
Chapter 18

Major Accidents and Disasters

Chapter 18

Major Accidents and Disasters

18.1 Introduction

This Chapter presents the information required to allow the Competent Authority (An Bord Pleanála) to complete an assessment of the proposed Flood Defences West development (the 'proposed development' hereafter) in terms of its potential to cause major accidents and disasters ('MADs' hereafter), and its vulnerability to the negative impacts of same.

18.2 Legislation

Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU ('the EIA Directive' hereafter) mandates the consideration of MADs in EIA.

Article 3 of the EIA Directive requires an assessment of *"the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned"*. Furthermore, Annex IV, Point 8 of the EIA Directive states that the EIAR shall contain:

"... a description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project 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."

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances (the 'Seveso-III Directive' hereafter) is also relevant to this assessment. It aims to prevent and control major accidents involving dangerous industrial substances. The Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. 209/2015) (the 'COMAH Regulations' hereafter) transpose the Seveso-III Directive into Irish law. They set out a suite of legal obligations for operators of industrial establishments where dangerous substances may be present. Such establishments, referred to as 'Seveso sites', are classified as 'upper tier' or 'lower tier' establishments. In Ireland, there are 95 Seveso sites, of which 46 are lower tier establishments and 49 are upper tier establishments. Under Regulation 25 of the COMAH Regulations, Upper Tier Establishments are required to submit certain information regarding their operations to the Health and Safety Authority (HSA). Each Seveso site also has a consultation zone. If a proposed development falls within a consultation zone for a Seveso site, the Applicant in question is required to consult with the HSA in relation to same.

18.3 Guidance Documents

The assessment of impacts in relation to MADs is a relatively new requirement in the context of EIA, and specific national guidelines have not yet been published. In the absence of official guidelines, the following documents have been given due consideration in the preparation of this Chapter:

- De Ville de Goyet, C., Marti, R.Z. & Osorio, C. (2006). Chapter 61: Natural Disaster Mitigation and Relief, in *Disease Control Priorities in Developing*

Countries (2nd Ed.), Eds.: Jamison, D.T., Breman, J.G., Measham, A.R., Alleyne, G., Claeson, M., Evans, D.B., Jha, P., Mills, A. & Musgrove, P. New York: Oxford University Press. ISBN-10: 0-8213-6179-1

- European Commission (2017). *Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)*.
- IEMA (2020). *Major Accidents and Disasters in EIA: A Primer*.
- IEMA (2019). *EIA Quality Mark Article: Major Accidents and Disasters and the Assessment of Significance*.
- IEMA (2018a). *Disasters in EIA*.
- IEMA (2018b). *EIA Quality Mark Article: Risk of Major Accidents and / or Disasters: An NSIP Experience*.
- IEMA (2018c). *EIA Quality Mark Article: Major Accidents and Disasters in EIA*.
- IEMA (2017). *EIA Quality Mark Article: What is this MADness?*
- IPCC (2012). *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. Special Report of Working Groups I and II of the IPCC [Field, C.B., Barros, V., Stocker, T.F., Qin, D., Dokken, D.J., Ebi, K.L., Mastrandrea, M.D., Mach, K.J., Plattner, G.-K., Allen, S.K., Tignor, M. & Midgley, P.M.]. Cambridge, UK and New York, USA: Cambridge University Press.
- UN/ISDR (2004). *Living with Risk: A Global Review of Disaster Reduction Initiatives*. Geneva, Switzerland: UN Publications. ISBN 92-1-101050-0.

18.4 Methodology

18.4.1 Scope

This Chapter presents the information required to allow the Competent Authority to complete an assessment of the significant adverse effects of the proposed development in terms of its potential to cause major accidents and disasters ('MADs' hereafter), and its vulnerability to the negative impacts of potential MADs. In accordance with the IEMA guidelines (IEMA, 2020), it considers whether the associated risks are mitigated to a level that is 'as low as reasonably practicable' (ALARP).

This Chapter differs from the other specialist Chapters of this EIAR in that it does not deal with *likely* effects. Rather, its scope is limited to sudden events of *low likelihood*, which *may conceivably occur*, and which would result in *major negative impacts* on human health, cultural heritage and / or the environment (or events of "*low likelihood but potentially high consequence*" as described by IEMA (2020; p. 13; Plate 18.1). Additionally, the understanding of what constitutes a 'significant' effect or impact in this context must differ from that of other Chapters of the EIAR, which typically apply the standard definitions provided by the EPA draft guidelines (EPA, 2017). As stated in those guidelines, "*Significance' is a concept that can have different meanings for different topics*" (ibid.; p. 50). In relation to MADs, the IEMA guidelines (IEMA, 2020) define a 'significant environmental effect' as one which "*Could include the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration*" (p. 6). This definition has been adopted herein.

As recommended by IEMA (2018a), minor accident risks of relatively low consequence, e.g. localised flooding, have been scoped out of the assessment. Such

events are addressed, where appropriate, in the relevant specialist Chapters of this EIAR.

This Chapter does not deal with the impacts of gradual trends associated with climate change, e.g. sea level rise or increasing annual rainfall volumes. It does, however, address sudden events whose frequency may be increased as a result of climate change related trends, e.g., extreme weather events.

The geographic scope of the assessment shall take in all external features which may present a hazard to the development, even if these are beyond the development boundary.

