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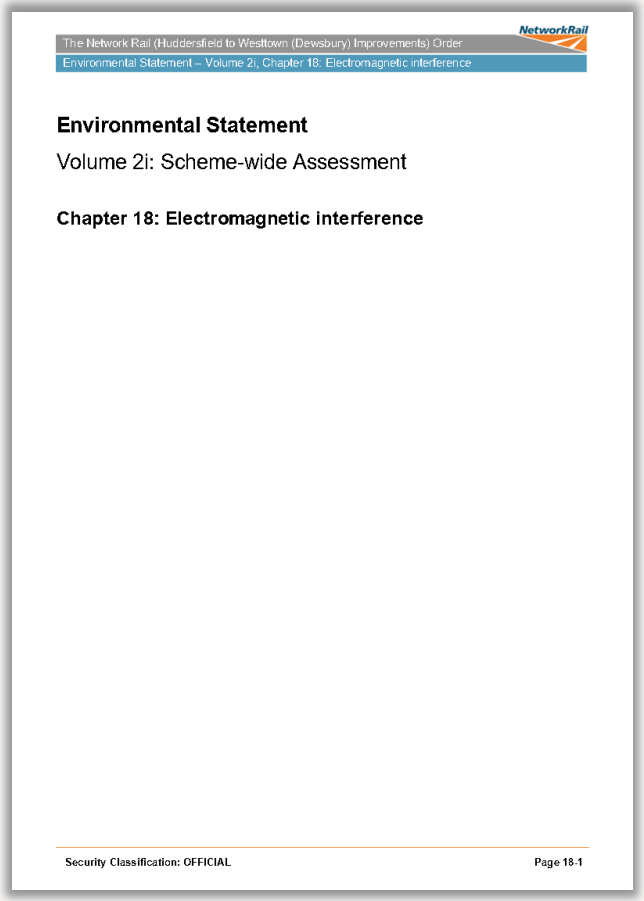
Environmental Impact Assessment of Electromagnetic Fields for Major Rail Schemes

Dr Ian Flintoft, Principal Engineer
Martin Grant CEng, Senior Engineer
Leslie McCormack CEng, FIET, Chief Engineer

Introduction

- Introduction
- Project Overview
- Lifecycle Dependency
- Assessment Process
- Findings
- Close and Q&A



