9. AGRICULTURAL RESOURCES

9.1 Introduction

9.1.1 This chapter considers the likely significant effects of the construction and operation of the Baldersby Gate MSA on agricultural resources. The assessment considers three main agricultural resources. These include the quality of the land and the agricultural soil resources, both determined by detailed survey according to the Ministry of Agriculture Fisheries and Food (MAFF) Agricultural Land Classification System (October 1988), together with the characteristics of the individual farm holding likely to be significantly affected by the proposals.

9.2 Assessment Methodology

Introduction

9.2.1 On the basis of current available guidance and Planning Policy documents, considered in Section 3 of this Chapter, the agricultural assessment includes likely significant effects arising from:

- The loss of the best and most versatile grade 1, 2 and 3a agricultural land and soil resources; and
- Effects on individual farm holdings.

9.2.2 In order to assess these agricultural effects the following baseline data has been collected:

1. The Agricultural Land Classification of land affected by the proposals. The information is used to assess the loss of the best and most versatile grades 1, 2 and 3a land arising from the construction and operation of the proposed MSA. It is also used to identify the distribution of soil types within the area affected and the availability of topsoil and subsoil resources.

2. Detailed Farm Holding information. This enables specific effects on individual farm holdings to be identified including:
   - the type of agricultural enterprises affected and the husbandry/management currently employed;
   - the effect of temporary construction land take and permanent land-take on the operation of farm holdings;
   - the temporary construction and permanent farm severance effects on farm access, drainage and water supply;
   - the temporary effects of construction noise on farm holdings;
   - the temporary effects of dust from construction activities on farm holdings; and
   - the effects on bio-security, where construction activities involve the movement of soil materials and/or construction traffic across agricultural land, and, in particular, from one farm holding to another.
   - effects of the proposals on participation on any farm diversification schemes, or involvement in the government funded agri-environment scheme including the Environmental Stewardship scheme.

9.2.3 The methodology for the collection of the baseline data is described in more detail below.

Baseline Information

Agricultural Land Classification (ALC)

9.2.4 The methodology employed for determining the quality of agricultural land is the Agricultural Land Classification (ALC), which is a system devised by MAFF (now part of Natural England). The original system was introduced in 1966, but has been comprehensively revised and the current guidelines, Agricultural Land Classification of England and Wales, revised guidelines and criteria for grading the quality of agricultural land, were introduced in October 1988.

9.2.5 The ALC provides a framework for classifying land according to the extent to which physical characteristics impose long-term limitations on agriculture use. The system is based on the assessment of the following limiting factors:
• Climate; accumulated temperature and annual average rainfall;
• Site; gradient, micro-relief and flood risk;
• Soil; texture, structure, depth and stone content; and
• Interaction of the above; soil wetness, droughtiness and liability to erosion.

9.2.6 These factors impose limitations on the performance of land in terms of the typical cropping range and expected level and consistency of yield. The ALC grade, that ranges from grade 1 (highest quality land) to grade 5 (lowest quality land), is determined according to the severity of the limitations. Grade 3 is further subdivided into subgrades 3a and 3b.

9.2.7 There are two stages in the ALC assessment. Firstly, the desk top study of all available published information to provide an indication of the soil types and ALC grades that are likely to be found on the site. The second stage comprises a detailed survey of the ALC and soil resources across the site.

**ALC Stage 1 - Desk Top Study**

9.2.8 The available information consulted in the desk top study included:

• Soil Survey of England and Wales 1:250,000 Sheet for Soils of Northern England
• British Geological Survey Sheet.
• MAFF Published 1 inch to 1 mile Provisional ALC Sheet.
• Site Specific Climatic Information taken from the Agroclimatic Datasets produced by the Meteorological Office for the MAFF ALC Guidelines (October 1988)

**ALC Stage 2 - Site Survey**

9.2.9 The detailed site survey has been undertaken using a 1m Dutch hand combination auger to examine soil profiles at regular intervals across the survey areas. A total of 20 auger borings have been examined across the site. In addition, three soil pits were examined on site. The auger boring and soil pit descriptions are contained in Appendix 9.1. All borings are located using a hand held global positioning system (GPS).