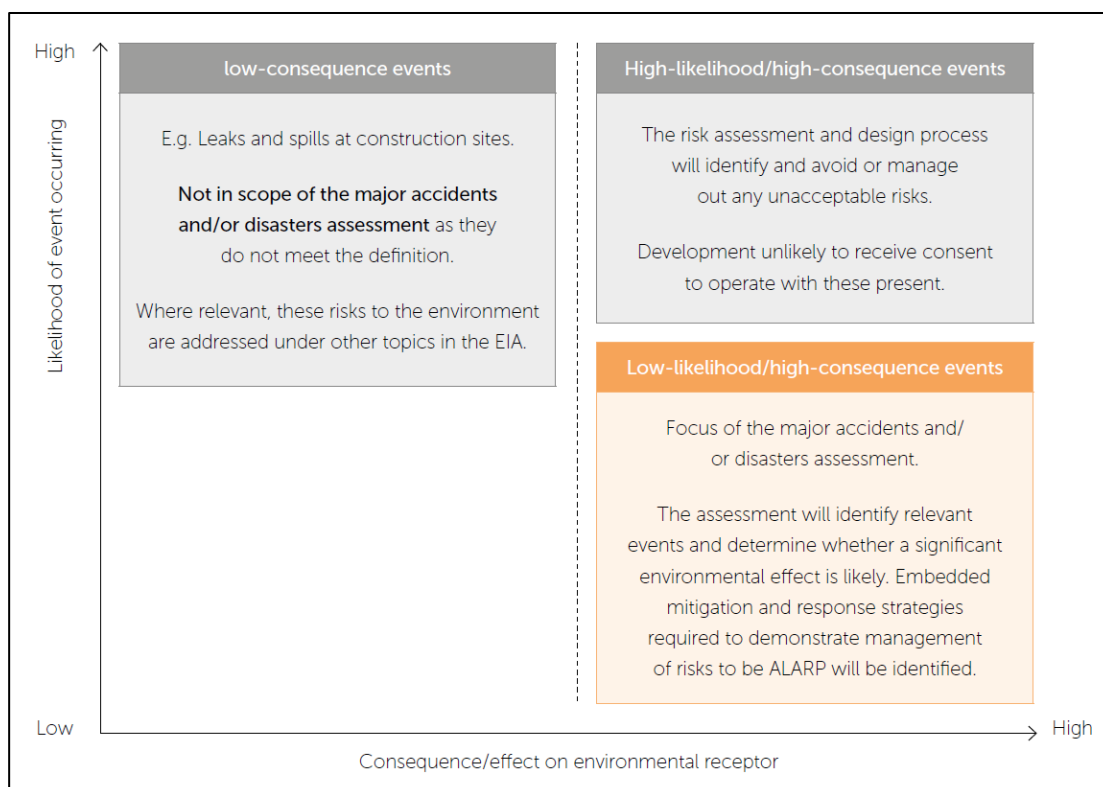


Plate 18.1 Summary of risk events considered in the scope of the impact assessment in relation to MADs (IEMA, 2020)

18.4.2 Definitions

This assessment is based on the following definitions of key concepts, which have been informed by the IEMA (2020), IPCC (2012) and UN/ISDR (2004) definitions, as well as the relevant sections of the EIA Directive.

Hazard

A potentially harmful, sudden event of natural, semi-natural or anthropogenic origin, including latent conditions which may pose future threats; and single, sequential, or combined events.

Receptors

Annex IV, Point 5(d) of the EIA Directive states that *“the risks to human health, cultural heritage or the environment”* [as a result of major accidents and disasters] should be considered. As such, humans, cultural heritage assets and the environment are considered potential receptors herein.

Vulnerability

The propensity of a receptor to be adversely affected by a hazard.

Major Accident / Disaster (MAD)

A hazard to which vulnerable receptors (i.e. humans, cultural heritage and / or the environment) are exposed, resulting in major negative impacts on one or more of these, which requires the use of resources beyond those of the Applicant or its appointed representatives (i.e. Contractors) to manage.

Note: Some sources differentiate between ‘accidents’ and ‘disasters’ as different classes of hazards, e.g. anthropogenic versus natural in origin. This is not necessary for the purposes of this assessment and is not carried out herein.

Risk

Risk = Hazards × Vulnerability. It is the probability of negative impacts on human health and / or cultural heritage and / or the environment as a result of the interaction between a hazard and receptors.

Significant Environmental Effect¹

Effect which could include the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration.

As Low As Reasonably Practicable (ALARP)

ALARP describes the level to which we expect risks to be controlled, i.e. a tolerable level. Whether a risk is ALARP comes down to a qualitative, professional judgement.

18.4.3 Methodology

According to the IEMA guidelines (IEMA, 2020), this assessment will follow a three-stage methodology:

Stage 1 – Screening

The IEMA (2020) guidelines state that “*During screening it should be sufficient to identify if a development has a vulnerability to major accidents and / or disasters and to consider whether a development could lead to a significant effect*” (p. 10). Questions to consider at this stage include the following (adapted from IEMA, 2020):

- Is the proposed development a source of hazard itself that could conceivably result in a major accident and / or disaster occurring?
- Does the proposed development interact with any sources of external hazards that may conceivably make it vulnerable to a major accident and / or disaster?
- If an external major accident and/or disaster occurred, would the existence of the proposed development conceivably increase the risk of a significant effect to an environmental receptor occurring?

Since the proposed development has screened in for mandatory EIA (i.e., is not a sub-threshold development), an EIA Screening Report has not been prepared for same. Accordingly, the screening exercise in respect of MADs is presented herein.

