

CONTENTS

18.0 MAJOR ACCIDENTS AND DISASTERS.....18-1

18.1 Introduction18-1

18.2 Methodology18-2

18.3 Regulatory and Policy Framework.....18-6

18.4 Predicted Impacts18-6

18.5 Mitigation and Enhancement Measures18-34

18.6 Cumulative Effects18-35

18.7 Conclusion18-36

18.8 References.....18-38

TABLES

Table 18.1 Dangerous Substances

Table 18.2 Summary of Major Accidents

Table 18.3 Summary of Natural Disasters

Table 18.4 Summary of Assessment

APPENDIX

(Refer to EIAR Volume II)

Appendix 18A Technical Land Use Planning Assessment (TLUP)

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18.0 MAJOR ACCIDENTS AND DISASTERS

18.1 Introduction

- 18.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) presents an assessment of the likely significant adverse effects arising from the potential risks of major accidents and disasters which are pertinent to the Proposed Development.
- 18.1.2 The Proposed Development, Tynagh North (the subject of this EIAR), consists of an Open Cycle Gas Turbine (OCGT) plant and associated ancillary connection infrastructure and development, site works and services ('the Proposed Development'). The Proposed Development will be located at Tynagh Power Station in Derryfrench, Loughrea, Co. Galway, on land to the immediate north of the existing Tynagh Power Station, which has been operational since 2006. The Proposed Development will operate as a "peaking plant", spending most of its time on standby, and will be run to complement renewable power generation technology. A detailed description of the Proposed Development is contained in Chapter 5: The Proposed Development of the EIAR and the following section summarises the key features. Full details of the Site and surroundings are presented in this EIAR Chapter 4: Existing Site and Conditions.
- 18.1.3 The assessment of the vulnerability of the Proposed Development to major accidents and disasters is included in EIAR following changes to EU legislation now transposed into Irish law. The revised EIA Directive 2014/52/EU states the need to assess:
- "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 natural disasters which are relevant to the project concerned".*
- 18.1.4 Major accidents and disasters are by their nature very low probability events. As such it is not considered necessary consider the cumulative impacts associated with similar simultaneous events occurring at other nearby facilities where there is no direct connection. The assessment does, however, consider the possibility for 'domino' effects to occur, where a major incident at the Proposed Development could cause an event at another site elsewhere to take place. Nearby industrial facilities include the existing Tynagh Power Station, the Submitted Development Ref: 21/2192 and the Sperrin Galvanising Ltd. metal finishing and galvanising operation.
- 18.1.5 The 'Submitted Development Ref: 21/2192' relates to planning application Ref. 21/2192 (submitted as an application to Galway County Council in November 2021, and currently awaiting determination by ABP under Ref. PL07.313538) – that is a separate 299MW development and project to that of the Proposed Development which is for a 350MW facility.
- 18.1.6 The Proposed Development would be operated adjacent but separate to the existing Tynagh Power Station (which is operated by Tynagh Energy Limited), with separate diesel offloading and storage (for when required in the event of an outage or interruption to the gas supply). The existing Tynagh Power Station has been operational for over 15 years and stores approximately 8,000 tonnes(t) of distillate fuel and therefore is regulated as a Lower Tier Installation in accordance with the Chemicals Act (Control of Major Accident Hazards (COMAH) involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015). The Chemical Act Regulations 2015 implement the Seveso III Directive (2012/18/EU). Installations subject to these Regulations are commonly referred to as either COMAH or Seveso Sites.

- 18.1.7 A separate application, Submitted Development Ref: 21/2192, submitted to Galway County Council in November 2021 proposes an OCGT plant on the western portion of the existing Tynagh Power Station Site and plans to demolish the existing Power Station site workshop, administration building and car park and relocate these items to the lands adjoining and to the immediate north of the power station facility. Subject to planning approval, (the application is currently awaiting determination by An Bord Pleanála under ABP-313538-22), the Applicant would intend to develop both the Submitted Development Ref: 21/2192 and Tynagh North. That development includes storage of 5,120t of distillate fuel (6,000 m³).
- 18.1.8 The facilities associated with the Proposed Development will include an inventory of 5,200t (6,100m³) of distillate fuel, therefore is within the Lower Tier COMAH threshold. The Applicant of the Proposed Development will therefore submit a formal notification to the Health and Safety Authority (HSA) at the appropriate juncture which includes information such as the inventory of dangerous substances which will be present at the Proposed Development.
- 18.1.9 In combination, the three power plant stations (the existing Tynagh Power Station, the Proposed Development, and Submitted Development Ref: 21/2192) would have a total inventory of 18,320t of distillate fuel, still below the 25,000 Upper Tier COMAH threshold and therefore the overall complex is maintained within the Lower Tier COMAH threshold.
- 18.1.10 The Sperrin Galvanising Ltd. metal treatment and galvanising facility is not a COMAH regulated site.
- 18.1.11 It is noted that the Health and Safety Authority (HSA) provided a consultee response in relation to Submitted Development Ref: 21/2192 requesting an assessment in accordance with Technical Land Use Planning (TLUP) Guidance be undertaken for that separate application. That TLUP was submitted for the Proposed Development as further planning information in advance of planning approval granted by Galway County Council (that planning application Ref. 21/2192 was submitted as an application to Galway County Council in November 2021, and currently awaiting determination by ABP under Ref. PL07.313538).
- 18.1.12 A TLUP assessment has been undertaken for the Proposed Development (which includes the existing Tynagh Power Station (CCGT) and the Submitted Development Ref: 21/2192) and a copy included in Appendix 18A (refer to EIA Volume II).

18.2 Methodology

Definitions

- 18.2.1 For the purpose of this assessment, the definition of a major accident is taken to be that which is contained within Article 3 of the Seveso Directive as enacted in Irish law by Regulations (Government of Ireland, 2015), which is as follows:
- “A ‘major accident’ means an occurrence such as a major emission, fire, or explosion resulting from uncontrolled developments in the course of the operation of any establishment covered by this Directive and leading to serious danger to human health or the environment, immediate or delayed, inside or outside the establishment, and involving one or more dangerous substances.”*
- 18.2.2 The impact of major accidents can be significant, with the potential to effect people both on and offsite, assets and property on and offsite, and the surrounding environment.

- 18.2.3 Disasters can be naturally occurring events, such as earthquakes, landslides and flooding, or can be caused by humans, such as fires and explosions.
- 18.2.4 Both natural and human causes of major accidents and disasters are considered in this assessment to determine the potential impact on:
- Population and human health, including persons employed at the Proposed Development, at the adjoining existing CCGT facility and Sperrin galvanising site, and in the local community.
 - Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC for the protection of habitats/ flora/ fauna (EU, 1992) and Directive 2009/147/EC for the protection of birds (EU, 1992).
 - Land, soil, water and groundwater, air, and climate; and
 - Material assets, cultural heritage, and the landscape.

