HINCKLEY NATIONAL
RAIL FREIGHT INTERCHANGE

Soils and agricultural land quality

One of a series of background topic papers prepared by db symmetry in support of a public consultation on proposals for a strategic rail freight interchange in Blaby district, to the north-east of Hinckley in Leicestershire.

INTRODUCTION

1. In 2019 db symmetry will apply to the government for a Development Consent Order (DCO) for a proposed strategic rail freight interchange (SRFI) on a site in Blaby District, to the east of Hinckley in Leicestershire. The project is known as the Hinckley National Rail Freight Interchange (HNRFI).

2. A DCO is a special form of planning permission for large infrastructure projects. It can include a range of additional powers required to implement the proposals, such as powers to acquire land, undertake works to streets, trees and hedgerows and divert utility services.

3. This topic paper has been produced by the Environmental Dimension Partnership Ltd (EDP) in consultation with Land Research Associates Ltd (LRA). It reports the effects of the proposed development in terms of soils and agriculture.

4. In particular it considers the likely significant effects of the proposed development on soil resources and functions, and Best and Most Versatile (BMV) agricultural land. Agricultural land within Grades 1, 2 and Subgrade 3a of the Agricultural Land Classification (ALC) is considered the *'best and most versatile agricultural land'* (BMV), which is therefore the most flexible, productive and efficient. Further details of the ALC system and policy implications are set out by Natural England[1].

LAW, POLICY AND GUIDANCE

Legislative framework

5. The Town and Country Planning (Development Management Procedure) (England) Order 2015 (HMSO, 2015) sets out the requirement for consultation with Natural

[1] http://publications.naturalengland.org.uk/publication/35012

England where development of agricultural land is proposed. Natural England should be consulted where *'development which is not for agricultural purposes and is not in accordance with the provisions of a development plan involves the loss of not less than 20 hectares of grades 1, 2 or 3a agricultural land which is for the time being used (or was last used) for agricultural purposes'* or where the loss of less than 20 hectares of BMV agricultural land *'is likely to lead to a further loss of agricultural land amounting cumulatively to 20 hectares or more'*.

Planning policy

National Policy Statement for National Networks (2014)

6. The National Policy Statement for National Networks, hereafter referred to as 'NPS', sets out the need for, and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England. It is the primary statement of policy for promoters of NSIPs on the road and rail networks and forms the basis for the examination by the Examining Authority and decisions by the Secretary of State.

7. Pages 79 to 83 of the NPS deals with Land use including open space, green infrastructure and Green Belt. At paragraph 5.168 it states:

'Applicants should take into account the economic and other benefits of the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification). Where significant development of agricultural land is demonstrated to be necessary, applicants should seek to use areas of poorer quality land in preference to that of a higher quality. Applicants should also identify any effects, and seek to minimise impacts, on soil quality, taking into account any mitigation measures proposed. Where possible, developments should be on previously developed (brownfield) sites provided that it is not of high environmental value. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination and how it is proposed to address this.'

National planning policy

8. The applicable legislative framework is summarised as follows from the National Planning Policy Framework (NPPF, 2018):

- Paragraph 170 includes references to agricultural land and soils. It states that *'Planning policies and decisions should contribute to and enhance the natural and local environment by:*
  - *a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*

- *b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*

- *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.'*

- In addition, Paragraph 171 states that *'Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework.'* This is supported by Footnote 53 which states *"Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality."*

Local planning policy

9. There is no policy regarding the protection of best and most versatile land or soil resources in either the Blaby District Local Plan 1999 (saved policies 2007) or the Blaby District Core Strategy (adopted February 2013).

Guidance

10. The National Planning Practice Guidance states that the planning system should protect and enhance valued soils and prevent the adverse effects of unacceptable levels of pollution. This is because soil is an essential finite resource that provides important ecosystem services, for example as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution.

