

9.0 AGRICULTURE AND SOIL RESOURCES

9.1 INTRODUCTION AND METHODOLOGY

9.1.1 Land Research Associates have been appointed to undertake an assessment of the proposed development of land at Lubbesthorpe, west of Leicester with respect to agriculture, land use and soil resources. The application is for a high quality Sustainable Urban Extension (SUE), described more fully within **Chapter 2: Development Proposals** of this **Environmental Statement**.

9.1.2 Within the application area agriculture is the main visible function supported by the land, so will be an important receptor of any effect of the proposals. The soil within the application area is largely undisturbed and acts as a filter to attenuate and immobilise substances falling on it, regulates rainfall movement to surface water and groundwater and supports ecological habitats and biodiversity. The sustainable management of soil and land is a central pillar in sustainable development and, consequently, any effects on soil will also be important.

Methodology

9.1.3 Agricultural land quality and soil resources were accurately assessed by means of a desk study of agricultural climate and a detailed survey involving observations of soil and land characteristics at the intersects and midpoints of a 200 m grid. This work is described more fully in a separate technical report included at **Appendix 9B: Soil Resources and Agricultural Use and Quality of Land North of Enderby, Leicestershire**. Using the **Revised Guidelines and Criteria for Grading the Quality of Agricultural Land** (Ref.9.1), published by MAFF in 1988, each observation point was assigned a land grade and the classification of land at each location was then translated into maps of land grades and soil resources with the help of ground observations during the survey and colour air photographs.

9.1.4 Details of the agricultural businesses that would be affected by the proposed development were assessed by interview. Other relevant baseline data was obtained from the publications detailed in the relevant paragraphs below.

Assessment criteria

9.1.5 There is no nationally agreed scheme for classifying the effects of development on agriculture or soils, and the approach used in this chapter has been developed over a number of years. Effects of a project can be adverse, causing negative effects to a receptor, beneficial, resulting in advantageous or positive effects to a receptor, or negligible. The significance of any beneficial or adverse effect can be assessed as either 'major (i.e. significant)', 'minor' or 'of no significance' according to the magnitude of the effect of the proposed development and the sensitivity of the receptor, as set out in **Table 9a** below.

Table 9a: Significance of Effects

Magnitude of effect	Sensitivity of Receptor		
	High	Medium	Low
High	Major	Moderate	Moderate
Medium	Moderate	Minor	Minor
Low	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible

9.1.6 Under the current legislative and planning policy framework, both local farm businesses and soil are considered to be of 'medium' sensitivity in terms of the national interest. Best and most versatile agricultural land (i.e. grades 1, 2 & 3a on MAFF's 1988 Agricultural Land Classification system) is considered to be a finite national resource, is given special consideration in national policy, and can be considered to be of higher sensitivity than land in Grades 3b, 4 and 5. The actual sensitivity category assigned will vary regionally. In areas where best and most versatile land is not uncommon, grade 1 and 2 land can be considered to be of high sensitivity, sub-grade 3a of medium sensitivity, sub-grade 3b and grades 4 and 5 of low sensitivity. In areas of the country with little best and most versatile land, sub-grade 3a might be of high sensitivity and sub-grade 3b of medium sensitivity. The disposition of the best and most land, e.g. as narrow strips within poorer land or as continuous blocks extending over one or more fields, will also influence the significance of loss.

9.1.7 The magnitude of effect on best and most versatile land will depend on the amount to be taken by the development. The former MAFF did not require to be consulted on applications that affected less than 20 ha of best and most versatile land, so the loss of areas smaller than this threshold is considered to have negligible effect on the national stock of best and most versatile land. Losses of over 80 ha of best and most versatile land are equivalent to the size of a medium to large farm and are considered to be of high effect. The judgement-based classification adopted for effect on best and most versatile land is given in **Table 9b** below:

Table 9b: Magnitude of Effect on Best and Most Versatile Land

Magnitude of adverse effect	Area of best and most versatile land lost
High	>80 ha
Medium	40-80 ha
Low	20-40 ha
Negligible	<20 ha

9.1.8 In considering the magnitude of the effect on farm businesses it is necessary to also consider if the change in use from agricultural to a non-agricultural is of economic benefit to the business. For example, a farm collaborating with a planning application might cease to become viable as an independent agricultural holding but financial benefits could enable the owner to retire from farming or buy a larger farm elsewhere. In that instance the effect on the occupant (as opposed to the agricultural holding) would be beneficial. Adverse effects will mainly arise through removal of all or part of land rented by a farm

business or by removal of small parts of an owner-occupied farm where the financial gain is insufficient to allow restructuring. **Table 9c** gives examples of adverse effects of different magnitude.