Receptors

- 18.2.5 The potential environmental sensitivities and receptors relevant to the Proposed Development (and that of the existing Tynagh Power Station and the Submitted Development Ref: 21/2192) are identified in EIAR Chapter 4: Existing Site and Conditions, Section 4.6. A summary of receptors is contained in the following sections.

Ground and Groundwater

- 18.2.6 The Site is located within the footprint of the former Tynagh mines site so the underlying ground and subsurface have historically undergone substantial disturbance as part of the previous mining activities. The current groundwater classification in the area ranges from poor and unproductive to locally important which is moderately productive. The aquifer has an extreme (E) vulnerability rating due to the limited overburden cover in some areas of the Site. Further information on groundwater is contained in EIAR Chapter 12: Water Environment and EIAR Chapter 13: Soils and Geology.
- 18.2.7 Investigations have detected localised elevated levels of some metals in soil and groundwater samples taken from the Site. Localised elevated levels of hydrocarbons were also detected in some of the soil samples; these were attributed to the past mining activities on the Site.

Surface Water Bodies

- 18.2.8 The treatment and disposal of storm water for the Proposed Development will be the same as the existing Tynagh Power Station. Storm water will be routed through treatment screens and an interceptor to remove any trace oils prior to discharge to surface water within the flooded Open Pit of the former Tynagh mine to the south.
- 18.2.9 The flooded Open Pit is located adjacent to the south-eastern boundary of the existing Tynagh Power Station Site. Upon closure of the mine, the underground section of the mine and Open Pit were allowed to flood. The Open Pit covers an area of 10ha, is up to 70m deep and contains approximately 10 million m³ of water. Analysis of the water quality in the Open Pit carried out as part of a previous EIA and IPC application for the existing Tynagh Power Station development, indicated elevated concentrations of heavy metals and sulphates in the water. Some individual polyaromatic hydrocarbons (PAHs) were also elevated, similar to the groundwater samples taken from the site at the same time.

- 18.2.10 Elevated levels of the various parameters detected in local surface water bodies have been attributed to the underlying geology of the area, the Tynagh mines residual orebody, and past mining activities on the site.
- 18.2.11 The tailings pond associated with the former mine covers an area of approximately 48.5ha and contains non-ore grade residual material generated during the processing of ore at the former mines site.
- 18.2.12 The tailings ponds have been subject to different levels of remediation (dredging, seeding with vegetation etc.) by the owners of the former mine site.
- 18.2.13 Therefore, the Open Pit and tailings pond of the former mines site have limited environmental sensitivity, ecological or amenity value.
- 18.2.14 The Site is located in the catchment of the River Shannon.
- 18.2.15 There are no designated conservation areas (SAC, SPA, NHA) located adjacent to/ in close proximity to the Site. The closest designated site is Eskerboy Bog NHA (Site Code 001264) located approximately 4.6km north-east of the Site.

Liquid Receptor Pathways

- 18.2.16 A release of liquid such as distillate fuel oil outside a bund/ contained area may be able to reach local environmental receptors via the following pathways:
- Spill to external paved area → Surface water drainage system → Surface water bodies, e.g., flooded open pit.
 - Spill to internal paved area → Process drain and effluent treatment plant → Surface water bodies, e.g., flooded open pit.
 - Spill to unpaved/ gravelled area → Ground/ groundwater → Local aquifer and/ or adjacent surface water body, e.g., flooded open pit.
- 18.2.17 The environmental impact of a release of distillate fuel oil and the potential for a major accident or disaster is considered in Scenario Reference 2.

Assessment of major accidents and disasters

- 18.2.18 The method employed for the identification of major accidents and disasters has been based on the application of industry standard risk assessment methodology, which first identifies the dangerous substances which could be present on the Site over the lifetime of the Proposed Development and applies guidewords such as ‘fire’ and ‘flooding’ to identify the credible hazard scenarios pertinent to the Proposed Development.
- 18.2.19 A proportionate approach has been used in this assessment, based on the relative likelihood of the identified credible scenarios, with a greater focus on those which are more likely to occur or those with greater consequences. This approach is as follows:
- Identify the substances which could be present, particularly those with hazardous properties.
 - Identify the credible major hazard scenarios that are relevant to and can affect the Proposed Development.
 - Where credible major hazard scenarios are identified, describe the potential for any change in the assessed significance of the project on relevant environmental and human health receptors in qualitative terms; and
 - Describe the mitigation measures which will be adopted during the design, construction and operation of the Proposed Development, to provide an evidence

base to support the conclusions and demonstrate that likely effects have been mitigated/ managed to an acceptable level.

- 18.2.20 In general, credible major accident and disaster scenarios, as they relate to the Proposed Development, will fall into three categories:
- Events that could not realistically occur, due to the substances present, the type of development or its geographic location.
 - Events that could realistically occur, but for which the Proposed Development, and associated receptors, are no more vulnerable than any other development; and
 - Events that could occur, and to which the Proposed Development is particularly vulnerable, or which the Proposed Development has a capacity to exacerbate.
- 18.2.21 For each identified scenario, the qualitative assessment documented in Table 18.1 and Table 18.2 considers the potential impact on the surrounding environment, taking into consideration the proximity and sensitivity of the receptors. The infrastructure, systems, and procedures in place to prevent or mitigate the consequences of each scenario are also listed.
- 18.2.22 The residual assessment is based on the exceptionality of the scenario to this Proposed Development and whether there is a significant effect after the application of mitigation.
- 18.2.23 Major Accidents and Disasters are assessed with direct reference to Tables 1.1 – 1.4 in Chapter 1: Introduction of this EIAR, which make reference to sensitivity, magnitude and significance of effect.
- 18.2.24 Sensitivity has generally been defined according to the relative value or importance of the feature, i.e., whether it is of international, national, regional, or local importance; by the sensitivity of the receptor in the case of the air quality and noise assessment; or by susceptibility or vulnerability to change in the case of landscape and visual aspects.
- 18.2.25 The environmental receptors described in Section 18.5 including the Open Pit and tailings pond of the former mine site have limited environmental sensitivity, ecological or amenity value. Consequently, the sensitivity is categorised as Negligible.