¹ In the context of MADs

Stage 2 – Scoping

If the proposed development is screened in for the assessment of impacts in relation to MADs at Stage 1, the scoping stage aims to determine *in more detail* whether there is potential for significant effects as a result of MADs in relation to the proposed development.

At this stage, various hazard classes are considered in relation to the proposed development. The UK National Risk Register of Civil Emergencies (2017 Edition) has been used as the primary source to identify hazard classes herein. The baseline (i.e., receiving) environment is described insofar as is relevant to the hazard class in question.

IEMA provide a useful infographic illustrating the scoping decision process to aid at this stage (Plate 18.2).

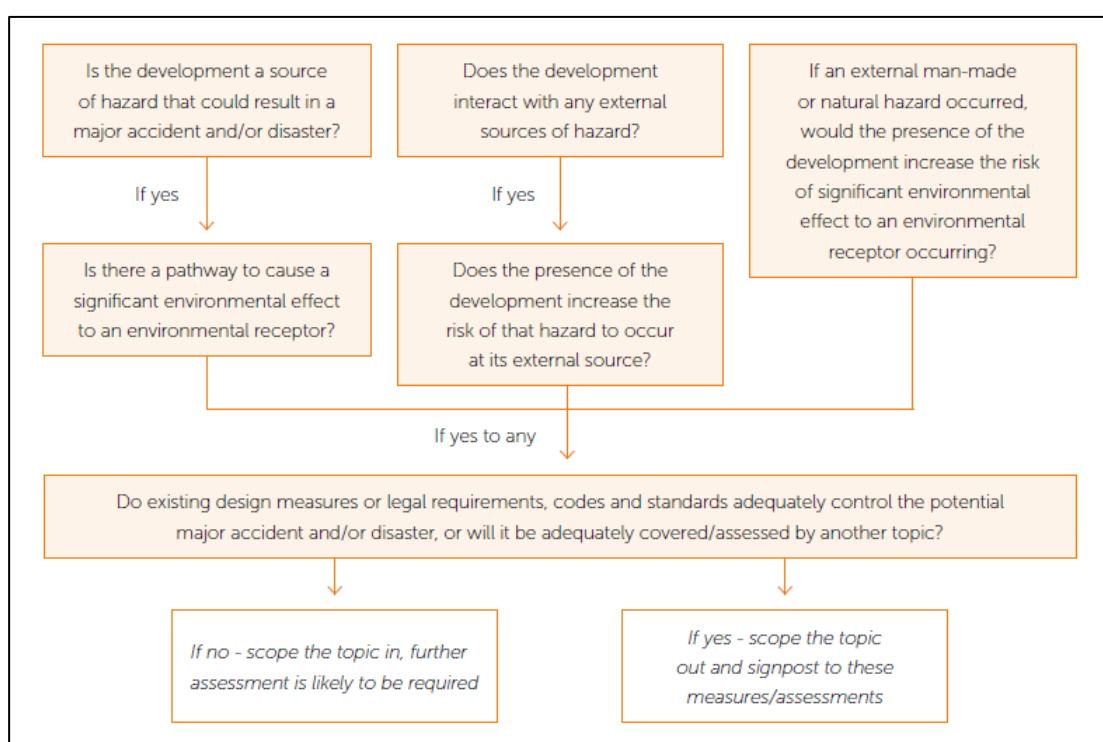


Plate 18.2 Scoping decision process flow (IEMA, 2020)

It is stated that the assessment of impacts in relation to MADs can be scoped out if it can be demonstrated that:

1. *“There is no source-pathway-receptor linkage of a hazard that could trigger a major accident and / or disaster or potential for the scheme to lead to a significant environmental effect; or*
2. *All possible major accidents and / or disasters are adequately covered elsewhere in the assessment or covered by existing design measures or compliance with legislation and best practice.” (IEMA, 2020; p. 12)*

It is pointed out in the IEMA (2020) guidelines that *“A major accidents and / or disasters assessment will be relevant to some developments more than others, and for many developments it is likely to be scoped out of the assessment”* (p. 11).

The EIA Scoping Report for the proposed development did not consider MADs, so this exercise is presented herein.

Stage 3 – Assessment

If hazard class(es) are screened in at Stage 2, they are brought forward to Stage 3 for a detailed consideration of the potential for significant impacts to arise. At this stage, the following exercises are carried out (as per IEMA, 2020):

- The potentially affected receptors are identified with as much specificity as is practicable. If no receptors can be identified, the hazard class in question is excluded from further consideration, since there is no valid source-pathway-receptor linkage.
- The reasonable worst-case impacts on the receptors are identified insofar as possible. This exercise is based on a qualitative, professional judgement. Uncertainty at this stage is to be acknowledged. Hazard classes which are not predicted to result in significant impacts under this reasonable worst-case scenario are excluded from further consideration.

If, after all of the above-stated exercises have been carried out, there remain hazard classes which may potentially give rise to significant effects as a result of the proposed development or interaction with the proposed development, it is considered whether mitigation measures can be incorporated into the design of the proposed development which would mitigate the associated risk level(s) to be ALARP.

18.5 Stage 1 – Screening

It is considered that the proposed development should screen in for the impact assessment in relation to MADs since, on the basis of a preliminary consideration of the proposed development and receiving environment, it is *conceivable* (although highly unlikely) that:

- the proposed development could result in a MAD;
- the proposed development could interact with external sources of hazards that could conceivably make it vulnerable to a MAD; and that
- if an external MAD occurred, the proposed development could conceivably exacerbate the associated risk of significant impacts.

