less than 5ha.
Very Low	Only minor loss or reduction or improvement of soil functions or volumes.

Note 1: A 20 ha threshold follows the approach of Annex B15 of PPG7 of February 1997, as amended March 2001. This stipulated that MAFF had a statutory right to be consulted, and thereby possibly object to a proposal, where a significant amount of higher quality land was proposed for non-agricultural Development. Whilst the statutory powers of MAFF were repealed with the advent of DEFRA in June 1997, and Annex B was not continued in PPS7 or the NPPF, the threshold of 20 ha or more of best and most versatile land, represents a measure of significance for the loss of such land which has been tried and tested in land use planning, and at public inquiries, over the last two decades, or more.

Note 2: A threshold of 10 acres (or approximately 4 ha) or more follows the approach of paragraph 6 of Department of the Environment Circular 71/71 'Development of Agricultural Land'.

### Significance Evaluation

13.2.25 The IEMA Guidance then determines the significance. Unlike the majority of ES assessments, as the IEMA Guidance can include a 'very high' sensitivity category, the criteria set out in **Table 13.3** could therefore refer to 'very high' sensitivity. Under the IEMA Guidance, one hectare of Grade 1 or 2 land lost would amount to a moderate adverse significant impact. But this gives the impact a greater degree of significance than is realistic. Natural England estimate that 21% of agricultural land is Grades 1 and 2. The utilised agricultural area of England on 1<sup>st</sup> June 2023 was 8.8 million hectares, such that there is an estimated 1.8 million hectares of Grades 1 and 2 in active agricultural use. The loss of small areas in that context should not be significant in EIA terms. Accordingly, it is considered appropriate that the assessment makes moderate significance impacts not 'significant' in EIA terms.

**Table 13.3: Significance of Effect Matrix**

		Sensitivity of Receptor / Receiving Environment				
		Very High	High	Medium	Low	Very Low
Magnitude of change / Impact	High	Major Adverse / Beneficial	Major Adverse / Beneficial	Major Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial
	Medium	Major Adverse / Beneficial	Major Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial	Negligible
	Low	Moderate Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial	Negligible	Negligible
	Very Low	Minor Adverse / Beneficial	Minor Adverse / Beneficial	Negligible	Negligible	Negligible
	No Change	Neutral	Neutral	Neutral	Neutral	Neutral

### Legislation and Policy which has Influenced Assessment or Mitigation

13.2.26 This section of the Chapter sets out the national and local planning framework in which to assess the opportunities and constraints for the Development in agricultural land quality terms.

#### National Policy and Guidance

National Planning Policy Framework (NPPF) (2024)<sup>2</sup>

13.2.27 National planning policy guidance on Development involving agricultural land is set out in the NPPF published December 2024.

13.2.28 Paragraphs 187 is of relevance to this assessment of agricultural land quality and soil.

13.2.29 In addition to the NPPF, the following documents include policy relevant to this assessment.

<sup>2</sup> Ministry of Housing, Communities and Local Government. National Planning Policy Framework (NPPF). 2024.

## Environment White Paper<sup>3</sup>

13.2.30 The NPPF was preceded and informed by the first White Paper on the Environment in twenty years<sup>[2]</sup>. It sets out, in part, the importance that the Government places on the soil's ability to support vital ecosystem services such as flood mitigation, carbon storage and nutrient cycling.

## Local Policy and Guidance

### Local Plans Dacorum and St Albans

13.2.31 The Dacorum Borough and St Albans Council Local Plan documents together make up the relevant planning policy for the area. The Study Area falls mainly under the planning jurisdiction of SADC with only a small area in Dacorum. Until a new local plan is adopted, relevant local plan policy is set out in the Local Plan.

13.2.32 Best and Most Versatile agricultural land is described as land in Grades 1, 2 and 3a of the Agricultural Land Classification.

## Other Relevant Policy and Guidance

### Best Practice Guidance

13.2.33 The Department for Environment, Food and Rural Affairs (Defra) has published '*Safeguarding our Soils – A Strategy for England*' (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.

