

19 RISK MANAGEMENT (MAJOR ACCIDENTS AND DISASTERS)

19.1 Introduction

This chapter describes the proposed development in respect of its potential vulnerability to major accidents / disasters, and its potential to give rise to the same.

The assessment is carried out in compliance with the EIA Directive on the assessment of the effects of certain public and private projects on the environment that entered into force on 16 May 2017 which states the need to assess: -

“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”

The underlying objective of this assessment is to ensure that appropriate precautionary actions are taken for those projects which *“because of their vulnerability to major accidents and/or natural disasters, are likely to have significant adverse effects on the environment.”*

19.2 Assessment Methodology

The scope and methodology of this assessment is centred on the understanding that the proposed development will be designed, built and operated in line with best international current practice. As such, major accidents resulting from the proposed development would be very unlikely.

The scope and methodology presented in the following sections are based on the provisions of the EIA Directive, the draft EPA Guidelines, EU Commission guidance, as well as professional judgement.

A risk analysis-based methodology that covers the identification, likelihood and consequence of major accidents and/or disasters has been used for this assessment (Refer to Section 16.5 for further detail on this approach).

The assessment of the risk of major accidents and/or disasters considers all factors defined in the EIA Directive that have been considered in this EIAR, i.e. population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and the landscape.

19.2.1 Guidance and Legislation

19.2.1.1 Legislative Requirements

The following paragraphs set out the requirements of the EIA Directive in relation to major accidents and / or disasters.

Recital 15 of the EIA Directive states that: -

“In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment. In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU of the European Parliament and the Council and Council Directive 2009/71/Euratom, or through relevant assessments carried out pursuant to national legislation provided that the requirements of this Directive are met.”

It is clear from the EIA Directive that a major accident and/or disaster assessment is most readily applied to 'Control of Major Accident Hazards involving Dangerous Substances' (COMAH) sites or major industrial/energy installations. Notwithstanding, the assessment of major accidents and disasters for the proposed development has been carried out for completeness given the strategic nature of the proposed development.

Article 3 of the EIA Directive requires that the EIAR shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and landscape deriving from (amongst other things) the “*vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned*”.

The information relevant to major accidents and/or disasters to be included in the EIAR is set out in Section 8 of Annex IV of the EIA Directive as follows: -

“(8) 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. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. 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.”

19.2.1.2 Guidance Documents

A number of guidance documents and published plans have been reviewed and considered in order to inform this assessment, as described in the following sections.

- European Commission - Environmental Impact Assessment of Projects- Guidance on the preparation of the Environmental Impact Assessment Report (2017).
- Draft EPA Guidelines (2017).
- Guidance on Assessing and Costing Environmental Liabilities (2014).
- A Framework for Major Emergency Management Guidance Document 1-A Guide to Risk Assessment in Major Emergency Management (2010).
- A National Risk Assessment for Ireland 2017 (2017).
- A Guide to Risk Assessment in Major Emergency Management (2010).

19.3 Receiving Environment

The proposed development comprises two residentially zoned sites and is set out in 3no. Character Areas on a greenfield site to the east of Dunshaughlin. The applicant’s overall landholding is c. 18.8 ha, Phase 2 plans are for the remaining section of the lands which are undeveloped. The lands are irregularly shaped and comprise two distinct sites that are bisected by the Dunshaughlin Link Road and Drumree road. The greenfield lands have a total area of c 14.8 ha with gradual fall gently in topography from north to south.

The application site is largely zoned for A2 – New Residential the objective of which is “*to provide for new residential communities with ancillary community facilities, neighbourhood facilities and employment uses as considered appropriate for the status of the centre in the Settlement Hierarchy.*” Residential use is acceptable in principal.

The remainder of the lands are zone F1 – Open Space the objective of which is to “*to provide for and improve open spaces for active and passive recreational amenities.*”

Areas 3 & 4 (c. 8.47 Ha) are generally bounded to the east by the existing Dunshaughlin Link Road, to the south and east by lands zoned for open space, to the north by Phase 1 lands (currently under construction by the Applicant) and lands identified for neighbourhood centre use which will ultimately accommodate a local centre providing local convenience and service uses.