18.6 Stage 2 – Scoping

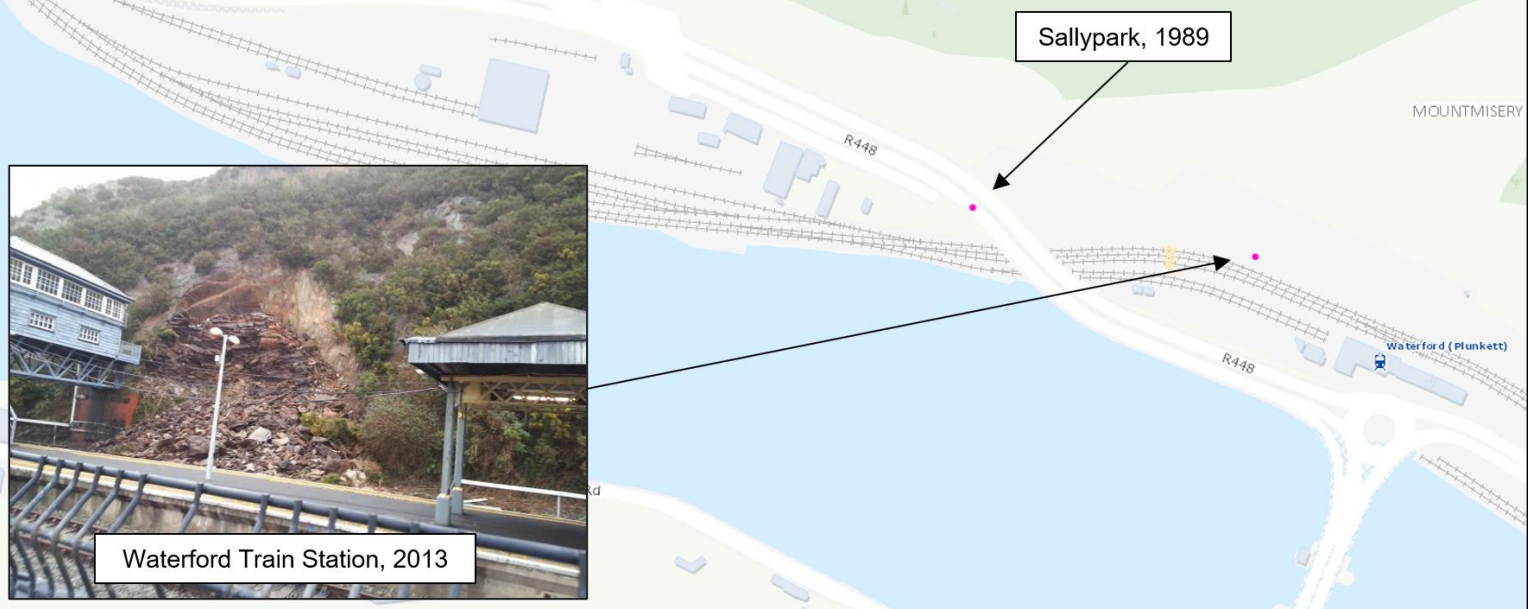
The scoping exercise is documented in Table 18.1.