13.2.34 Paragraph 6.14 of the Strategy states that Defra and the Department for Communities and Local Government will review:

*"Planning policy on agricultural land requires local planning authorities to take account of the presence of best and most versatile agricultural land (BMV) (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) alongside other sustainability considerations (e.g. biodiversity and the quality and character of the landscape) when determining planning applications".*

## Assessment Limitations

13.2.35 Lack of historical detailed soils information has required a full ALC assessment across the Site to determine the soil resource and agricultural land classification grades. Following Site work and assessment, the classification of land and soils on the Site was well understood.

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<sup>3</sup> 'The Natural Choice: Securing the Value of Nature' (2011)

## 13.3 Relevant Baseline Conditions

### Current Baseline

#### Farming Framework

13.3.1 The structure of land ownership and farming has been further considered through Site visits to look at patterns of agricultural land use. The land is within one ownership (the Applicants) and three tenant occupiers. Site visits to look at locations of farm land and associated buildings and discussions with land agents working on behalf of the owner and an inspection of the farm holdings were conducted in summer 2025 and included a discussion with a tenant farmer that would be affected by the published scheme. The discussion was an informal interface which sought to confirm the following:

13.3.2 Identification of the ownership and occupation of agricultural land within the Site area;

- Description of the scale and nature of agricultural activities undertaken on affected farms within the Site;
- Identification of the principal potential impacts on the farm holdings;
- Consideration of the views of the tenant as to how these impacts could best be mitigated; and
- Assessment of the concerns expressed by the individual farmers.

13.3.3 The desktop study review of information on the local farming framework has included information from the following sources:

- Department for Food, Environment and Rural Affairs (DEFRA) District Farming Statistical data available from [www.data.gov.uk](http://www.data.gov.uk);
- Interactive MAGIC website for rural land designations including areas within the environmental stewardship and other schemes; and
- Land ownership information.

#### Climate and Altitude

13.3.4 Agro-climatic data for the area have been interpolated from the meteorological office's standard 5km grid point data set at a representative altitude of 130 metres AOD. The data shown in **Table 13.4** is the local agro climatic factors affecting the Site. The Site is dry and moderately warm with a medium soil moisture deficit. The number of field capacity days is typical for lowland England and is considered to be relatively favourable for providing opportunities for agricultural field working. There are no significant climatic limitations to Grade 1 across the majority of the Site except where the land is identified as of non-agricultural character.

13.3.5 There is a heavy plant-water demand in this low rainfall area and unirrigated land suffers from drought. There is no available water on the Site to fully sustain crop growth in the form of irrigation.

**Table 13.4: Summary of Local Agro-climatic Factors**

Climatic Factor	Quantity
Grid reference	TL092 087
Altitude	130m
Average annual rainfall	694
Accumulated temperature >0°C (Jan - June)	1351-day degrees Jan-June
Moisture deficit, wheat	100mm
Moisture deficit, potatoes	89mm
Field capacity period	146 days
Overall Climatic Grade	1

### Soil Parent Material, Geology and Soil Types

- 13.3.6 The published small scale (1:250,000) geology map (Institute of Geological Sciences, 1983) shows the Site to comprise superficial deposits: Clay-with-Flints Formation – Clay, Silts, Sand and gravel. The Bedrock geology is Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated) – Chalk; and Lambeth Group – Clay, silt and Sand.
- 13.3.7 The Soil Survey of England and Wales have mapped the soils in the Hemel Hempstead area on two occasions; in 1965 at 1:63,360 scale and in 1983, at a reconnaissance scale of 1:250,000. These maps show the occurrence of soils mainly derived from clay 528a Batcombe Association, characterised by fine silty or fine loamy topsoils over clays subsoils. Subsoils are red and typically mottled orange and grey due to the presence of slowly permeable layer, which makes them susceptible to seasonal waterlogging. Seasonal wetness affects the land use of this association, while droughtiness does not often affect the crops. Soils of this association typically support a wide range of arable crops and are highly productive. Other soils include 582c Hornbeam 2, 581d Carstens and 571m Charity 2 Associations.
- 13.3.8 The Agricultural Land Classification for East of England at a scale of 1:250,000 shows the area as a mixture of Grade 2 and Grade 3.