Technical Land Use Planning (TLUP) Assessment

- 18.2.26 The Proposed Development will qualify as an establishment under the control of major accident hazard regulations (COMAH Regulations, SI 209 of 2015) because of the inventory of dangerous substances that will be stored at the site. The site will be primarily fuelled by a natural gas supply. There will be no storage of natural gas at the site, but there will be storage of 5,200 tonnes of distillate fuel as a backup power supply.
- 18.2.27 In combination, the three power plant stations (the existing Tynagh Power Station, the Proposed Development, and Submitted Development Ref: 21/2192) would have a total inventory of 18,320t of distillate fuel. The quantity that will be stored at the site is sufficient to qualify the Tynagh Power Station as a lower tier establishment under the Regulations, still below the 25,000 Upper Tier COMAH threshold and therefore the overall complex is maintained within the Lower Tier COMAH threshold.
- 18.2.28 Under the COMAH Regulations (SI 209 of 2015) Regulations, where a new development is planned which qualifies as an upper or a lower tier establishment, the Health & Safety Authority (HSA) will advise the planning authority on whether the risks associated with constructing this development are in accordance with the Authority's criteria for individual risk and for societal risk. An assessment of the risks that the Proposed Development could present to the surroundings based on the HSA guidance has therefore been

undertaken (and includes, for cumulative assessment, the existing Tynagh Power Station and the Submitted Development Ref: 21/2192, plus the associated combined inventory) and the Technical Land Use Planning (TLUP) assessment undertaken and a copy included in Appendix 18A (refer to EIAR Volume II).

18.3 Regulatory and Policy Framework

18.3.1 An EIAR is defined in the EIA Regulations (Government of Ireland, 2018) as:

“A statement of the effects, if any, which proposed development, if carried out, would have on the environment”.

18.3.2 Specifically:

“The significant effects to be identified, described and assessed include, where relevant, the expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters that are relevant to that development”.

“A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters, which are relevant to the project concerned”.

18.3.3 An assessment of the risk of major accidents and disasters relevant to the Proposed Development is therefore required to inform decision making on the project, to ensure a high level of protection is incorporated in the design of the Proposed Development and that appropriate emergency policies and procedures are developed and implemented.

18.3.4 Further detailed hazard and risk analyses will be carried out throughout the project development lifecycle. The engineering design of the Proposed Development will be subject to formal process safety risk assessments which typically comprise of Hazard Identification (HAZID), Hazard and Operability (HAZOP) and Layers of Protection Analysis (LOPA) at the appropriate project/ design stage(s). The purpose of these studies is to subject the design to a rigorous, structured assessment by suitably qualified, experienced people, to identify potential hazards. The identified hazards can then be subject to further analysis to determine the appropriate measures to eliminate or manage hazards to reduce risk.

18.4 Predicted Impacts

Do Nothing

18.4.1 In the absence of the Proposed Development, credible major accident and disaster scenarios would remain in this geographic location due to the presence of the existing Tynagh Power Station and the Submitted Development Ref: 21/2192 and the associated infrastructure. However, the likelihood of these scenarios is very low.

Assessment of Major Accidents

18.4.2 The assessment of potential Major Accidents initially considers the substances present at the Proposed Development, identifying those which are potentially dangerous, such as combustible and flammable materials.

18.4.3 The following materials will be present at the Site, which are considered in detail within Table 18.1.

- Natural gas, which is the primary source of fuel used to produce power in the OCGT and will be supplied to the Proposed Development via an existing underground

pipeline to an Above Ground Infrastructure (AGI) (an AGI which is assessed in this EIAR but not included in the planning application as will be applied for separately by Gas Networks Ireland (GNI)).

- Distillate fuel, which is used as a secondary source of fuel to produce power in the event of an interruption in the gas supply to the Site. The secondary fuel is a requirement of the connection agreement for security of supply. Distillate fuel will be stored in substantial quantities in above ground bunded tanks however as the gas supply is very reliable, typically only small quantities are used for testing purposes.
- Small quantities of distillate fuel will also be used in fire water pumps.
- Emergency distillate fuel operated power generators will not be required on Site.
- Construction materials are also considered such as concrete which may be used in pre-formed sections and as a wet pour.

18.4.4 The following substances are also included on the Proposed Development, which are subject to confirmation during the detailed engineering design phase, when detailed process and equipment selection will be confirmed.

- The gas combustion turbine generator will use an air-cooled system (rather than hydrogen which is used in the existing Tynagh Power Plant).
- A small number of compressed gas cylinders containing substances such as Liquefied Petroleum Gas (LPG), e.g. propane, are commonly used in pilot ignition systems for combustion plant and as reference gases in the continuous emissions monitoring systems installed within the Proposed Development OCGT emissions stack.
- Acetylene contained in compressed gas cylinders may be present on-site during construction and when operational during maintenance activities for welding.
- Hydraulic and lubrication oils comprising a synthetic blend of hydrocarbons are typically present within equipment such as gas turbines. Small quantities are contained in the equipment item and also held in the maintenance stores.

18.4.5 Firewater runoff is also considered as a potentially dangerous substance in this assessment. In the event of a major distillate fuel fire, firewater containing foam concentrate could be applied to extinguish fires, particularly within the storage area and potentially the offloading and forwarding areas. The firewater runoff would contain a mixture of materials that could be harmful to the environment if released to ground and groundwater.

18.4.6 Table 18.1 contains a review of the potential accident scenarios which involve the substances described in the previous bullet points, assessing the likely significance of the impact on the environment. The hazard codes of each substance are listed in accordance with the Classification, Labelling and Packaging (CLP) Regulation (EC) No 1272/2008.

18.4.7 The conclusions of the substance review are that the only substances with the potential to initiate a major accident hazard scenario are natural gas and distillate fuel. For the accident scenarios associated with these substances, the likelihood and risk of significant effects are described in Table 18.2, along with mitigating measures.

Table 18.1: Dangerous Substances

REF.	SUBSTANCE	DESCRIPTION OF USE	CLP HAZARD CLASSIFICATION	SCREENING AND IDENTIFICATION OF POTENTIAL MAJOR ACCIDENTS	INCLUDED IN ASSESSMENT (Y/N)
DS1	Natural Gas	Supplied via below ground pipework to the proposed AGI expansion, and within transfer pipework to the OCGT.	H220 - Extremely flammable gas.	<p>Loss of containment of natural gas from process equipment or pipework could ignite and result in a flash fire, jet fire or vapour cloud explosion.</p> <p>The potential impacts of a fire and/ or explosion as a result of a release of natural gas include:</p> <ul style="list-style-type: none"> - A major fire which could escalate to other areas of Site including the distillate fuel storage tanks and the existing Tynagh Power Station. - Thermal radiation generated by a major fire and/ or explosion overpressures could cause significant harm to persons on Site. <p>There is the potential for a major accident scenario(s) associated with a significant loss of containment of natural gas, therefore these scenarios are considered further in this assessment.</p> <p>A Technical Land Use Planning Assessment (TLUP) is submitted (refer to Appendix 18A, EIAR Volume II) which also assesses these impacts.</p>	Y

