

A38 Derby Junctions

TR010022

Volume 6

6.3 Environmental Statement Appendices

Appendix 4.4: Screening of Major Accidents and Disasters

Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

April 2019

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A38 Derby Junctions Development Consent Order 202[]

6.3 Environmental Statement Appendices

Appendix 4.4: Screening of Major Accidents and Disasters

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Planning Inspectorate Scheme Reference	TR010022
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APPENDIX 4.4: Screening of Major Accidents and Disasters

1.1 Background

- 1.1.1 Regulation 5(4) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (amended 2018) (the 2017 EIA Regulations) stipulates that the “*expected significant effects arising from the vulnerability of a proposed development to major accidents or disasters that are relevant to that development*” are to be identified and assessed as part of an Environmental Impact Assessment (EIA).
- 1.1.2 Schedule 4(8) of the EIA Regulations also require that the ES include:
‘A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. ...Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies’.
- 1.1.3 It is considered likely that the original changes to the EIA Directive that introduced the requirement to consider major accidents and disasters were made in order to bring certain other statutory requirements, mainly other EU Directives, within the overall ‘wrapper’ of EIA and the Environmental Statement (ES). This is implied both in the Directive itself and the domestic Regulations, which cite two specific Directives as examples of risk assessments to be brought within EIA; these are Directive 2012/18/EU of the European Parliament and of the European Council (the ‘Seveso III Directive’) which deals with major accident hazard registered sites - enacted in the UK by the Control of Major Accident Hazards Regulations (2015) and Council Directive 09/71/Euratom, which deals with nuclear sites. Neither of these Directives is relevant to the Scheme.
- 1.1.4 The identification of likely significant effects associated with major accidents and disasters enables projects to be developed in a manner that provides protection of the environment, for example by making allowances in the design of developments to build resilience to the effects of a flood event arising from future climate change.

1.2 Highways England guidance

- 1.2.1 Highways England issued supplementary guidance in May 2017 to the Design Manual for Roads and Bridges (DMRB) on how the changes introduced by the 2017 EIA Regulations are to be implemented on road projects they promote.
- 1.2.2 This supplementary guidance sets out the matters to be covered as part of the scope of a major events assessment (‘events’ being the collective term used by Highways England to describe both major accidents and disasters). It states that assessments need to consider the vulnerability of a project to risks of major events, and any consequential changes in the predicted effects of that project on other environmental topics.

- 1.2.3 This guidance was referenced as part of the formal scoping exercise undertaken during the preliminary stages of the EIA of the A38 Derby Junctions Scheme (referred to herein as “the Scheme”), which concluded a need to consider the subject of major events due to the potential for significant environmental effects to occur on environmental resources and/ or receptors.

1.3 Scope of the assessment

- 1.3.1 The scope of the major events assessment was presented within the A38 Derby Junctions EIA Scoping Report (Highways England, 2018).
- 1.3.2 Scoping acknowledged the potential for the topic of major events to be scoped out of the EIA, prior to publication of the ES. This was because the design-development process would continue post-scoping to ensure that no genuine risk or serious possibility remains of an event interacting with the Scheme.
- 1.3.3 The Inspectorate provided their formal Scoping Opinion on 25 April 2018 (refer to Appendix 4.1 [TR010022/APP/6.3]) which identified a need for the ES to include a description of the potential vulnerability of the Scheme to risks of major accidents and/or disasters, including vulnerability to climate change, which are relevant to the Scheme.
- 1.3.4 The Scoping Opinion noted that other EU legislation could be used to identify relevant information and to inform risk-based assessments, where appropriate. Additionally, the Inspectorate noted that any measures envisaged to prevent or mitigate significant adverse effects on the environment arising from major events should be described in the assessment, and information included on the preparedness for (and response to) such emergencies. The Inspectorate also agreed that the reporting of major events within relevant environmental topics reported in the ES would be appropriate for this assessment.
- 1.3.5 In order to frame the assessment scope, a major event has been defined as an acute or chronic accident or disaster, of human or natural origin, which occurs either as a consequence of, or which interacts with, the construction or operation of the Scheme, and which has substantial consequences for people or the environment.
- 1.3.6 This definition does not distinguish between a major accident and a major disaster as substantial overlap exists, but does recognise that an accident is necessarily of human origin, whereas a disaster can be of human or natural origin.
- 1.3.7 Scoping concluded that the Scheme can be a: source of major events, for example if a bridge forming an integral component of the Scheme were to fail and collapse; and a receptor of major events, for example if a major flood event occurred which inundated the carriageway of the Scheme.