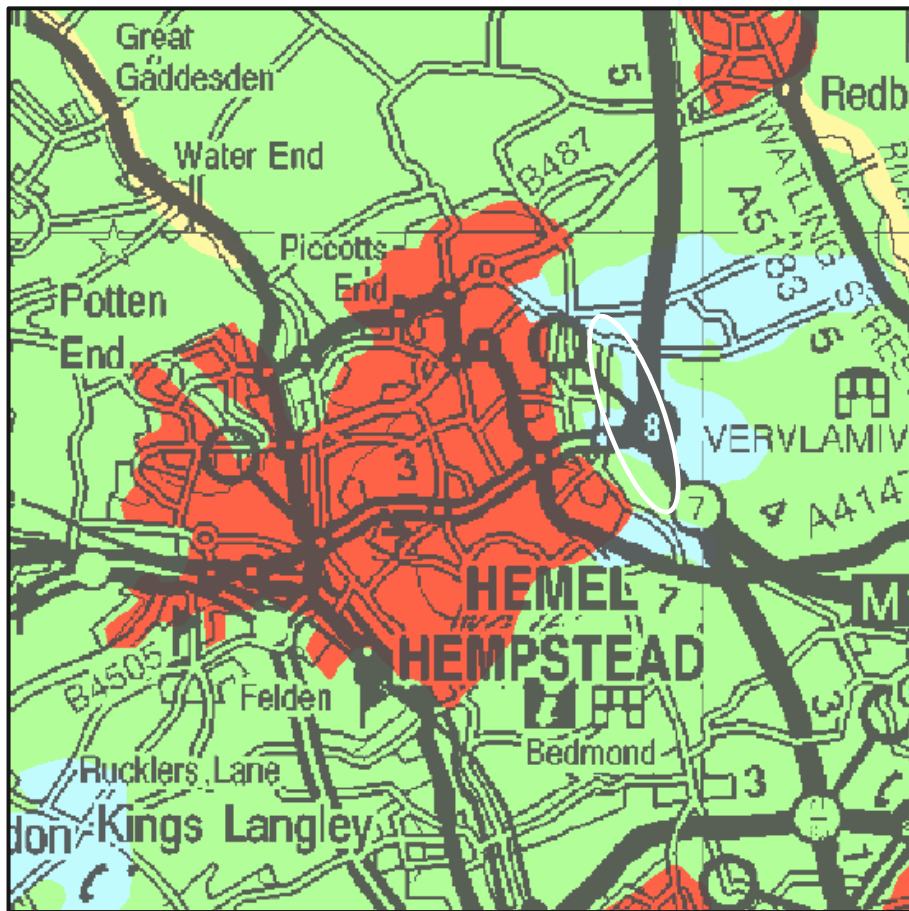
### Drainage and Flood Risk

- 13.3.9 The Environment Agency’s flood risk mapping shows most of the Site does not flood and most of the land is undrained.

## Agricultural Land Classification

- 13.3.10 The records of Defra (Ministry of Agriculture, Fisheries & Food, 1996) on the "provisional" ALC maps from the 1970s as being of be mainly Grade 3 (moderate to good) with some Grade 2 (very good) agricultural land quality. As demonstrated on **Figure 13.1** Extract from Provisional ALC Map, much of the wider area in the vicinity of the Site is similarly shown to be of mainly Grade 3 agricultural land quality. 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, as advised in Natural England's TIN 049.
- 13.3.11 The guidelines introduced in 1988 with improved criteria for climatic limitations and climate-soil interactions adopted only two Subgrades for Grade 3 (Natural England, 2009).