REF.	SUBSTANCE	DESCRIPTION OF USE	CLP HAZARD CLASSIFICATION	SCREENING AND IDENTIFICATION OF POTENTIAL MAJOR ACCIDENTS	INCLUDED IN ASSESSMENT (Y/N)
DS2	Distillate Fuel	<p>Supplied via road tanker to the offloading area and transferred to storage tanks located within a bunded area. The total back up fuel capacity for the Proposed Development is 5,200 tonnes.</p> <p>The total capacity for the existing Tynagh Power Station is 8,000 tonnes and the total capacity for the Submitted Development Ref:21/2192 is 5,120 tonnes.</p> <p>From storage, distillate fuel is pumped to the OCGT.</p> <p>During construction, there may be small quantities of distillate fuel present in temporary equipment such as</p>	<p>H226 - Class 3 flammable liquid and vapour. H411 - Toxic to the aquatic environment, Category 2. H332 - Toxic if inhaled. H315 - Skin Sensitiser.</p>	<p>A catastrophic loss of containment of diesel has the potential to cause a major accident hazard if released to the environment where it can contaminate soil and groundwater.</p> <p>If ignited, a release of distillate fuel can result in a pool fire which has the potential to cause harm via thermal radiation effects to persons on Site. A plume of smoke containing harmful substances would be generated by a major fire and could be visible from offsite receptors. Application of firewater containing foam would typically be used in a distillate fuel pool fire scenario. Firewater runoff would contain foam and other substances used for fire suppression along with products of combustion. This material has the potential to cause harm if released to the environment.</p> <p>There is the potential for a major accident scenario(s) associated with a significant loss of containment of distillate fuel, therefore these scenarios are considered further in this assessment.</p>	Y

REF.	SUBSTANCE	DESCRIPTION OF USE	CLP HAZARD CLASSIFICATION	SCREENING AND IDENTIFICATION OF POTENTIAL MAJOR ACCIDENTS	INCLUDED IN ASSESSMENT (Y/N)
		mobile cranes, mobile power generators, etc.			
DS3	LPG (e.g. Propane)	Pilot ignition systems within the OCGT and gas monitoring systems.	H220 - Extremely flammable gas. H280 - Contains gas under pressure; may explode if heated.	<p>The Proposed Development will require a small number of LPG cylinders only. No bulk storage tanks will be present.</p> <p>An accidental release of LPG from a compressed gas cylinder will rapidly disperse at ambient conditions if no active source of ignition is present.</p> <p>A release of LPG which is ignited may result in a fire or explosion on Site. If people are present in the immediate area, this has the potential to cause harm and asset damage from exploding cylinders. However, this would be unlikely to extend to offsite areas.</p> <p>Consequently, no credible major accident scenarios are identified for LPG.</p>	N
DS4	Acetylene	Welding gas used during construction and maintenance activities.	H220 - Extremely flammable gas. H230 - May react explosively even in the absence of air. H280 - Contains gas under pressure; may explode if heated.	<p>A small number of acetylene gas cylinders may be occasionally present on Site for welding activities. Permanent storage of gas cylinders would not be required.</p> <p>In the event of an accidental release, acetylene will disperse if not in contact with an active source of ignition.</p>	N

REF.	SUBSTANCE	DESCRIPTION OF USE	CLP HAZARD CLASSIFICATION	SCREENING AND IDENTIFICATION OF POTENTIAL MAJOR ACCIDENTS	INCLUDED IN ASSESSMENT (Y/N)
				<p>A release of acetylene which is ignited will result in an explosion and potentially a fire, causing harm to persons if present in the vicinity of the cylinders. The impact of these scenarios would not however extend to neighbouring facilities and/ or offsite areas.</p> <p>In the event of a major fire on Site, acetylene cylinders exposed to heat may explode, potentially causing harm to persons present and assets on Site. A major fire could only be initiated by a significant loss of containment of gas or distillate fuel which is considered within substance references 1 and 2.</p> <p>Due to the small number of cylinders which could be present on site for a limited time and impacts which would be onsite only, no credible major accident scenarios are identified for Acetylene.</p>	
DS5	Synthetic lubricants and hydraulic fluid	Stored in Maintenance Building, contained within equipment such as pumps, compressors and lifting equipment.	These products are typically not classified as hazardous in accordance with CLP; however, their properties could be considered similar to distillate fuel.	The quantity of hydraulic and lubricant fluids contained on Site will be relatively low, typically less than 1 tonne would be present, most of which would be stored in the maintenance stores. Containment bunds are typically used in these areas to collect any drips or spills and are sized to contain 110% of the largest container.	N

REF.	SUBSTANCE	DESCRIPTION OF USE	CLP HAZARD CLASSIFICATION	SCREENING AND IDENTIFICATION OF POTENTIAL MAJOR ACCIDENTS	INCLUDED IN ASSESSMENT (Y/N)
				<p>A failure or leak from a storage container would be detected by maintenance personnel. The material would be contained in the bund and disposed of appropriately.</p> <p>Within equipment such as pumps, loss of fluids would be detected by condition monitoring systems and routine site walkrounds.</p> <p>In the event that a release of these substances occurred during delivery e.g. accidental damage during delivery, material would be contained within the drainage system and interceptor.</p> <p>For all potential release mechanisms, there will be no significant effects on or offsite, on people or the environment. Consequently, there is no potential for a major accident hazard associated with these substances.</p>	
DS6	Concrete	Construction	Concrete is not classified hazardous in accordance with CLP; however, concrete paste is alkaline (pH 10-14) and therefore harmful to people if in contact with skin or eyes.	<p>During construction, concrete use will be strictly controlled to prevent any wet material from entering the environment.</p> <p>These controls will be established in an oCEMP produced for the Proposed Development, containing the appropriate safety and environmental protection</p>	N

REF.	SUBSTANCE	DESCRIPTION OF USE	CLP HAZARD CLASSIFICATION	SCREENING AND IDENTIFICATION OF POTENTIAL MAJOR ACCIDENTS	INCLUDED IN ASSESSMENT (Y/N)
			<p>If concrete enters the environment via a release to water, it can raise the pH causing harm to aquatic ecosystems. Concrete released to the environment can also cause sedimentation on aquatic beds, which could harm flora and fauna.</p>	<p>measures. This mitigation is referenced in the oCEMP (refer to EIAR Appendix 5A, EIAR Volume II).</p> <p>In the event of a fire, the pH of water applied to areas where dry concrete is present may increase slightly. However, the Proposed Development will be designed to contain firewater and would prevent this entering the environment.</p> <p>Consequently, there is no potential for a major accident hazard associated with this substance.</p>	

