

15 MAJOR ACCIDENTS AND DISASTERS

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15.1 Introduction

- 15.1.1 Regulation 4(2) of The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 requires that the EIA must consider “(3)(b) *the expected effects deriving from the vulnerability of the proposed development to risks of major accidents and disasters that are relevant to that development*”.
- 15.1.2 This chapter assesses the likely significant effects from major accidents and disasters as a result of the construction and operation of the Proposed Development. Decommissioning of the Proposed Development is not envisaged until many years into the future, and the risks in terms of major accidents and disasters are considered to be effectively the same as those for construction. No further assessment of decommissioning is therefore provided.
- 15.1.3 This chapter is intended to be read as part of the wider ES, with particular reference to **ES Chapters 1 to 4**, as well as **ES Chapter 6: Air quality**, **ES Chapter 8: Biodiversity**, **ES Chapter 9: Surface water flood risk and drainage**, **ES Chapter 10: Land, soil and groundwater**, **ES Chapter 12: Transport and access**, **ES Chapter 13: Climate change**, and **ES Chapter 15: Cumulative effects**.

15.2 Statutory and planning context

- 15.2.1 The UK has an existing, structured framework of risk management and safety legislation covering the vulnerability of infrastructure and other built development to major accidents and disasters. In most circumstances, the required procedures and mitigation put in place through this legislative framework are sufficient, without the need to implement secondary mitigation.
- 15.2.2 Legislative frameworks and guidance relevant to major accidents and hazards are outlined in **Table 15.1** below.

Table 15.1: Legislation and policy relevant to major accidents and disasters

Document	Summary
Health and Safety at Work etc. Act 1974	This is the primary legislation governing occupational health and safety. It provides the framework for regulating industrial health and safety in the UK. The key requirement is that foreseeable risks to those in the workplace must be reduced as far as reasonably practicable and adequate evidence is provided to demonstrate this.
Control of Major Accident Hazards (COMAH) Regulations 2015	Administered jointly by the Health and Safety Executive (HSE) and Environment Agency (EA), the COMAH Regulations aim to prevent and mitigate the effects of major accidents involving dangerous substances that can cause serious damage and/or harm to people and/or the environment by ensuring that businesses “ <i>take all necessary measures to prevent major accidents involving dangerous substances [and] limit the</i>

Document	Summary
	<i>consequences to people and the environment of any major accidents which do occur”.</i>
Planning (Hazardous Substances) Regulations 2015	Implements land use planning requirements under the Seveso III Directive on the Control of Major Accident Hazards (see below).
Seveso III Directive (Directive 2012/18/EU)	Establishes the rules for the control of major accident hazards involving dangerous substances for the prevention of major industrial accidents resulting from hazardous substances, and for limiting the consequences of such accidents for human health and the environment. Seveso III is implemented in national legislation and is enforced by national safety authorities. In the UK, the Seveso III Directive is implemented as part of the COMAH Regulations as referred to above.
Construction (Design and Management) Regulations 2015.	Places specific duties on developers, contractors and designers to ensure that health and safety is taken into account throughout the life of a construction project, including decommissioning and removal.
The Management of Health and Safety at Work Regulations 1995	More detailed provisions made under the Health and Safety at Work etc. Act 1974, requiring employers to manage health and safety, including carrying out risk assessments and providing appropriate training for employees.
The Workplace (Health, Safety and Welfare) Regulations 1992	Provides for a wide range of basic health, safety and welfare issues applicable to most workplaces (except those involving construction work on construction sites or those below ground at a mine). It sets out duties for providing appropriate ventilation, lighting, cleanliness, floor conditions and traffic routes.
The Electricity at Work Regulations 1989	Sets out the precautions to be taken by employers, employees and the self-employed against the risk of death or personal injury from electricity associated with work activities.
The Dangerous Substances and Explosive Atmospheres Regulations (2002)	Governs the control of substances that cause explosions and fires. Sets out requirements for employers to assess and mitigate risks by ensuring the safe storage, handling and use of hazardous materials, along with any appropriate safety measures.

Document	Summary
Environmental Permitting Regulations 2016	Sets out laws to govern various commercial and industrial activities that have the potential to impact the environment. With respect to major accidents and disasters, this piece of legislation ensures the safe handling, storage and disposal of hazardous substances that have the potential to cause damage to human health or the environment. The Proposed Development will require a variation to the existing Environmental Permit that currently corresponds to the old steel working processes.
Civil Contingencies Act 2004	Establishes a framework for emergency preparedness and response. Imposes a clear set of roles and responsibilities of local authorities whose role it is to respond to emergencies.
Water Environment (Water Framework Directive) (England and Wales) Regulations 2017	Provides a framework for managing the water environment, to ensure the protection and maintenance of a sustainable water environment.
The Electricity Safety, Quality and Continuity Regulations 2002	Set out standards for the generation, transmission and distribution of electricity in the UK. It establishes specific safety standards for operators to prevent hazards and includes power quality and supply continuity requirements.

15.3 Consultation undertaken

- 15.3.1 Consultation relevant to major accidents and hazards has been undertaken with Neath Port Talbot Council (NPTC). The potential for significant effects relating to major accidents and hazards was initially intended to be addressed outside of the Environmental Statement. However, following consultation, NPTC recommended that this be developed into a dedicated ES chapter. NPTC cited a need to identify specific sources of hazard, potential significant environmental effects, and means by which these are mitigated either through legislation, design or otherwise.

15.4 Approach to the assessment

- 15.4.1 The Institute of Environmental Management and Assessment (IEMA) provides guidance for consideration of major accidents and disasters in EIA, titled; *Major Accidents and Disasters in EIA: A Primer* (2020) (hereafter, the 'IEMA Primer').
- 15.4.2 Major accidents and disasters relate to extreme events that would not reasonably be predicted or assessed within the other factors of EIA. The following definitions (IEMA, 2020) have been applied:
- A '*major accident*' is defined as an event that threatens immediate or delayed serious environmental effects to human health, welfare and/or the environment and requires the use of resources beyond those of the Applicant or its appointed

representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events;

- A ‘*disaster*’ is defined as a natural hazard (e.g. earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident;
- ‘*Risk*’ is defined as the likelihood of an impact occurring, combined with the effect or consequence(s) of the impact on a receptor if it does occur;
- A ‘*risk event*’ is defined as an identified, unplanned event, which is considered relevant to the development and has the potential to result in a major accident and/or disaster, subject to assessment of its potential to result in a significant adverse effect on an environmental receptor;
- For an accident to be considered ‘*major*’, this is defined as an occurrence leading to a loss of life or serious danger to human health and/or the environment, whether immediately or over time, onsite or off-site;
- ‘*Serious danger to human health*’ relates to people present permanently or for prolonged periods of time in the potentially affected area but excludes workers operating the facility. Injuries leading to disability or prolonged states of ill health shall count as serious dangers to human health; and
- ‘*Serious danger to the environment*’ relates to a contaminant source strength that does not decrease significantly within a short time, permanent or long-lasting environmental damage and the affected environment not being restored through minor clean-up and restoration efforts.