1.4 Assessment

1.4.1 The major events assessment methodology adopted includes the following four stages:

- a) **Stage 1 – Long List:** generation of a long list of possible major events. This has been compiled from the following data sources:
 - The UK Government's Risk Register of Civil Emergencies (2017).
 - Information provided by the Inspectorate and statutory and non-statutory bodies within the EIA Scoping Opinion.
 - Professional judgement based on the form and nature of the Scheme and knowledge regarding the surrounding environment.
 - Review of the Scheme risk register and the design hazard assessment log.
- b) **Stage 2 – Screening:** screening of the long list of major events to determine those events that are relevant to the Scheme, or where the Scheme may have a realistic sensitivity to a particular event. Any major events that could not realistically occur, due to the type of development and the characteristics of the Scheme geographic location were omitted from the assessment at this stage.
- c) **Stage 3 – Scoping:** a scoping exercise was then undertaken to review the remaining relevant major events to see whether they require further evaluation or design mitigation (scoped in) or whether they would be appropriately mitigated/ managed such that consequential environmental effects would be insignificant (scoped out). Justification for scoping each major event in or out is reported herein. Where this exercise is unable to adequately justify the scoping out of a particular major event, such an event has been included on the Scheme-specific shortlist and taken through to Stage 4 (as applicable).
- d) **Stage 4 – Assessment:** where any major events cannot be scoped out at Stage 3, and where further design mitigation is unable to remove the potential for the major event to have potential significant environmental effects, the relevant ES chapters identify the potential consequences for receptors, and give a qualitative evaluation of the potential significance of effects as a result of the major event.

Stage 1: Long List

1.4.2 A long list of major events was compiled, based on the following types of disaster and accident (refer to Table A4.4.1):

- a) Geological disasters.
- b) Hydrological disasters.
- c) Meteorological disasters.
- d) Space disasters.

- e) Transport accidents and disasters.
- f) Engineering accidents and failures.
- g) Industrial accidents.
- h) Terrorism, crime and civil unrest.
- i) War.
- j) Disease.

Stage 2: Screening

- 1.4.3 The screening review of the collated long list of major events indicated that a number of accidents and disasters have little or no applicability in the UK, for example famine and volcanic eruptions (see Table 1) and thus could be screened out of the assessment.
- 1.4.4 The screening review also indicated that a number of the events contained in the long list are already covered by other legislative or design requirements, which offer legal protection and provide minimum design standards and operational requirements, examples of which include:
 - a) Health and Safety at Work etc. Act 1974.
 - b) The Workplace (Health, Safety and Welfare) Regulations 1992.
 - c) The Management of Health and Safety at Work Regulations 1999.
 - d) Construction (Design and Management) Regulations 2015.
 - e) Design Manual for Roads and Bridges (1993 - 2018).
 - f) Interim Advice Note 191/16 Safety Governance for Highways England.
- 1.4.5 The screening review also identified that it would be reasonable and proportionate to scope out construction workers, and similar operatives undertaking future maintenance activities on the Scheme, as a specific receptor in the assessment. This was on the grounds that worker health and wellbeing in the workplace would be safeguarded through existing legal protection through the above legislation, which would minimise the risk from major events to an acceptable level.
- 1.4.6 Table A4.4.1 illustrates which major events are considered to be relevant to the Scheme.