**Figure 13.1: Extract from Provisional ALC Map**



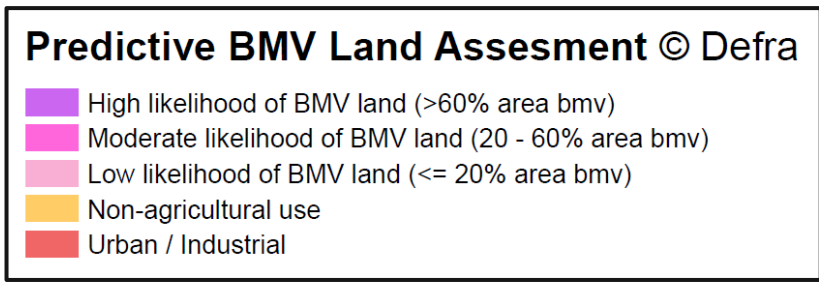
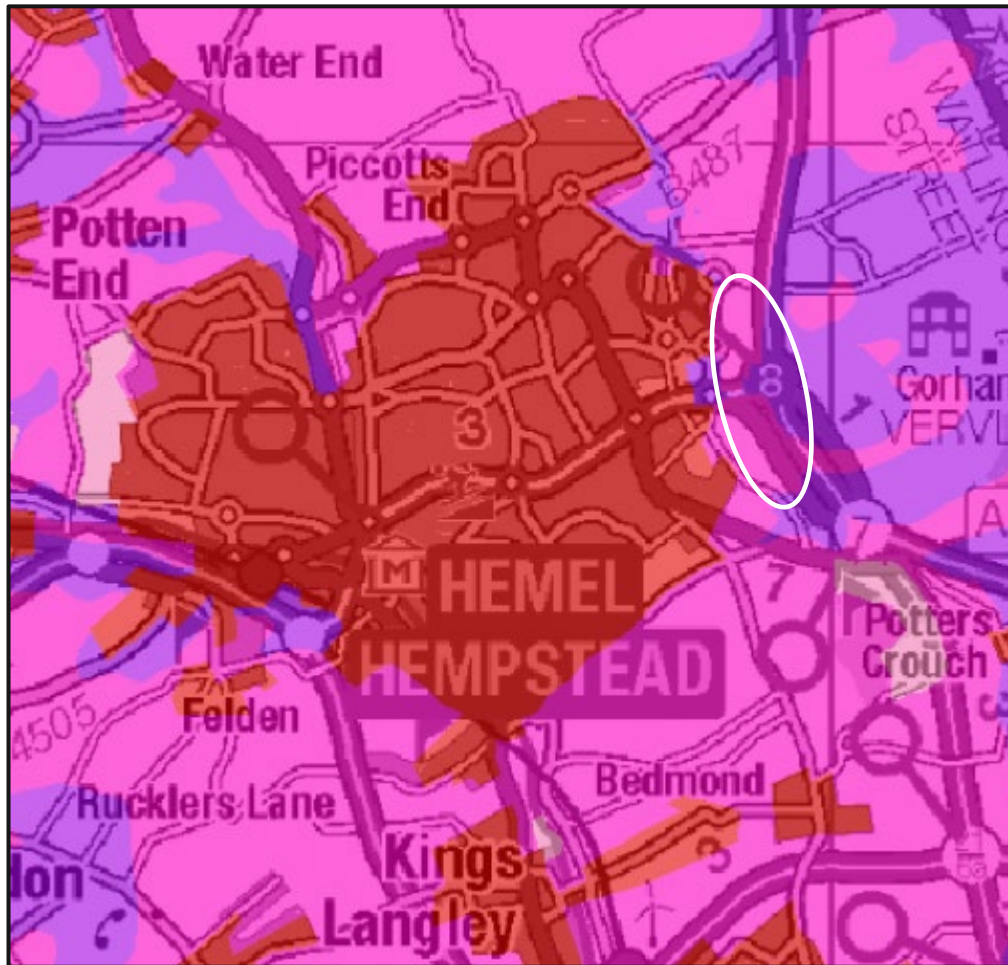
<u>Grade</u>	<u>Description</u>
1	Excellent
2	Very Good
3	Good to Moderate
4	Poor
5	Very Poor
<u>Non-Agricultural Land</u>	
	Other land primarily in non-agricultural use
	Land predominantly in urban use

13.3.12 In 2017, Natural England published plans showing the likelihood of the proportion of BMV agricultural land. These maps divide the agricultural land across England into three categories of proportions:

- High (>60% area of BMV agricultural land);
- Moderate (20 - 60% area of BMV agricultural land); and
- Low (<20% area of BMV agricultural land).