- 15.4.3 Whilst the IEMA definition of a ‘*serious danger to human health*’ listed above excludes workers operating a facility, temporary and permanent workers onsite have been included in the scope of this topic for purposes of provided a full and robust assessment.

Scope of the assessment

- 15.4.4 In line with the IEMA Primer, the following are excluded from the scope of the major accidents and disasters assessment:

- “*High likelihood events with the potential for high consequences*”: These events are excluded from the scope of this assessment on the basis that they would be “*unacceptable for any development*” and “*should already be managed or designed-out*” of the Proposed Development. The construction processes and operations of the proposed scheme must conform to the relevant design and safety standards, and any environmental permits or licenses in order to prevent high likelihood, high consequence events from happening or to reduce the risk of occurrence to a level that will not result in a significant effect.
- “*Low impact events whatever the likelihood, such as minor spills*” on the basis that these “*are low risk and are unlikely to be considered a major accidents and/or disasters risk. These events would not threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment*”.

- 15.4.5 Therefore, this chapter assesses the reasonably foreseeable, unplanned events that have a low likelihood of occurring but have the potential for high consequences (i.e., a likely significant effect). It focuses on determining the tolerability of the identified risks, taking into account the proposed embedded mitigation measures.

Study area

- 15.4.6 The assessment relates to both activities within the Site itself, and the potential effects to receptors within the vicinity of the Site, being that these are the areas where any effects will be focused in the event of a major accident or disaster.
- 15.4.7 In the absence of a recognised EIA methodology for the assessment of major accidents and disasters, the study area to be used for the assessment is based on professional judgement and covers a radius of 3km from the centre of the existing operational steelworks. This study area captures nearby residential receptors of note (particularly Margam estate and Eglwys Nunydd), and various key environmental receptors.

Hazard categories

- 15.4.8 Major hazard categories and types applicable to the Proposed Development have been considered in the context of those identified in the UK National Risk Register of Civil Emergencies (Cabinet Office, 2023) and NPTC Local Risk Register (NPTC, 2017). These have been adapted below in **Table 15.2**.
- 15.4.9 The assessment places national risks in a local context by considering the economic, geographic, environmental and demographic profile of Neath Port Talbot. This enables a better understanding of which risks are likely to be more significant locally compared with the national picture.
- 15.4.10 **Table 15.2** provides an overview of the highest ranking/priority hazards in the Neath Port Talbot and Swansea area, as identified in the NPTC risk register.

Table 15.2: Hazard types in the Neath Port Talbot area

Hazard category	Examples of the type of hazard (from National Risk Register)	Hazard types in Neath Port Talbot area (NPTC)
Environmental hazards	Coastal flooding, low temperatures, heatwaves, droughts, severe space weather, volcanic eruptions, poor air quality, earthquakes, environmental disasters overseas and wildfires.	Flooding: river, coastal, Canalside, Aberdulais, Neath. Severe weather: Extreme temperatures (hot and cold), storms events, heavy snowfall.
Human and animal health	Human diseases, animal diseases, antimicrobial resistance and pandemics.	Pandemic: new, non-seasonal flu viruses. Animal diseases: Bovine Tuberculosis, Swine Flu, Bluetongue, among the most notable examples.
Major accidents	Widespread electricity failures, major transport accidents, system failures, commercial failures, systematic financial crisis, industrial accidents – nuclear, industrial accidents - non nuclear, and major fires.	Coastal pollution: chemical sites, COMAH sites, hazardous cargo/substance release into the sea, degradation of marine environment. Transport incidents: Road incidents rail network (Swansea to London), Port Talbot Tidal Harbour, Bristol Channel.

Hazard category	Examples of the type of hazard (from National Risk Register)	Hazard types in Neath Port Talbot area (NPTC)
		Industrial accidents: COMAH sites, nuclear sites, industrial fire/explosion, Major Accident Hazard Pipelines. Major traffic accidents: rail, air and road. Fuel shortages: Scarcity of supply, technical problems, Industrial action.
Societal risks	Industrial action, widespread public disorder, and serious and organised crime.	Loss of critical infrastructure: electricity, gas, oil/fuel, water, telecoms.
Malicious attacks	Attacks on publicly accessible locations, attacks on transport systems, attacks on infrastructure, chemical, biological, radiological and nuclear attacks, small, medium and large scale cyber attacks and undermining the democratic process (disinformation)	Malicious attacks: Attacks on crowded places, transport systems, electronic systems and other.

Identification of potential hazards

- 15.4.11 The UK National Risk Register of Civil Emergencies (Cabinet Office, 2020) provides an overview of the key risks that have the potential to cause significant disruption in the UK. These risks include consideration of environmental hazards such as flooding and severe weather, and major industrial accidents.
- 15.4.12 At a local level, the Neath Port Talbot Local Risk Register provides insight on the risks that have potential to cause significant disruption, accidents or disasters specifically in the Neath Port Talbot area.
- 15.4.13 The risks relevant to the Proposed Development and their potential to cause significant effects are detailed in the assessment section of this chapter.

15.5 Established, interim and future environmental baseline

Desktop study

- 15.5.1 A desktop review was undertaken of existing information provided by the Applicant, particularly the extant steelworks COMAH Safety Report and Environmental Permit. These documents offer detail of the specific major accidents and hazards related to the established operation of the steelworks and control measures implemented for mitigation, thereby establishing a baseline for further analysis.
- 15.5.2 It should be noted that many of the established hazards associated with the operation of the steelworks will cease or reduce following closure of the 'heavy end'. These hazards are nevertheless described below in a manner consistent with the Safety Report, accompanied with discussion that examines the extent to which these established

hazards will persist, or otherwise, following implementation of the Proposed Development.

Established baseline

- 15.5.3 The established steelworks comprises a large and complex network of blast furnaces, coke ovens, conveyors, pipelines, and raw material handling, processing and storage facilities. The potential for major accidents or hazards to occur as a result of the established operations is managed primarily under the Site's COMAH status and associated actions required to minimise accident risk.
- 15.5.4 The COMAH Safety Report considers the hazards associated with established operation in distinct operational areas that govern key site operations:
- Raw Materials Works Area – Features a coke making plant, focused on receiving, storing and processing raw materials into sinter and coke for supply to the Ironmaking Works Area.
 - Ironmaking Works Area – Features blast furnaces, focused on producing molten iron using blast furnace technology.
 - Steelmaking Works Area – Features Basic Oxygen Steelmaking facility to processes molten iron from blast furnaces and scrap metal to make steel.
 - Energy Works Area - Responsible for producing and distributing electricity for the steelworks.
 - Mills – Concerned with processing, curing and rolling slabs to eventually be sold.
- 15.5.5 Following a review of the client's COMAH Safety Report, a number of major hazards are identified as being associated with the established operation of the Site.

