The Great Grid Upgrade

North Humber to High Marnham

Preliminary Environmental Information Report

Volume 3: Appendix 19.2 In-Combination Climate Impact Assessment

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nationalgrid

Contents

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1. Introduction

1.1 Overview

1.1.1 This appendix supports **Chapter 19 Climate Change** and presents the results of the In-combination Climate Change Impact (ICCI) Assessment for the construction, operation, maintenance phases of the Proposed Overhead Line.

1.2 In-Combination Climate Change Impact Assessment

1.2.1 The technical disciplines have reviewed the future climate projections as set out in **Chapter 19 Climate Change** and examined the sensitivity of assets before commenting on the combined impact of Climate Change and the Proposed Overhead Line on surrounding sensitive receptors (as identified by the relevant technical disciplines in the Chapters listed below, as well as **Appendix 19.1 CCRA**).

- **Chapter 6 Landscape;**
- **Chapter 7 Visual;**
- **Chapter 8 Ecology;**
- **Chapter 9 Water Environment;**
- **Chapter 10 Cultural Heritage;**
- **Chapter 11 Water Environment;**
- **Chapter 12 Geology and Hydrogeology;**
- **Chapter 13 Agriculture and soils;**
- **Chapter 14 Traffic and Transport;**
- **Chapter 15 Air Quality;**
- **Chapter 16 Noise and Vibration; and**
- **Chapter 18 Health and Wellbeing**

1.2.2 The parameters considered by the technical disciplines in the preparation of the ICCI assessment are:

a. Extreme weather events (heatwaves, storm surges, wildfire and drought);

b. Sea level rise;

c. Temperature changes;

d. Rainfall changes; and

e. Changes in wind patterns.

1.2.3 Table 1.1 and Table 1.2 below shows the results of the ICCI assessment for the construction and operational (and maintenance) phase of the Project, following consultation with key disciplines. Further context regarding mitigation measures should be referred to as in the individual discipline chapters within this PEIR.

Table 1.1 ICCI assessment construction phase

Discipline	Climate hazard	Likelihood of climate hazard occurring	Likely ICCIs identified	Description of ICCI considering environmental measures	Likelihood of ICCI occurring	Level of consequence	Significance of effects
Air Quality	Decrease in annual precipitation rate and increase in risk of drought.	Unlikely	Increase in dust due to lower rainfall	Air Quality is to be monitored during construction. Dust impacts from construction will be mitigated through the appropriate site mitigation level for the identified risk level. This is to be detailed in the Framework Construction Environment Management Plan (CEMP). For example, through increased frequency of damping down using water (reusing water or suppressants where practicable) or using temporary covering, or earlier seeding where this would deliver a benefit. With appropriate mitigation, the effect is negligible (not significant). (Refer to **Chapter 15 Air Quality** for full mitigation measures).	Negligible	Negligible	Not Significant.

Discipline	Climate hazard	Likelihood of climate hazard occurring	Likely ICCIs identified	Description of ICCI considering environmental measures	Likelihood of ICCI occurring	Level of consequence	Significance of effects
	Increase in frequency and intensity of heatwaves	Unlikely	Increase in dust due to faster drying of soil stockpiles	Air Quality is to be monitored during construction. Dust impacts from construction will be mitigated through the appropriate site mitigation level for the identified risk level. This is to be detailed in the Framework Construction Environment Management Plan (CEMP), which will be demonstrated at ES. For example, through increased frequency of damping down using water (reusing water or suppressants where practicable) or using temporary covering, or earlier seeding where this would deliver a benefit. With appropriate mitigation the effect is negligible (not significant). (Refer to **Chapter 15 Air Quality** for full mitigation measures).	Negligible	Negligible	Not Significant.
Ecology	No ICCIs identified						

Discipline	Climate hazard	Likelihood of climate hazard occurring	Likely ICCIs identified	Description of ICCI considering environmental measures	Likelihood of ICCI occurring	Level of consequence	Significance of effects
Cultural Heritage	No ICCIs identified						
Landscape	No ICCIs identified						
Geology and Hydrogeology	No ICCIs identified						
Noise and Vibration	No ICCIs identified						
Health and Wellbeing	Increase in dust and recued air quality due to low rainfall, impacting human health.	Unlikely	Increase in dust and reduced air quality due to low rainfall, impacting health of staff on site for construction and maintenance works.	Low rainfall may lead to increases in dust and worsened air quality. Breathing in this dust can have negative health impacts, especially on construction workers spending lots of time onsite and nearby residents to the Site. (Refer to **Chapter 15 Air Quality and Chapter 18 Health** and **Wellbeing** for full mitigation measures).	Negligible	Negligible	Not significant.
Agriculture and Soils	Decrease in summer precipitation rate	Unlikely	Soils may be at risk of erosion if handled when too dry. This	Decreased precipitation could result in the drying of soils both in situ and in the temporary stockpiles created during the	Negligible	Low	Not significant.