Character Area 6 (c. 3.75 Ha) comprises a greenfield site which lies north of Drumree Road and to the west of the Dunshaughlin Link Road. A single private dwelling adjoins the subject site along the south eastern boundary.

The application site is located within close proximity to Dunshaughlin Town Centre lies c. 1 km to east of the site and all the associated amenities supermarkets, restaurants, pharmacies, schools and sports facilities, childcare facilities, primary health centre, and library are within walking distance.

The lands are serviced by a frequent, high quality bus network which connect Navan and Cavan to Dublin City Centre and Belfield (UCD). The 109 and 109B bus routes provide frequent services to Busaras in Dublin city centre (approx. every 20-30 minutes on weekdays). The subject lands are approximately a 10 minute drive from M3 Parkway (PACE) Railway Station and its park and ride facility which provides direct links to Dublin City Centre. A quality Bus Corridor has been provided along the R147 on the approach to Dunshaughlin Town.

The subject lands are served with significant road infrastructure with an exceptional road network containing the Dunshaughlin Link Road to the M3 Motorway, and potential future cycle and pedestrian links which have been initiated in the Phase 1 development (currently under construction and is largely occupied). The Skane Greenway which is incorporated into Phase 1 has the potential to directly connect the subject lands to Dunshaughlin Main Street. Dunshaughlin GAA and Basketball Club is located immediately to the north-east of the subject lands and a wide range of community facilities and amenities of Dunshaughlin Town Centre are also a short walk away – i.e. within 1km distance.

The site is not within an Architectural Conservation Area (ACA), zone of archaeological interest and does not contain any Protected Structures or Sites of Archaeological Interest.

19.4 Characteristics of the Proposed Development

In summary, the proposed Strategic Housing Development broadly comprises: -

- 415no. residential units (254no. houses, 55no. duplex and 106no. apartments) in buildings ranging in height from 2 to 5-storeys.
- 1no. childcare facility (c. 409 sq. m gross floor area).
- Provision of access from Drumree Road (Character Area 6) and Dunshaughlin Link Road – R125 (Character Areas 3 & 4) and provision of internal road network including pedestrian and cycle links.
- Provision of public open space including facilitation of planned pedestrian and cyclist connection along River Skane Greenway toward Dunshaughlin Town Centre.
- Provision of wastewater infrastructure including connections to main sewers on Drumree Road and to foul networks in permitted Phase 1 development and provision of SuDS infrastructure.
- All associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works.

A full project description is provided in Chapter 3: Description of Proposed Development.

19.5 Potential Impact of the Proposed Development

19.5.1 Proposed Development

As discussed above, the scope and methodology of this assessment is centred on the understanding that the proposed development would be designed, built and operated in line with best international current practice and, as such, the vulnerability of the proposed development to risks of major accidents and / or disasters is considered low.

Current EIA practice already includes an assessment of some potential accidents and disaster scenarios such as pollution incidents to ground and watercourses as well as assessment of flooding events. These are described in detail in the relevant EIAR assessment Chapters (refer to Chapter 8: Water and Chapter 7: Land, Soil and Geology for further detail).

19.5.1.1 Site Specific Risk Assessment

A site-specific risk assessment identifies and quantifies risks focusing on: unplanned, but possible and plausible events occurring during the construction and operation of the proposed development. The approach to identifying and quantifying risks associated with the proposed development by means of a site-specific risk assessment is derived from the EPA guidance.

The criteria for categorising impact is derived from the DoEHLG guidance (Refer to below tables).

The following steps were undertaken as part of the site-specific risk assessment: -

- Risk identification.
- Risk classification, likelihood and consequence.
- Risk evaluation.