Raw Materials Works Area

- 15.5.6 There is potential for loss of containment of hazardous gases used to fire the coke oven, which may result in jet fires or flash fires or semi-confined explosions.
- 15.5.7 By-products from the coke-making process (such as crude tar) is highly flammable, toxic and hazardous for the environment. There is potential for major environmental contamination or an ignition event.

Ironmaking Works Area

- 15.5.8 The main hazard associated with blast furnace operation in the iron-making process is a water/molten metal explosion. In 2001, such an incident occurred within the Port Talbot steelworks, resulting in damage to blast furnace 5 and three fatalities.
- 15.5.9 Loss of containment of large volumes of blast furnace gases may result in a toxic atmosphere. For example, in 2009, the main gas pipe from the Site's blast furnace cracked, leading to significant loss of containment of hazardous gases, though no workers were affected.

Steelmaking Works Area

- 15.5.10 Loss of containment of molten metal during the BOS process may result in a major accident or hazard, depending on the location of the ladle containing it and the quantity released. This may result in the release of hazardous gases and subsequent ignition.

- 15.5.11 There is potential for loss of containment of gases associated with the BOS process, resulting in a toxic atmosphere or major accident hazards.

Energy Works Area

- 15.5.12 Loss of containment of gases associated with electricity generation and distribution may result in a hazardous toxic environment or an ignition event leading to jet fires or explosion.

Mills

- 15.5.13 There is potential for the release of extremely flammable gas during the steel treatment process which may result in jet fires, flash fires or a toxic atmosphere. In 2008 an explosion occurred in a pipeline associated with the steel reheating process, although no injuries occurred from this.

Documented safety management procedures

- 15.5.14 The established steelworks site is a COMAH Upper Tier site, due primarily to hazardous gas storage on site for the blast furnaces. The COMAH Regulations (see Legislation and policy relevant to major accidents and disasters **Table 15.1**) impose mechanisms for hazardous substances to prevent major accidents and limitation of their consequences. Under the COMAH Regulations, the Applicant is required to:

- Take all measures necessary to prevent major accidents and limit their consequences for persons and the environment;
- Prepare an on-site emergency plan.
- Demonstrate to the competent authority that all measures necessary to comply with the COMAH Regulations are in place; and
- Notify any major accidents to the competent authority.

- 15.5.15 The Site's COMAH Safety Report sets out evidence to confirm the safety and integrity of the activities within the Port Talbot site. One of the requirements of the Safety Report is to describe on-site and off-site resources which can be mobilised by the operator to show that the necessary measures have been taken to limit the consequences of a major accident to people and the environment.

- 15.5.16 The arrangements and guidance for emergency arrangements for environmental incidents / scenarios are outlined in an Environmental Contingency Plan (ECP) which documents the steps to be taken in the event of an incident that has the potential to cause environmental harm. The ECP also describes general guidelines for evaluation of significance and identifying the appropriate level of action and communications that should be adopted in the event of an incident. In addition to this, a Major Emergency Plan (MEP) and Local Emergency Plans (LEP) are in place as part of the emergency planning requirements and require liaison and interface with local authority services. The existing steelworks is also covered by an Environmental Permit.

Environmental Receptors

- 15.5.17 In accordance with the IEMA Primer, the various receptors who would be at risk in the event of a major accident or hazard are outlined below. **ES Chapter 3: Environmental context and alternatives** has been used to identify nearby sensitive receptors within the study area:

People and human health

- 15.5.18 The Site is located approximately 1 km south-west of the residential estate of Margam and 2 km north-west of the residential estate of Eglwys Nunydd.
- 15.5.19 There is an internal rail system within the Site connecting to the South Wales main line railway running to the East of the Site. The Site is well connected to the surrounding road network, including the M4 and A4241 to the East and A48 to the north.
- 15.5.20 Other human receptors include users of Cycle Network Route 4 running approximately 1km to the East of the Site, and Longlands Lane Public Right of Way (PRoW) running along the southern boundary of the Site.

Water environment

- 15.5.21 As described in **ES Chapter 9: Surface water flood risk and drainage**, the Site features a network of drainage channels, ditches and culverts.
- 15.5.22 The Site is located adjacent to Swansea Bay. There are no NRW Main Rivers within the planning application boundary.
- 15.5.23 A number of NRW Main Rivers are located within the 3 km study area, including the Afon Cynffig to the south and the Afon Afan and Nant Ffrwd Wylt to the north. Under the established baseline, all three of these rivers are used for process water abstraction at the Site.
- 15.5.24 Eglwys Nunydd Reservoir, which is a SSSI, is located approximately 300m south-east of site boundary

Soils and ground water

- 15.5.25 As described in **ES Chapter 10: Land, soil and groundwater**, soils within the Site are predominantly characterised by loamy and clayey soils with naturally high groundwater, sand dune soils (to the south) and freely draining slightly acidic loamy soils (to the north and north-east). Groundwater beneath the Site is defined as a secondary aquifer.

Environmental designations

- 15.5.26 As described in **ES Chapter 8: Biodiversity**, there are a number of statutory designated sites within the 3 km study area:
- Margam Moors (SSSI) directly south;
 - Eglwys Nunydd Reservoir (SSSI) approximately 300 m southeast;
 - Kenfig (SAC, SSSI) approximately 1.5 km south;
 - Kenfig Pool and Dunes (NNR) located 1.5 km south;
- 15.5.27 There are also three non-statutory designated sites within the 3 km study area.
- Neath Port Talbot Watercourses within the Site boundary.
 - Eglwys Nunydd 310 m south-east.
 - Junction 38 Wetland Complex 335 m south-east.

Heritage designations.

15.5.28 As described in **ES Chapter 11: Cultural heritage**, there are no designated historic assets within the actual site boundary, however there are three non-designated historic assets located within the Site:

- Morfa Colliery (421174) is a 19th century colliery in the north-western area of the Site;
- Morfa Colliery Gas Works (710277) was a private gasworks used to light the colliery buildings; and
- Theodrics Grange (20041) is a ruined Medieval building which formed part of a monastic grange, possibly of a domestic function.

15.5.29 There are eight Registered Parks and Gardens, Scheduled Monuments and Conservation Areas within the 3 km study area, all situated within the Margam Mountain Historic Landscape Character Area.

Surrounding road network

15.5.30 **ES Chapter 12: Transport and access** investigates the frequency of road accidents within the surrounding road network, recording a total of three or less accidents during a five-year study period on all roads except for the M4 Junction 38, where a total of nine accidents were recorded in the same study period.

Other infrastructure

15.5.31 To the east of the Site is the main South Wales national rail lines which connects to the internal rail system within the Site. Beyond this is the M4 motorway.