13.3.13 The Site is shown in **Figure 13.2** Extract from Predictive BMV Map as being mostly of moderate likelihood of comprising BMV agricultural land, as is much of the wider area in the vicinity of the Site.

Figure 13.2: Extract from Predictive BMV Map



13.3.14 The Site has been the subject of a detailed ALC survey. This was undertaken by Wardell Armstrong in 2015 and 2016. The ALC survey results are reported at **Appendix 13.1**.

13.3.15 Assessment of quality has been undertaken according to the MAFF revised guidelines (1988) and soil profiles have been described in accordance with Hodgson (2022).

Current Grading

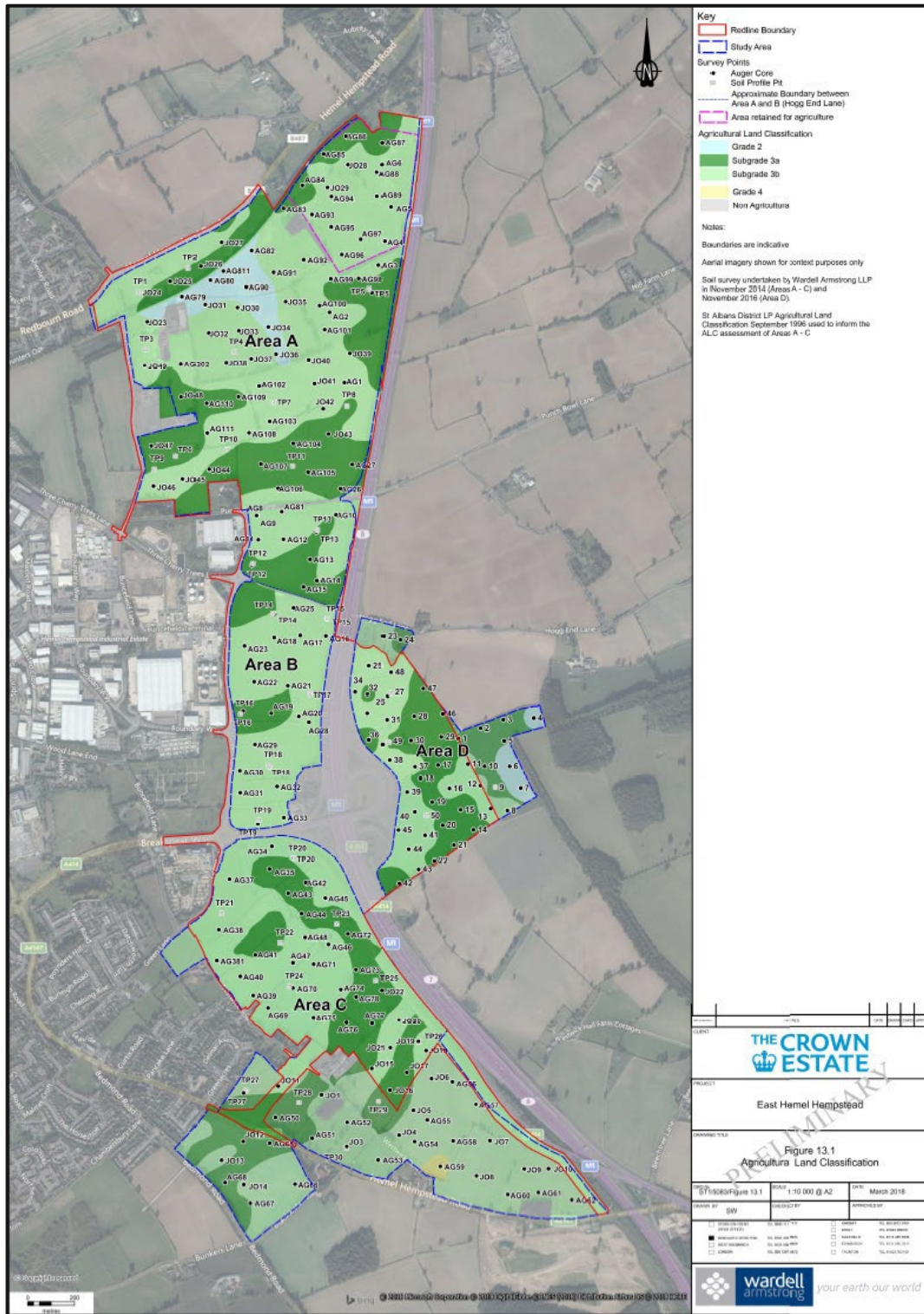
13.3.16 This assessment has resulted in an Agricultural Land Classification of the following grades (**Table 13.5**):