9.2.10 For each of the auger borings the following standard soils data has been collected:

• Soil horizon depths;
• Soil texture of all horizons;
• Soil colour;
• Stone contents, estimated from augering, confirmed by soil pit excavation/ and or sample analysis;
• Presence and characteristics of mottling, a soil wetness indicator;
• Presence of manganese concretions, a soil wetness indicator;
• Identification of gleyed horizons;
• Identification of slowly permeable layers;
• Identification of impenetrable rock layers; and
• Presence of free calcium carbonate

**Farm Holdings**

9.2.11 A detailed farm holding interview has been held with the farmer affected by the proposals. The interview has been based on a farm holding proforma, an example of which is attached as Appendix 9.2. The interview collected the following type of information:

• The size and location of the farm holding;
• The distribution of cropping and stocking on the farm holding;
• Number of people employed on the holding;
• The location of the farm buildings;
• Farm access routes;
• Land drainage characteristics;
• Farm diversification activities including for example shoots or bed and breakfast enterprises; and
• Involvement in any government schemes including the Environmental Stewardship Scheme.
Assessment of Significant Effects

Significance Criteria for the Assessment of Effects on Agricultural Land Quality and Soil Resources

9.2.12 Whilst there is no nationally recognised standard set of criterion for the assessment of the effects on agriculture, the key criterion for determining the significance of effects on agricultural land as a national resource is the extent of loss of "best and most versatile" agricultural land. As set out by the Planning Policy Statement (7) this is land which has been classified in accordance with MAFF ALC Guidelines (1988) as being of Grade 1, Grade 2 or Subgrade 3a. A four-threshold scale of significance has been adopted based on the definitions indicated in Table 9.1.

Table 9.1 Significance of Effects on Agricultural Land Quality

<table>
<thead>
<tr>
<th>Significance of Effects</th>
<th>Agricultural Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major adverse</td>
<td>Permanent loss of more than 20ha of the “best and most versatile” agricultural land in MAFF ALC Grade 1, Grade 2 and Subgrade 3a.</td>
</tr>
<tr>
<td>Moderate adverse</td>
<td>Permanent loss of 10-20ha of the “best and most versatile” land</td>
</tr>
<tr>
<td>Minor adverse</td>
<td>Permanent loss of &lt;10ha of the “best and most versatile” grade 1, 2 and 3a agricultural land.</td>
</tr>
<tr>
<td>Neutral</td>
<td>No loss of the “best and most versatile” land</td>
</tr>
</tbody>
</table>

Significance Criteria for Effects on Farm Holdings

9.2.13 It should be noted that a nationally recognised, standard set of significance criteria for the assessment of effects on agriculture does not exist. Consequently, a bespoke set of significance criteria has been devised in the light of relevant European, national, regional, county and local policies and guidance. Therefore, for the purposes of this study, the assessment of significance of effects on farm holdings is based on the characteristics of the effect, and the sensitivity of the receptors.

9.2.14 The significance of adverse farm effects can be described as ‘major, moderate, minor or neutral’ as set out in Table 9.2 below. In addition, any positive (or beneficial) effects that the proposals have on local agriculture can be described in general terms.

Table 9.2 Significance of Effects on Farm Holdings

<table>
<thead>
<tr>
<th>Significance of Farm Effects</th>
<th>Description of significance of the effect and sensitivity of receptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Adverse</td>
<td>Renders an existing full-time farm business (including any diversification enterprises) unworkable in its current form. In such a case, the farm business would not be able continue in the same way as before the development, and the farmer would have to change the farm enterprises carried out on the remainder of the holding (during and post construction). The farmer will have to seek alternative means of income, which will most likely include some non-agricultural means.</td>
</tr>
<tr>
<td>Moderate Adverse</td>
<td>A significant effect on the workability of a full time farm business (including any diversification enterprises) but where farming could continue in the same way as before the scheme. In such a case, the farm business could largely continue in its present form, albeit the effects of the proposed scheme are likely to reduce net farm income and day-to-day management is likely to change from the present, e.g. where farmers have to drive longer distances to out-lying holdings due to closure of certain local roads.</td>
</tr>
</tbody>
</table>
9.3 Planning Policy and Relevant Guidance

National Policy - PPS7

9.3.1 Planning Policy Statement (PPS) 7 ‘Sustainable Development in Rural Areas’ came into effect in August 2004. The PPS summarises the role of the planning system in the maintenance of the countryside resource as follows (Para 14):

“Whilst much of the land use activity in the countryside is outside the scope of the planning system, planning has an important role in supporting and facilitating development and land uses which enable those who earn a living from and help to maintain and manage the countryside, or continue to do so.”

