M60/M62/M66 Simister Island Interchange

TR010064

ENVIRONMENTAL STATEMENT APPENDICES

APPENDIX 4.2 MAJOR ACCIDENTS AND DISASTERS

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ENVIRONMENTAL STATEMENT APPENDICES
APPENDIX 4.2 MAJOR ACCIDENTS AND DISASTERS

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Appendix 4.2. Major accidents and disasters

1.1 Introduction

1.1.1 A disaster is defined as a sudden, catastrophic event that can result in serious damage to human welfare or the environment. A disaster can result in major disruption to society or communities and can result in economic and environmental losses. Disasters can be caused by both natural processes and human actions.

1.1.2 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') require that risks due to accidents and disasters be considered within the Environmental Impact Assessment (EIA). This appendix provides a risk assessment of the major accidents and disasters that could affect the Scheme, and where these are being reported and mitigated within the environmental assessment.

1.2 Screening assessment

1.2.1 A screening matrix (Table 1.1) has been completed detailing a long list of major accidents and disasters that could reasonably occur. This long list has been compiled using information from:

- The International Federation of Red Cross and Red Crescent Societies website (n.d.)
- National Risk Register (NRR) (2020)
- The Health and Safety Executive (HSE)'s Control of Major Accident Hazards (COMAH) Regulations Public Information Search (2015)
- The HSE's Scoping Opinion response (Annex 2 of the Scoping Opinion (TR010064/APP/6.7))

1.2.2 The screening matrix considers the Scheme's location and intended land use to determine if it is at risk from a major accident or disaster. For example, as there are areas close to the Scheme at high risk of surface water flooding, the location presents a potential risk from major flooding. Likewise, as the Scheme would be used as a transport route, the risk of a major transport accident exists. Where potential risks were identified, these were taken forward for further consideration.

1.2.3 There are no COMAH Regulations establishments within 1km of the Scheme (HSE.gov.uk, 2015). The nearest COMAH establishment is Heap Bridge Site, Bury, located approximately 2.4km north-east of the Scheme. In its Scoping Opinion (TR010064/APP/6.7) response, the HSE confirmed that *'there are no major accident hazard installations with Hazardous Substances Consent or pipelines in the vicinity of the road improvement scheme'* and hazardous substances consent is not applicable to the Scheme. In addition, the HSE did not make comment on explosives sites *'since there are no licensed explosives sites in the vicinity of the proposed development'*, and did not make comment on electrical safety.

Table 1.1 Major accidents and disasters screening

Key: light orange = major accidents or disasters requiring further consideration due to either the location of the Scheme or its intended use

Major accident/disaster	Location risk	Land use risk	Further consideration required?
Biological hazards: epidemics	No	No	No
Biological hazards: animal and insect infestation	No	No	No
Earthquakes	No	No	No
Mass movements / ground hazards	Yes	No	Yes
Tsunamis	No	No	No
Volcanic eruptions	No	No	No
Drought	No	No	No
Heatwaves	Yes	No	Yes
Wildfires	No	No	No
Inland floods	Yes	No	Yes
Coastal floods	No	No	No
Tropical storms	No	No	No
Storms and gales	Yes	No	Yes
Industrial accidents	No	No	No
Transport accidents	Yes	Yes	Yes
Famine	No	No	No
Displaced populations	No	No	No
Malicious attacks on infrastructure	No	Yes	Yes
Cyber attacks	No	No	No
Public disorder	No	No	No
Critical infrastructure failure	No	Yes	Yes
Heavy snowfall / low temperatures	Yes	No	Yes
Armed conflict / complex emergency	No	No	No

1.2.4 The following major accidents / disasters have been taken forward for further consideration due to a potential risk resulting from either the location of the Scheme or its intended use:

- Mass movements and ground hazards
- Heatwaves
- Inland floods
- Storms and gales
- Transport accidents
- Malicious attacks on infrastructure
- Critical infrastructure failure
- Heavy snowfall / low temperatures

1.2.5 Accidents and disasters requiring further consideration were subject to a more detailed risk assessment (Table 1.2).

1.3 Risk assessment

1.3.1 Table 1.2 summarises the risk assessment which has been used to scope potential environmental impacts from major accidents and disasters.

1.3.2 The risk assessment involved looked at the probability of an event occurring, and the consequence/effect if an event did occur. Probabilities of event occurrence were obtained from the NRR, considering the local context of the Scheme and future climate change. NRR probabilities represent the likelihood of the reasonable worst-case scenario of the risk occurring in the next year. This means that they represent the worst plausible manifestation of that particular risk once highly unlikely variations have been discounted. These factors were used to determine if an event presented a significant risk and how this is considered in the environmental assessment. In this instance, a significant risk is one with the potential to cause loss of life or long-lasting/permanent environmental damage and would require a response beyond existing response measures in place.