Table 18.2: Summary of Major Accidents

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	SUBSTANCE / SYSTEM HAZARD	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL EFFECTS
1	Loss of containment resulting in a major fire or explosion from the AGI, OCGT or containment pipework	Natural Gas	<p>A release of natural gas could be caused by mechanical failure, impact damage or an operator error resulting in a loss of containment.</p> <p>Immediate ignition of the gas release could result in a flash or jet fire.</p> <p>Delayed ignition could lead to an explosion with damaging overpressures which could impact people and assets.</p> <p>A major fire could have the potential to escalate to other areas of the Site such as the distillate fuel storage, the existing Tynagh Power Station, the Submitted Development Ref: 21/2192 and potentially impact the neighbouring industrial facility (Sperrin galvanising operations). It is however considered unlikely to impact offsite receptors.</p> <p>The impact of a fire and explosion would be significant to personnel on Site but would be</p>	<p>The Proposed Development will include the following mitigation measures which would prevent and minimise the consequences of this scenario:</p> <ul style="list-style-type: none"> - The design of the natural gas equipment and pipework will be to industry codes and standards to reduce the potential for a loss of containment, including the use of welded connections to avoid potential leak sources. Pipework between equipment will be predominantly routed below ground, further reducing the potential for a loss of containment. - Pipeline safety systems including pressure regulation is to be installed along with operational controls and monitoring. Instrumentation and control systems will monitor the process and detect leaks. - ATEX compliant equipment to be installed as required by Explosives Atmosphere Risk Assessment, to be carried out during the detailed engineering design of the Proposed Development. 	<p>With mitigation measures, the Residual Effects are assessed as:</p> <p>Slight</p>

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	SUBSTANCE / SYSTEM HAZARD	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL EFFECTS
			<p>unlikely to cause significant harm to the environment.</p> <p>Fire water runoff would be contained on Site, however if capacity was exceeded it would be contained within the tailings pond.</p> <p>In the event of a major fire there is the potential for emissions to air such as particulates and uncombusted hydrocarbons.</p> <p>The unmitigated classification of this scenario is as follows:</p> <p>Sensitivity: Medium Magnitude: Moderate Significance: Moderate</p>	<ul style="list-style-type: none"> - Control systems including Emergency Shutdown (ESD) systems to isolate sections of equipment and pipework in the event of a release will be designed and installed to the appropriate engineering design standards, such as those published by International Electrotechnical Commission (IEC). - In the event of a loss of containment of gas, the emergency response procedure would typically be to automatically operate isolation valves and restrict the duration of the release. In the event that a source of ignition is present resulting in a fire, firewater would be unlikely to be used to extinguish gas fires but may be applied to adjacent areas for cooling and to prevent escalation. The potential for contaminated firewater runoff would however be low. - Regulatory Authorities including the HSA and EPA will be closely involved throughout the design, construction, and operation of the facilities to ensure compliance with all legislative requirements and to ensure compliance with design specifications and codes. 	

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	SUBSTANCE / SYSTEM HAZARD	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL EFFECTS
				<ul style="list-style-type: none"> - An Emergency Response Plan will be developed prior to the commencement of operations and will include detailed procedures in the event of a major accident. 	
2	Loss of containment resulting in a major fire from bunded storage area, forwarding area or offloading area.	Distillate fuel	<p>A significant loss of containment of distillate fuel e.g. catastrophic failure of a tank; followed by subsequent ignition of the material in the bund could result in a pool fire. This scenario has the potential for an impact on Site and escalation to neighbouring sites and receptors.</p> <p>A major distillate fuel pool fire could impact people on and offsite via a plume containing particulates and other potentially harmful substances.</p> <p>Fire water may be applied during an event and if not fully contained on Site, fire water runoff containing uncombusted distillate fuel and other substances may enter the environment with potential to impact soils and groundwater via tailings pond.</p>	<p>The Proposed Development will include the following mitigation measures which would prevent and minimise the consequences of this scenario:</p> <ul style="list-style-type: none"> - Distillate fuel tanks will be designed in accordance with internationally recognised design codes such as API 620 and API 650 and fitted with level control, monitoring and alarms. These assets will be subject to regular inspection and maintenance. - Storage tanks will be situated within an impervious concrete bund limiting spread of fire across the Site. The bund will be sized appropriately (110% of largest tank or 25% of total capacity, as a minimum). - Foam pouring systems will be provided for fire suppression and to prevent escalation via tank failure. Firewater runoff containing foam will be contained onsite. 	With mitigation measures Residual Effects are assessed as: Slight

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	SUBSTANCE / SYSTEM HAZARD	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL EFFECTS
			<p>Large volumes of distillate fuel and firewater released to ground may penetrate soil and could contaminate groundwater.</p> <p>The unmitigated classification of this scenario is as follows:</p> <p>Sensitivity: Medium Magnitude: Moderate Significance: Moderate</p>	<ul style="list-style-type: none"> - An ATEX assessment will be carried out during the design phase to specify the appropriate mechanical and electrical equipment within the distillate fuel systems and to manage ignition controls. - Distillate fuel is a relatively high flash point flammable liquid which will be stored and transferred to the OCGT at ambient conditions therefore below the flash point of distillate fuel, and at low pressures to minimise the potential for mist formation. - An Emergency Response Plan will be developed prior to the commencement of operations. 	

Assessment of Potential Disasters

- 18.4.8 The identification of potential disasters, both natural and anthropogenic, which are pertinent to the Proposed Development, is primarily based on geographical location. For example, seismic events which include earthquakes and quarry blasts have the potential to cause significant damage to infrastructure resulting in a loss of containment of dangerous substances and subsequent fires and explosions. The potential impact of climate change effects, such as increased ambient temperatures, rising river and sea levels are also considered in this assessment.
- 18.4.9 The potential disaster scenarios which have been identified as being credible for the Proposed Development are listed in Table 18.3. These are low probability events, and their potential impacts are mitigated during the engineering design and construction of the Proposed Development. For example, in the mechanical and structural design codes used for pipework, process equipment, supports and structural assets.
- 18.4.10 The overall risk of disasters occurring at the Proposed Development is very low but cannot be entirely eliminated; therefore, management measures such as operating systems and procedures, the Accident Prevention Plan, and Emergency Response Procedures will be developed. These measures further reduce the risk and impacts of disasters, with key procedures summarised in Table 18.3.

