



Preliminary Environmental Information
(Work in Progress) Report (PEIR)

Draft Environmental Statement

Chapter 14: Soil Resources and Agricultural Land

On behalf of
Oxfordshire Railfreight Limited

Prepared by Land Research Associates Limited
Revision B
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14.1 INTRODUCTION

14.1.1 This draft Chapter addresses the impacts of the Proposed Development to soil resources and agricultural land quality. It has been prepared for the purposes of consultation to explain the assessment work carried out to date which covers a soils and agricultural land quality survey of the Main Site. The remaining work to be done includes survey of the agricultural land affected by the proposed Highway Works within the Application Site

Competency

14.1.2 The Chapter has been prepared by Laura Thomas, MSc, MISoilSci, of Land Research Associates Limited. Laura has a Masters in Soils and Sustainability, is a full member of the British Society of Soil Science and has over six years experience in the sector. All outputs are cross checked by Dr Mike Palmer, Director of Land Research Associates, with over fifteen years experience in the sector and a professional member (CSci) of the British Society of Soil Science

14.2 ASSESSMENT SCOPE AND METHODOLOGY

Methodology

14.2.1 The collection of soil resources and agricultural land quality information for the Main Site involved a desk study and field survey.

- Data sources used in the desk study include the following:
- British Geological Survey (BGS) mapping (at 1:50,000 scale)
- National Soil Mapping (at 1:250,000 scale)
- Natural England available Agricultural Land Quality mapping
- Meteorological Office climatological data

14.2.2 This information was then used to inform a soils and Agricultural Land Classification (ALC) survey, carried out to Natural England TIN049 and MAFF post 1988 guidelines. The detailed survey of the Main Site was undertaken in October 2021 and carried out at a density of one auger observation every hectare. Soil resources within the Main Site were identified. The soil data was then used to draw maps showing land quality, identifying any areas of best and most versatile (BMV) land. Agricultural land within the Highway Works area of the Application Site has not been surveyed yet. The remaining land will be surveyed using the same methodology as that used in the Main Site. The work will be described fully in the Agricultural Land Quality Report once all land has been surveyed (Appendix 14.1).

Assessment Criteria and Assignment of Significance

14.2.3 There is no nationally agreed scheme for classifying the impacts of development on agriculture or soils and the approach used in this chapter has been developed over a number of years. Impacts of a project can be: adverse, causing significant negative impacts on a receptor; beneficial, resulting in advantageous or positive impacts on a receptor; or negligible.

Receptor Sensitivity/Value

14.2.4 All natural soils are finite resources, but where sites are to be developed, their quality as a resource for reuse varies. Medium and coarse loamy soils are regarded as of higher value for reuse and so of the highest sensitivity, since these soils are most effective at mitigating the effects of flooding and are of highest quality for reuse in gardens and planting schemes (the most likely to meet British Standards criteria for use at other sites). Lower quality soils such as sandy or clayey topsoils are susceptible to damage and less valuable if lost.

14.2.5 Permeable coarse or medium textured subsoils are reusable for planting schemes (e.g. to support tree growth) and have a greater function in mitigating the effects of flooding than heavy and slowly permeable subsoils. In some instances, soils have important properties which make them able to support rare habitats (e.g. species diverse calcareous grassland or lowland heath habitats).

14.2.6 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. In the south-east of the country where best and most versatile land is widespread, the best land (Grades 1 and 2) is considered of higher sensitivity than Subgrade 3a. The loss of lower quality land is considered of lower importance under the planning system of England and Wales.

14.2.7 The sensitivity criteria used in the assessment of effects upon the two receptors are summarised in Table 14.1.

Table 14.1: Sensitivity/Value Criteria

RECEPTOR	HIGH	MEDIUM	LOW
Agricultural land quality	Grades 1 & 2	Subgrade 3a	Subgrade 3b and grades 3 & 4
Soil resource	Permeable coarse loamy and medium loamy soils, or other soils capable of supporting valuable habitats	Fine textured or sandy topsoils not capable of supporting valuable habitats	Damaged or contaminated soils Slowly permeable subsoils

		Mixed permeable and slowly permeable subsoils.	
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Magnitude of Impact

The magnitude of effect on 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 major magnitude effect. 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 minor. The intention at OxSRFI is to re-use top-soil within the site to meet all requirements of the proposed development.