9.3.2 The policy with regards to the “best and most versatile” land is stated as follows (Para 28)

“The presence of the best and most versatile agricultural land (defined as grades 1, 2 and 3a of the Agricultural Land Classification), should be taken into account alongside other sustainability considerations (eg. Biodiversity; the quality and character of the landscape; its amenity value or heritage interest; accessibility to infrastructure; workforce and markets; maintaining viable communities; and the protection of natural resources, including soil quality) when determining applications.”

9.3.3 The assessment of the quality of the land therefore forms only one element to be considered together with a wide range of other features in the overall management of the countryside. This policy reflects the continuing shift in government policy since the mid-80s towards the incorporation of farming into the broader stewardship of the countryside and the integration of environmental schemes into a whole farm based approach.

Regional Planning Policy

9.3.4 The Regional Spatial Strategy for Yorkshire and Humber (May 2008) includes the following policy in regard to Agricultural Land.

“POLICY ENV 7

A. If development of agricultural land is required it should take place on poorer quality land wherever possible and appropriate.”

Relevant National Guidance


The vision of the Strategy is

“By 2030, all England’s soils will be managed sustainably and degradation threats tackled successfully. This will improve the quality of England’s soils and safeguard their ability to provide essential services for future generations.”

DEFRA – Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (September 2009)
9.3.5 This code of practice is developed to assist anyone involved in the construction sector to better protect the soil resources with which they may work. In particular, the guide is aimed at assisting in pre-construction planning for soil resources, soil management during construction and landscape and habitat creation with soil resources.

9.4 Existing (Baseline) Conditions

Agricultural Land Classification and Soils – Desk Top Information

Published Geological Information

9.4.1 The published British Geological Survey Sheet (1:50,000) shows the site to be underlain by Devensian till material, which overlies Sherwood Sandstone.

Published Soils Information

9.4.2 The Soil Survey of England and Wales map of Soils of Northern England (1:250,000) shows the site to comprise soils from the Escrick Soil Association or grouping of soils. The bulletin that accompanies the map (Soils and their Use in Northern England Bulletin 10) describes these soils as coarse and fine loam brown soils developed in glaciofluvial drift. The main soils are coarse loamy typical argillic brown earths of the Escrick or Wick Series. However, the bulletin identifies that Wighill and Arrow soils occur around Thirsk where coarser material overlies the till to more than 40cm depth.

9.4.3 Typical descriptions of the Escrick, Wick and Arrow series soils taken from the Soil Survey Bulletin are given below:

**Escrick Soil Series**

- 0 – 20cm dark brown, slightly stony sandy loam or sandy silt loam
- 20 – 40cm brown, slightly stony sandy loam or sandy silt loam
- 40 – 60cm reddish brown, slightly stony sandy loam or clay loam;
- 60 – 100cm reddish brown, slightly stony or moderately stony sandy loam or clay loam

**Wick Series**

- 0 – 30cm dark brown slightly stony sandy loam
- 30 – 60cm brown, slightly stony sandy loam
- 60 – 80cm yellowish brown, slightly or moderately stony loamy sand or sandy loam;
- 80 – 100cm brownish yellow, slightly or moderately stony sandy or loamy sand

**Arrow Soil Series**

- 0 – 25 dark brown, stoneless or slightly stony sandy loam
- 25 – 50 dark yellowish brown, slightly stony sandy loam
- 50 – 100 brown, mottled, slightly stony sandy loam or loamy sand

Published Agricultural Land Classification Information

9.4.4 The published 1 inch to 1 mile (1:63,360) MAFF Agricultural Land Classification map for this area shows the site to comprise grade 2 land. Although these maps provide a guide to the relative quality of different types of land in an area, they were produced in the 1960’s and 1970’s using reconnaissance fieldwork and a system of classification of that has been comprehensively revised. They cannot, therefore be relied on for an accurate classification of land on individual sites.