Table 18.3: Summary of Natural Disasters

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
3	Earthquake/ Seismic Event	<p>An earthquake in the area of the Proposed Development could result in damage to equipment, pipelines and auxiliary systems, with the potential for harm to persons onsite and the environment.</p> <p>Sensitivity: Negligible Magnitude: Minor Significance: Slight</p> <p>If the damage from an earthquake resulted in a loss of containment of distillate fuel or natural gas which resulted in a fire and/ or explosion, the level of risk and likely effects would increase.</p> <p>Sensitivity: Medium Magnitude: Moderate Significance: Moderate</p> <p>The likelihood of a seismic event initiating a fire and/ or explosion is however lower than via a mechanism such as impact damage.</p>	<p>The Proposed Development will include the following mitigation measures which would prevent and minimise the consequences of this scenario:</p> <ul style="list-style-type: none"> - The Irish National Seismic Network (INSN, 2021) documents a complete list of earthquakes since 1980. There have been minor, low magnitude events; however, Ireland is recognised as having a low level of seismic activity, with most earthquakes being recorded in the south-east or north-west of Ireland. - Mining has historically taken place in Tynagh, however these activities are not 	<p>With mitigation measures, Residual Effects are assessed as: Neutral</p>

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
			<p>expected to resume and the area was subject to partial restoration and rehabilitation following mine closure. The location of the Proposed Development, Tynagh North, is not above former underground mine works (refer to EIAR Chapter 13: Soils and Geology).</p> <ul style="list-style-type: none"> - Mechanical and civil engineering design codes used for the Proposed Development will take into consideration the requirement for resilient equipment and structures, for example, the structural strength of pipeline supports which will accommodate natural movement and expansion. 	

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
			<ul style="list-style-type: none"> - A seismic event resulting in a loss of containment of dangerous substances has the potential to result in a scenario such as those described in Table 18.2. The mitigation measures described in this table will be applicable, including an Emergency Response Plan which will be developed prior to the start of operation. 	
4	Climate Change – Including Surface Water Flooding during Storms	Surface water flooding from storms could result in asset damage, with the potential for subsequent loss of containment of distillate fuel, natural gas or other substances stored and handled on Site. The frequency of these natural events could increase as a result of climate change.	<p>The Proposed Development will include the following mitigation measures which would prevent and minimise the consequences of this scenario:</p> <p>A Flood Risk Assessment has been carried out for the Proposed Development. This is</p>	With mitigation measures, Residual Effects are assessed as: Neutral or Slight.

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
		<p>There is the potential for fires and/ or explosion if distillate fuel or natural gas releases were ignited resulting in an impact on and offsite.</p> <p>A catastrophic release of distillate fuel has the potential to cause harm to the environment if reaching unmade ground and groundwater.</p> <p>Sensitivity: Low (the flood risk assessment has concluded the Site would be at a low risk of surface water flooding).</p> <p>Magnitude: Moderate as significant inventory of distillate fuel present on site which if released during a flood event has the potential to impact environmental receptors.</p> <p>Significance: Slight.</p>	<p>described in EIAR Chapter 12: Water Environment and concludes the following:</p> <ul style="list-style-type: none"> • The Site is not at risk of coastal flooding due to its geographic location. • Fluvial flooding is assessed from Galway County Council’s Strategic Flood Risk Assessment (SFRA). This indicates the Proposed Development is not in a ‘Flood Risk Zone’ (i.e. Flood Zone C). • The Flood Risk Assessment concludes that the area of the Proposed Development is at a low risk of flooding from groundwater sources, overland flow from storm water is a more credible flooding mechanism. The available mitigation measures reduce the 	

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
			<p>risk of overland flooding to low.</p> <p>The potential climate change impacts such as increased storm water volumes would be considered in the development of mitigation measures. These measures are described in Section 12.6, Mitigation and Enhancement Measures.</p> <ul style="list-style-type: none"> • Distillate fuel tanks will be located within an impermeable concrete bund designed to prevent tank lift and subsequent damage which could lead to a loss of containment. • An Emergency Response Plan will be developed prior to the commencement of operations to manage incidents such as flooding should this occur. 	

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
5	Climate Change – Temperature Extremes	<p>Increasing atmospheric temperatures could result in the operational instability of equipment such as cooling systems.</p> <p>This has the potential to impact the operation and efficiency of the Proposed Development but would be unlikely to result in a major accident or disaster.</p>	No additional mitigation proposed other than the engineering design of process systems including cooling and heating to established engineering codes and standards.	Not applicable
6	Climate Change – Severe Wind	<p>Wind speeds approaching hurricane force have been recorded by Met Eireann in Ireland (Met Eireann, 2021) and there is the potential for climate change to increase the frequency of such storms.</p> <p>Potential accidents caused by severe winds could include impact damage from windblown debris and premature failure of structure resulting in loss of containment, release of distillate fuel and natural</p>	<p>The Proposed Development will include the following mitigation measures which would prevent and minimise the consequences of this scenario:</p> <ul style="list-style-type: none"> - The Proposed Development will be designed in accordance with the appropriate engineering codes and standards, to withstand the forces generated 	With mitigation measures, Residual Effects are assessed as: Neutral or Slight.

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
		gas to environment and/ or major fire. Sensitivity: Medium Magnitude: Moderate Significance: Moderate	by wind on the systems and structures.	
7	Acts of Terrorism/ Arson/ Cyber Terrorism	Acts of vandalism and/ or terrorism could have hazardous consequences, such as fire and/ or explosion. Acts of terrorism could also include unauthorised access to IT and control systems associated with the process equipment. Sensitivity: Medium Magnitude: Moderate Significance: Moderate	The Proposed Development will include the following mitigation measures which would prevent and minimise the consequences of this scenario: <ul style="list-style-type: none"> - A secure fence (e.g. Palisade) will be installed around the perimeter of the Proposed Development. - Security measures will include security guards and Closed-Circuit Television (CCTV) throughout the facility at strategic locations to deter intruders. 	With mitigation measures, Residual Effects are assessed as: Neutral or Slight.

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
			<ul style="list-style-type: none"> - The most up-to-date security advice will be obtained from the appropriate authorities for inclusion within a Site Security Plan. - IT and instrumented control system security will be installed to prevent unauthorised access to electronic systems. - An Emergency Response Plan will be developed prior to the commencement of operations to manage major accident and disaster hazards. 	
8	Lightning	Direct or indirect lightning strikes have the potential to cause a major accident due to electrical energy which can result in fires and equipment damage.	The Proposed Development will include the following mitigation measures which would prevent and minimise the	With mitigation measures, Residual Effects are assessed as: Neutral or Slight.

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
		<p>This can cause harm to people working at the Proposed Development, damage to the Site infrastructure and harm to the environment in the event of a major fire.</p> <p>Lightning could also present a source of ignition to flammable materials resulting in a major fire, which could harm people both onsite and offsite.</p> <p>Sensitivity: Low Magnitude: Moderate Significance: Slight</p>	<p>consequences of this scenario:</p> <ul style="list-style-type: none"> - Lightning risks will be assessed in accordance with recognised standards such as BS EN/IEC 62305. - The engineering design of the Proposed Development will include the appropriate electrical earthing and bonding systems installed to provide a safe route for lightning to earth. - Electrical and mechanical equipment will be specified in accordance with the requirements of the ATEX Directive 2014/34/EU (EU, 2014), which defines standards for equipment. 	