**Table 13.5: Agricultural Land Classification Results Summary**

ALC Grade	Description	Area (%)	Area (Ha)
2	Very Good	2.5	9
3a	Good	28.8	102.8
3b	Moderate	67	239.2

13.3.17 The ALC report (refer to **Appendix 13.1**) describes the soils identified and these are detailed below and a plan of the area is shown in **Figure 13.3**. The ALC report also sets out photographs of soils identified during the survey.

Figure 13.3: Map Showing Main Soil Types



Note: The above figure is extracted from **ES Volume 3, Appendix 13.1: Soils and Agricultural Land Classification** which was prepared by Wardell Armstrong in 2015. As such, the identified 'Redline Boundary' varies slightly to the Site boundary identified in **ES Volume 2, Chapter 1: Introduction, Figure 1.1: Site Boundary Plan**.

### Type 1 Soils – Wetness Limitation

13.3.18 The soils generally have heavy clay topsoils over heavy textured subsoils and are known not to be well drained. The Wetness Class of III is assigned due to the depth to slowly permeable horizon and some evidence of gleying within 40 cm of the surface. The combination of Wetness Class (Class III), topsoil texture (Clay or Clay loam) and the number of field capacity days results in an ALC grading of 3b for Type 1 soils.

### Type 2 Soils – Wetness Limitation

13.3.19 These soils generally have slightly lighter topsoils, being more medium clay loam over heavy textured subsoils. The combination of Wetness Class III, topsoil texture (medium Clay Loam) and the number of field capacity days results in an ALC grading of 3a for the Type 2 soils.

### Type 3 Soils – Workability Limitation

13.3.20 These soils cover a small area in the north of the Site and east of the M1. They are assessed as Wetness Class I due to permeable chalky lower subsoil. However, the heavy clay loam topsoil results in slight wetness and restrictions in workability which limits the land to Grade 2 quality.

## Land Quality

13.3.21 Land quality on this Site is mainly Grade 3b due to the presence of slowly permeable lower subsoils which have affected the drainage characteristics of the soils with some areas of Grade 3a and a small area of Grade 2. Areas of non-agricultural designation are either farmsteads or woodland shelterbelts.

### Grade 1

13.3.22 No land of this grade has been mapped on Site.

### Grade 2

13.3.23 A small quantity of this grade has been mapped on Site, in one area at the northern end of the Site, extending to 9 hectares.

### Grade 3a

13.3.24 This Sub-grade is mapped over 102.8 ha and 28.8% of the Site and includes areas of medium clay textured soil, which overlie heavy clay upper subsoils, these soils show signs of seasonal wetness in the form of gley colours and mottles at shallow and variable depths and a slowly permeable layer at depths of 40cm; they fall into Wetness Class III; and hence with a medium clay loam topsoil into Sub grade 3a.

### Sub-Grade 3b

13.3.25 This sub-grade is mapped over 239.2 ha and 67.0% of the Site and includes areas of heavy textured soil, which overlie heavy clay upper subsoils, these soils show signs of seasonal wetness in the form of gley colours and mottles at shallow and variable depths and a slowly permeable layer at depths of 40cm; they fall into Wetness Class III; and hence with a heavy clay or heavy clay loam topsoil into Sub grade 3b.