Stage 3: Scoping

- 1.4.7 During Stage 3 scoping the methodology aims to categorise relevant major events into one of the following two types (refer to Table 1), based on its relationship to the Scheme:
 - a) Type 1: events that could realistically occur, but for which the Scheme and its associated environmental resources and receptors are no more vulnerable than any other development type.

- b) Type 2: events that could occur, and to which the Scheme is particularly vulnerable, or which the construction and operation of the Scheme has a particular capacity to exacerbate.

1.4.8 Details are provided in Table 1 regarding design measures that have been included in the Scheme design to mitigate/manage effects associated with such potential major events, and/ or measures that would be included within applicable construction and/or operational phase management plans (noting that some actions may be legal requirements). By taking into account these measures, decisions can be made as to whether the major event requires further consideration (i.e. scoped in for Stage 4 assessment) or whether actions are adequate to avoid potential significant environmental effects.

1.4.9 The analysis provided in Table 1 indicates that no major events need to be taken forward to Stage 4 assessment, given that all major events that could realistically occur are either:

- a) Already mitigated as far as reasonably practicable, or
- b) The Scheme would be no more vulnerable than the existing road.

1.4.10 Nevertheless, Table 1.1 indicates that a number of major events are considered within some of the technical assessments presented within this Environmental Statement e.g. flood risks are considered in Chapter 13: Road Drainage and Water Environment.

1.5 References

1.5.1 Cabinet Office (2017) National Risk Register of Civil Emergencies. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/644968/UK_National_Risk_Register_2017.pdf

Highways England (1993 to date) Design Manual for Roads and Bridges, Volume 11.

Highways England (2016) Interim Advice Note 191/16: Safety Governance for Highways England.

Highways England (2018) A38 Derby Junctions – Environmental Impact Assessment Scoping Report.

<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010022/TR010022-000036-38DY%20-%20Scoping%20Report.pdf>

HMSO (1974) Health and Safety at work etc. Act 1974.

HMSO (1992) The Workplace (Health, Safety and Welfare) Regulations 1992.

HMSO (2017) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

Official Journal of the European Union (2011) Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification).

Official Journal of the European Union (2014) Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.

The Stationary Office (1999) The Management of Health and Safety at Work Regulations 1999.

The Stationary Office (2015) Construction (Design and Management) Regulations 2015.

Table 1: Major accidents and emergencies screening and scoping

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Geological and ground related disasters						
Avalanches	No	-	-	Avalanches not relevant in context of Scheme.	No	n/a
Landslides	Yes	2	<ul style="list-style-type: none">Water resources and ecological receptorsNearby propertiesPeople, drivers and workers	<p>Considered by geotechnical team as a fundamental part of the Scheme design.</p> <p>Appropriate design of the Scheme to applicable standards means that receptors would not be of greater risk as a result of the Scheme.</p>	No	n/a
Earthquakes	No	-	-	The Scheme is not located in a geologically active area and as such earthquakes are not considered to be a significant risk.	No	n/a
Sinkholes	Yes	2	<ul style="list-style-type: none">Water resources and ecological receptorsNearby propertiesPeople, drivers and workers	<p>Considered by geotechnical team as a fundamental part of the Scheme design. Appropriate design of the Scheme to applicable standards means that receptors would not be of greater risk as a result of the Scheme.</p> <p>The nature of the geology beneath the Scheme is such that sinkholes are unlikely to occur.</p>	No	n/a
Ground stability	Yes	2	<ul style="list-style-type: none">Aquatic environment and ecological receptorsNearby propertiesPeople, drivers and workers	<p>Considered by geotechnical team as a fundamental part of the Scheme design. Appropriate design of the Scheme to applicable standards means that receptors would not be at greater risk as a result of the Scheme.</p>	No	n/a