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
			<ul style="list-style-type: none"> - An explosion risk assessment will be carried out in accordance with ATEX Directive 1999/92/EC (EC, 1999) which establishes the required standards to protect people. This will also consider the potential for lightning to be a source of ignition to flammable gases and vapours. 	
9	Aircraft/ Drone Strike	<p>The impact of an aircraft on the Proposed Development could result in significant asset damage, with subsequent fires and explosions from potentially released distillate fuel/ natural gas.</p> <p>Sensitivity: Low Magnitude: Moderate Significance: Slight</p>	<p>The Proposed Development will include the following mitigation measures which would prevent and minimise the consequences of this scenario:</p> <ul style="list-style-type: none"> - The nearest major airport is Galway Airport which currently does not run any commercial flights and will 	<p>With mitigation measures, Residual Effects are assessed as: Neutral</p>

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
			<p>receive a low volume of air traffic annually. There are a few small local airfields which will also have limited volumes of air traffic.</p> <ul style="list-style-type: none"> - Personnel vigilance and security systems are the key mitigation measures to prevent drones being used in the area of the Proposed Development. 	
10	Road/ Rail Impact	<p>The accidental impact of a vehicle on pipework and assets associated with the Proposed Development containing distillate fuel or natural gas could result in asset damage and loss of containment.</p> <p>Ignition of gas or distillate fuel could result in a major fire, potentially causing harm to people onsite and offsite.</p>	<p>The Proposed Development will include the following mitigation measures which would prevent and minimise the consequences of this scenario:</p> <ul style="list-style-type: none"> - There are no existing or planned rail networks in the vicinity of the Proposed Development. 	<p>With mitigation measures, Residual Effects are assessed as: Slight</p>

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
		<p>Sensitivity: Low Magnitude: Moderate Significance: Slight</p>	<ul style="list-style-type: none"> - The road to the Site is a single carriageway limited to 80km/hour, with the Site entrance set back by over 100m via an access road. - Entrance to the Site will be restricted to the Security Building and car park by fencing and barriers, preventing unauthorised vehicles from accessing operational areas. This will prevent members of the public gaining access in their vehicles. - Visiting traffic will be control by onsite traffic rules including speed restrictions. - Crash protection will be implemented 	

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
			<p>where there is vulnerable equipment susceptible to impact e.g. pipework and equipment in close proximity to roadways. In particular, areas for the delivery and offloading of distillate fuel will be protected using barriers.</p> <ul style="list-style-type: none"> - Gas pipework will be routed below ground where practical, including at the AGI. - Isolation valves will be installed in the gas pipework to seal off sections of pipework if a loss of pressure is detected e.g. via a gas release as a result of damaged pipework. This will restrict the volume 	

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
			of gas which could be released.	
11	<p>Domino effect (fire/ explosion) from existing Tynagh CCGT Power Station and the Submitted Development Ref: 21/2192.</p> <p>Refer to Technical Land Use Planning (TLUP) Assessment (Appendix 18A, EIAR Volume II).</p>	<p>A loss of containment of natural gas or distillate fuel from the existing power plant which resulted in a major fire or explosion could potentially have an impact on the Proposed Development via thermal radiation or overpressure effects.</p> <p>Sensitivity: Low Magnitude: Moderate Significance: Moderate</p>	<p>The Proposed Development will include the following mitigation measures which would prevent and minimise the consequences of this scenario:</p> <ul style="list-style-type: none"> - The proposed layout of the facilities has been designed and arranged to incorporate segregation distances between process units to minimise the potential for domino effects. - The OCGT equipment systems will be installed within appropriately designed enclosures and firewalls constructed around electrical transformers. 	<p>With mitigation measures, Residual Effects are assessed as: Slight</p>

SCENARIO REF.	MAJOR ACCIDENT / DISASTER	RISKS AND LIKELY EFFECTS	MITIGATION MEASURES AND REFERENCES	RESIDUAL IMPACTS
			<ul style="list-style-type: none"> - Fire suppression systems including firewater and foam will be installed to provide facilities for fighting fires and also applying cooling water to adjacent structures and equipment to prevent escalation. 	

Decommissioning

- 18.4.11 Effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising from the construction process which have been assessed and therefore have not been considered separately in this chapter.
- 18.4.12 A Decommissioning Plan (including a Decommissioning Environmental Management Plan) will be produced and agreed as part of the Industrial Emissions (IE) Licence of the site and site surrender process.

18.5 Mitigation and Enhancement Measures

- 18.5.1 Measures to prevent other potentially major incidents include:
- Compliance with all relevant health, safety and environmental legislation including COMAH / Seveso.
 - The design, construction, and operation of the Proposed Development in accordance with international, national, and established industry codes, standards, and practice.
 - A site-specific Health and Safety Plan produced by the Engineering and Construction Contractor covering the works and commissioning of the Proposed Development will be prepared to ensure compliance with relevant health and safety legislation.
 - A Site Emergency Response Plan (ERP) will be developed to cover the Proposed Development in accordance with legislative requirements including COMAH / Seveso and IE Licence, which will include a fire strategy and appropriate training procedures.
 - Regular maintenance and inspection of all facilities to reduce the potential for equipment failures which could lead to a loss of containment.
 - Procedures will be in place to clearly detail the responsibilities, actions and communication channels for operational staff and personnel on how to deal with emergencies should they occur. Staff will also receive the level of training required for their role and position. This will include dealing with events such as fires, spillages, flooding etc. Such measures will be included in the site operating and management system and regulated by EPA through the IE Licence.

Emergency Management

- 18.5.2 The mitigation measures described in Table 18.2 and Table 18.3 contain references to the ERP for the Site. This document will be developed and reviewed by the Regulatory authorities.
- 18.5.3 The proximity of the Site to the existing Tynagh Power Station and the Submitted Development Ref:21/2192 will be considered in the development of the ERP and it will be expected for these sites to work closely together in the management of emergencies. There is the potential to share information, knowledge and resources.
- 18.5.4 The ERP will contain detailed plans for the response to emergencies such as loss of containment, fires, and severe weather events. The Director of Operations at the Proposed Development will be in contact with the Galway Fire and Rescue Service, to regularly review and update procedures. There is the potential for the Galway Fire Service to assume the role of incident commander during emergency events. All personnel on Site will receive appropriate training in the contents of the ERP and be fully aware of their responsibilities during emergency events and participate in regular training exercises.

- 18.5.5 Emergency critical roles will involve personnel trained to use fire hydrants, foam pourers and other fire suppression systems.