15.5.32 North of the Site boundary is hardstanding; beyond which is Port Talbot deep sea harbour, owned by ABP.

Interim baseline

15.5.33 As described in **ES Chapter 4: Environmental assessment methodology**, the interim baseline represents the Site conditions following the closure of the steelworks' 'heavy end' infrastructure. This includes the cessation of operations at the stockyard, sinter plant, coke ovens, blast furnaces and steel converter. In this scenario those processes will cease operation, with the associated structures made safe but remaining standing.

15.5.34 Activities resulting in major accidents and disasters are linked with the various site operations described in sections **15.5.7** to **15.5.14**. The cessation of established site activities essentially eliminates numerous risks that may result in fires, explosions, loss of hazardous gas containment, and major pollution incidents.

15.5.35 The closure of the existing steelworks also eliminates the requirement for coke deliveries to the Site, thereby reducing the number of traffic movements and accident risks associated with those traffic movements.

15.5.36 Therefore, under this interim baseline, the potential for major accidents and disasters would see a considerable reduction from the established baseline. The main focus of major accident and disaster prevention in this period will relate to the maintenance of assets in a safe structural condition, and avoidance of legacy pollution to ground water and the water courses in the vicinity of the Site.

Future baseline

- 15.5.37 From the perspective of major accidents and hazards resulting from the development, it is anticipated that the future baseline will be relatively similar to the interim baseline, given the absence of operational stockyards, sinter plants, coke ovens, blast furnaces and steel converters.

Climate change

- 15.5.38 Long-term climatic predictions suggest a future increase in warmer, wetter winters and drier summers. This may result in major accidents and hazards resulting from extreme weather events. Impacts of climate change and their implications on development are assessed further in **ES Chapter 13: Climate change**.
- 15.5.39 Given the Site's location, climate change related effects such as increased prevalence of coastal or fluvial flooding may affect the Site but as most sources of major hazards will have ceased in the future baseline scenario it is not anticipated that this will lead to an increased risk of major accidents.

15.6 Project characteristics and embedded mitigation

- 15.6.1 The assessment of effects of the Proposed Development assumes the implementation of embedded mitigation. These such mitigation measures are identified below with a summary provided on how the measures contribute to the mitigation and management of major accidents and disasters.

Construction phase

- 15.6.2 Construction activities have the potential to cause contamination of water and/or land and soils due to runoff from diffuse or point source pollution events. This may potentially result in significant effects on water receptors and/or land and soil receptors. To minimise this risk, standard good practice measures will be implemented via a full Construction Environmental Management Plan (CEMP), complete with pollution prevention and control measures to mitigate and manage major accidents and disasters.
- 15.6.3 Control measures include:
- Controls and limitations on the use of potential pollutants such as cementitious materials.
 - Correct storage, handling and usage of hazardous substances (both liquid and solid), including secure, bunded areas with impervious walls.
 - Correct storage, handling and usage of hazardous substances (liquid and solid), including secure, bunded areas with impervious walls. Drip trays will be in place to collect leaks.
 - The use of oil interceptors fitted to all temporary discharge points.
 - Restrictions on use of unnecessary machinery near adjacent water. Exclusion zones around sensitive areas (e.g. drainage ditches) may be implemented.
 - A pollution incident control and emergency preparedness plan to be maintained by the construction contractor, including a list of measures and processes to be enacted in the event of environmental pollution incidents.

- 15.6.4 While the construction phase is expected to have lower traffic volumes than those associated with the established baseline, a Travel Plan will be provided for construction personnel. HGVs will be required to route via the M4 Junction 38, thereby avoiding congestion at Port Talbot, and reducing the risks of road accidents.

Operational phase

- 15.6.5 The potential for major accidents and disasters relating to the operation of the Proposed Development will be actively managed through compliance with a range of relevant statutory and non-statutory requirements.

COMAH:

- 15.6.6 The Proposed Development is anticipated to remain subject to the COMAH Regulations 2015, as the storage of eco-toxic materials, specifically dust from the fume extraction plant, is expected to exceed the COMAH threshold. However, the range and complexity of activities subject to COMAH notification will be substantially reduced compared with the established operation of the steelworks, due to the cessation of the 'heavy end' activities
- 15.6.7 Under the COMAH Regulations, the Applicant will be required to:
- Take all measures necessary to prevent major accidents and limit their consequences for persons and the environment;
 - Prepare an on-site emergency plan;
 - Demonstrate to the competent authority that all measures necessary to comply with the COMAH Regulations are in place; and
 - Notify any major accidents to the competent authority.
 - Hold and maintain a 'Safety Report' that identifies evidence to confirm the safety and integrity of site activities.

Environmental Permit

The Proposed Development will be subject to the Environmental Permitting Regulations 2016. As Site operations will change from the established baseline, a variation of the existing Environmental Permit will be required. The environmental permitting process imposes restrictions and monitoring requirements for waste handling and emissions (to land air or water), thereby minimising the risk of major environmental accidents and hazards.

Hazardous substances consent

- 15.6.8 Full assessment against the requirements of the Planning (Hazardous Substances) Regulations 2015 will be completed once a full inventory of process substances and quantities is available. If required, hazardous substances consent will play an important role in the control of major hazards, assessing the potential risks any hazardous substance poses and the potential for harm it may cause.

Hazard Identification (HAZID) and Hazard and Operability (HAZOP) studies.

- 15.6.9 As part of the detailed project design, risk assessments would be undertaken including hazard identification studies (HAZID) and hazard and operability studies (HAZOP) to ensure that potential hazards are recorded and actioned in order that they can be

avoided, mitigated or highlighted for further risk reduction measures during detailed design.

Internal major accidents prevention policies

- 15.6.10 The Applicant operates a business-wide Health & Safety Management System, which includes Emergency Preparedness principles that must be applied across the business. This management system includes the requirements for a host of emergency plans, including an MEP and ECP, ensuring that all reasonably practicable measures are taken to prevent major accidents involving hazardous substances and limit their consequences to people and the environment.
- 15.6.11 Various other major accident and disaster prevention and management legislation will apply to the Proposed Development including but not limited to:
- Health and Safety at Work etc. Act 1974, governing worker health, safety,
 - Construction (Design and Management) Regulations 2015, to minimise the risk of major accidents and disasters via project design (from construction to decommissioning),
 - The Electricity Safety, Quality and Continuity Regulations 2002, to prevent major accidents and hazards during electrical outages; and,
 - Civil Contingencies Act 2004, to mitigate the consequences major accidents and disasters through emergency planning and preparedness.
- 15.6.12 Further detail about legislative controls and regulations, and the potential effects they aim to address can be found in **Table 15.3**.