11. The applicable guidance is summarised as follows:

- The government's Planning Practice Guidance advises that soil is an essential finite resource that provides important *ecosystem services*;

- As such the government produced *'Safeguarding our Soils: A strategy for England'* (2011) through which Defra has published a code of practice on the sustainable use of soils on construction sites; and

- A 2007 Environment Agency document *'Soil a Precious Resource: Our Strategy for Protecting, Managing and Restoring Soil'* aims to encourage the construction industry to: reuse soils; reduce the amount of soil disposed as waste; and reduce flood risk and pressures on urban drainage.

THE SITE

12. The survey area covered the land within the Draft DCO Boundary and comprises a mixture of arable farmland and grassland. The site is bordered to the north by the B581, to the east by the M69, to the south by Sapcote Road (B4669) and to the west by a railway line. Burbage Common Road runs through the centre of the site.

13. The land is mainly level, with an area of sloping land in the south-west. The average elevation of the site is approximately 100 m AOD.

14. At the time of survey, the majority of the site was in autumn-sown cereals, with land in the south under grassland used to graze sheep and cattle. Approximately half of the site is registered to an Entry Level Stewardship scheme, which is an agri-environment scheme that provides funding to farmers and other land managers in England in return for delivering environmental management on their land.

OUR APPROACH TO ASSESSMENT

15. The assessment of the effects on agricultural land is being carried out in three stages, as follows.

- *stage 1* - the magnitude of potential changes arising from the proposed development is being considered;
- *stage 2* - the importance and sensitivity of receptors (people) likely to experience a change is being considered;
- *stage 3* - the significance of these effects will be defined by the interaction of magnitude and sensitivity (by combining stage 1 and stage 2).

16. To assist in assessing land quality, the former Ministry of Agriculture, Fisheries and Food (MAFF) developed a method for classifying agricultural land by grade according to the extent to which physical or chemical characteristics impose long-term limitations on agricultural use for food production. The MAFF Agricultural Land Classification (ALC)[2] system classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The system was devised and introduced in the 1960s and revised in 1988.

17. The MAFF ALC system describes that *'The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which*

[2] 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'*

mostly occurs in the uplands.'

18. The land for the proposed development is predominantly agricultural. The only available agricultural land quality information is freely available online mapping (MAFF/DEFRA), which shows the land as grade 3. These maps have a low degree of accuracy and do not differentiate between subgrade 3a (BMV) and subgrade 3b (non-BMV). Detailed survey work is required to accurately determine the quality of the agricultural land resource.

19. A number of farm businesses have been identified as having land within the site and, as such, are accordingly affected by the proposed development. Consideration of these agricultural businesses are provided within the *'Land use and socio-economic effects'* Topic Paper.

20. A detailed soil resource and agricultural quality survey of the site was carried out in February 2018. In summary, it found that the agricultural quality of the land is determined by wetness. Land of grade 3 has been identified, as follows:

- Subgrade 3a (considered to be BMV) covers 2.9ha of the site. This land covers a small area in the north-east of the site, being made up of land with a permeable upper sub-soil and sandy clay loam topsoil.

- Subgrade 3b (not considered to be BMV) covers 186ha of the site. This land makes up the majority of the site, being land with a shallow slowly permeable subsoil or more heavy topsoil.

Scope of the assessment

21. The assessment considers the whole of the proposed site within the Draft DCO Boundary, being 225.6 hectares.

Methodology

22. The method of baseline data collection and assessment is in accordance with current guidance and industry best practice.

23. 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. The NPS states that '*Applicants should take into account the economic and other benefits of the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification).* Identification and consideration of BMV agricultural land is therefore necessary and the loss of BMV is a measure of the effect of proposed development. The thresholds set out in the following tables have been developed over time and are based on professional judgement and best practice.

Stage 1 - Magnitude of Change

Agricultural Land

24. The magnitude of the effect on agricultural land will depend on the amount of BMV land to be taken by the development. The judgment-based classification is given in Table 1.1.