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Volcanic eruptions	No	-	-	Highly unlikely that a volcanic eruption or ash cloud could significantly impact on any aspect of the Scheme.	No	n/a
Landfill accidents (gas migration, leachate leakage, asbestos)	Yes	2	<ul style="list-style-type: none"> Aquatic environment and ecological receptors Nearby properties People, drivers and workers 	<p>Historic landfills are present within the footprint of Kingsway and Markeaton junctions, whilst a former landfill north of Little Eaton junction would be used as a construction compound.</p> <p>Through the appropriate design of the Scheme and the adoption of the construction methods as detailed in the Outline Environmental Management Plan (OEMP) (refer to Appendix 2.1 [TR010022/APP/6.3]), potential effects associated with gas migration, leachate leakage and asbestos would be appropriately managed such that significant effects would be avoided (noted that some actions are needed for legal compliance). The measures detailed within the OEMP would be developed into a Construction Environmental Management Plan (CEMP) by the selected construction contractor which would be implemented for the duration of the Scheme construction phase.</p>	No	Chapter 10: Soils and Geology

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Hydrological disasters						
Groundwater contamination events (SPZs)	Yes	2	<ul style="list-style-type: none">• Aquatic environment and ecological receptors• People, drivers and workers	<p>The Scheme overlies groundwater resources, whilst parts of Little Eaton junction fall within a Groundwater Source Protection Zone (SPZ).</p> <p>A range of measures would be applied during the Scheme construction phase which would be included in the CEMP to control accidental spillages and prevent groundwater contamination (refer to Appendix 2.1 [TR010022/APP/6.3] which provides the OEMP). In addition, the Scheme design at Markeaton junction would include measures to isolate any contamination from the nearby petrol station.</p> <p>Mitigation measures that would appropriately control potential risks and impacts upon groundwater resources are detailed in Chapter 10: Geology and Soils, and Chapter 13: Road Drainage and Water Environment. [TR010022/APP/6.1]</p>	No	Chapter 10: Geology and Soils and Chapter 13: Road Drainage and Water Environment
Limnic eruptions	No	-	-	Not applicable given that there are no deep water lakes near to the Scheme.	No	n/a

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Floods	Yes	2	<ul style="list-style-type: none"> • Aquatic environment and ecological receptors • Nearby properties • People, drivers and workers 	<p>The Scheme would cross areas with flooding risks at Kingsway junction and Little Eaton junction. Various flood protection measures have been integrated into the Scheme design, namely (refer to Table 2.1 in Chapter 2: The Scheme)[TR010022/APP/6.1]:</p> <ul style="list-style-type: none"> • Flood storage areas at Kingsway junction • Provision of a floodplain compensation area to the south of the A38 and to the west of the River Derwent. • Diversion of Dam Brook into a new realigned watercourse that takes account of brook flooding, plus the provision of new ecology ponds. • Provision of a flood alleviation channel that connects a surface watercourse downstream of Breadsall Manor with the realigned Dam Brook, plus a new 600mm diameter culvert from the watercourse under the new A38 embankment that connects into the existing channel upstream of an existing 500mm diameter culvert. • Provision of a highway runoff drainage system at all junctions to control the quality and quantity of runoff from the road surface (taking account of climate change). <p>It is considered that the measures above would appropriately manage potential flood risks associated with the Scheme.</p>	No	Chapter 13: Road Drainage and Water Environment
Tsunami/storm surge	No	-	-	Not applicable, given that the Scheme is not located in a coastal location.	No	n/a