Risk Identification

The identification of plausible risks has been carried out in consultation with relevant specialists. A Risk Register which was prepared during the design of the proposed development was also reviewed in order to inform the identification of risks for this assessment. The identification of risks has focused on non-standard but plausible incidents that could occur at the proposed development during construction and operation.

In accordance with the European Commission Guidance risks are identified in respect of the developments: -

- 1) Potential vulnerability to disaster risks.
- 2) Potential to cause accidents and / or disasters.

Risk Classification

Having identified the potential risks, the likelihood of occurrence of each risk has been assessed. An analysis of safety procedures and proposed environmental controls was considered when estimating likelihood of identified potential risks occurring. Table 19.1 defines the likelihood ratings that have been applied.

The approach adopted has assumed a 'risk likelihood' where one or more aspects of the likelihood description are met, i.e. any risk to the proposed development less than extremely unlikely to occur has been excluded from the assessment. The likelihood rating assigned to each risk has assumed that all proposed mitigation measures and/or safety procedures are in place and have succeeded in reducing or preventing the major accident and/or disaster occurring.

Rating	Classification	Effect Description
1	Extremely Unlikely	May occur only in exceptional circumstances; once every 500 or more years.
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communities; and / or little opportunity, reason or means to occur. May occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisations worldwide; some opportunity, reason or means to occur; May occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years.
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Table 19.1: Risk Classification Table – Likelihood.

Classification of Consequence

The consequence rating assigned to each risk has assumed that all proposed mitigation measures and / or safety procedures have failed to prevent the major accident and / or disaster occurring. The consequence of the impact if the event occurs has been assigned as described in Table 19.2.

The consequence of a risk to the proposed development has been determined where one or more aspects of the consequence description are met, i.e. risks that have no consequence have been excluded from the assessment.

Ranking	Consequence	Impact	Description
1	Minor	Life, Health, Welfare Environment Infrastructure Social	Small number of people affected; no fatalities and small number of minor injuries with first aid treatment. No contamination, localised effects <€0.5M. Minor localised disruption to community services or infrastructure (<6 hours).
2	Limited	Life, Health, Welfare Environment Infrastructure Social	Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements. Simple contamination, localised effects of short duration €0.5-3M Normal community functioning with some inconvenience.
3	Serious	Life, Health, Welfare Environment Infrastructure Social	Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated.

Ranking	Consequence	Impact	Description
			External resources required for personal support. Simple contamination, widespread effects or extended duration. €3-10M. Community only partially functioning, some services available.
4	Very Serious	Life, Health, Welfare Environment Infrastructure Social	5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated. Heavy contamination, localised effects or extended duration €10-25M. Community functioning poorly, minimal services available.
5	Catastrophic	Life, Health, Welfare Environment Infrastructure Social	Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated. Very heavy contamination, widespread effects of extended duration >€25M. Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.

Table 19.2: Risk Classification Table – Likelihood.

Risk Evaluation

In accordance with the DoEHLG 2010 Guidelines, the evaluated major accidents and natural disasters (MANDs) will be subject to a risk matrix to determine the level of significance of each risk for each scenario. These have been grouped according to 3 categories: -

- High Risk**

Scenarios that have an evaluation score of 12 – 25, as indicated by the Red Zones in Table 19.3.
- Medium Risk**

Scenarios that have an evaluation score of 8 – 11 as indicated by the Amber Zone in Table 19.3.
- Low Risk**

Scenarios that have an evaluation score 1 – 7, of as indicated by the Green Zones in Table 19.3.

Likelihood	5 – V. Likely					
	4 – Likely					
	3 – Unlikely					
	2 – V. Unlikely					
	Ext. Unlikely					
		1 Minor	2 – Limited	3 Serious	4 – V. Serious	5 – Catastrophic
Consequence of Impact						

Table 19.3: Levels of Significance

Significant effects resulting from MANDs are adverse effects that are described as ‘Significant’, ‘Very Significant’ or ‘Profound’ under the Draft EPA Guidelines (2017) and Volume 2, Section 2: The EIA Process of this report. Consequently, MANDs that fall within Amber or Red Zones (‘Medium’ or ‘High’ Risk Scenarios) are brought forward for further consideration and assessment for further mitigation.