15.7 Assessment of potential effects

Desktop study

- 15.7.1 A review was undertaken of the NRR and the NPTC Local Risk Register. Both of these documents provide insights into the key risks that have the potential to cause significant disruption, accidents or disasters in the UK and the local area.
- 15.7.2 While the above risk registers are useful for defining general hazard categories, more specific detail on the sources of risk associated with EAF technology was required. At the time of this assessment, both the HAZID and HAZOP study are in the process of being completed. Therefore, a review of the following sector-wide guidance documents and published research was undertaken:
- **Safety guidelines for Iron & Steel Sector: Electric Arc Furnace** (Government of India, 2019): A guidance document highlighting various risks and management measures for EAF technology.
 - **Statutory guidance for electrical furnaces** (Defra, 2013): A process guidance note on the best available techniques for regulating EAF air emissions.
 - **Carbon Monoxide Explosion Hazards in Electric Arc Furnace Steelmaking Operations** (US Labor Department Occupational Safety and Health Administration, 2015): A guidance document highlighting carbon monoxide explosion risks associated with EAF technology.

- **Electric Arc Furnace Explosions: A Deadly but Preventable Problem** (Ferguson and Zsamboky, 2017): A technical paper providing information, history and management strategies for fires and explosions associated with EAF technology.
- 15.7.3 These sources in particular were selected due to their relevance to EAF operations and also their credibility (e.g., authored by government bodies like the Government of India and US Labour Department). These documents, particularly those related to safety, reference real-life examples and best-practice case studies ensuring that any identified sources of risk are based on real-world experience rather than theoretical scenarios.
- 15.7.4 A review of **ES Chapter 2: Proposed Development** was key for understanding the various EAF process streams. From here, it was possible to infer the potential sources of risk associated with the EAF process.
- 15.7.5 Additional consideration was afforded to the following ES chapters in order to identify sensitive receptors impact pathways, and potential effects:
- **ES Chapter 3: Environmental context and alternatives**, in relation to nearby sensitive receptors;
 - **ES Chapter 6: Air quality**, in relation to airborne gases and particulates;
 - **ES Chapter 8: Biodiversity**, in relation to the presence and value of habitats and species of conservation importance;
 - **ES Chapter 9: Surface water flood risk and drainage**, in relation to flood risk;
 - **ES Chapter 10: Land, soil and groundwater**, in relation to contamination of soils and ground water;
 - **ES Chapter 12: Transport and access**, in relation to increased vehicle movements and associated accident risks,
 - **ES Chapter 13: Climate change**, in relation to extreme weather events and temperatures; and,
 - **ES Chapter 15: Cumulative effects**, in relation to hazards and disasters of surrounding development sites and the potential for domino-effect hazards.

Identification of receptors

- 15.7.6 The receptors considered in this assessment are:
- Human receptors, comprising:
 - o Site workers and site visitors during both the construction and operational phases;
 - o Local residents/Members of the public at nearby settlements (including Margam and Eglwys Nunydd)
 - o Users of Longlands Lane PRoW;
 - o Users of National Cycle Network 4;
 - o Users of the M4, A4241, A48 and local railway lines; and

- o Emergency personnel attending the Site in the event of a major accident or disaster.
- Environmental receptors comprising:
 - o Groundwater;
 - o On-site drainage, watercourses and Swansea Bay;
 - o Afon Cynffig, and Afon Afan and Nant Ffrwd Wylt; and
 - o Habitats and species on and near the Site (particularly Margam Moors, Eglwys Nunydd Reservoir, and Kenfic Pool and Dunes);
- Historic receptors comprising:
 - o On-site non-designated historic assets (Morfa Colliery, Morfa Colliery Gas Works, and Theodrics Grange).
- Infrastructure and industry, comprising:
 - o Proposed Development's new infrastructure and ancillary equipment/facilities.
 - o Highways and rail infrastructure.

Identification of hazards

15.7.7 Following a review of the aforementioned risk registers, documents, and ES chapters, the main sources of risk relate to the potential for fires and explosions, or hazardous substance leakage. These hazards are generally expected to be substantially reduced for the Proposed Development compared with the established operation of the steelworks. This is due to cessation of the 'heavy end' operation, which currently carries a number of major accident risks.

Fire/Explosion

15.7.8 The EAF process stream makes use of extremely high temperatures to create steel from scrap metal and other raw materials. Due to the use of high temperatures, there is potential for fires or explosions, which may result in significant effects on humans or other environmental receptors. Fires or explosions may result from a variety of causes;

- Wet scrap metal or water leakages intervening with combustion process resulting in fire or explosion;
- Excess carbon monoxide concentrations in furnace resulting in fire or explosion;
- Loss of containment of oxygen, nitrogen, hydrogen or other gases associated with the steelmaking process resulting in fire or explosion;
- Spillage of hot slag or metal resulting in fire or explosion;
- Electrical errors or failures resulting in electric arc flashes or explosions; and
- Other process, equipment or electrical failures resulting in fire or explosion.

Uncontrolled release of hazardous substances due to loss of containment of off-gases

15.7.9 The steel melting process produces off-gases in the form of fumes and dust. EAF dust is hazardous, containing toxic compounds such as zinc, lead and dioxins. The Proposed

Development features a fume treatment plant, to extract and treat hazardous fumes and dust.

- 15.7.10 There may be a loss of containment of the aforementioned off-gases resulting from faulty equipment (pipes, storage tanks, valves, etc.) or extraction system error or failure. In such an event, if these emissions are not controlled, this may result in toxic exposure to people or environmental damage.

Environmental contamination from hazardous substances

- 15.7.11 The delivery, storage and handling of scrap metal is a key component in the EAF process. Scrap metal may contain contaminants such as oil or grease. Improper storing or handling of scrap metal may result in environmental contamination.
- 15.7.12 Loss of containment of gases used in the EAF process (such as oxygen, nitrogen or natural gas), may result in toxic exposure to people or environmental damage.
- 15.7.13 Slag generated from the EAF process can contain toxic metals. If slag is not stored, handled and disposed correctly, this may result in the release of harmful pollutants into the environment or on-site drainage systems.
- 15.7.14 The aforementioned hazardous substances may potentially enter the Proposed Development's surface water drainage channels resulting in pollution of surface water and Swansea Bay (outfall).

Other hazards

- 15.7.15 The Proposed Development will result in a decrease in traffic movements due to the cessation of coke deliveries. That said, there is still the potential for transport accidents involving site workers or visitors.
- 15.7.16 Workers and visitors of the Proposed Development may be subject to disease, or a pandemic. In the event of a pandemic or the introduction of an animal disease to the Site, illness and potentially death may occur as a result of interactions between site workers and visitors.
- 15.7.17 The unlikely event of a malicious attack on the Proposed Development may result in injury, death or destruction of infrastructure, environmental and historic receptors.

Predicted construction and operational effects.