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Meteorological disasters						
Blizzards	Yes	1	<ul style="list-style-type: none"> People, drivers and workers 	Could cause road users to be trapped on the road. Risk is no different from any other road/road users in the UK and specific measures not considered to be required for the Scheme.	No	n/a
Cyclonic storms	Yes	1	<ul style="list-style-type: none"> People, drivers and workers 	Major storms are a risk for any location in the UK. Risk is no different from any other road/road users in the UK and specific measures not considered to be required for the Scheme.	No	n/a
Droughts	Yes	1	<ul style="list-style-type: none"> Aquatic environment and ecological receptors People, drivers and workers 	Scheme not considered to be vulnerable to drought. Risk is no different from any other road/road users in the UK and specific measures not considered to be required for the Scheme.	No	n/a
Thunderstorms	Yes	1	<ul style="list-style-type: none"> People, drivers and workers 	New bridges and structures would be elevated and as such at risk from lightning strikes. However, the risks are no different from any other road/ road users in the UK.	No	n/a
Hailstorms	Yes	1	<ul style="list-style-type: none"> People, drivers and workers 	Scheme not considered vulnerable to hailstorms. Risk is no different from any other road/ road users in the UK and specific measures not considered to be required for the Scheme.	No	n/a
Heat waves	Yes	1	<ul style="list-style-type: none"> Aquatic environment and ecological receptors People, drivers and workers 	Scheme no more vulnerable to heat wave conditions than any other road. Tunnels are also not proposed, so no consideration of sensitivity of tunnels to heatwave conditions is required.	No	n/a

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Tornadoes	Yes	1	<ul style="list-style-type: none"> Aquatic environment and ecological receptors People, drivers and workers 	Risk is no different from any other road/road users in the UK and specific measures not considered to be required for the Scheme.	No	n/a
Wildfires	Yes	1	<ul style="list-style-type: none"> Aquatic environment and ecological receptors Nearby properties People, drivers and workers 	<p>The Scheme is not surrounded by significant areas of scrub, grassland or heather. Risk is no greater than for the existing road and specific measures are not considered to be required for the Scheme.</p> <p>It is anticipated that the reduced car accident rate would reduce the risk of an accident causing a fire.</p>	No	n/a
Air quality events	Yes	2	<ul style="list-style-type: none"> Ecological habits and receptors People, drivers and workers 	Vehicle emissions can contribute to poor air quality. It is not considered necessary to undertake any more assessment than is already included in the assessment provided in Chapter 5: Air Quality [TR010022/APP/6.1].	No	Chapter 5: Air Quality
Space disasters						
Impact events and airburst	No	-	-	The Scheme is not considered to be any more vulnerable than any existing road.	No	n/a
Solar flare	Yes	1	<ul style="list-style-type: none"> Road users 	<p>Solar flares can interrupt radio and other electronic communications.</p> <p>Significant communication and electronic systems are not proposed as part of the Scheme. Therefore, the Scheme is at no more risk than the existing road.</p>	No	n/a

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Transport accidents/ disasters						
Road accidents	Yes	2	<ul style="list-style-type: none">• Aquatic environment and ecological receptors• People, drivers and workers	<p>The Transport Assessment Report [TR010022/APP/7.3] indicates that over the sixty-year evaluation period, the Scheme would save 1,396 collisions across the whole highway network. These would include savings of eight fatal casualties and 135 serious casualties (i.e. saving of 143 killed and seriously injured).</p> <p>The Scheme highway drainage systems take account of potential road accidents. The environmental risks posed by spillages of hazardous loads as a result of road accidents is considered in Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1].</p>	No	Chapter 13: Road Drainage and Water Environment
Rail accidents	Yes	2	<ul style="list-style-type: none">• Aquatic environment and ecological receptors• People, drivers and workers	<p>At Little Eaton junction, the Midland Mainline railway line runs north-south beneath the existing A38. This bridge would be extended as part of the Scheme.</p> <p>The presence of the railway has been taken into account during the definition of construction methods and the construction programme. Rail accident risks associated with the Scheme are no greater than the existing road. Furthermore, the reduced traffic accident rate due to the Scheme means that accident risks would be lower than the existing road.</p>	No	n/a
Aircraft disasters	No	-	-	There are no RAF bases or airports in the vicinity of the Scheme. Risk is no different from any other road/road users in the UK and specific measures not considered to be required for the Scheme.	No	n/a
Maritime disasters	No	-	-	The Scheme is not located in an area susceptible to maritime disasters.	No	n/a