Overview

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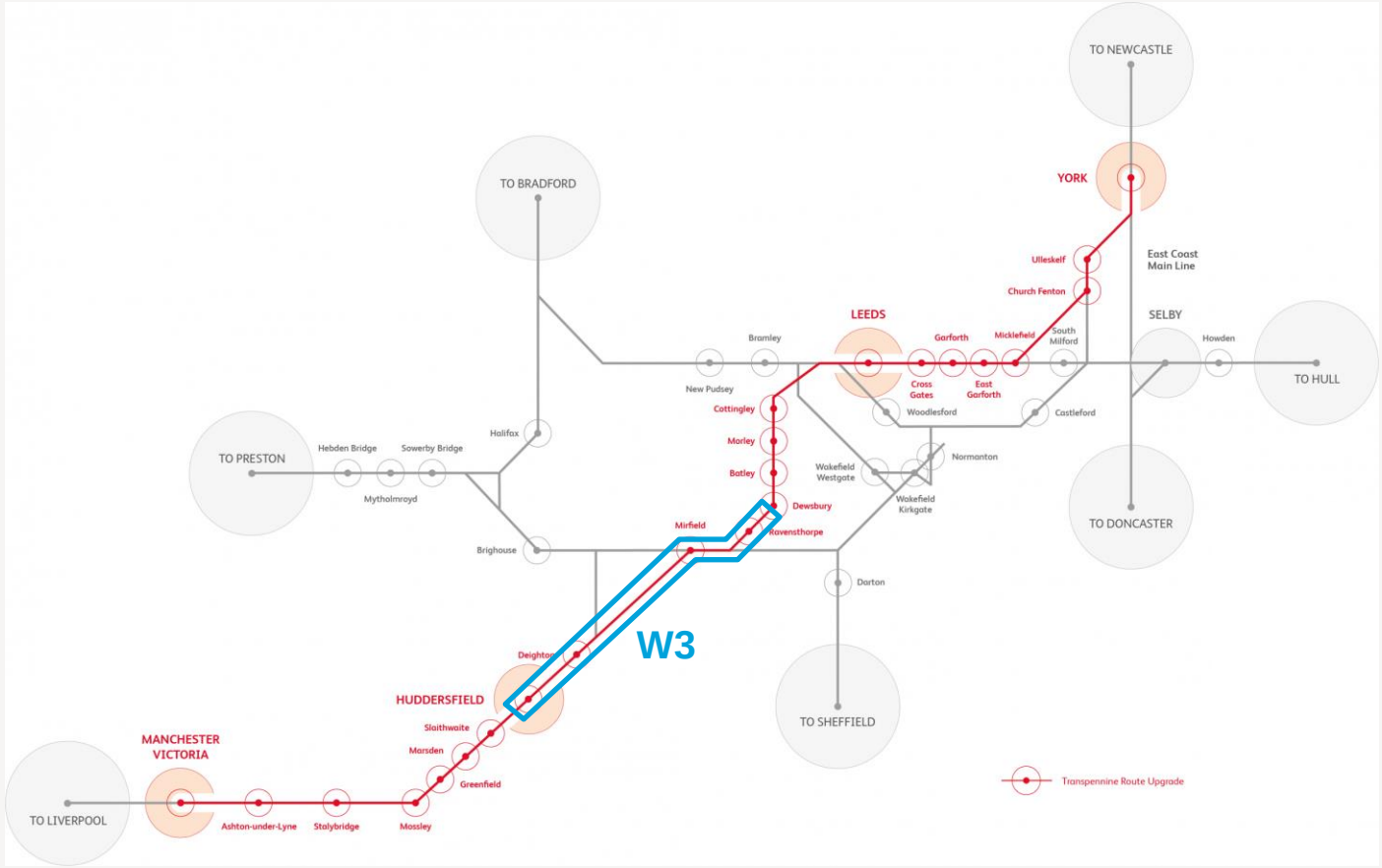
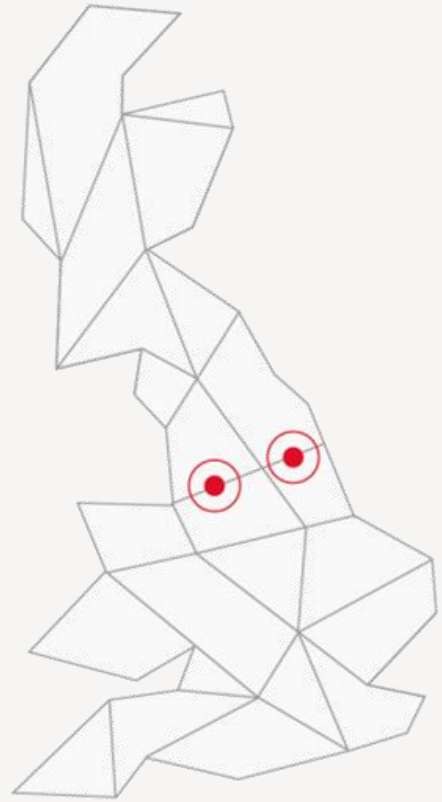