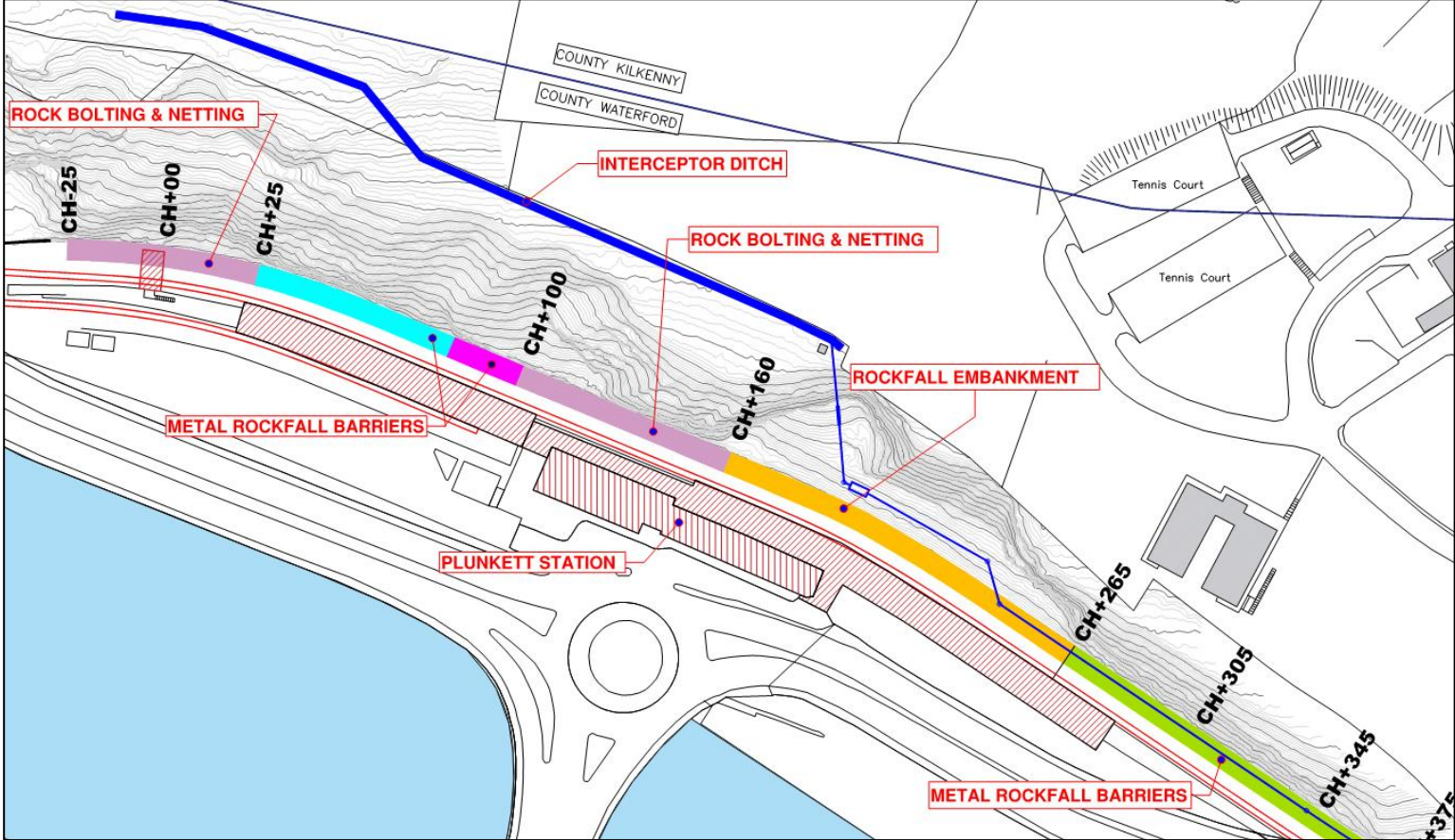
Table 18.1 Stage 2 – Scoping


Class of Hazard	Reason(s) for Scoping Out	Scoped In/Out?
Flooding	Subject addressed in Chapter 10 – Hydrology. Discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out
Storm surges	The proposed development does not have the potential to cause such an event. Flooding at the location of the proposed development (which may occur, in the event of a storm surge) is addressed in Chapter 10 – Hydrology – and is discounted from further consideration herein. Otherwise, the proposed development is not considered especially susceptible to the impacts of such events. Nor is it likely to exacerbate such an event. Discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out
Gale force winds / tornado / cyclone / hurricane / typhoon	The proposed development does not have the potential to cause such an event. Flooding at the location of the proposed development (which may occur, in the event of an extreme wind event) is addressed in Chapter 10 – Hydrology – and is discounted from further consideration herein. Structural damage can occur in the built environment as a result of high wind events (NBS, 2015; Thoman, 1975). However, the proposed development is not considered especially susceptible to such impacts by virtue of its nature or scale / dimensions, and the detailed design of the proposed development will be in accordance with the relevant design codes and standards in order to ensure structural integrity such that the level of risk associated with such an event will be mitigated to a tolerable level. Likelihood of significant impacts ALARP.	Out
Lightning strikes	The proposed development does not have the potential to cause such an event. The detailed design of the proposed development will be in accordance with the relevant design codes and standards in order to ensure structural integrity such that the level of risk associated with such an event will be mitigated to a tolerable level. Likelihood of significant impacts ALARP.	Out
Heatwaves	The proposed development does not have the potential to cause such an event. The proposed development is not particularly susceptible to the negative impacts of such an event. Nor is it likely to exacerbate such an event. Accordingly, it is considered that the design of the proposed development is such that the level of risk associated with such an event will be mitigated to a tolerable level. Likelihood of significant impacts ALARP.	Out
Drought	The proposed development does not have the potential to cause such an event. It is not especially vulnerable to negative impacts as a result of water supply shortages / restrictions. Nor is it likely to exacerbate such an event. Discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out
Extreme cold weather	The proposed development does not have the potential to cause such an event. The detailed design of the proposed development will be in accordance with the relevant codes and standards, including <i>BS EN 1991-1-5:2003 Eurocode 1 – Actions on structures. General actions – Thermal actions</i> , such that the level of risk associated with such an event will be mitigated to a tolerable level. Likelihood of significant impacts ALARP.	Out
Severe snowfall / blizzard / hailstorm	The proposed development does not have the potential to cause such an event. The proposed development is not considered to be vulnerable to negative impacts as a result of severe snowfall events. Nor is it likely to exacerbate such an event, e.g. by increasing the accumulation of snow on the adjacent railway line. Likelihood of significant impacts ALARP.	Out
Volcanic eruption	There is no volcanic activity in Ireland. Indirect impacts (i.e., tsunamis and disruption to air travel) are considered separately below. Subject discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out
Earthquake	The proposed development does not have the potential to cause such an event.	Out