19.5.1.2 Construction Stage

Risk ID	Potential Risk	Possible Cause	Requirement for further assessment?
Potential Vulnerability to Accidents and / or Disasters			
A	Flooding of site, from the River Skane, surface water, groundwater.	Proximity to River Skane. Extreme weather- periods of heavy rainfall, taking into account climate change, strong winds and tidal events	No. The site is not at risk of flooding. The proposed development will have no impact on floodplain storage and conveyance and will also not increase flood risk off site during construction. Earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe run-off and prevent ponding and flooding. Refer to findings of the Flood Risk Assessment, prepared by Waterman Moylan Consulting Engineers for the proposed development.
Potential to cause major accidents and / or disasters			
B	Fire / Explosion	<ul style="list-style-type: none"> Damage to unmapped services / utilities during earth works. Vehicle and vehicle collision. 	No. The construction phase of the proposed development will be carried out in accordance with all relevant health and safety guidance and legislation, as well as the provisions of the Construction Management Plan, prepared by Waterman Moylan Consulting Engineers.
C	Unplanned outages / disruption to services	Damage to unmapped services / utilities during earth works.	No. Disruption to services not considered to constitute a ‘major accident or disaster’ for the purposes of this assessment.
D	Road traffic accidents resulting from construction phase traffic or temporary construction traffic management measures.	<ul style="list-style-type: none"> Driver error. Object on road. Failure of vehicle control systems. Public confusion. 	No. The construction phase of the proposed development will be carried out in accordance with all relevant health and safety guidance and legislation, as well as the provisions of the Construction Management Plan, prepared by Waterman Moylan Consulting Engineers.
E	Contamination of the groundwater / surface water.	Construction phase spills or leakages.	No. The construction phase of the proposed development will be carried out in accordance with construction best-practise and provisions of the Construction Management Plan, prepared by Waterman Moylan Consulting Engineers.

Risk ID	Potential Risk	Possible Cause	Requirement for further assessment?
F	Falling debris from construction vehicles / cranes or cranes striking rail overhead cables or poles	<ul style="list-style-type: none"> Inadequate securing. Overloading of vehicles. 	<p>No.</p> <p>The construction phase of the proposed development will be carried out in accordance with construction best-practise and provisions of the Construction Management Plan, prepared by Waterman Moylan Consulting Engineers.</p>
G	Release of asbestos fibres to atmosphere or surface water	<ul style="list-style-type: none"> Inadequate handling and removal of Asbestos Containing Materials (ACMs). Removal of un-surveyed ACM. 	<p>No.</p> <p>No demolition of structures containing asbestos is proposed as part of this development.</p> <p>The construction phase of the proposed development will be carried out in accordance with construction best-practise and provisions of the Construction Management Plan, prepared by Waterman Moylan Consulting Engineers.</p>

Table 19.4: Risk Register – Construction Stage.

None of the potential construction phase risks considered have been identified as requiring further assessment.

19.5.1.3 Operational Stage

Risk ID	Potential Risk	Possible cause	Requirement for further assessment?
Potential Vulnerability to Disaster Risks			
H	Flooding of site	Extreme weather – periods of heavy rainfall, taking into account climate change, strong winds and tidal events.	<p>No.</p> <p>The site is not at risk of flooding. The proposed development will have no impact on floodplain storage and conveyance. The likelihood of flooding is further minimised with adequate sizing of the on-site surface network and SuDS measures. Finished floor levels of the residential units are also raised 2.18m above the relative Top Water Level.</p> <p>Refer to findings of the Flood Risk Assessment prepared by Waterman Moylan Consulting Engineers for the proposed development.</p>
I	Incident at nearby SEVESO site resulting in off-site environmental impact	<ul style="list-style-type: none"> Fire / Explosion. Equipment / Infrastructure failure. 	<p>No.</p> <p>A “consultation distance” is very broadly defined under Regulation 2 of the COMAH Regulations as “a distance or area relating to an establishment, within which there are potentially significant consequences for human health or the environment from a major accident at the establishment. The consultation distance for some types of COMAH facility ranges from 300m for establishments where the risk is from flammable non-pressurised materials, to 1 km for establishments where chemical processing involving flammable or toxic substances takes</p>