### Grade 4

13.3.26 No land of this grade has been mapped on Site.

### Grade 5

13.3.27 No land of this grade has been mapped on Site.

### Non-Agricultural Land

13.3.28 Comprising buildings tracks and some small areas of boundary shelterbelts, covers approximately 6 hectares or 1.7%.

## Future Baseline

13.3.29 Without the Development being brought forward, it is anticipated that the agricultural would continue to be farmed either by the existing occupants or possibly other tenants. The land would not otherwise be expected to change.

## Identified Receptors and their Sensitivity

13.3.30 **Table 13.6** provides a description of the receptors identified through the baseline review.

**Table 13.6: Identified Receptors and their Sensitivity**

Receptor	Sensitivity	Justification
Best and most versatile land (Grades 1 and 2)	High	Permeable coarse, loamy and medium loam soils or other soils capable of supporting valuable habitats.
Soil resource and function	Medium	Loss of >80% topsoil resources and insufficient topsoil protected for on-Site uses.

## 13.4 Likely Effects of the Development and Their Significance

### The Works

- 13.4.1 Development on the Site being brought forward will result in the entirety of the Site being built on or landscaped, including the removal of topsoils and loss of farming opportunity on current agricultural land.

### Effect on Agricultural Land Quality and Soil

- 13.4.2 Land within the Site, and the topsoil and subsoil which it contains, will be affected, e.g. excavated, driven over or used for storing materials, during the construction phase of the Development.
- 13.4.3 The Development would result in the loss of all topsoils within the construction area during stripping and stockpiling if not carefully managed, meaning insufficient resources are available to complete landscaping. These are permanent effects.
- 13.4.4 There is a risk that the subsoils of the greenspace surrounding the built development could become compacted through handling and trafficking. Such compaction would adversely affect drainage, and would lead to increased surface water flood risk (which would be mitigated by proposed SUDS schemes). It could also restrict rooting depth and affect the success of proposed planting schemes.
- 13.4.5 The soil resources within the Works are a combination of coarse and fine loamy over slowly permeable subsoils, and therefore are medium sensitivity receptors. The potential loss of all topsoil resources and compaction of subsoils is of a high magnitude. This is a potential **major adverse** effect at the local level in the absence of mitigation (additional mitigation is discussed in Section 13.5).
- 13.4.6 The Development would result in the loss of approximately 111.8 hectares of land within the 'best and most versatile' category being 9 hectares of Grade 2 - land of very good quality and 102.8 hectares of Subgrade 3a - land of good quality, together with the loss of 239.2 ha of agricultural land classed as Subgrade 3b, i.e. moderate quality. This would be considered as a high magnitude impact. Using the significance criteria set out in **Table 13.3** the loss of this quality land (e.g. High sensitivity) is assessed as a **major adverse** direct, permanent/irreversible, adverse effect at a national level.
- 13.4.7 The loss of the agricultural land resource will be progressive through construction. The significance of this impact is considered post-completion, however, at which point all land will be removed from agricultural use (a long term effect).
- 13.4.8 **Table 13.7** summarises the expected effects on agricultural land and soils.

**Table 13.7: Summary of Effects during the Works**

Receptor	Sensitivity	Description of Effect	Magnitude of Change / Impact	Effect Significance
Loss of best and most versatile land	High	Irreversible loss.	High	Major adverse at national scale
Loss of soil resource and function	Medium	Irreversible loss. Soil compaction and erosion	High	Major adverse at local level

### Intermediate Year(s) Construction Effects

13.4.9 Due to the phased nature of the delivery of the Development, there may be some opportunity during the construction phase to retain farming activities on parts of the Site as construction proceeds over the course of more than one year, though this will be limited.

### The Completed and Operational Development

13.4.10 The impacts to agricultural land use would occur during the Works phase and there are not expected to be any significant effects during operation.