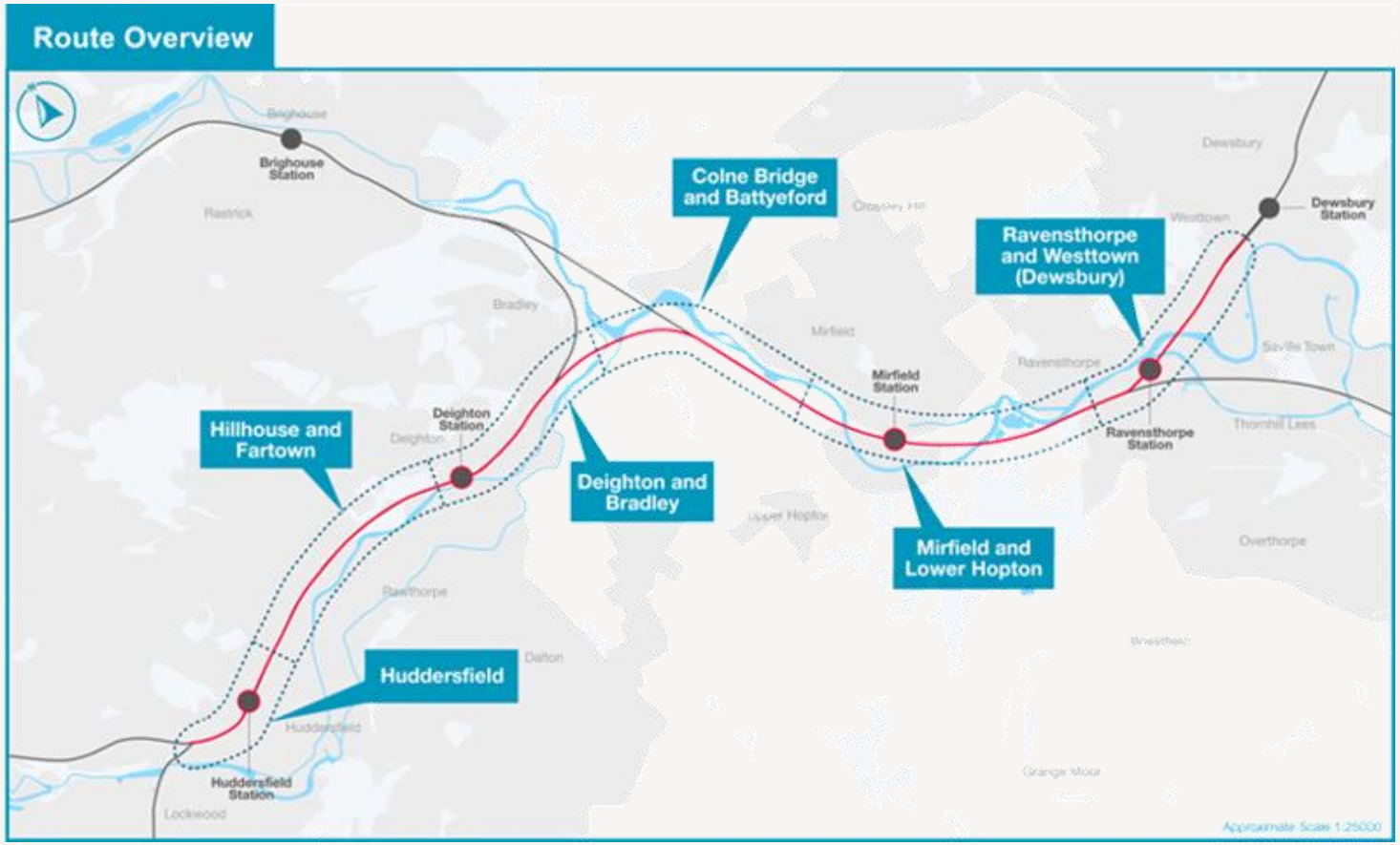
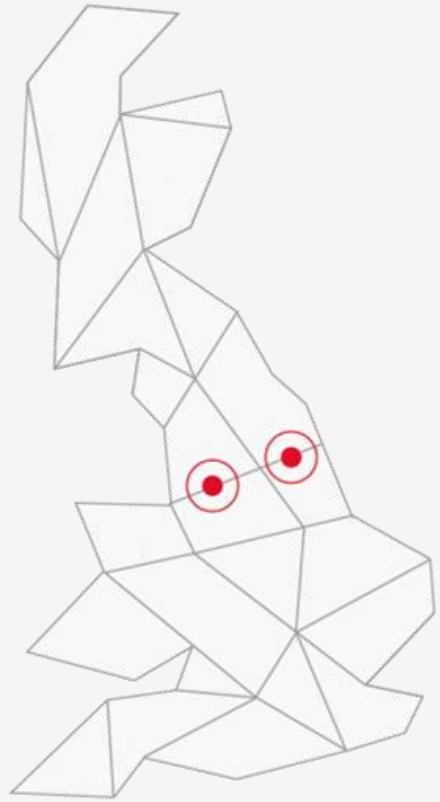
Transpennine Route Upgrade Overview