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Engineering accidents/ failures						
Bridge failure	Yes	2	<ul style="list-style-type: none"> Aquatic environment and ecological receptors People, drivers and workers 	New bridges would be required at each junction. Appropriate bridge design to current design standards is a fundamental component of the Scheme design. No further mitigation requirements are considered to be needed.	No	n/a
Property or bridge demolition accidents	Yes	2	<ul style="list-style-type: none"> People, drivers and workers 	The Scheme would involve the demolition of 15 detached residential properties on Queensway and the demolition of two semi-detached properties on the A52 Ashbourne Road. The existing Markeaton Park footbridge would also be demolished, as would a disused toilet block within Markeaton Park. Risks during demolition have been taken into account with advice from Highway England's appointed buildability advisors (considered as part of design hazard assessment). Asbestos surveys would be carried out prior to demolition activities, whilst the works would need to be undertaken in accordance with legislative requirements and an Asbestos Management Plan (part of the CEMP – refer to the OEMP in Appendix 2.1 [TR010022/APP/6.3]).	No	n/a
Tunnel failure/fire	No	-	-	There are no proposed tunnels included in the Scheme design.	No	n/a
Dam failure	No	-	-	There are no dams within close proximity of the Scheme, although this risk is considered within the Flood Risk Assessments (FRAs) that are referred to in Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1] and provided within Appendices 13.2A, 13.2B and 13.2C [TR010022/APP/6.3].	No	Chapter 13: Road Drainage and Water Environment and the FRAs in Appendices 13.2A, 13.2B and 13.2C [TR010022/APP/6.3]

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Flood defence failure	Yes	2	<ul style="list-style-type: none"> People, drivers and workers 	The Scheme is not at risk from flood defence failures, although this risk is considered within the FRAs that are referred to in Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1] and provided within Appendices 13.2A, 13.2B and 13.2C [TR010022/APP/6.3].	No	Chapter 13: Road Drainage and Water Environment and the FRAs in Appendices 13.2A, 13.2B and 13.2C [TR010022/APP/6.3]
Mast and tower collapse	No	-	<ul style="list-style-type: none"> People, drivers and workers 	The existing telecommunications mast at Markeaton junction would be relocated during the Scheme construction phase.	No	n/a
Building failure or fire	Yes	2	<ul style="list-style-type: none"> People, drivers and workers 	Buildings in proximity of the Scheme are low-rise, and predominantly residential, although there are some commercial properties, including the Esso garage at Markeaton junction. Risk of fires associated with most land uses are no greater for the Scheme than risks for the existing road. However, accidents associated with the petrol station at Markeaton junction have been specifically considered and the Scheme design amended to ensure continued safe operation.	No	n/a
Utilities failure	Yes	2	<ul style="list-style-type: none"> People, drivers and workers 	Numerous utilities are located in the vicinity of the Scheme, which are the responsibility of relevant utility companies. Environmental impacts associated with utilities diversion works are considered within the EIA. The potential for construction related incidents is covered by safe working practices and CDM regulations.	No	n/a