## 13.5 Additional Mitigation / Enhancement and Likely Residual Effects of the Development and their Significance

### The Works

#### Effect on Agricultural Land Quality and Soil

13.5.1 Whilst there is no mitigation for the loss of agricultural land, it is possible to mitigate for effects of the Development on soil. The better soil at the Site is likely to be of 'general purpose' grade in terms of 'BS3882:2007 Topsoil'. It would, therefore, be suitable for re-use in a landscaping scheme, for example, provided it is handled appropriately.

13.5.2 Therefore, the quality and quantity of soil on the Site should be maintained by implementing appropriate techniques for stripping, storing and re-use. This approach will be adopted in a Soil Resources Management Plan (SRMP), included in **Appendix 13.2** which will form part of the Construction Environmental Management Plan (CEMP), or similar, to be prepared as part of the Development. This is consistent with the findings and recommendations of recent research carried out on behalf of DEFRA, including the Development of a '*Code of Practice for the Sustainable Management and Use of Soil on Construction Sites*'. The preparation and implementation of a SRMP would be secured by an appropriately worded planning condition.

Adherence to the soil management measures will protect soil resources ensuring their availability for use in landscaping and maintaining subsoil drainage through preventing compaction. This would reduce the magnitude of impact to low, resulting in a **minor adverse** effect.

**Table 13.9: Appropriate additional mitigation for and residual effects during the Works**

Receptor	Significance before Mitigation	Additional Mitigation	Residual Effect Significance
Agricultural land quality	Major adverse	N/A	Major adverse at national level
Soil	Major adverse	Soil Resource Management Plan	Minor adverse at local level

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The impacts to agricultural land use would occur during the Works phase and there are not expected to be any significant effects during operation that would require any additional mitigation.

## 13.6 Likely Residual Cumulative Effects and their Significance

- 13.6.1 There are a number of cumulative schemes that will form new clusters of primarily residential developments across the locality, and are assessed as part of the cumulative effects assessment.
- 13.6.2 The Development is part of a larger development of land to create an extension to Hemel Hempstead. The larger scheme would take around 700 hectares of land within several ownerships. Whilst the Development is relatively large scale, as part of the wider development there will be a cumulative impact on possibly agricultural land of higher quality grades in the immediate area.
- 13.6.3 Land locally close to Hemel Hempstead is likely to contain at least some best and most versatile, as demonstrated by ALC reports locally, where typically BMV is at least 30% of agricultural land and in some cases slightly more.
- 13.6.4 A number of these cumulative schemes will affect agricultural land. A number will affect such land irreversibly. As not all the information is available to enable the loss to be quantified, assessing the significance of the cumulative effect of these proposals quantitatively is not possible. However, as the effect of the Development alone in relation to agricultural land is Major Adverse and therefore Significant in terms of the EIA Regulations, the effects of the other cumulative schemes would not alter this assessment.
- 13.6.5 It is assumed that cumulative schemes would be required to follow best practice with regards to soil handling and re-use and therefore the cumulative effect on soils would remain as minor adverse. Areas of vulnerability can be fenced in order to limit compaction.

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- 13.6.6 There are not expected to be any significant cumulative adverse effects during operation, so the cumulative impact is neutral at a national level.

### 13.7 Conclusions

- 13.7.1 This assessment has been informed by a desk study accompanied by ALC surveys. Of the agricultural land of the Site, it is predominantly (67%) of lower agricultural quality or of no agricultural potential. Soils within the Site are almost exclusively heavy clay fine textured topsoils with slowly permeable clay subsoils. However around 30% of the land is best and most versatile land. The Site will lose up to 357 hectares of agricultural land, most of which is not best and most versatile, resulting in a major adverse effect (significant) on agricultural land. There is no possible mitigation for this loss.
- 13.7.2 Before mitigation measures are provided, the assessment found that there would be an irreversible loss of soil resource and function. Mitigation in the form of the implementation of a detailed soil resource management plan which would be included as part of a Construction Environmental Management Plan (CEMP) would reduce the impact on the soil resource to a minor adverse effect (not significant).