Table 9c: Magnitude of Effect on Individual Farm Businesses

Magnitude of adverse effect	Effect on an individual farm business (including diversification enterprises)
High	An effect that renders an existing full-time farm business unworkable and unviable in its current form. The farmer will have to seek alternative means of income.
Medium	Effect on the operation of a full time farm business whereby net farm income will be reduced and day-to-day management will need modifying.
Low	A small effect on the operation and economic performance of a full-time farm unit or a larger effect on (or loss of) a part-time farm business where income is derived mainly from non-agricultural means.

9.1.9 Where land is currently farmed through a tenancy arrangement without long-term security of tenure or is contract-farmed, then the significance of the effect on a farm business is deemed to be slight, because the right of the tenant or contractor to farm the land could cease, with agreed notice, at any time.

9.2 PLANNING CONTEXT

9.2.1 The main item of policy guidance relating to agriculture is **Planning Policy Statement 7: Sustainable Development in Rural Areas** (Ref.9.2), while the overarching approach to soils in the planning system is expressed in paragraph 20 of **Planning Policy Statement 1: Delivering Sustainable Development** (Ref.9.3).

PPS 7 states at paragraph 28 that:-

"..the presence of best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification), should be taken into account alongside other sustainability considerations ... when determining planning applications. Where significant development of agricultural land is unavoidable, local planning authorities should seek to use areas of poorer quality land (grades 3b, 4 and 5) in preference to that of a higher quality, except where this would be inconsistent with other sustainability considerations".

Policy 26 of the **East Midlands Regional Plan** also states that:-

"The Region's best and most versatile land should be protected from permanent loss or damage."

PPS 1 is concerned with the protection of soil through development plan policies, but further strategy on protection of soil is set out in **The First Soil Action Plan for England**

2004-2006 (Ref.9.4) and the recently published soil strategy **Safeguarding our Soils: a Strategy for England** (Ref.9.5). The latter aims to ensure that soil functions are sufficiently understood in the planning system and that soils are better managed through all stages of construction. An Environment Agency document, **Soil a Precious Resource: Our Strategy for Protecting, Managing and Restoring Soil** (Ref.9.6) has complementary aims. The **East Midlands Regional Plan** also supports this policy.

9.3 BASELINE CONDITIONS

Soils

9.3.1 The **National Soil Map** (Ref.9.7) at 1:250,000 scale shows the soils to be in the Salop association, comprising slowly permeable seasonally waterlogged reddish fine loamy over clayey soils developed in reddish till, with associated better drained types.

9.3.2 The 186 soil descriptions made across the Project area confirms a similar range of soils, and in addition a heavy soil type developed in chalky grey till. There are two principal soil types across the site. The most widespread are heavy textured and slowly permeable types developed in either reddish till, or on hill tops, greyish chalky till. A typical profile from the site described below:-

- 0-30 cm - Dark brown heavy clay loam with 3% small rounded quartzite stones; moderately developed medium and coarse subangular blocky structure; common fine fibrous roots; sharp smooth boundary to:
- 30-52 cm - Grey heavy clay loam with common strong brown mottles; 3% small rounded quartzite stones; weakly developed coarse subangular blocky structure; 3% fine pores; a few fine fibrous roots; clear smooth boundary to:
- 52-100 cm - Yellowish red clay with common grey and strong brown mottles; a few small stones of sandstone, limestone and quartzite; weak very coarse prismatic structure; 1% fine pores; a few fine fibrous roots.

9.3.3 On hillsides in many parts of the site there is a thicker drift over the till giving rise to better drained soils with loamy upper layers and over mainly slowly permeable lower subsoils which occur below 40 cm depth. An example soil profile is described below:-

- 0-26 cm - Dark brown medium sandy loam with 4% small rounded quartzite and subangular flint stones; moderately developed medium subangular blocky structure; common pores and fissures; many fine fibrous roots; clear smooth boundary to:
- 26-42 cm - Brown medium sandy loam with a few yellowish red mottles; 3% small rounded quartzite stones; moderately developed medium and fine subangular blocky structure; common pores and fissures; common fine fibrous roots; clear smooth boundary to:

- 42-110 cm - Yellowish red clay with common grey and strong brown mottles; common ferri-manganiferous concretions; a few small sandstone limestone and quartzite stones; weakly developed coarse prismatic becoming structureless, massive deeper; 1% fine pores; a few fine roots.

