

13.0 RISK MANAGEMENT

13.1 INTRODUCTION

This chapter of the EIAR was prepared by Niall Byrne, B.Sc. (Hons), M.Sc, MRTPI, MIPI, Associate Director, in consultation with the wider design team and reference to other chapters of the EIAR. The chapter has been reviewed by Paul Turley, BA, MRUP, Dip Environmental & Planning Law, MIPI, Executive Director with John Spain Associates.

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIAR and has included 'Risk Management' as a new chapter to be addressed. Article 3 of the new EIA Directive requires that the EIA 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 chapter identifies and assesses the likelihood and potential significant adverse impacts on the environment arising from the vulnerability of the proposed development to risks of major accidents and / or natural disasters. It considers whether the proposed development is likely to cause accidents and / or disasters and its vulnerability to them. This chapter has been prepared by the design team including Garlands, RKD and John Spain Associates.

The purpose of the chapter is to ensure that the safety and precautionary measures necessary to protect the proposed development in the event of a major accident and / or natural disaster are identified and that appropriate mitigation measures are provided that would protect the environment in the event of such occurrences.

This chapter will identify the types of major accidents / natural disasters that the project is vulnerable to; whether major accidents or natural disasters and the responses to these give rise to significant adverse environmental impacts; the nature of these impacts and the measures needed to prevent or mitigate the likely adverse impact of such events on the environment.

13.2 STUDY METHODOLOGY

The starting point for the scope and methodology of this assessment is that the proposed development has been designed and will be constructed in line with best practice and, as such, major accidents and / or natural disasters will be very unlikely. The identification, control, and management of risk is an integral part of the design and assessment process throughout all stages of a project lifecycle. For example, a Flood Risk Assessment was carried out. Measures to control risks associated with Construction Phase activities are incorporated into the Construction Environmental Management Plan.

The following sections set out the requirements as stated in the new EIA Directive and in the EPA draft Guidelines on the information to be contained in an Environmental Impact Assessment Report (EIAR). The scope and methodology presented is based on the new EIA Directive, the draft EPA guidelines, on other published risk assessment and on professional judgement of the consultants with this responsibility in the construction and operation of the proposed development. A risk analysis-based approach methodology which covers the identification, likelihood and consequence of major accidents and / or natural disasters has been used for the assessment. This type of risk assessment approach is an accepted methodology.

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 Council¹ and Council Directive 2009/71/Euratom², or through relevant assessments carried out pursuant to national legislation provided that the requirements of this Directive are met’.

The intent of the directive is that a major accident and/or natural disaster assessment should be mainly applied to COMAH (Control of Major Accident Hazards involving Dangerous Substances) sites or nuclear installations. The proposed development in this instance is an urban regeneration project (primarily residential development) in Kildare Town which when completed, will not give rise to ongoing significant risks in its operating environment.

The 2017 EPA Draft Guidelines on the information to be contained in an EIAR refer to major accidents and/or disasters in a number of sections:

Characteristics of the Project – the draft guidelines state that the project characteristics should “a description of the Risk of Accidents – having regard to substances or technologies used.”

Impact assessment - the draft guidelines state that the impact assessment should include “the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)”.

Likelihood of Impacts - the draft guidelines state the following:

“To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other regulations e.g. a COMAH assessment.”

There are also a number of mechanisms which currently manage accidents outside of the EIA process. These would include through the Construction Environmental Management Plan, which would deal with pollution risks during construction (See Chapters 8, 9 and 10 on Land, Soils, Water and Air) and risk of accidents during construction, including traffic accidents (see separate CEMP). The risk of flooding is dealt with in Chapter 9; Water and in the accompanying Flood Risk Assessment (FRA).

The FRA concluded that based on all information reviewed relating to flood risk, the site is located within a Flood Zone C (low risk) for all sources of flood risk (i.e. fluvial flood risk, pluvial/storm water flood risk and groundwater flood risk).

Separately, the risk of fire is managed through the Fire Safety Certification process, which is an integral part of the design of the proposed development.

13.3 SITE SPECIFIC RISK ASSESSMENT METHODOLOGY

This section identifies the potential of unplanned but potential events that could occur during construction and operation of the proposed development.

Risks are set out according to the classification of risk, taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010), as follows:

Table 13.1 Risk Classification

Table 2 - Classification of Likelihood

Ranking	Classification	Likelihood
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 communicates; 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.

13.2.1 Hazard identification

The site is not in an area prone to natural disasters. Risks were reviewed through the identification of plausible risks in consultation with relevant specialists. Therefore the risks set out below are considered the most relevant potential risks.

Table 13.2 Risk Likelihood

Category	Risk Factor Type	Likelihood
Weather	Storms, snow	5
Hydrological	Risk from flooding	1
Geological	Made ground	3
Road	Traffic accident	3
Industrial accident	Not proximate to Seveso site	1
Explosion	Natural gas	1
Fire	Construction and operation	3

Building Collapse	Structural failure	5
Hazardous substance escape	Construction	3
Pollution	Construction	3

The risks are then tested in terms of consequences. It should be noted that when categorising the Consequence Rating, the rating assigned assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster. In addition, Dublin City Council have in place a 'Major Emergency Plan' which, if implemented as intended, will work to reduce the effect of any major accident or disaster.