Published Climatic Information

9.4.5 The following site specific climatic data has been obtained from the Agroclimatic Datasets produced by the Meteorological Office for the MAFF ALC Guidelines (October 1988).
Table 9.3 – Site Specific Climatic Data

<table>
<thead>
<tr>
<th>Grid Reference</th>
<th>SE 350 760</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>45m</td>
</tr>
<tr>
<td>Average Annual Rainfall (mm)</td>
<td>643mm</td>
</tr>
<tr>
<td>Accumulated Temperature (day degrees)</td>
<td>1347</td>
</tr>
<tr>
<td>Field Capacity Duration (days)</td>
<td>150</td>
</tr>
<tr>
<td>Moisture Deficit Wheat (mm)</td>
<td>106</td>
</tr>
<tr>
<td>Moisture Deficit Potatoes (mm)</td>
<td>96</td>
</tr>
</tbody>
</table>

Survey Results – Agricultural Land Classification and Soils

Site Description, Topography and Land Use

9.4.6 The site lies to the west of the Junction of the A61 with the A1(M) approximately 2 km to the southeast of Melmerby and 2km southwest of Baldersby St James. The site lies at a height of approximately 45m AOD and is gently sloping from the western and northeastern parts of the site down towards the central lower lying part of the site.

9.4.7 The site is being used for intensive arable cultivation, with the majority of the site planted for winter barley with the southern fringe having recently been cropped for carrots.

Agricultural Land Classification

9.4.8 The site is graded a mixture of grades 2 and 3a quality land. There is a central area of grade 2 land running northwest to southeast through the central lower lying part of the site with areas of grade 3a on the west and north eastern areas.

9.4.9 The grade 2 land is characterised by medium sandy loam topsoils overlying similar subsoils to depths of 45 - 60cm overlying sandier loamy medium sand lower subsoils to depth. The profiles contain limited amounts of total stone (<5%). These profiles are limited to grade 2 by a slight susceptibility to droughtiness.

9.4.10 The grade 3a land comprises three different soil profile types:

1. Medium sandy loam topsoils with 2-5% total stone, overlying yellowish or reddish brown loamy medium sand upper subsoils, and medium sand lower subsoils at depths of 70-80cm depth. These sandier profiles are located on the higher parts of the site particularly to the north east. The main limitation on these soils is their susceptibility to droughtiness.

2. Similar sandy profiles to type 1 soils, but with notably higher percentages of stone, including large stones (>6cm diameter) present within the profiles. These profiles were identified on the western part of the site. Stone picking had been carried out on the western fringe of the site where the carrots had recently been grown and there was a notable proportion of large stones within the heaps of stones lying alongside the cultivated area. The main limitation on these soils is their susceptibility to drought and a similar stoniness limitation.

3. Medium sandy clay loam soils overlying heavy clay loam upper subsoil and mottled and slowly permeable clay lower subsoil. Profile 18 was recorded in a lower lying area of the carrot cultivated area. There was notable compaction here where harvesting would seem to have taken place in less than ideal conditions. This profile is limited by a susceptibility to wetness to grade 3a. In addition, it was notable that adjacent profiles at 17 and 19 also comprised clayey lower subsoil horizons. However, the clayey textural horizons in these profiles were mixed within a matrix of sandier and stonier material and therefore no wetness limitation caused by a presence of a slowly permeable layer within 80cm was recorded.

9.4.11 The areas and percentages of grades of land on the site are therefore as follows:
Table 9.4 – Agricultural Land Classification – Grades and Percentages

<table>
<thead>
<tr>
<th>Grade</th>
<th>Area (ha)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>6.3</td>
<td>47</td>
</tr>
<tr>
<td>3a</td>
<td>7.0</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>13.3</td>
<td>100</td>
</tr>
</tbody>
</table>

Farm Holdings

9.4.12 The site forms part of a family owned farming enterprise that comprises approximately 255ha (630 acres) of land. The farm buildings are based at The Brooms in Baldersby St James. The holding is arable based, with a rotated area let out annually, by agreement, for the production of carrots. The areas which are let out for carrot growing are only where the lightest land on the holding is found, although stone picking is commonly required on these soils. The crop rotation on the arable areas is commonly wheat, followed by oilseed rape, wheat and then spring beans.