Class of Hazard	Reason(s) for Scoping Out	Scoped In/Out?
	<p>Seismic activity in and around Ireland is typically of low magnitude – although moderately damaging events of higher magnitude do occasionally occur (Blake, 2006). Besides houses, no account could be found of any damage to built infrastructure in Ireland as a result of a seismic event and it is considered that the proposed development is not especially vulnerable to the impacts of seismic activity by virtue of its nature or scale / dimensions. The detailed design of the proposed development will be in accordance with the relevant design codes and standards in order to ensure structural integrity such that the level of risk associated with such an event will be mitigated to a tolerable level. Likelihood of significant impacts ALARP.</p>	
<p>Mass wasting²</p>	<p>The topography immediately north of the location of the proposed flood defences is steeply sloping, and there is exposed rock cutting (south face of Mount Misery hill) to the rear (north) of the train tracks and station which has a history of landslide / rockfall events.</p> <p>According to the Geological Survey of Ireland (GSI) map viewer and desk research previously carried out by ROD under the scope of a Part VIII Planning Report (ROD, 2018), there have been a number of landslide events immediately north of the location of the proposed development:</p> <ul style="list-style-type: none"> • A large rockfall event occurred in the 1950s (date not specified) at the location of the gentler sloping rock face directly opposite the Plunkett Station building. • January 1977 – A rockfall event in which a boulder approximately 0.9 m³ in volume damaged a house near the slopes at Sally Park. • January 1983 – A wedge failure approximately 4 m long, exposing faces at the top of the rock face at a location approximately 25m east of the signal box. • A rockfall event in 1989, which “<i>emanated from the top of a large rock outcrop behind the houses in Sallypark</i>”, displacing a 30 m² area of made ground / debris. The trigger of the Sallypark landslide is identified as exceptional rainfall. • A rockfall event of New Years’ Eve 2013, when an area of exposed rock behind the train station collapsed and was displaced a small distance, burying 20m of the Waterford – Kilkenny train tracks. The trigger for this event is identified as an exceptional rainfall / winter storm event. Irish Rail passenger services were prohibited from using this section of track thereafter due to the risk of further rockfall events. <p>The locations of the two more recent events, from 1989 and 2013, have been logged on the GSI map viewer and are illustrated in Plate 18.3, below.</p> <p>A Part VIII planning application was approved by WCCC in January 2019 to carry out remedial works to the rock cutting in question, in order to reduce the risk of future landslides. These works include rock bolting, netting, drainage measures and rock fall barriers / embankments, as illustrated in Plate 18.4. The Planning Report states that these rock stabilisation measures will “<i>provide a significant positive impact to reduce the risks of landslides</i>” (ROD, 2018, p. 18). It is not clear whether these rock stabilisation measures will address the stability of the slope which was the source of the 1989 Sallypark landslide described above. The GSI record for this event (Plate 18.3) is situated slightly to the west of the extents of the rock stabilisation measures which have been approved. However, a visual inspection of the rock face in question using Google Street View (© 2021) indicates that measures, including rock bolting, have already been applied to this face, which also happens to be located at a further remove from the location of the proposed development (Plate 18.5).</p> <p>This hazard class has been considered in relation to the proposed development by the Soils and Geology specialist who has concluded that the potential for the proposed development to trigger a landslide/rockfall, and the potential for landslide/rockfall to be exacerbated by the proposed development is virtually non-existent, given that the proposed development will not affect the rockfall source area nor it will change the indirect triggering mechanism such as groundwater levels. The likelihood of landslide/rockfall from Mount Misery Hill slope negatively affecting the</p>	<p>Out</p>

² Landslides, rockfalls, debris flows, mudflows, avalanches, soil creep, etc.

Class of Hazard	Reason(s) for Scoping Out	Scoped In/Out?
	<p>proposed development is exceedingly low. This is partly due to large distance between the proposed development and the hazard area (with the exception of short segment of proposed trackside drainage running between Plunkett station and the slope), and partly due to the rock stabilisation works that will be carried out to rock face before the construction of proposed development, under the scope of previously approved Rock Stabilisation project discussed above.</p> <p>Likelihood of significant impacts is ALARP.</p>  <p>Plate 18.3 Records of landslide events in immediate vicinity of proposed development (Map: GSI Map Viewer, 2021; Inset image: The Journal, 2014)</p>	

Class of Hazard	Reason(s) for Scoping Out	Scoped In/Out?
	 <p>Plate 18.4 Overview of rock stabilisation measures approved in 2019</p>	

Class of Hazard	Reason(s) for Scoping Out	Scoped In/Out?
	 <p data-bbox="385 1129 1912 1193">Plate 18.5 Evidence of rock stabilisation measures on rock face associated with 1989 Sallypark landslide. Rock stabilisation measures were carried out in the 1990s.</p>	
Sinkhole	Subject addressed in Chapter 8 – Soils & Geology. Discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out