TRU W3 Route Overview

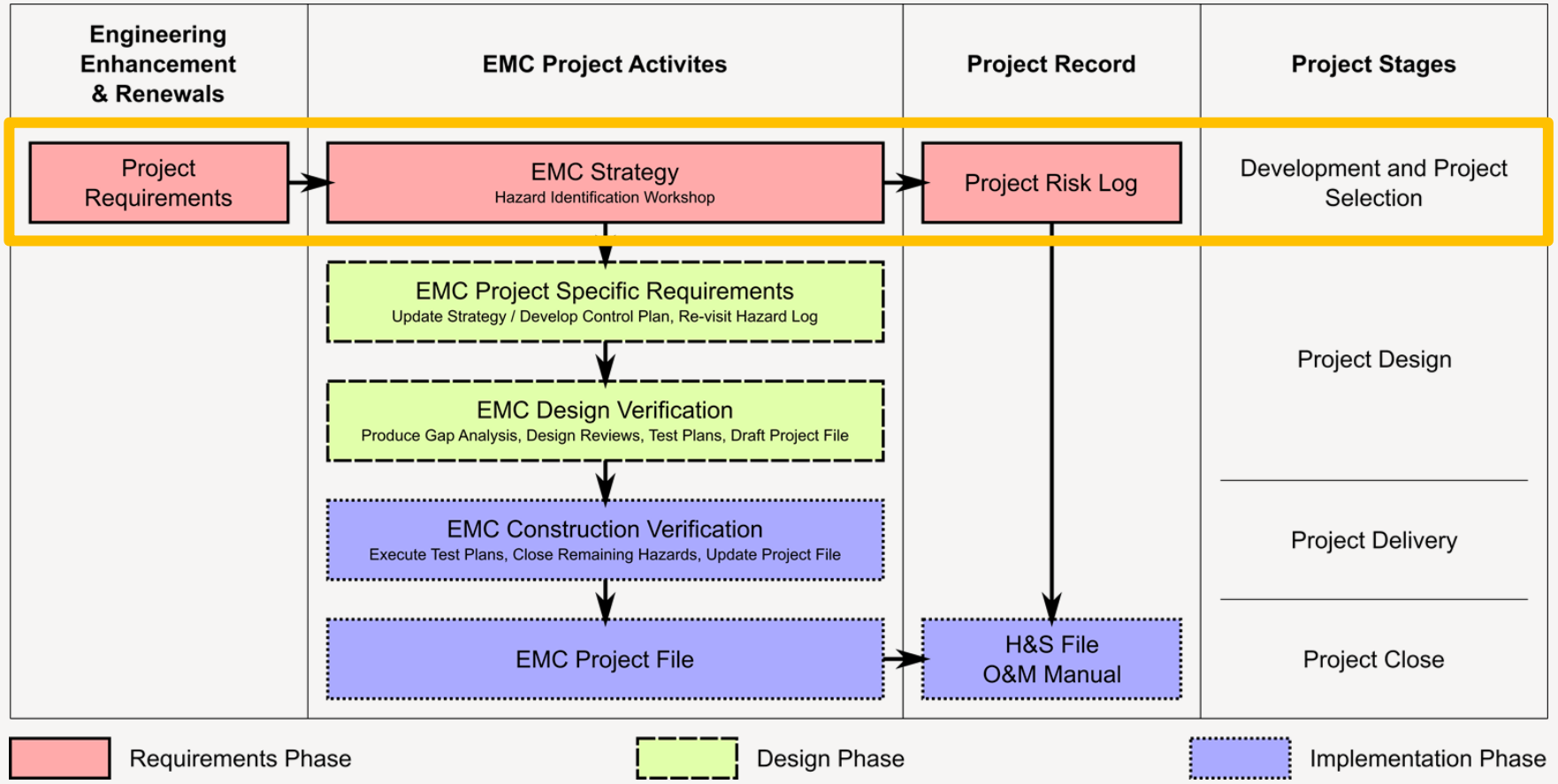




Lifecycle Dependency

Project Acceleration in a Controlled Environment (PACE)	Governance of Railway Investment Projects (GRIP)	Royal Institute of British Architects (RIBA) Plan of Work 2020
Stage 1 **Strategic Development and Project Selection**	**Stage 1** **Output Definition**	**Stage 0** **Strategic Definition**
	Stage 2 **Feasibility**	**Stage 1** **Preparation and Briefing**
	Stage 3 **Option Selection**	**Stage 2** **Concept Design**
Stage 2 Project Development and Design	Stage 4 Single Option Development	Stage 3 Spatial Coordination
	Stage 5 Detailed Design	Stage 4 Technical Design
Stage 3 Project Delivery	Stage 6 Construction, Testing and Commissioning	Stage 5 Manufacturing and Construction
Stage 4 Project Close	Stage 7 Scheme Handback	Stage 6 Handover
	Stage 8 Project Close-Out	Stage 7 Use