14.2.8 Subsoil compaction under greenspace areas increases flood risk (and is not typically accounted for in sustainable drainage system (SUDS) design). Severe compaction is also likely to adversely affect the success of landscaping/ecological planting schemes. Magnitude is considered as a percentage of the development scheme. Compaction of greater than 10% of the Site is considered as major magnitude as it is likely to result in tangible increases in runoff volumes, of a magnitude which could affect the efficacy of SUDS design capacity.

14.2.9 The magnitude of effect on best and most versatile land will depend on the amount to be taken by the proposed development. Schedule 4, paragraph ‘y’ of the Town and Country Planning (Development Management Procedure) (England) Order 2015 only requires Natural England to be consulted (on behalf of the Secretary of State for the Environment, Food and Rural Affairs) on development that involves the loss of not less than 20 ha of grades 1, 2 or 3a agricultural land. Consequently, the magnitude of losses smaller than this threshold is considered to have a minor 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 consequently the magnitude of effect is considered to be major.

Table 14.2: Impact Magnitude Criteria

	MAJOR	MODERATE	MINOR	NEGLIGIBLE
Agricultural land	Irreversible loss of >80 ha of	Irreversible loss of 20-80 ha of best and	Irreversible loss of 5-20 ha of best and	Irreversible loss of <5 ha of best

	best and most versatile land	most versatile land	most versatile land	and most versatile land
Soil resource	Loss of >80% of topsoil resources and insufficient topsoil protected for on-site uses. Subsoil compaction of >10% of Site	Loss or irreversible damage to 50-80% of topsoil resources. Compaction of 5-10% of subsoils	Loss or irreversible damage to <50% of topsoil resources. Compaction of <5% of subsoils	Only minor disturbance of soils within the Site.

14.2.10 The significance matrix is shown in **Table 14.3**.

Table 14.3: Significance of effects

Magnitude	Sensitivity			
	High	Medium	Low	Negligible
Major	Major	Major	Moderate	Minor
Moderate	Major	Moderate	Minor	Negligible
Minor	Moderate	Minor	Minor	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Limitations and Assumptions

14.2.11 There are no published or widely-accepted assessment criteria for impacts on agricultural land resources (i.e. best and most versatile land) or soil resources. The assessment method used by Land Research Associates has been developed in-house over a number of years and been found to be robust and acceptable on many previous proposals and EIAs. Impact magnitudes for loss of best and most versatile land relates to consultation thresholds in Technical Information Note 049 (TIN049), published by Natural England to provide general guidance. Impact decisions can also be based on the loss of such land in relation to the quantum of best and most versatile land in the local area.

14.3 POLICY CONTEXT

National Planning Policy

14.3.1 The National Policy Statement for National Networks (NPSNN) provides specific policy guidance for Nationally Significant Infrastructure Projects (NSIP), and is intended to guide applicants, and provides a basis for examination of proposals by

the Planning Inspectorate. Section 5 of the NPSNN includes guidance regarding ‘Generic Impacts’ to be considered in assessing proposed NSIP development projects. This includes a section on ‘*Land use including open space, green infrastructure, and Green Belt*’ which contains specific content regarding assessing the impacts on agricultural land by national infrastructure schemes.

14.3.2 With regard to agricultural land the NPSNN guidance focuses on understanding the impacts on land in grades 1, 2 and 3a (sometimes referred to as ‘the best and most versatile’ land), and applicants are required to identify any effects and seek to minimise the impacts. Brownfield land, and development of land in the lowest categories of quality are encouraged over sites in the higher quality categories, with the loss of land in grades 3b, 4 and 5 is to be given “little weight” (NPSNN paragraph 5.176).

14.3.3 The NPSNN is generally consistent with planning policy guidance relating to agriculture and soils in the National Planning Policy Framework (2021) which states in Chapter 15, paragraph 174, that:

“Planning policies and decisions should contribute to and enhance the natural and local environment by:

- a) protecting and enhancing...soils...*
- b) recognising the...economic and other benefits of the best and most versatile land.”*

Relevant Guidance

14.3.4 National Planning Practice Guidance also highlights that the Defra Code of Practice for the Sustainable Use of Soils on Construction Sites: *“may be helpful when setting planning conditions for development sites.”*

Local Planning Policy

14.3.5 Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment of the Cherwell Local Plan 2011 to 2031, states that:

“Protection and enhancement of...the natural environment will be achieved by...the reuse of soils”

14.4 BASELINE CONDITIONS

Soil Resources

14.4.1 The Main Site predominantly comprises agricultural land to the west of the B430 with minor areas of non-agricultural land to the east. The field survey found the Main Site to comprise heavy soils of varying depths over hard limestone. The shallow soils

comprise slightly to moderately stony fine loamy or clayey topsoils that grade to hard limestone at around 30 cm depth. Deeper soils occur within the Main Site comprising fine loamy topsoils over permeable unmottled clay subsoil that is brashy with limestone slabs in places and extends to between 50-90 cm depth.