9.3.4 There are local variations. In some parts, slowly permeable clay is not present, and the soils are deep and loamy throughout. Elsewhere, there are sandy layers at depth and the soils are freely draining. **Figure 9.1** shows the distribution of the principal soil types.

Agricultural Use

9.3.5 The land is under a mixture of arable land and grassland, and is subject to several Entry Level Environmental Stewardship schemes. These provide funding to farmers and other land managers in England who deliver effective environmental management on their land. The land is used by tenants at four farms as shown in **Figure 9.2**.

9.3.6 Hopyard Farm is a 135 ha acre mixed holding, half arable growing winter-sown crops, and half grassland used for fattening cattle. A scheduled monument is inside the farm curtilage, and this cannot be disturbed by ploughing so can only be used for grazing on permanent grass.

9.3.7 Hunscombe Grange, Enderby is a 800 ha mixed farm supporting arable land for winter-sown cereal crops, and over 500 beef cattle, some as a suckler herd, and some fattened from stores. About 151 ha of the land are within the site, including land close to the motorway service area.

9.3.8 Old Warren Farm is a 60 ha mixed holding growing grass for dairy cattle and maize for fodder. The rest of the land is given over to cereal cropping.

9.3.9 Lawn Farm is a 60 ha mixed holding mainly given over to fattening 200 cattle. The arable land within the Project area, about 24 ha, is used for growing feed grain for the cattle and some temporary grassland.

Agricultural Land Resource

9.3.10 The MAFF agricultural land classification system grades land into five grades: 1 (excellent quality) to 5 (very poor quality). Grade 3 is subdivided into sub-grades 3a and 3b. Land in grades 1 to 3a is termed the 'best and most versatile'. The principal factors influencing long-term limitations to agricultural use have been used to classify the land of the application area (**Figure 9.3**), and the results are described fully in **Appendix 9B**.

9.3.11 The Project area includes land of grades 2, sub-grades 3a and 3b, and grade 4. **Table 9d** shows the areas and proportion of the different land grades.

Table 9d: Quality of the Agricultural Land within the Application Boundary

Agricultural quality	Area (ha)	% of agricultural component
Grade 2	33	10
Sub-grade 3a	61	18
Sub-grade 3b	234	70
Grade 4	9	2
TOTAL	337	100

9.4 PROJECT DESIGN

9.4.1 The Project design as described in **Chapter 2: Development Proposals** and the accompanying Parameters Plans includes measures to reduce the potential environmental effects of the development on important functions of the soils.

9.4.2 Loss of valuable soil resources can occur if topsoils are not first stripped from areas to be disturbed and topsoil quality will deteriorate if moved when wet. Over-compaction of subsoil as a result of trafficking by construction vehicles over ground to be used for gardens or landscaping not only affects the performance and visual quality of the vegetated areas but also affects hydrology. Where subsoils remain over-compacted, rainfall fails to percolate beyond the base of the topsoil and run-off increases. The lack of a full soil profile into which roots can proliferate reduces soil moisture deficits in summer so that moisture repletion occurs sooner in autumn, further exacerbating the soil's ability to absorb excess rainfall. The consequence is increased hydraulic and sediment loadings to watercourses and an increased risk of flooding. The potential effects on soil functions are summarised in **Table 9e**.

Table 9e: Potential Effect of Construction on the Main Functions of the Soils and Land

Soil or land function	Potential effect on the proposed land uses	
	Built environment	Gardens and landscaping
Landscape support	Mainly adverse	Neutral
Food and fibre production	Adverse	Adverse
Transformation and buffering	Adverse	Adverse
Supporting habitats/biodiversity	Adverse	Beneficial
Storing and transmitting water	Adverse	Neutral

9.4.3 The recently published **Construction Code of Practice for Sustainable Use of Soils on Construction Sites** (Ref.9.8) provides guidance on good practice in soil handling. Soil management to be employed on the project will include:

- Avoidance of traffic in areas that do not need to be disturbed.
- Careful stripping of topsoils (using suitable soil-handling equipment) from areas to be disturbed, ensuring no mixing with the subsoils.

- Storing soils in temporary low stockpiles, protected from contamination by other materials and sown with grass if being stored for more than 6 months.
- Spreading topsoils only onto subsoil that has been de-compacted.
- Using any surplus topsoil beneficially elsewhere.