- 15.7.18 Potential major accidents and disasters are described according to the hazard categories identified in **Table 15.2**. Potential effects are presented in a risk assessment matrix (see the below **Table 15.3**), based on the one provided in the IEMA Primer. Also based on that guidance, the requirement for further assessment is focused on low risk, high consequence events whose residual effects have not been minimised to levels as low as reasonably practical. Only those events considered to meet with this criterion will require further assessment.
- 15.7.19 Between both the construction phase and operational phase, the hazard sources and pathways exhibit considerable similarities. Furthermore, many of the embedded and tertiary mitigation measures for both phases are largely consistent. Therefore, in line with proportional assessment, both the construction and operational phases have been assessed collectively within a single matrix.

Table 15.3: Construction and operational risk matrix

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
Environmental hazards					
Flooding	Potentially vulnerable to tidal/storm surges due to proximity to the Swansea bay. Presence of construction/operational materials, electrical equipment and onsite contaminants. Effects of climate change impacting the Proposed Development.	Damage to electrical equipment causing unplanned system shutdown, failure, fire or explosion. Indirect effects to offsite receptors and assets. Uncontrolled release of contaminants via ground, air or water resulting in pollution event. Risk of death or injury to site workers from mobilised materials/debris, contaminants and electrocution	Human Environmental Infrastructure	Across the vast majority of the Site, and in all locations of sensitive development, ground levels will be raised. This ground raising forms a mitigation to the risk of flooding from coastal or surface waters or from Eglwys Nunydd reservoir failure. The SuDS system will ensure conveyance of surface water flows away from on-site areas and watercourses of high flood risk. Bunding for process plant and storage areas handling contaminants or hazardous substances, with capacity in excess of volume. Correct storage, handling and use of hazardous substances (liquid and solid). Adequately bunded and secure areas with impervious walls and floor will be provided for the temporary storage of fuel, oil and chemicals on site during construction. Surface water attenuation measure in place to reduce flood risk elsewhere, in accordance with the drainage strategy.	No. With implementation of mitigation, the risk of coastal flooding on the Proposed Development, and as a consequence of the Proposed Development is considered to be as low as reasonably practicable. The risk of major accidents and disasters caused by flooding is therefore not significant.

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
Severe weather (extreme hot or extreme cold)	Presences of mechanical and technical components. Presence of process fluids, combustible materials, water supplies and drainage infrastructure. Use of internal access/haul roads. Effects of climate change impacting the Proposed Development.	Potential freezing of mechanical and electrical components, process fluids, water supplies and drainage systems, leading to system failures, pipeline/containment seal rupture, hazardous substance leakages, and subsequent fire/explosion. Overspill of contaminated process/surface water due to blocked or ruptured drainage infrastructure. Potential thermal expansion of mechanical components or overheating of combustible materials resulting process failures and subsequent fire/explosion.	Human Environmental Infrastructure	CEMP to include Travel Plan and provision of shuttle bus service to minimise the risk of road collisions. Gritting during icy seasons to minimise slips and falls MEP and ECP detailing emergency preparedness and response plan to ensure safe system shutdown is achieved. Regular maintenance and performance checks. All fixed equipment, instrumentation and electronics to have an operating range exceeding expected climate change scenarios. Implementation of spill response plan to be included in CEMP and ECP. Coolants and fire protection systems in place. <u>Legislation:</u> <i>Workplace (Health, Safety and Welfare) Regulations 1992</i> Will ensure working environments are appropriately equipped to handle extreme temperatures	No. With implementation of mitigation and legislative requirements, the risk of severe weather on the Proposed Development, and as a consequence of the Proposed Development is considered to be as low as reasonably practicable. The risk of major accidents and disasters caused by severe weather is therefore not significant.

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
		Dust generation affecting highways/access roads.		<i>Management of Health and Safety at Work Regulations 1995</i> Will require risk assessments to ensure safe working conditions during severe weather conditions	

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
Human and animal health					
Pandemic	Interactions between permanent and temporary site workers, contractors and visitors.	Potential spread of disease locally/regionally via temporary and permanent staff, and out of area via delivery staff and other site visitors. Potential for disease to spread due to close contact between workers on site. Potential for pandemic to result in closure of the Proposed Development due to restrictions on movement and due to widespread illness amongst site workers.	Human	Site safety inductions provided to all staff. Proposed development can remain operational on a skeleton staff and partial/complete system shutdown can be implemented as required. Safety related matters would be critical to operation with 'key worker' status reflected accordingly. Key workers will be identified by the Applicant in the event of a Government lockdown for essential repair/maintenance to ensure the safety and security of the proposed scheme whilst not operational. <u>Legislation:</u> <i>Health and Safety at Work etc. Act 1974</i> Will require that foreseeable health and safety risks to Site workers are reduced as far as reasonably practicable. Will require evidence to demonstrate this.	No. With implementation of mitigation and legislative requirements, the risk of a pandemic on the Proposed Development and the spread of pandemic-related disease as a consequence of the Proposed Development is as low as reasonably practicable. The risk of major accidents and disasters caused by pandemic is therefore not significant.
Animal diseases	Introduction of source of animal disease	Accidental introduction via scrap delivery.	Human	Not anticipated to be an issue given the nature of the raw materials required in the EAF process.	No. The risk of major accidents and disasters caused by animal diseases is not significant.

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
Major accidents					
Coastal pollution	Presence of hazardous substances or materials in onsite drainage system. Discharge of highly contaminated/hazardous water accidentally into Swansea Bay.	Uncontrolled release of untreated contaminants causing harm to the marine environment.	Environmental	The operation of the EAF facility compared to the existing steelworks will result in a significant reduction in effluent volume and therefore contaminant mass. A wastewater treatment plant to dilute and treat contaminated water before discharge into Swansea Bay. A separate 'contaminated stream' will be operated alongside a 'clean water stream', ensuring all hazardous water is treated before outfall. Across the vast majority of the Site, and in all locations of sensitive development, ground levels will be raised. This ground raising forms a mitigation to the risk of flooding from Eglwys Nunydd reservoir failure. Legislation: <i>COMAH Regulations 2015</i> - Will ensure hazardous substances are handled and stored correctly to prevent coastal pollution. <i>Environmental Permitting Regulations 2016</i> - Will impose discharge limits and monitoring requirements to avoid coastal pollution.	No. With implementation of mitigation, the risk of coastal pollution as a consequence of the Proposed Development or as a consequence of the proposed development is as low as reasonably practicable. The risk of major accidents and disasters caused by coastal pollution is expected to be lower than that of the established baseline. and is therefore not significant.