Risk ID	Potential Risk	Possible cause	Requirement for further assessment?
			place, to 2km for establishments with bulk storage of pressurised or toxic substances, triggering an obligation on the Planning Authority to notify the HSA.” There are no COMAH sites within 15km of the proposed development site.
Potential to Cause Accidents and / or Disasters			
J	Fire / Explosion	<ul style="list-style-type: none"> Equipment or infrastructure failure. Act of terrorism. Electrical problems. 	No. The proposed development will be designed, built and operated in line with best international current practice, and will be compliant with all relevant Health and Safety and Fire regulation and guidance.
K	Collision of Aircraft	<ul style="list-style-type: none"> Failure of air traffic control systems Act of terrorism 	No. The proposed development does not include buildings in excess of 5 storeys. There are no active airfields or airports within 15km of the site.
M	Vehicle collisions on site	<ul style="list-style-type: none"> Public negligence. Failure of vehicular operations. 	No. The internal road network and car parking areas have been subject to a Road Safety Audit. Private car use is also minimised by a reduced car parking provision and ready access to high quality public transport. Further, individual accidents / incidents are not considered to constitute a ‘major accident / disaster’ for the purposes of this assessment.

Table 19.5: Risk Register – Operational Stage.

None of the potential operation phase risks considered have been identified as requiring further assessment.

19.5.1.4 Risk Assessment

Having regard for Section 19.5.1.2 and 19.5.1.3 above, neither the construction phase or the operation phase risk have been identified as requiring further assessment. Therefore, a risk assessment is not required.

19.5.1.5 Do-Nothing Impact

In the event that the proposed development does not proceed, the site would remain in its current undeveloped, greenfield state. In absence of an increased number of people residing, working or visiting the site, there would be no increase in the risk of major accidents occurring due to human interaction, should a disaster take place.

19.5.1.6 Construction Stage

None of the potential risks to be noted during the construction phase were identified as requiring further assessment.

19.5.1.7 Operational stage

None of the potential risks to be noted during the construction phase were identified as requiring further assessment.

19.5.2 Cumulative

As outlined in sections 19.5.1.6 and 19.5.1.7 above, no likely risks of a major accident / disaster occurring are identified during construction stage. A medium risk of major accident / disaster in respect of the proposed development during the operational phase. No cumulative effects are identified.

19.6 Mitigation Measures (Ameliorative, Remedial or Reductive Measures)

19.6.1 Rating of Major Accidents and Disasters without Mitigation

19.6.1.1 Construction Phase

The mitigation measures relevant to each environmental factor outlined in chapters 5 – 18 of the EIAR, as well as in the CMP, will be implemented during the construction phase of the development and will collectively mitigate the risk of major accidents and disasters during this time.

The construction phase of the proposed development will be carried out in accordance with best practice site management measures relating to health and safety and emergency response. These measures are described in the CMP.

19.6.1.2 Operational Stage

No mitigation or monitoring measures are proposed specific to reducing the risk of major accident / disaster during operation.

19.7 Residual Impact of the Proposed Development

The risk of a major accident and / or disaster during the construction phase of the proposed development is considered low.

The risk of a major accident and /or disaster during the operational phase of the proposed development is considered medium.

19.8 Monitoring

No monitoring associated with risks of major accidents and / or disaster is proposed during construction or operational phases

19.9 Reinstatement

No reinstatement measures are necessary during the construction or operational phases of this development.

19.10 Difficulties Encountered

No difficulties were encountered during the assessment process.