Agricultural Land Quality

- 14.4.2 The agricultural quality of the land is primarily determined by droughtiness with areas equally limited by stoniness and wetness. The Main Site comprises 30.5 ha of best and most versatile land formed on the deeper soils giving land of subgrade 3a agricultural quality. The shallower soils over limestone give poorer quality land of subgrade 3b agricultural quality (209.6 ha). Land grade areas are provided on Table 14.4 below and a map showing their distribution is provided in Appendix 14.1.

Table 14.4: Areas occupied by the different land grades within the Main Site

<i>Grade/subgrade</i>	<i>Area (ha)</i>	<i>% of the land</i>
Subgrade 3a	30.5	13
Subgrade 3b	209.6	87
Total	240.1	100

Future Baseline

- 14.4.3 Should the Proposed Development not go ahead, the baseline conditions would remain as outlined in this Chapter.

14.5 ASSESSMENT OF LIKELY EFFECTS

Construction Phase

Soil resources

- 14.5.1 The Proposed Development could potentially result in the loss of all topsoils during stripping and stockpiling if not carefully managed and specific mitigation measures not taken, meaning insufficient resources are available to complete landscaping. These would be permanent effects.
- 14.5.2 The proportion of proposed built development currently anticipated within the Main Site is approximately 70%, the remaining 30% of the Proposed Development comprises strategic mounding, green infrastructure and SUDS attenuation basins. Without appropriate management of soil resources there is the potential for 70% of the soils to be damaged through stripping and handling with machinery leading to compaction. 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.

- 14.5.3 The soil resources within the Main Site are a mixture of permeable loamy and fine loamy over slowly permeable, and therefore are considered to be moderate to high sensitivity receptors. The potential damage of up to 70% of the resource is moderate magnitude. This would be a potential major adverse impact of the Proposed Development without mitigation.
- 14.5.4 The loss of the agricultural land resource will be progressive through phased 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).
- 14.5.5 The potential loss of 30.5 ha of subgrade 3a land from development of the Main Site is regarded as a moderate magnitude change to a medium sensitivity resource. Overall the potential loss of agricultural land is regarded as a moderate adverse effect.

Operational Phase

Soil resources

- 14.5.6 Any adverse impacts caused during construction without mitigation are 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 soil resources caused during construction are largely permanent potential adverse impacts which will persist post completion, and represent a potential major adverse effect.

Agricultural land quality

- 14.5.7 There will be a loss of 30.5 ha of best and most versatile land following the development of the Main Site, a moderate adverse effect of the Proposed Development.

14.6 MITIGATION AND RESIDUAL EFFECTS

Soil Resources

- 14.6.1 Mitigation and management to prevent and minimise the potential loss or damage to soil resources is available in the form of a site specific Soil Management Plan (in accordance with the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites). This will include clear criteria and measures relating to:

- 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 (e.g. specific pathways and restricted areas for construction traffic) and remedial measures (such as ripping/subsoiling) to remove damage.

Agricultural Land Quality

14.6.2 There is no mitigation possible for the loss of agricultural land to enable built development.

Residual Effects

14.6.3 Following the adoption of the above mitigation the residual effects are judged to be:

- Moderate adverse effects on agricultural land quality
- Negligible effects on soil resources

Climate Change

14.6.4 There are not considered to be any significant interactions with climate change to the soil resources and agricultural land quality.

Human Health

14.6.5 There are not predicted to be any adverse effects to Human Health.

14.7 CUMULATIVE EFFECTS

14.7.1 Soil and agricultural land loss from an individual site should be considered on a site-by-site basis (against the benefits of the scheme) and therefore it is not considered there are any relevant cumulative effects to the Proposed Development.

14.8 SUMMARY AND CONCLUSIONS

14.8.1 The preliminary conclusions from the assessment undertaken to date are that there would be no significant impacts on soil resources following mitigation (in the form of a detailed Soil Management Plan).

14.8.2 Further land quality surveys are planned within the Highways Works area.

- 14.8.3 Based on the assessment undertaken as described in this draft chapter, the moderate magnitude loss of medium sensitivity subgrade 3a land on the Main Site represents a moderate adverse effect of the Proposed Development which cannot be mitigated against.