Lifecycle Dependency



Environmental Impact Assessment Process

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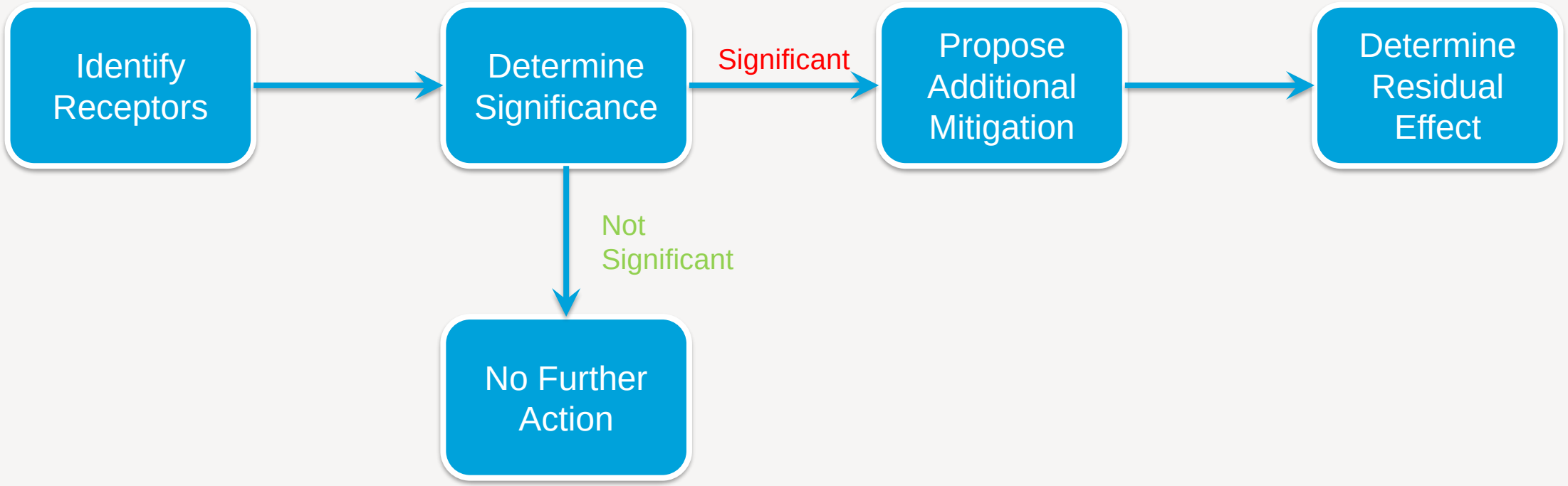
Environmental Impact Assessment Topics

Historic Environment	Air Quality	Noise and Vibration	Biodiversity	Landscape, Townscape and Visual
Water Environment	Geology, Soil and Land Contamination	Waste Materials	Traffic and Transport	Population and Human Health
Climate Change	**Electromagnetic Interference**	Agriculture	Public Open Space	Socio-Economics

Environmental Impact Assessment Process



Identifying Receptors

Scheme Design

- Drawings and Documents
- Project Mapper
- iModels

External Sources

- Google Maps
- Google Earth
- Google Street View
- Open Street Maps
- Atkins Geospatial Opendata
- Network Rail Route View
- Mastdata
- Cellmapper

Identifying Receptors: Distances

Categories	Distance (m)
Interfacing Railways	50
Railway Depots and Signal Control Centres	50
Educational Premises	50
Intentional Radio Transmitters	50
Other Commercial Premises (Retail Unit, Light & Heavy Industrial, etc.)	50
Hospitals, Clinics, Other Medical Establishments	100
Recording, Film Studios	100
High Voltage Transmission and Distribution Lines/Cables	500
Airports	1000
Military Establishments	1000
Research Laboratories	1000
Radio Telescopes	5000
Other sites not listed above	20

Sensitivity of Receptors

Sensitivity of receptor (EMI)	Type of Property
Very High	Sensitive sites which may include: Research laboratories (including within universities) Radiocommunication facilities
High	Heavy industrial sites
Medium	Light industrial and commercial premises
Low	Residential properties

Sensitivity of receptor (EMF)	Property Location
High	Property located inside the railway boundary
Low	Property located outside the railway boundary

Magnitude of Impact

Magnitude of impact	Impact of EMI	Impact of EMF
High	Any EMI effects lead to degradation of performance of equipment or systems in such a way that injury or worse may be incurred by the operator, third party or member of the public or which leads to unrecoverable operation of equipment or system itself.	EMF exposure levels may approach or exceed the applicable limits at localised areas.
Medium	Any EMI effects lead to degradation of equipment or system performance leading to maloperation or delay which requires intervention to recover following the removal of the disturbance.	EMF exposure levels are increased but remain within the applicable limits.
Low	Any EMI effects lead to some degradation of equipment or system performance leading to annoyance or delay which is fully recoverable following the removal of the disturbance.	EMF exposure levels may be increased but remain well within the applicable limits.
Very Low	Any EMI effects are negligible with regard to operation of equipment or systems which continue to operate as normal.	There is negligible effect on EMF exposure to people.