The impact ratings are taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010).

A risk matrix can be prepared against which the proposed development can be tested.

Table 13.3 Risk Matrix

Likelihood Rating	Very likely	5					
	Likely	4					
	Unlikely	3					
	Very unlikely	2					
	Extremely Unlikely	1					
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
			Consequence Rating				

13.4 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

13.4.1 Likely Significant Effects

13.4.1.1 Do Nothing Scenario

In the do-nothing scenario, the potential risk of the proposed development causing, or being affected by a disaster and / or accident would be low.

13.4.1.2 Construction Phase

It is considered that the main risks associated with the proposed development will arise during the construction phase. The proposed development will involve the demolition of buildings contained within red-line boundary, and demolition of existing hard-standings. The proposal also includes excavations for a basement level.

The application includes a CEMP which will be managed and updated in advance of and throughout the construction phase as required by the appointed Main Contractor.

13.4.2 Operational Phase

The proposed development is a mixed-use development consisting of the construction of 375 no. residential units, a neighbourhood centre comprising of 3 no. single-storey retail units, a café (including gallery / exhibition area at mezzanine level), a two-storey childcare facility and associated play area, all internal roads, car parking, pedestrian and cycle paths, public open space, and all associated site and infrastructural works on an application site of c. 11.35 ha.

The main risk identified during operation is the risk of fire. The proposed uses are considered normal hazard fire risks as would be encountered in most developments and do not include any hazards which would be regarded as presenting an exceptional environmental fire hazard.

All storage facilities in the commercial units are subject to design and detail of a valid fire safety certificate.

The fire risk mitigation for the project will comprise all fire safety measures necessary to comply with the requirements of Part B (Fire) of the Second Schedule to the Building Regulations 1997-2017.

13.5 PREDICTED IMPACTS - RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

A Risk Register has been developed which contains the main risks identified with the construction and operation of the Proposed Project. These have been identified as follows:

Table 13.4: Risk Register

Risk No.	Risk Event	Possible Cause
1	Accidents during construction	Traffic accident Working at height Risk of fire Groundwater pollution
2	Fire following occupation	Inappropriate use of electrical devices / cooking etc.
3	Falls	Window cleaning Falls from roofs

13.6 RISK ANALYSIS

Following identification of risks, the next stage is to analyse how likely this is to occur and the consequences, should the risk arise. This will provide a risk score, i.e. the consequences versus the likelihood of the event taking place.

Table 13.5: Risk Analysis

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score
1a	Accidents during construction	Movement of vehicles	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1b		Manual handling	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1c		Slips or falls	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1d		Ground water pollution	Impact on aquatic life, illness	1	The EIAR concludes that the overall impact on groundwater will be imperceptible provided sufficient mitigation measures are in place.	3	Could result in environmental pollution	3
2a	Fire following occupation	Electrical equipment / cooking	Injury or loss of life	1	Causes of fire statistics	3	Could result in loss of life	3
2b	Falls	Loss of balance	Injury or loss of life	1	CSO statistics	3	Could result in loss of life	3

13.7 RISK EVALUATION

Taking the above table, and applying it below, the red zone represents ‘high risk’ scenarios’, the amber zone represents ‘medium risk scenarios’ and the green zone represents ‘low risk scenarios.’

Table 13.6: Risk Evaluation

Likelihood Rating	Very Likely	5					
	Likely	4					
	Unlikely	3			1a – 9, 1b – 9 1c – 9, 1d - 3		
	Very Unlikely	2				2b - 3	
	Extremely Unlikely	1				2a - 3	
				Minor	Limited	Serious	Very Serious
			1	2	3	4	5
Consequence Rating							

13.8 MAIN RISKS

The main risks arise during the construction period. Consequences may be limited but severe for the individuals concerned. Geographical widespread environmental consequences are not anticipated.

13.9 MITIGATION MEASURES

The Construction Environmental Management Plan, as well as good housekeeping practices will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The estate management company will have responsibility for fire safety during operations. In relation to falls these have been dealt with during design.

13.10 INTERACTIONS

There are interactions with Population and Human Health, Land, Soils, Water and Hydrogeology, Noise, Climate and Air, Material Assets, Traffic and Transport, Landscape and Visual, and Cultural Heritage. However, subject to implementation of mitigation measures, good working practises and codes, the interactions between these areas have been sufficiently considered in relation to risk management.

13.11 CONCLUSION

Through the implementation of mitigation measures, there are no identified incidents or examples of major accidents and or natural disasters that present a sufficient combination of risk and consequence that would lead to significant residual impacts or environmental effects.

13.12 REFERENCES

- ARUP: *Luas Cross City EIAR Risk of Major Accident And Or Disaster*, 2017
- DD *A National Risk Assessment for Ireland* 2017
- DHPLG: *Causes of Fire Attended by Brigades* 2015
- DHPLG: *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* 2018
- DOELG: *A Framework for Major Emergency Management Guidance Document 1: A Guide To Risk Assessment In Major Emergency Management* 2010
- Department of the Taoiseach *National Risk Assessment Overview of Strategic Risks* 2017
- EPA: *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* 2017
- EPA: *Guidance on Assessing and Costing Environmental Liabilities* 2014
- Irish Water Safety: *Analysis of Drowning* 2014
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