1.3.3 Table 1.2 shows how risks are being managed through the Scheme design or reported and mitigated within other areas of the environmental assessment (e.g. climate change adaptation). Major accidents and disasters has therefore not been scoped into the environmental assessment as an EIA aspect chapter (as proposed in the Environmental Scoping Report (TR010064/APP/6.6)) but has been reported on within relevant aspects. The Scheme design has considered the potential effects associated with accidents and disasters, with mitigation embedded into the design where required.

Table 1.2 Major accidents and disasters risk assessment

Key: yellow = risks considered within the Scheme design.

Event	Likelihood of occurrence	Consequence of event occurring	Further considerations
Mass movements/ground hazards	A risk assessment was undertaken to inform the geotechnical design of the Scheme. This identified several ground hazards which are 'probable' or 'likely' to occur before mitigation, including collapsible and compressible ground.	Subsidence and other ground hazards can occur rapidly with little warning. They can cause damage to infrastructure, disruption to the traffic network, and casualties/fatalities. Depending on the nature of the incident, environmental damage can occur through release of contaminants and opening source-pathway-receptor linkages.	Geophysical hazards have been considered in the Scheme design. Ground investigations have been undertaken to assess the potential hazards and risks associated with the ground conditions. The results of the ground investigations (see Appendix 9.3: Ground Investigation Report of the Environmental Statement Appendices (TR010064/APP/6.3) for further details) have factored into the geotechnical design process. Geophysical hazards have therefore not been considered further in terms of major accidents and disasters.
Heatwaves	The NRR probability of a heatwave occurring in the next year is between 25 to 125 in 500. Summer temperatures are predicted to increase in the UK due to climate change, potentially increasing the likelihood of this event occurring.	Hot weather increases the risk of tarmac melting and technology overheating. This could result in unsafe driving conditions, potentially leading to accidents. Hot temperatures could also result in increased driver stress, increasing the likelihood of an accident occurring. Environmental damage could occur if a crash resulted in discharge of contaminants (e.g. if an oil tanker crashed).	The UK Met Office has a system in place for providing warnings of extreme weather, which reduces the risk of drivers driving in extreme weather. There is a minor risk of high temperatures damaging the road surface and technology, however, the likelihood of this resulting in a catastrophic event is considered unlikely. Heatwaves have therefore not been considered further in terms of major accidents and disasters.

Event	Likelihood of occurrence	Consequence of event occurring	Further considerations
Storms and gales	The NRR probability of a storm/gale occurring in the next year is between 25 to 125 in 500. It is uncertain if wind speeds are likely to increase or decrease in the north of England due to climate change.	High wind speeds can fell trees and man-made structures. This can result in property damage, disruption to the transport network, disruption to critical infrastructure, and casualties/fatalities. Large scale events have the potential to impact at a regional or even national scale.	High wind speeds have caused historic disruption to transport networks in England, and there is potential for future events to impact the M60, M62 and M66. The Scheme has been designed in accordance with best practice (BS EN 1991-1-4:2005 – Actions on Structures (covering wind) and the associated UK National Annex), and no further measures taken. Storms and gales have therefore not been considered further in terms of major accidents and disasters.

Event	Likelihood of occurrence	Consequence of event occurring	Further considerations
Inland floods	The NRR probability of inland flooding occurring in the next year is between 5 to 25 in 500. Locally, the Scheme is located in areas of Flood Zone 1 (1 in 1000-year event), however there are areas at medium to high risk from surface water flooding. Winters are predicted to get wetter in the UK due to climate change, potentially increasing the likelihood of this event occurring.	Large scale flooding events can result in damage to property, disruption of the transport network, casualties and fatalities. There can also be impacts on local communities if they are not equipped to deal with a large-scale event in their area. Depending on the nature of the event, environmental damage can occur through release of contaminants and opening source-pathway-receptor linkages. The magnitude and severity of an event could increase due to future climate change and land use change (e.g. development within floodplain).	The Scheme is located in areas of Flood Zone 1, however there are areas at medium to high risk from surface water flooding. There are also areas at medium to high risk of flooding from rivers. The Scheme is therefore at risk from a flood event and potentially increases the risk of flooding elsewhere. This problem is likely to be exacerbated by future climate change. As such, Appendix 13.6: Flood Risk Assessment of the Environmental Statement Appendices (TR010064/APP/6.3) has included an allowance for climate change and mitigation measures as required to reduce potential future risks. Inland floods have been considered in Chapter 13: Road Drainage and the Water Environment of the Environmental Statement (TR010064/APP/6.1), in terms of reducing future flood risk, and in Chapter 14: Climate of the Environmental Statement (TR010064/APP/6.1), on climate change adaptation.