18.6 Cumulative Effects

- 18.6.1 This section of the chapter assesses the potential effects of the Proposed Development along with combination of the potential effects of other development schemes (referred to as 'cumulative developments' – this includes the Tynagh Power Station Plant and the Submitted Development Ref: 21/2192) within the surrounding area, as listed within Chapter 19: Cumulative Effects & Interactions of this EIAR.
- 18.6.2 Under the COMAH Regulations (SI 209 of 2015) Regulations, where a new development is planned which qualifies as an upper or a lower tier establishment, the Health & Safety Authority (HSA) will advise the planning authority on whether the risks associated with constructing this development are in accordance with the Authority's criteria for individual risk and for societal risk.
- 18.6.3 An assessment of the risks that the Proposed Development could present to the surroundings based on the HSA guidance has therefore been undertaken (and includes, for cumulative assessment, the existing Tynagh Power Station and the Submitted Development Ref: 21/2192, plus the associated combined inventory) and the Technical Land Use Planning (TLUP) assessment undertaken and a copy included in Appendix 18A (refer to EIAR Volume II).

Cumulative Effects during Construction

- 18.6.4 There will be overlap of 3 months between construction of the Proposed Development and the construction of the Submitted Development Ref: 21/2192. Thus, there is the potential for short-term, temporary effects associated with major accidents or disasters to occur. However, provided that standard and good practice mitigation is implemented through their respective CEMP (refer to oCEMP – EIAR Appendix 5A, EIAR Volume II) the cumulative risk can be effectively managed and there would not be a significant impact. As such, there would not be any additional cumulative impacts during construction.

Cumulative Effects During Operation

- 18.6.5 The Proposed Development, the Tynagh Power Station and the Submitted Development Ref: 21/2192 will be managed by experienced operating personnel to ensure communication and cooperation in activities thus reducing risk and the potential for accidents. In addition to implementing the mitigation measures outlined in Tables 18.1 – 18.2 and those in Section 18.11, risk assessment reviews such as HAZID will be conducted at an appropriate stage of the process to capture any potential cumulative effects or impacts from Proposed Development, the Submitted Development Ref: 21/2192 and the existing Tynagh Power Station site operating adjacent to each other.

18.7 Conclusion

18.7.1 This assessment has identified a loss of containment and subsequent fire and/ or explosion within the natural gas and distillate fuel systems as the most likely cause of a major accident at the Proposed Development. A summary of the assessment is contained in Table 18.4.

Table 18.4: Summary of Assessment

SCENARIO REF.	DESCRIPTION	UNMITIGATED ASSESSMENT	MITIGATED CLASSIFICATION
1	A loss of containment of natural gas resulting in a major fire or explosion from AGI, OCGT or containment pipework	Sensitivity: Medium Magnitude: Moderate Significance: Moderate	Slight
2	Loss of containment of distillate fuel resulting in a major fire from banded storage area or forwarding area.	Sensitivity: Medium Magnitude: Moderate Significance: Moderate	Slight
3	An earthquake or seismic event resulting in catastrophic damage and potentially loss of containment of natural gas and/ or distillate fuel which if ignited, could result in a major fire and/ or explosion.	Without subsequent release of natural gas / distillate fuel: Sensitivity: Negligible Magnitude: Minor Significance: Slight Without subsequent release of natural gas / distillate fuel and fire / explosion: Sensitivity: Medium Magnitude: Moderate Significance: Moderate	Neutral
4	Climate Change – Including Surface Water Flooding during Storms	Sensitivity: Low Magnitude: Moderate Significance: Slight.	Neutral or Slight
5	Climate Change – Temperature Extremes	N/A	N/A
6	Climate Change – Severe Wind	Sensitivity: Medium Magnitude: Moderate Significance: Moderate	Neutral or Slight
7	Acts of Terrorism / Arson / Cyber Terrorism	Sensitivity: Medium Magnitude: Moderate Significance: Moderate	Neutral or Slight

SCENARIO REF.	DESCRIPTION	UNMITIGATED ASSESSMENT	MITIGATED CLASSIFICATION
8	Lightning – direct and indirect impacts including as a potential source of ignition	Sensitivity: Low Magnitude: Moderate Significance: Slight	Neutral or Slight
9	Aircraft/ Drone Strike - direct and indirect impacts such as catastrophic asset damage and initiating a loss of containment of dangerous substances	Sensitivity: Low Magnitude: Moderate Significance: Slight	Neutral
10	Road/ Rail Impact - direct impact of collisions with site vehicles	Sensitivity: Low Magnitude: Moderate Significance: Slight	Slight
11	Domino effect (fire/ explosion) from the existing Tynagh CCGT Power Station and the Submitted Development Ref: 21/2192.	Sensitivity: Low Magnitude: Moderate Significance: Moderate	Slight

18.7.2 Fires and explosions can cause significant harm to people and the environment as a result of the direct effects of thermal radiation and overpressure, plumes containing harmful materials and firewater runoff containing diesel and products of combustion. The Proposed Development will therefore be developed with a number of installed safety systems to prevent a loss of containment and subsequent fire and/ or explosion including:

- The design and construction of process equipment, structural assets and pipework systems to internationally recognised engineering standards and best practice.
- Use of welded pipework to minimise joints, installation of flange guards and routing pipework sections below ground to minimise the risk of accidental damage.
- Introduction of a planned, preventative maintenance and asset inspection regime to minimise the potential for failures and defects.
- Site surfacing will be impervious in all areas where distillate fuel could be present and routed to process drainage systems where oil can be contained and removed should a release occur.

18.7.3 The potential impact of natural disasters including climate change effects, such as rising temperatures, storms, and flooding, has been considered with an assessment that the overall residual risk from these events causing a major accident as neutral or slight.

18.7.4 The risk of a major accident or disaster from the Proposed Development has been assessed as ‘Slight’. Neutral or Slight adverse impacts will be adequately addressed by implementing the mitigation measures described in this assessment.

18.7.5 There will be no significant residual impacts associated with major accidents and disasters.

- 18.7.6 In accordance with best practice for facilities, regular reviews of major accidents and disasters will be undertaken to ensure lessons are learned from any incidents at the Proposed Development, the existing Tynagh Power Station and the Submitted Development Ref: 21/2192 and at similar facilities worldwide.

18.8 References

EU Commission (2017) Guidance on the Preparation of the Environmental Impact Assessment Report. Available at:

https://ec.europa.eu/environment/eia/pdf/EIA_guidance_EIA_report_final.pdf.

Accessed 15 December 2020.

IEMA (2020) Major Accidents and Disasters in EIA: A Primer. Available at:

<https://www.iema.net/resources/blog/2020/09/23/iema-major-accidents-and-disasters-in-eia-primer>. Accessed 15 December 2020.

Government of Ireland, (2018). S.I. No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018

<http://www.irishstatutebook.ie/eli/2018/si/296/made/en/print>

Government of Ireland, (2015). Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015.

CDOIF, (V2 2016). Chemicals and Downstream Oil Industries Forum (CDOIF) Guideline on Environmental Risk Tolerability of COMAH Establishments V2.