9.4.13 The holding is operated by two full time employees with part time input from one of the family members. All operations are carried out by these staff, apart from spraying operations which are contracted out. All machinery required for operations, with the exception of spraying, is owned within the holding.

9.4.14 The land is all able to be irrigated, but this facility is only used on the area where carrots are being grown.

9.4.15 There are no shooting/fishing or other diversification enterprises operated by the holding. The farm is entered in the Entry Level Stewardship scheme.

9.5 Assessment of Effects

Construction Impacts

Agricultural Land Quality

9.5.1 The potential significant adverse effects on soil resources and agricultural land quality are most likely to occur during the construction phase. This will include the permanent loss of the agricultural land within the site. The detailed ALC survey has confirmed that the proposal would lead to the loss of 6.3 ha of grade 2 land and 7ha of grade 3a land. A total of 13.3 ha of the “best and most versatile” grades 1, 2 and 3a land, with approximately 53% of this land being in the lowest grade of land within this category.

9.5.2 The loss of this area of the “best and most” versatile land is assessed, in accordance with the criteria laid out in Table 9.1 to be of Moderate Adverse Significance.

Farm Holdings

9.5.3 The permanent loss of land from the overall farming enterprise would occur during the construction phase. The loss of approximately 13.3 ha of land from a holding comprising 255ha of land represents approximately 5% of the total arable enterprise. Such a loss would have little effect on the day-to-day management of the land by the appointed farm manager, or the operations carried out by local contractors.

9.5.4 The loss of the site would not have an effect on the cultivation of the surrounding land and there would be no severance effects arising from the loss of this land. No farm access routes or farm buildings would be affected.

9.5.5 In addition to the permanent loss of land during the construction phase there can also be temporary effects on farm holdings arising from temporary site activities. This can include:

- Temporary loss of land to be restored following construction;
- Crop losses during construction on areas beyond the permanent land take area;
- Construction severance including short term disruption to field access and farm access routes;
- Disruption to services and drainage;
- Potential risk to bio-security; and
- Generation of dust and noise which can affect arable cropping and livestock enterprises

9.5.6 The site includes a well defined area of arable land all farmed as part of the same single farm holding. There are no proposals to use temporary land areas beyond the site boundary and therefore no temporary loss of land would be expected to occur. The containment of the construction and the implementation of appropriate construction management techniques would ensure that any risks to nearby land in terms of the generation of dust and noise, and risks to bio-security are reduced as far as possible. Access routes for the construction phase would also be developed to ensure that the risk of disruption to farming access routes in the vicinity is reduced as far as possible.

9.5.7 The main effects on farming therefore arise from the limited loss of arable land from a large arable farming enterprise. This loss would have a very limited effect on the day-to-day operation of the farming enterprise and its effect is therefore assessed within the framework of Table 9.2 to be of Minor Adverse Significance.

9.6 Mitigation Proposals – Soil Resources

9.6.1 It is not possible to reduce the amount of agricultural land permanently affected within the proposal. However, the agricultural soils within the site, which comprise an important physical resource, could be sustainably reused within the proposal.

9.6.2 It is proposed that within the proposed development opportunities for the re-use of the topsoil and subsoil resources to fulfil vital soil functions would be identified wherever possible. This is in accordance with the framework of DEFRA guidance and emerging policy contained in the publication Safeguarding our Soils – A Strategy for England.

9.6.3 In addition, principles of best practice with regard to the handling storage and re-use of soils within the proposal would also be applied in accordance with the most recent DEFRA Code of Practice for the Sustainable Use of Soils on Construction Sites (2009) and the appropriate sheets from the MAFF Soil Handling Guide (2000).

9.7 Residual Effects

Agricultural Land Quality

9.7.1 The development of the site would lead to the permanent loss of approximately ha of the “best and most versatile” agricultural land, comprising 7 of grade 3a land and 6.3 of grade 2 land. The loss of this area of such land is assessed to be of Moderate Adverse Significance

Farm Holdings

9.7.2 The development of the site would lead to the limited loss of land from a large family owned 255 ha arable holding. There would be no loss of farm buildings or farming employment as a result of the loss of this land and no surrounding farmland would be adversely affected. The loss of this area of land from the farming enterprise is therefore assessed to be of Minor Adverse Significance.