9.4.4 These measures, and the soil and land functions that they are designed to protect, are summarised in **Table 9f**.

Table 9f: Design Measures to Avoid or Reduce the Main Effects of Construction on Soil and Land Functions

Soil/land function	Design measures
Landscape support	Retention of stripped topsoil. Minimising soil compaction in landscaped areas. Avoidance of traffic on undisturbed areas
Production of food & fibre	None possible in disturbed land
Transformation & buffering	Maximising use of porous surfaces. Minimizing soil compaction
Supporting habitats/biodiversity	Minimizing soil compaction in landscaped areas. Avoidance of traffic on undisturbed areas
Storing and transmitting water	Maximising use of porous surfaces. Minimizing soil compaction in landscaped areas

9.4.5 The loss of land from agricultural use and the sealing of soils within the construction areas cannot be mitigated, but the gardens and verges within the built areas will retain most soil functions for the long-term.

9.5 ASSESSMENT OF EFFECTS

Construction Effects

9.5.1 Construction will involve the stripping of topsoils, storing them for future use, and using them to create gardens, structural landscape and areas for enhancement of biodiversity. Some damage to soil functionality is inevitable through this process but will be mainly mitigated by design.

9.5.2 In parallel with this will be the progressive loss of agricultural use of the land. While the site is being developed it will be necessary to create new accesses to agricultural fields that might result in some inconvenience to the agricultural users.

Cumulative Effects

9.5.3 There is provision in the Hinckley and Bosworth Core Strategy for Sustainable Urban Extensions to the west of Barwell (60-65 ha of housing and 15 ha of employment and local facilities) and to the south of Earl Shilton (50-55 ha of housing and 10 ha of employment/local facilities). The areas identified for these extensions cover land that a desk study, and survey work for the Earl Shilton bypass, indicates is mainly of subgrade

3b agricultural quality with subsidiary subgrade 3a and small areas of grade 2. If all three extensions go ahead there is unlikely to be significant additional impact on best and most versatile land. None of the farmers within the proposed New Lubbesthorpe development have farming interests to the south of Earl Shilton or to the west of Barwell so there would be no cumulative effect on agricultural businesses.

Residual Effects

9.5.4 There will be a loss of 337 ha of agricultural land, and this will affect the farm businesses. Hopyard Farm and Old Warren Farm are entirely within the land take of the Project, and would cease to exist. Lawn Farm would lose over a third of its area, and Hunscombe Grange about one fifth. The effects on the farm businesses are summarised in **Table 9g** below.

Table 9g: Effect of the Project on the Farm Businesses

Farm	Loss of holding (%)	Effect
Hopyard Farm	100	Moderate, adverse
Old Warren Farm	100	Moderate, adverse
Lawn Farm	40	Moderate, adverse
Hunscombe Grange	19	Minor, adverse

9.5.5 Most of the application area will be disturbed to create the platform for development and over much of this area the soils will be sealed by paving or buildings, severely compromising the long-term ecosystem services that they provide.

9.5.6 There will a loss of 94 ha of best and most versatile land. Because this is mainly sub-grade 3a and much of the extend is in strips within fields, the sensitivity is considered to be medium and the overall effect of its loss moderate.

9.6 STATEMENT OF EFFECTS

9.6.1 The development of land to the north of Enderby will remove 337 ha of land from agricultural use and will have a **moderate adverse** effect on at least three farm businesses.

9.6.2 94 ha of the land that will be lost to agriculture is of best and most versatile quality but two thirds is of sub-grade 3a and much of the best and most versatile land is in strips within fields where the poorer land controls agricultural use and cropping options.

9.6.3 Soil functions will be severely compromised over most of the site through sealing by roads and buildings. However, this will be partly mitigated by ensuring that the soils within domestic gardens and open space are in the best possible condition.

9.6.4 The effects are summarised in **Table 9h**.

Table 9h: Overall Effect of the Proposed Development on Agriculture and Soil Resources

Receptor	Effect
Farm businesses	Moderate to substantial adverse
Agricultural land resource	Moderate adverse
Soil ecosystem services/functions	Major adverse in built areas Minor beneficial in landscape areas

References

- 9.1. Ministry of Agriculture, Fisheries and Food (1988). Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land.
- 9.2. Office of the Deputy Prime Minister (2006). Planning Policy Statement 7: Sustainable Development in Rural Areas.
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