Table 1:1 Methodology for determining magnitude of change on agricultural land

Magnitude of Change	Definition of effects of Agricultural Land
Large	The proposed development would directly lead to the loss of over 50 ha of BMV agricultural land.
Medium	The proposed development would directly lead to the loss of between 20 ha and 50 ha of BMV agricultural land.
Slight	The proposed development would directly lead to the loss of less than 20 of BMV agricultural land or the loss of any quantity of non-BMV land (Grades 3b, 4 and 5).
Negligible	No permanent adverse effect on agricultural land.

Topsoil Resources

25. The magnitude of the change upon topsoil resources makes the assumption that, as a valuable finite resource, the requirement should be to protect topsoils from damage. However, since built developments often generate large surpluses of topsoil, the primary requirement is considered to be that sufficient topsoil should be protected to complete all on-site landscaping/greenspace requirements (provided the baseline resource is suitable for the proposed uses). Failure to do so is regarded as a large magnitude of change. If all topsoil is protected from damage, the effect is regarded as negligible. As few built developments are likely to require more than 50% of topsoil for reuse, losses below this figure are regarded as a minor effect.

26. Subsoil compaction under greenspace areas increases flood risk. Severe compaction is also likely to adversely affect the success of any proposed landscaping or ecological planting schemes. Magnitude is considered as a percentage of the development scheme. Compaction of greater than 10% of the Site is considered as high magnitude as it is likely to result in tangible increases in runoff volumes, of a magnitude which could affect the efficacy of future sustainable drainage measures.

Stage 2 – Sensitivity of Receptors

27. The methodology for determining the sensitivity of receptors is set out in Table 1.2, defined by the quality of the agricultural land. BMV agricultural land is of national importance whilst poorer quality agricultural land (non-BMV) are of local importance.

Table 1.2: Methodology for Determining Sensitivity

Sensitivity	Receptor
High	Land resources are matters of potentially national importance, as identified in the NPS. The BMV agricultural land (Grades 1, 2 and 3a) is of national importance. The effect on land resources is a combination of the quantum and quality of agricultural land affected, relative to both the national resource and the relative availability of land of that quality locally. Land resources of BMV quality should therefore be classified as being of high environmental value (sensitivity).
Medium	Land that is of poorer quality, Grades 3b, 4 and 5, is of lower sensitivity. It is nevertheless a finite resource of local importance and so is regarded as of moderate sensitivity.
Low	None

Stage 3 – Significance of Effects

28. The significance of the effects of the proposed development have then been determined by the interaction of the magnitude of change and the sensitivity of the receptor (by combining stage 1 and stage 2), as set out in the matrix in Table 1.3. This is followed by the assessment of significance as set out below.

Table 1.3: Significance of effects

Magnitude	**Sensitivity**		
	High	Medium	Low
Large	Major	Major	Moderate
Moderate	Major	Moderate	Minor
Small	Moderate	Minor	Minor
Negligible	Minor	Negligible	Negligible

Assessment of significance

29. There is no definition of 'significance' in the NPS regarding the loss of agricultural land. As set out at paragraph 5.176 of the NPS, *'The decision-maker should take into account the economic and other benefits of the best and most versatile agricultural land. The decision-maker should give little weight to the loss of agricultural land in grades 3b, 4 and 5, except in areas (such as uplands) where particular agricultural practices may themselves contribute to the quality and character of the environment or the local economy.'*

30. As set out above, the loss of 20 ha or more of BMV agricultural land for non-agricultural purposes, requires consultation with Natural England. Based on this

threshold and on professional experience, the loss of 20 ha or more of BMV agricultural land would be identified as a permanent significant adverse effect, i.e. an effect of moderate significance and above.

THE LIKELY MAIN EFFECTS OF THE PROPOSALS

31. The potential effects of the proposed development include the loss of agricultural land as a national and local resource. These effects on agricultural land can be split into construction phase and operational phase effects.

32. Construction phase effects have been identified as effects on the national resource of agricultural land. However, this effect would most likely be permanent and would continue throughout the operation of the proposed development once completed.