Class of Hazard	Reason(s) for Scoping Out	Scoped In/Out?
Limnic eruption / venting ³	The proposed development does not have the potential to cause such an event. No lakes in immediate vicinity. Discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out
Tsunami	The proposed development does not have the potential to cause such an event. Extreme waves events do occur in Ireland's marine and coastal waters, although seldom resulting in major impacts (O'Brien <i>et al.</i> , 2013). Future extreme wave events affecting the British Isles are conceivable (Giles, 2020; Ward & Day, 2001). However, as pointed out by O'Brien and co-authors (2013; p. 643), "... these types of events occur very rarely, approximately of the order of thousands of years" and tsunami risk in Ireland is, on the whole, "very low" (ibid; p. 645). Accordingly, this class of hazard is discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out
Major system / utilities / infrastructure failure ⁴	<i>Damage to Existing Utilities Infrastructure</i> Construction works can have the potential to result in damage to existing utilities infrastructure, including underground and overhead lines, if improperly planned and managed. The proposed works will involve the excavation of a shallow underground trench within the car parking area in front of Plunkett Train Station, where there is likely to be a high density of underground utilities as detailed in Chapter 16 Material Assets and Land. However, these works will be carried out in such a way as to ensure there are no impacts on utilities and to ensure the safety of site personnel. Likelihood of significant impacts ALARP. <i>Failure of Proposed Flood Defence Measures</i> As detailed in Chapter 4 – Description of the Proposed Development – the proposed development aims to prevent flooding of critical rail infrastructure including the existing Plunkett Train Station and railway lines to the east and west, and the future Waterford North Quays SDZ Transportation Hub, thereby preventing associated interruptions to transport services. In extreme weather events, surface water and pluvial flooding of the railway line and adjacent road network at the eastern end of the site could occur, with the associated possibility of temporary interruptions to rail service and / or road use. However, as discussed in Chapter 10 Hydrology, the provision of pumping stations within the defended lands will ensure the continued drainage of the subject lands during exceptional flood events within the River Suir. It is considered that the associated impacts (in terms of flooding and journey characteristics for affected persons) would not be of the order of magnitude which would constitute a MAD. Likelihood of significant impacts ALARP.	Out
Major nuclear radiation event ⁵	The proposed development does not have the potential to cause such an event. It is not especially vulnerable to negative impacts as a result of elevated levels of background radiation. Nor is it likely to exacerbate such an event. Discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out
Major disruption of air travel	The proposed development does not have the potential to cause such an event. It would not be affected negatively by a major disruption of air travel. Nor is it likely to exacerbate such an event. Discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out

³ Sudden or gradual liberation of dissolved gases reaching saturation in lake waters, resulting in formation of deadly cloud in low-lying areas (Hirslund, 2020).

⁴ Of electrical supply, communications systems, energy supply, fuel supply, water supply, wastewater drainage and treatment systems, etc.

⁵ As a result of space weather, nuclear arms, accident at nuclear reactor or otherwise.

Class of Hazard	Reason(s) for Scoping Out	Scoped In/Out?
Major air pollution event	Likely significant effects of the proposed development in relation to air quality have been addressed comprehensively in Chapter 13 – Air Quality and Climate. Protocols to be implemented in the unlikely event of a major construction phase pollution incident shall be set out in the Incident Response Plan (IRP), which has been appended to this EIAR in an outline form (see Appendix 4.1 – C) and is to be finalised by the Contractor prior to the commencement of works. The proposed development does not have the potential to cause a major air pollution event of the order of a MAD. The proposed development is not especially vulnerable to such an event or likely to exacerbate such an event. Discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out
Major water pollution event	Potential impacts of the construction and operation of the proposed development in relation to water quality have been addressed comprehensively in Chapter 7 – Biodiversity – and Chapter 10 – Hydrology. Protocols to be implemented in the unlikely event of a major construction phase pollution incident shall be set out in the Incident Response Plan (IRP), which has been appended to this EIAR in outline form (see Appendix 4.1 – C) and is to be finalised by the Contractor prior to the commencement of works. The proposed development is not considered to be particularly vulnerable to the effects of such an event. Nor does it have the potential to exacerbate such an event. It is considered that the design and operational procedure of the proposed development are such that the risk associated with such an event is mitigated to a tolerable level. Likelihood of significant impacts ALARP.	Out
Major explosion / fire	<p>During the construction phase of the proposed development, it is conceivable that an explosion could occur as a result of improper handling / storage of flammable substances. However, as discussed in Chapter 4, the Environmental Operating Plan (and all of its constituent elements and plans, including the IRP) and best practice guidelines will be adhered to during the construction phase such that the level of risk associated with such an event will be mitigated to a tolerable level.</p> <p>It is not outside the realm of possibility that, due to unforeseen circumstances, a major explosion or fire could occur in the vicinity of the proposed development, e.g. as a result of a road traffic accident, rail accident or an accident at a nearby industrial facility. In the unlikely event that such an event was to occur, direct or indirect structural damage of the proposed development would be highly unlikely, considering the nature and scale / dimensions of the proposed development.</p> <p>Likelihood of significant impacts ALARP.</p>	Out
Wildfire	The proposed development does not have the potential to cause such an event. No vegetation which could support wildfire in the immediate vicinity. Discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out
Infectious disease pandemic	The proposed development does not have the potential to cause such an event. It would not be affected negatively by such an event. Nor is it likely to exacerbate such an event. Discounted from further consideration herein. Likelihood of significant impacts ALARP.	Out
Major traffic accident	<p><i>Road Traffic</i></p> <p>Road safety during the construction and operation of the proposed development are addressed in Chapter 4 – Description of the Proposed Development – and in Chapter 5 – Traffic Analysis. Potential associated water pollution events (e.g., due to hydrocarbon spillage from construction traffic or plant) are addressed in Chapter 10 – Hydrology. Potential associated fire / explosion(s) are addressed above. There is the possibility that a traffic accident on the R448, R711 or at the Rice Bridge Roundabout could result in structural damage to adjacent flood defences, necessitating repair works. The likelihood of such an accident occurring while the flood defences in question are holding back significant flood waters is exceedingly low and it is considered that such an event in and of itself would not constitute a MAD. Likelihood of significant impacts ALARP.</p>	Out