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
Transport incidents	Use of the M4, A4241 and A48. Use of Cycle Network Route 4 or Longlands Lane PRow. Use of onsite railway line.	Risk of injury or death to commuting site workers or general public. Risk of environmental contamination following transport accident involving scrap delivery.	Human Environmental	The introduction of EAF technology in favour of traditional blast furnaces eliminates the need for coal delivery, thereby reducing the number of road vehicle movements associated with the Site. Inclusion of a travel plan in the CEMP, outlining commuting routes less prone to hazards. Implementation of a ECP in the event of potentially contaminated. <u>Legislation:</u> <i>Management of Health and Safety at Work Regulations 1995</i> To address transport safety, with risk assessments for accidents hazards.	No. With implementation of mitigation, the risk of transport incidents as a result of the Proposed Development or as a consequence of the proposed development is as low as reasonably practicable. The risk of major accidents and disasters caused transport incidents is expected to be lower than that of the established baseline and is not significant.

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
Industrial accidents (fire/explosion)	Presence of COMAH operations onsite. Presence of flammable and/or toxic gases associated with EAF process.	Loss of containment of flammable gases due to process failure or faulty ancillary equipment, resulting in fire/explosion, causing injury or fatalities to Site workers, visitors, or the general public. Loss of containment of flammable gases due to process failure or faulty ancillary equipment, resulting in fire/explosion, causing damage or destruction of infrastructure or historic assets.	Human Environmental Infrastructure Historic	Introduction of EAF technology greatly reduces the risk of fires and/or explosion by minimising the use of hazardous substances like coke and blast furnace gases. Automated fire prevention and safety systems, featuring coolants, alarms and sprinkler systems. <u>Legislation:</u> <i>Health and Safety at Work etc Act 1974</i> - Will ensure the risk of fire is reduced as low as reasonably practicable. <i>COMAH Regulations 2015</i> - Requires control and safety protocols for hazardous substances, mitigating the risk and effects of fires and/or explosions. <i>Construction (Design and Management) Regulations 2015</i> - Requires project design to account for fire/explosion prevention during the life of a project (construction to decommissioning). <i>Planning (Hazardous Substances) Regulations 2015</i>	No. With implementation of mitigation, industrial accidents (fires and/or explosions) as a consequence of the Proposed Development is expected to be as low as reasonably practicable. The closure of the existing steelworks and introduction of new EAF technology is expected to reduce the risk of industrial accidents (fires and/or explosions). The risk of major accidents and hazards as a result of industrial incidents (fires and/or explosions) is not significant.

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
				- Will establish rules for controlling fire/explosion events and limit the consequences of such incidents. <i>Dangerous substances and explosive Atmospheres Regulations 2002</i> - Will require the control, assessment and mitigation of explosion/fire risks resulting from hazardous substances. <i>Pipelines Safety Regulations 2015</i> - Imposes requirements for pipeline construction, preventing fugitive gas emissions. <i>Civil Contingencies Act 2004</i> - Will require an established framework for emergency preparedness and response, with a clear set of roles and responsibilities.	

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
Industrial accidents (pollution incident)	Presence of hazardous gases associated with EAF process such as carbon monoxide, nitrogen or natural gas. Presence of hazardous substances or materials onsite. Production of by-products from EAF process (Fumes, dust, and slag).	Loss of containment of hazardous gases due to process failure or faulty ancillary equipment (storage tanks, pipelines, etc.) leading to uncontrolled release of toxic compounds via air, resulting in injury, death or environmental contamination. Improper storage or handling of hazardous substances leading in uncontrolled release of hazardous substances, resulting in environmental damage or water contamination.	Human Environment	Introduction of EAF technology greatly reduces the risk of pollution incidents by minimising the use of hazardous substances like coke and blast furnace gases. Water usage is also much reduced for the EAF compared with the established operation. Implementation of spill response plans to be specified in CEMP during construction phase and ECP during operational phase. Best practice control measures in the event of a pollution incident to be implemented through a CEMP during construction and a MEP during operation. <u>Legislation:</u> <i>Health and Safety at Work etc Act 1974</i> - Will ensure the risk of a toxic atmosphere is reduced as low as reasonably practicable. <i>COMAH Regulations 2015</i> - Requires control and safety protocols for hazardous substances, mitigating the risk and effects of pollution events. <i>Construction (Design and Management) Regulations 2015</i>	No. With implementation of mitigation, industrial accidents (major pollution events) on the Proposed Development or as a consequence of the Proposed Development is expected to be as low as reasonably practicable. The closure of the existing steelworks and introduction of new EAF technology is expected to reduce the risk of industrial accidents (major pollution events).

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
				- Requires project design to account for pollution incident prevention during the life of a project (construction to decommissioning). <i>Planning (Hazardous Substances) Regulations 2015</i> - Will establish rules for controlling pollution incidents and limit their consequences <i>Pipelines Safety Regulations 2015</i> - Imposes requirements for pipeline construction, preventing fugitive gas emissions. <i>Civil Contingencies Act 2004</i> - Will require an established framework for emergency preparedness and response, with a clear set of roles and responsibilities	

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
Societal risks					
Loss of critical infrastructure	Presence of plant, equipment, and safety systems dependent on power supply to operate. Potential impact on automated systems such as safety control due to power failure, resulting in unplanned process failure, fire or explosion.	A complete loss of electricity supply could result in the temporary closure of the EAF facility until power is restored. Potential impact on automated system such as safety control due to power failure, leading to unplanned system shutdown, fire or explosion, injury or death to site workers. Loss of cooling water supply leading to overheating and subsequent process failure. Loss of telecoms has potential to delay contact with emergency services and onsite health and safety personnel.	Human Environmental Infrastructure	Site-specific MEP and Major Accident Prevention Plan to ensure safe system shutdown is achieved. Dedicated emergency power generators in place, where power supply is critical to safe operation. <u>Legislation:</u> <i>Health and Safety at Work etc Act 1974</i> - Will require that foreseeable health and safety risks resulting from power outages are adequately mitigated against. <i>The Electricity Safety, Quality and Continuity Regulations 2002</i> - Sets out requirements for the safety and quality of electricity supply, setting out precautions against supply failure	No. With implementation of mitigation, the effects of a loss of critical infrastructure on the Proposed Development, and as a consequence of the Proposed Development is considered to be as low as reasonably practicable. The risk of major accidents and disasters caused by a loss of critical infrastructure is therefore not significant.

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
Malicious attacks					
Malicious attacks	Proposed Development may be targeted due to essential steelmaking and distribution functions.	Targeted attacks on infrastructure and publicly accessible locations by land/air, resulting in major fires/explosions and injury or death to site workers, visitors and the general public. Cyber-attacks causing disruption to communications and failure of automated safety systems and warnings. Potential for automated safety controls to fail in the event of power loss, electrical malfunction or mechanical malfunction following malicious attack.	Human Infrastructure	The Proposed Development is not in a publicly accessible location. A gated security entrance will be in place. Manual override protocols for system shutdown. Multiple layers of automated safety alerts and controls will be in place including procedures for manual shutdown/isolation of facility components. Security advice for high hazard sites is provided within documents published by the National Counter Terrorism Security Office and Association of Chief Police Officers (NaCTSO, 2014) as well as the Centre for the Protection of National Infrastructure (CPNI). Appropriate advice to be set out within the MEP. Cyber security measures to prevent hacking to also be included. Legislation: Management of Health and Safety at Work Regulations 1995 Will require risk assessment and mitigation of risks associated with malicious attacks	No. With implementation of mitigation, the risk of a malicious attack on the Proposed Development, and as a consequence of the Proposed Development is considered to be as low as reasonably practicable. The risk of major accidents and disasters caused by a malicious attack is therefore not significant.