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Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Industrial accidents						
Defence industry and unexploded ordnance (UXO) risk	Yes	2	<ul style="list-style-type: none"> Aquatic environment and ecological receptors People, drivers and workers 	<p>There are no defence manufacturing facilities in the vicinity of the Scheme, although there is an Army Reserves Centre immediately off Markeaton junction.</p> <p>An UXO risk assessment for the area around Markeaton junction specifies areas of Low and Medium risk (refer to Chapter 10: Geology and Soils [TR010022/APP/6.1]). Mitigation measures included within the OEMP (refer to Appendix 2.1 [TR010022/APP/6.3]) during Scheme construction phase include UXO awareness briefings (for low risk areas) and UXO specialist presence (for shallow intrusive works in medium risk areas). The operational Scheme would likely be no more vulnerable than the existing road to UXO risks.</p>	No	Chapter 10: Geology and Soils OEMP (refer to Appendix 2.1 [TR010022/APP/6.3])
Energy industry (fossil fuel)	Yes	2	<ul style="list-style-type: none"> People, drivers and workers 	<p>There is an Esso petrol station at Markeaton junction. Ground contamination risks were assessed during the geotechnical ground investigation and reported in Chapter 10: Soils and Geology [TR010022/APP/6.1]. Mitigation measures would be applied during the construction phase via the CEMP (refer to the OEMP in Appendix 2.1 [TR010022/APP/6.3]), whilst the Scheme design takes account of the petrol station and its continued safe operation. Accidental spillages of hydrocarbons would be mitigated as detailed in the Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1].</p>	No	Chapter 10: Soils and Geology and Chapter 13: Road Drainage and Water Environment
Nuclear power	No	-	-	No facilities nearby, whilst the Scheme is at no more risk than the existing road. No further mitigation requirements are considered to be needed.	No	n/a

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Oil and gas refinery/storage	No	-	-	No facilities nearby, whilst the Scheme is at no more risk than the existing road. No further mitigation requirements are considered to be needed.	No	n/a
Food industry	No	-	-	No facilities nearby, whilst the Scheme is at no more risk than the existing road. No further mitigation requirements are considered to be needed.	No	n/a
Chemical industry	No	-	-	No facilities nearby, whilst the Scheme is at no more risk than the existing road. No further mitigation requirements are considered to be needed.	No	n/a
Manufacturing industry	No	-	-	No facilities nearby, whilst the Scheme is at no more risk than the existing road. No further mitigation requirements are considered to be needed.	No	n/a
Mining industry	No	-	-	No facilities nearby, whilst the Scheme is at no more risk than the existing road. No further mitigation requirements are considered to be needed.	No	n/a
Crime/war/civil unrest						
Bomb/vehicle attack on people	Yes	2	<ul style="list-style-type: none"> People, drivers and workers 	There are no tunnels or features that would make the Scheme more of a terrorist attack target than the existing road. No further mitigation requirements are considered to be needed.	No	n/a
Bomb/vehicle attack on infrastructure	Yes	2	<ul style="list-style-type: none"> People, drivers and workers 	There are no tunnels or features that would make the Scheme more of a terrorist attack target than the existing road. No further mitigation requirements are considered to be needed.	No	n/a
Mass shooting	No	-	-	The Scheme is unlikely to be more of a target than the existing road to this type of incident due to low number of exposed targets. No further mitigation requirements are considered to be needed.	No	n/a

Stage 1: Long-List	Stage 2: Screening	Stage 3: Scoping			Stage 4: assessment	Relevant topic chapter (if covered in the Environmental Statement) [TR010022/APP/6.1]
Type of major event	Relevant to Scheme?	Type 1 or 2	Relevant receptors	Mitigation and/or management action	Requires assessment?	
Chemical/gas attack	No	-	-	The Scheme is unlikely to be more of a target than the existing road to this type of incident due to low number of exposed targets. No further mitigation requirements are considered to be needed.	No	n/a
Rioting	No	-	-	The Scheme is unlikely to be more of a target than the existing road to this type of incident. No further mitigation requirements are considered to be needed.	No	n/a
Cyber attack	Yes	2	<ul style="list-style-type: none"> People, drivers and workers 	No significant roadside technology is proposed, and as such the Scheme would be no more vulnerable than the existing road. Notwithstanding this, it is not considered to be more vulnerable to attack than similar infrastructure installed and running elsewhere on the strategic road network. Highways England is accountable to the Secretary of State for Transport for ensuring the resilience of their strategic road network to national security risks, including from terrorism, cyber-attack, natural hazards and other risks outlines in the National Risk Assessment.	No	n/a