Agricultural land (during construction)

33. Mitigating the loss of agricultural land would be best achieved by limiting the extent of development to the smallest size possible, consistent with operational requirements. There are no measures that can be put in place to mitigate the effects of the proposed development on agricultural land.

34. The loss of the agricultural land resource would be progressive through phased construction. As such the impact of the development would increase in magnitude as the project progresses.

35. The proposed development could directly result in the permanent loss of all topsoils during stripping and stockpiling if not carefully managed, meaning insufficient resources will be available to complete landscape works in the proposed development.

36. The proportion of proposed built development within the site comprising land within the Draft DCO Boundary is approximately 63%. The remaining 37% of the proposed development comprises greenspace (green infrastructure, SUDS attenuation basins, etc.) on land risk of compaction during the construction phase. In the absence of protective measures such compaction would adversely affect drainage, and would lead to increased surface water flood risk (beyond that mitigated by proposed SUDS schemes). It would also restrict rooting depth and affect the success of proposed planting schemes.

37. This is a large loss of a predominantly medium sensitivity resource and represents a potential major adverse impact of the proposed development.

Agricultural land (after completion)

38. Following completion, the proposed development could result in the loss of 188.5 ha of agricultural land, of which 2.9 ha is within the BMV category (subgrade 3a). This

loss of a medium sensitivity resource (subgrade 3a land) would represent a negligible impact of the proposed development on the agricultural land resource.

39. Any adverse impacts caused during construction would be likely to persist where compaction is severe, although over time some recovery of soil function will occur under re-established vegetation in landscaped parts. Damage or loss of the high and medium sensitivity topsoil resources and compaction of the permeable subsoils caused during construction are permanent major potential adverse impacts which will persist post completion, including all impacts in developed areas of the site.

PROPOSED APPROACH TO MITIGATION

Agricultural land (during construction)

40. Mitigation for the effect of the loss of agricultural land to built development is not possible.

41. Mitigation for loss or damage of soil resources requires the adoption of a Soil Management Plan, undertaken by a suitably qualified practitioner in accordance with the principles outlined in the *Construction Code of Practice for Sustainable Use of Soils on Construction Sites* (DEFRA, 2009), which will detail:

- depth and method of topsoil stripping and stockpiling;
- identification of landscaping topsoil requirements and assessment of suitability and availability of on-site resources;
- means of subsoil protection from compaction damage and remedial measures (such as ripping/subsoiling) to remove damage.

Agricultural land (post-completion)

42. Once the development is complete, land use of the site will permanently change from agricultural to urban. As such, no mitigation is possible.

43. The loss of soil functions (ability to support plant life, to absorb excess rainfall etc.) under sealed surfaces (new hard standing) cannot be mitigated. However, adherence to a Soil Management Plan would mitigate construction damage such as compaction to landscaped areas, protecting the entire topsoil resource and preventing significant damage to the subsoil resource.

NEXT STEPS

In order to progress the ongoing assessment of the proposed Hinckley National Rail Freight Interchange on soils and agricultural land quality, the following future work is proposed:

- Continue to undertake EIA assessment, with ongoing consultation, discussions and agreements being sought with relevant consultees; and

- a site-specific Soil Management Plan should be written up and adhered to. This will protect the entire topsoil resource and prevent significant subsoil compaction.

Statement of competency

This Topic Paper has been produced by the Environmental Dimension Partnership Ltd and Land Research Associates Ltd. Laura Thomas is responsible for the production of the Agricultural Land Chapter. She holds a Masters degree in Soils and Sustainability and has been working for Land Research Associates Ltd (LRA) for two and a half years. During this time she has gained extensive experience in assessing the environmental impact of development and infrastructure projects on soil functions and best and most versatile agricultural land. All work produced is cross-checked before submission to clients by either Malcolm Reeve (chartered soil scientist, over 40 years consultancy experience) or Dr Michael Palmer (Professional Member of the British Society of Soil Scientists, over 15 years consultancy experience).

EDP ◆ October 2018