Event	Likelihood of occurrence	Consequence of event occurring	Further considerations
Transport accidents	The NRR probability of a major transport accident occurring in the next year is less than 1 in 500. This probability could increase (e.g. due to future stress on the network) or decrease (e.g. through advances in technology) beyond five years.	Major accidents can result in fatalities, casualties, and damage to infrastructure, causing disruption to the network. There can also be impacts on local communities if they are not equipped to deal with a large-scale event in their area. Environmental damage could occur if a crash resulted in discharge of contaminants (e.g. if an oil tanker crashed).	Although accidents may take place on the M60, M62 and M66, these are not likely to occur at a scale that would be considered a national or regional disaster. The Scheme is also being designed to increase capacity and improve safety, which should reduce the probability of an incident occurring. Traffic accidents would be managed through existing emergency service procedures and would be unlikely to need a coordinated Government response. Traffic accidents have therefore not been considered further in terms of major accidents and disasters.
Critical infrastructure failure	The NRR probability of a widespread electricity failure occurring in the next year is between 5 to 25 in 500. A regional or national blackout has never occurred in the UK; however it has occurred in Argentina and South Australia within the last decade. The risk could increase due to the increased risk of severe weather.	The M60/M62/M66 Simister Island Interchange is a strategic route that relies on powered technology, such as variable message signs and traffic signals, to allow safe operation of the road. A critical electricity failure could disrupt this technology, resulting in potential casualties and fatalities due to road accidents.	The National Protective Security Authority (NPSA) is the UK's National Technical Authority for physical and personnel protective security, working to make the UK less vulnerable and more resilient to national security threats. The NPSA works closely with industry and Government. Contingency planning is in place in the event of a widespread electricity shutdown occurring. Existing measures are in place to manage this event, and it is therefore not considered further.

Event	Likelihood of occurrence	Consequence of event occurring	Further considerations
Malicious attacks on infrastructure	The NRR probability of a malicious attack on critical infrastructure occurring in the next year is between 25 to 125 in 500. Terrorists in the UK have previously attacked, or planned to attack, national infrastructure; attempts were made to attack electricity substations in the 1990s.	Consequences of an attack on a transport system may include fatalities and physical and / or psychological casualties, damage to property and infrastructure, disruption to essential services, particularly transport, and disruption and negative impact on local, regional and national economy.	The UK has a comprehensive and well-established programme of work to protect its national infrastructure from terrorism and other security threats. The NPSA is the UK's National Technical Authority for physical and personnel protective security. The NPSA works closely with industry and Government. They provide integrated advice on physical and personnel security, which aims to reduce risk and vulnerability to terrorism, espionage and other national security threats. Existing measures are in place to manage this event, and therefore malicious attacks on infrastructure are not considered further in terms of major accidents and disasters.

Event	Likelihood of occurrence	Consequence of event occurring	Further considerations
Heavy snowfall / low temperatures	The NRR probability of low temperatures and heavy snowfall occurring in the next year is between 25 to 125 in 500. Winters are predicted to get milder in the UK due to climate change, potentially reducing the likelihood of this event occurring.	Heavy snowfall can result in serious disruption to the transport network, resulting in road closures and increasing the hazard of vehicle accidents. This has the potential to result in casualties and fatalities. Environmental damage could occur if a crash resulted in discharge of contaminants (e.g. if an oil tanker crashed).	The UK Met Office has a system in place for providing warnings of extreme weather. National Highways and local authorities operate gritting lorries and manage operations for removing snow. These existing mitigation measures reduce the risk of accidents occurring. Although a residual risk remains for an accident to occur, the chance of one resulting in catastrophic damage to human health or the environment is considered unlikely. As such, heavy snowfall and low temperatures have not been considered further in terms of major accidents and disasters.

1.4 Conclusion

1.4.1 The risk assessment concluded that there is one residual risk remaining that would need to be addressed through the design of the Scheme, relating to inland flooding.

1.4.2 Inland floods are partly covered under Chapter 14: Climate of the Environmental Statement (TR010064/APP/6.1) on climate change adaptation, and partly through Chapter 13: Road Drainage and the Water Environment of the Environmental Statement (TR010064/APP/6.1) in terms of reducing future flood risk. Impacts and mitigation associated with these are covered in the respective chapters of the Environmental Statement (TR010064/APP/6.1).

1.4.3 Risks relating to ground hazards, extreme weather, transport accidents, malicious attacks on infrastructure, critical infrastructure failure or industrial accidents could result in environmental impacts if the hazard were to occur. However, these risks are mitigated either through designing to industry or regulatory requirements, or by existing emergency procedures; or are unlikely to result in an event that could reasonably be classed as a ‘major’ accident or disaster. Risk from these hazards were therefore not considered further within the Environmental Statement (TR010064/APP/6.1) but will be considered in terms of future design-development and construction methodology.

Acronyms and initialisms

Acronym or initialism	Term
EIA	Environmental Impact Assessment
HSE	Health and Safety Executive
NRR	National Risk Register
COMAH	Control of Major Accident Hazards
NPSA	National Protective Security Authority

References

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