Embedded Mitigations

- Robust EMC assurance process is in place
- Application of relevant EMC standards and good practices
- Product acceptance and EMC compliance achieved for apparatus
- Railway standard electrical clearances achieved at structures
- Findings of the EIA are taken forward as part of the project's EMC assurance process

Significance of Receptor

Sensitivity of Receptor → ↓ Magnitude of Impact	Very High	High	Medium	Low
High	**Significant**	**Significant**	**Significant**	**Significant**
Medium	**Significant**	**Significant**	**Significant**	Not significant
Low	**Significant**	**Significant**	Not significant	Not significant
Very Low	**Significant**	Not significant	Not significant	Not significant

Significance of Receptors – Examples

Property	Type	Sensitivity	Magnitude	Significance
Army Reserve Centre	Military Establishment	Very High	Medium	**Significant**
Dr Reddy's Laboratories EU Ltd	Laboratories and Heavy Industry	Very High	Medium	**Significant**
Vodafone	Radio / Phone Mast	High	Medium	**Significant**
Montgomery Engravers Ltd	Heavy Industry	High	Very Low	Not Significant
Halfords	Light Industry / Commercial	Medium	Very Low	Not Significant
Sparkles Car Wash	Light Industry / Commercial	Medium	Low	Not Significant

Additional Mitigations and Residual Effect – Examples

Property	Type	Initial Significance	Proposed Mitigation	Residual Effect
Army Reserve Centre	Military Establishment	**Significant**	Desktop survey identified the premises as a traditional building with no visible antenna/communication systems or heavy equipment and is no longer considered a significant receptor of EMI.	**No Residual Effect**
Dr Reddy's Laboratories EU Ltd	Laboratories and Heavy Industry	**Significant**	Consultation with the site owner to be undertaken. EMI risk assessment to be carried out during detailed design to identify any specific mitigations required by the owner for onward management.	**Implementation of the additional mitigations would be sufficient to ensure no residual effect**
Vodafone	Radio / Phone Mast	**Significant**	Location of mast obtained from site-finder database (2012) and could not be located in the vicinity by desktop survey. Likely to have been relocated or superseded by a new mast.	**No Residual Effect**

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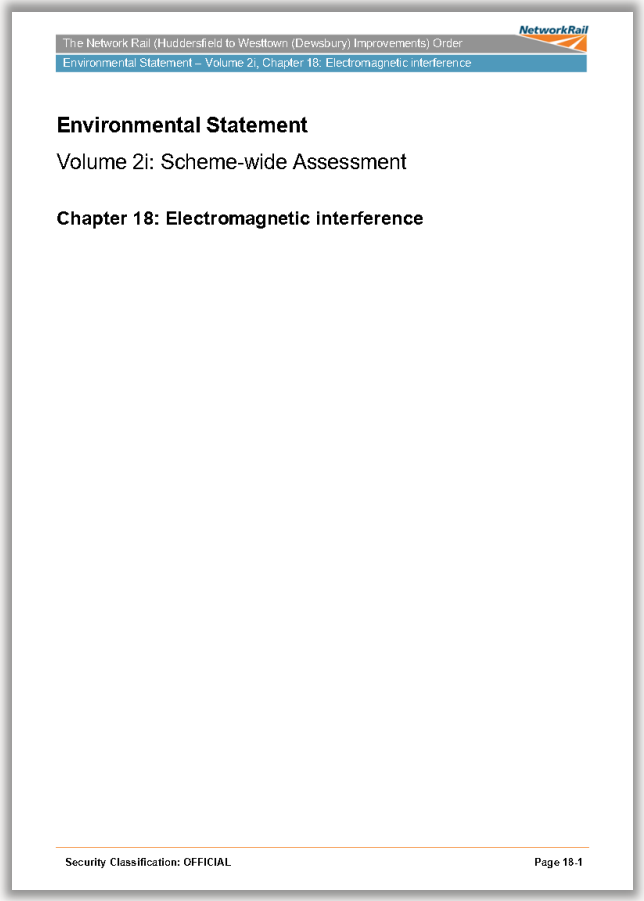
The Network Rail (Huddersfield to Westtown (Dewsbury) Improvements) Order
Environmental Statement – Volume 2i, Chapter 18: Electromagnetic interference

Environmental Statement

Volume 2i: Scheme-wide Assessment

Chapter 18: Electromagnetic interference

Security Classification: OFFICIAL Page 18-1

Thank You

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