Class of Hazard	Reason(s) for Scoping Out	Scoped In/Out?
	<p><i>Rail</i></p> <p>Since the proposed development is to be situated immediately adjacent to an active commuter railway line, there is the potential for rail accidents to occur in the study area. During the construction phase of the proposed development, there are risks associated with site personnel working in close proximity to moving trains. However, these risks will be minimised / avoided during the construction of the landside flood defences with the provision of a temporary fence separating the works from the tracks. During the operational phase, there are risks associated with maintenance personnel working in close proximity to moving trains. These risks to construction site and maintenance personnel are addressed in the IRP which has been appended to this EIAR in outline form (see Appendix 4.1 – C) and is to be finalised by the Contractor prior to the commencement of works.</p> <p>Otherwise, the proposed development does not have the potential to cause a rail accident in and of itself. On the contrary, by preventing flooding of the tracks, the proposed development may be expected to improve the safety of this section of the line. Rail accidents, such as derailments and collisions, are uncommon, with rail being the safest form of land-based transportation in Ireland and the Irish rail network being among the safest in Europe (Irish Rail, 2018). However, accidents do occasionally occur, most commonly at platforms, level crossings and on rail bridges (ibid). In the unlikely event of an unrelated rail accident occurring on the track or at the station adjacent to the proposed flood defences, the proposed development is not expected to exacerbate such an event and is unlikely to be directly affected itself. As stated in Chapter 4 – Description of the Proposed Development – the proposed flood defence walls are situated at a sufficient distance from the adjacent tracks that it is not necessary to design the walls for horizontal impact loading as a result of train derailment, in accordance with Irish Rail standards. On the basis of this statement, it is assumed that, in the unlikely event of derailment, impact with the proposed development will not occur.</p> <p>Likelihood of significant impacts ALARP.</p>	
Major industrial accident	<p>Of the Seveso Sites listed on the HSA website, three are situated within 10km of the proposed development; one of which is an upper tier establishment and the other two of which are lower tier establishments (Table 18.2). On the 19th of February 2021, the Health and Safety Authority (HSA) were consulted, and it was confirmed that the location of the proposed development does not fall within the consultation distances of any of the sites in question (Table 18.2). Accordingly, no consultation with any of the operators is required.</p> <p>The proposed development does not have the potential to cause a major accident / disaster at a Seveso site or any other industrial facility in the vicinity. Regarding the potential release of harmful substances from a Seveso site or other industrial facility, the proposed development is not considered to be especially vulnerable to such an event. Nor is the proposed development likely to exacerbate such an event. Likelihood of significant impacts ALARP.</p>	Out
Building collapse	<p>The proposed development does not include any buildings and does not have the potential to cause such an event. It is not especially vulnerable to such an event or likely to exacerbate such an event. Discounted from further consideration herein. Likelihood of significant impacts ALARP.</p>	Out
Major public disorder	<p>The proposed development does not have the potential to cause such an event. It is not especially vulnerable to such an event or likely to exacerbate the unrelated occurrence of such an event. Discounted from further consideration herein. Likelihood of significant impacts ALARP.</p>	Out
Physical attack	<p>The proposed development does not have the potential to cause such an event. It is not likely to be targeted for such an event, or to exacerbate the unrelated occurrence of such an event. Discounted from further consideration herein. Likelihood of significant impacts ALARP.</p>	Out
Cyber attack	<p>The proposed development does not have the potential to cause such an event. It is not likely to be targeted for such an event, or to exacerbate the unrelated occurrence of such an event. Discounted from further consideration herein. Likelihood of significant impacts ALARP.</p>	Out

Table 18.2 Seveso Sites within 10km of the Proposed Development (HSA 2020a; 2020b; 2020c)

* Linear distance from location of proposed development to the nearest 0.5 km, based on Google Maps (© 2021) search.

Tier	Site	Classes of Dangerous Substances	Characteristics of Dangerous Substances	Approx. Distance*	Consultation Distance
Upper	<u>Trans-Stock Warehousing and Cold Storage Ltd</u> Christendom, Ferrybank, Co. Waterford	E1 Hazardous to the Aquatic Environment E2 Hazardous to the Aquatic Environment H1 Acute Toxic Cat. 1 P5a Flammable Liquids P5c Flammable Liquids Ammonia Petroleum Products (Kerosene)	H226 Flammable liquid and vapour H330 Fatal if inhaled H400 Very toxic to aquatic life H410 Very toxic to aquatic life with long lasting effects H411 Toxic to aquatic life with long lasting effects	1.5 km	700m
Lower	<u>SSE Generation Ireland Ltd</u> Great Island Generating Station, Campile, New Ross, Co. Wexford	Hydrogen	H220 Extremely flammable gas H280 Contains gas under pressure; may explode if heated	8.5 km	300m
	<u>Stafford Wholesale Ltd</u> Lockheed Avenue, Airport Business Park, Co. Waterford	P5c Flammable Liquids	H225 Highly flammable liquid and vapour	9.5 km	300m

18.7 Stage 3 – Assessment

Not applicable.

18.8 Mitigation Measures

Not applicable.

18.9 Residual Impacts

Not applicable.

18.10 Difficulties Encountered

No particular difficulties were encountered in the compilation of the information presented herein.

18.11 Conclusion

It is the conclusion of this assessment that there are no risks of MADs associated with the proposed development which are not already mitigated to levels that are ALARP through the design and / or proposed operational procedures of the proposed development. As such, no mitigation measures beyond that which is already proposed under the scope of the design and proposed operational procedures of the proposed development, are required in relation to MADs. No consultation or mitigation measures are required in relation to Seveso Sites.

18.12 References

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