Discipline	Climate hazard	Likelihood of climate hazard occurring	Likely ICCIs identified	Description of ICCI considering environmental measures	Likelihood of ICCI occurring	Level of consequence	Significance of effects
			could also result in drier stockpiles.	construction phase. Dry soil can be more prone to erosion, particularly where there is an absence of vegetation cover. Mitigation measures will be identified in the advanced Soil Management Plan (SMP) during the ES. Details will be provided regarding the requirements for the appropriate management of soil resources during the Project's lifetime, Project including the construction phase.			
Traffic and Transport	No ICCIs identified						
Water environment	Increase in winter precipitation rate	Possible	Increased groundwater level mixed with potential existing contamination if present.	Any areas of contamination encountered during construction would be removed, remediated, or mitigated.	Low	Negligible	Not significant.
	Increase in winter precipitation	Possible	Peak discharge rates	As noted in **Appendix 4.1 Draft Outline Code of Construction Practice**,	Low	Negligible	Not significant.

Discipline	Climate hazard	Likelihood of climate hazard occurring	Likely ICCIs identified	Description of ICCI considering environmental measures	Likelihood of ICCI occurring	Level of consequence	Significance of effects
	rate and associated further flood risk		exceeding capacity of attenuation treatment train.	the contractor(s) will subscribe to the Environment Agency's Floodline service, which provides advance warning of potential local flooding events, and subscribe to the Met Office's Weather Warnings email alerts system and any other relevant flood warning information. The contractor(s) will implement a suitable flood risk action plan, which will include appropriate evacuation procedures should a flood occur or be forecast.			

Table 1.2 ICCI assessment operation (and maintenance) phase

Discipline	Climate hazard	Likelihood of climate hazard occurring	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance of effects
Air Quality	Decrease in annual precipitation rate and increase in risk of drought	Unlikely	Increase in dust due to lower rainfall	Air Quality is to be monitored on-site as part of regular maintenance, and otherwise using temporary covering for assets. (Refer to **Chapter 15 Air Quality** for full mitigation measures).	Negligible	Negligible	Not Significant.
	Increase in frequency and intensity of heatwaves	Unlikely	Increase in dust due to faster drying of soil stockpiles	Air Quality is to be monitored on-site as part of regular maintenance, and otherwise using temporary covering for assets. (Refer to **Chapter 15 Air Quality** for full mitigation measures).	Negligible	Negligible	Not Significant.
Ecology	No ICCIs identified						
Cultural Heritage	No ICCIs identified						
Landscape	No ICCIs identified						
Geology and Hydrogeology	No ICCIs identified						

Discipline	Climate hazard	Likelihood of climate hazard occurring	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance of effects
Noise and Vibration	No ICCIs identified						
Health and Wellbeing	Increase in frequency and intensity of heatwaves in addition to general temperature increases.	Unlikely	Increased pressure on the local healthcare system due to health impacts of higher temperatures on local residents, especially older residents.	Increased temperatures and heatwaves are associated with health risks for older individuals. This may reduce access to the local healthcare system if capacity isn't big enough to deal with increased numbers of patients. (Refer to **Chapter 18 Health** and **Wellbeing** for full mitigation measures).	Negligible	Low	Not significant.
Agriculture and Soils	Decrease in summer precipitation rate	Unlikely	Soils may be at risk of erosion if handled when too dry. This could also result in drier stockpiles.	Decreased precipitation could result in the drying of soils both in situ and in the temporary stockpiles created during the construction phase. Dry soil can be more prone to erosion, particularly where there is an absence of vegetation cover. Mitigation measures will be identified in the advanced Soil Management Plan (SMP) in the following ES	Negligible	Low	Not significant.

Discipline	Climate hazard	Likelihood of climate hazard occurring	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance of effects
				review. A Biodiversity Net Gain (BNG) Assessment is to be produced prior to construction to identify habitat management and maintenance of vegetation cover. (Refer to **Chapter 6Landscape and Chapter 13 Agriculture and Soils** for full mitigation measures).			
Agriculture and Soils	Increase in winter precipitation rate	Possible	Soils may be at risk of structural damage if handled or trafficked when too wet. This could result in increased flood risk and erosion of soils.	The incorrect handling of soils (e.g., stripping, storage or reinstatement) when they are in a wet state can cause structural damage for example through compaction or deformation. Compaction lowers soil permeability increasing the risk of flooding and levels of surface water runoff. Structural damage can also leave the soils more vulnerable to erosion, increasing the risk of silty run off. Structural damage (compaction and smearing) can also occur due to	Negligible	Low	Not significant.

Discipline	Climate hazard	Likelihood of climate hazard occurring	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance of effects
				heavy machinery trafficking (driving over) of wet soils. Increase in winter precipitation will increase the likelihood of soils being in a wet state. Mitigation measures will be identified in the advanced SMP in the following ES review. Details will be provided regarding the requirements for the appropriate management of soil resources during the Project's lifetime, including operation (and maintenance). (Refer to **Chapter 6 Landscape and Chapter 13Agriculture and Soils** for full mitigation measures).			
Traffic and Transport	No ICCIs identified						
Water environment	Increase in winter precipitation rate and	Possible	Peak discharge rates exceeding capacity of attenuation	Attenuation storage will be designed to take account of climate change. Water environment, and associated Drainage	Low	Negligible	Not significant.

Discipline	Climate hazard	Likelihood of climate hazard occurring	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance of effects
	associated flood risk		treatment train.	Strategy to be further developed at ES. Refer to **Chapter 11Water environment** for full mitigation measures).			
	Increase in winter precipitation rate and associated flood risk	Possible	Increase flow leading to change in sediment dynamics within the channel.	Climate change allowances have been included in the drainage design. (Refer to **Chapter 11 Water environment** for full mitigation measures).	Low	Negligible	Not significant.

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