Hazard Type	Source and/or Pathway	Reasonable worst-case consequence	Receptor(s)	Mitigation (primary and tertiary) and legislative controls	Is the residual level of risk significant?
				<i>Civil Contingencies Act 2004</i> Will establish a framework for preparedness and response in the event of a malicious attacks.	

- 15.7.20 The above risk matrix assesses the predicted worst-case scenario effects of potential major accidents and hazards, details relevant legislation and embedded and tertiary mitigation measures to address these effects. Following this assessment, it is determined that the residual risk of all major accident and hazards associated with the Proposed Development is as low as reasonably practicable.
- 15.7.21 EAF steelmaking will remove or significantly reduce many of the established sources of hazard at the Site. The Proposed Development also presents opportunity for renewal of aged infrastructure to incorporate modern day standards of safe working. Whilst some sources of major accident risk will persist, the overall level of hazard presented by the Proposed Development is considered to be much reduced when compared with the established baseline.
- 15.7.22 The residual risk of major accidents and hazards is assessed as not significant.

Proposed additional mitigation

- 15.7.23 The Proposed Development's legislative requirements and mitigation measures are deemed sufficient to reduce the risk of significant effects to levels as low as reasonably practicable. Therefore, no further mitigation measures have been proposed beyond legislative requirements and the embedded mitigation set out in **Table 15.3**.

15.8 Further survey and monitoring requirements

- 15.8.1 Monitoring is integral for ensuring that the legislative requirements referenced in this chapter as embedded mitigation are effectively implemented. Compliance with monitoring requirements is assessed by the respective governing body of each legislation. Monitoring requirements will include but not be limited to:
- **Environmental Permitting Regulations 2016:** Monitoring of emissions and water quality are a mandatory requirement of the environmental permit to be varied according to the proposed development.
 - **Water Environment (Water Framework Directive) Regulations 2017:** Water quality will be monitored to ensure compliance with "good status" for all relevant waterbodies associated with the Proposed Development.
- 15.8.2 **Construction Environmental Management Plan:** Mitigation measures outlined in the CEMP will be monitored by an Environmental Clerk of Works, who will oversee pollution prevention, storage of hazardous substances and other relevant hazard prevention measures.
- 15.8.3 The various components and process streams of the proposed development will be regularly maintained and performance checked to ensure a continually minimised risk of major accidents and disasters resulting from process failures or errors.

15.9 Opportunities for enhancement

- 15.9.1 Given that the risks associated with major accidents and hazards have been reduced to ALARP, no additional opportunities for enhancement have been proposed. However, the Applicant is in the process of preparing a HAZID and a HAZOP study, which may identify

further measures for enhancement in relation to the prevention and mitigation of major accidents and disasters.

15.10 Cumulative effects

- 15.10.1 Cumulative effects are the combined effects of several development projects (in conjunction with the Proposed Development) on common receptors, which may result in additional or combined significant effects which may not have occurred when assessing each project in isolation. This section examines cumulative risks from major accidents and disasters.
- 15.10.2 The cumulative impacts of the Proposed Development with other planned developments within the Zone of Influence (ZoI) is assessed at length in **ES Chapter 16: Cumulative effects**.
- 15.10.3 Using the ZoI established in **ES Chapter 16: Cumulative effects**, a list of committed developments that have potential for reasonably foreseeable, unplanned events that have a low likelihood of occurring but have the potential for high consequences (i.e., major accidents and disasters) are specified below in **Table 15.4**.

Table 15.4: Developments with potential for Major Accidents and Disasters within ZoI

Planning Ref and status	Description	Distance from EAF	Reason for inclusion
P2021/1255 Approved 13.01.2023	<u>Land off J38 of the M4, Margam</u> Full planning application by Sandvik Osprey Ltd for a metal processing facility totalling 28,500sq.m of floorspace comprising a powder processing plant, warehouse and store, office building, amenity building, laboratory, services building, substation, phase 2, CCTV, storage tanks and plant, parking, servicing and roads and associated works.	850 m north	Risk of fires, explosions or environmental contamination.
P2023/0858 Awaiting decision (validated 13.11.2023)	<u>Crown Wharf Port Talbot Docks Port Talbot SA13 1RA (Project Dragon)</u> LanzaTech Ltd has submitted an application for the demolition of existing structures and erection of a Sustainable Aviation Fuel (SAF) production facility, including the production of green hydrogen and sustainable diesel, enclosed ground flare, storage tanks, installation of pipework and electrical, processing and utility equipment, administration, warehouse and laboratory buildings, new access, car parking and transport	1.3 km north-west	Risk of fires, explosions or environmental contamination.

Planning Ref and status	Description	Distance from EAF	Reason for inclusion
	infrastructure including a truck loading area and associated works, hard and soft landscaping, areas for temporary construction laydown, and associated development on land at Crown Wharf Port Talbot Docks Port Talbot SA13 1RA.		

Metal processing facility: Land off J38 of the M4, Margam

- 15.10.4 This development has been included in this section due to the involvement of hazardous substances associated with metal processing. Potential major accidents such as fires, explosions or environmental contamination may result in cumulative effects when considered alongside the Proposed Development.
- 15.10.5 If a major cumulative fire event were to occur, cumulative smoke generation could negatively impact air quality. This poses health risks for residents at Margam estate, the residential area approximate 1 km north of the Proposed Development as this is likely to be a common receptor for both developments.
- 15.10.6 It is expected however, that this development will be subject to strict safety regulations and an environmental permit among other safety management systems. There will be a host of legislative requirements to which the metal processing facility must adhere to, not dissimilar to those outlined in **Table 15.1** of this ES chapter. These controls will mitigate the risks and effects of major accidents and disasters, thereby reducing the cumulative risk of significant impacts as low as reasonably practicable.
- 15.10.7 Drainage arrangements for this development would discharge into Margam Moors, which ultimately drains through Port Talbot steelworks and into Swansea Bay. Both this development and the Proposed Development may exacerbate the risk of flooding in Margam Moors. Furthermore, sharing the same outfall location as the proposed development, the cumulative runoff from both projects may negate the beneficial effects of the Proposed Development on Swansea Bay, or result in a coastal pollution event.
- 15.10.8 Both developments will incorporate SuDS as required under legislation, which will mitigate the risk of increased surface water flows and associated impacts. Furthermore, both developments will be subject to environmental permits, imposing contamination limits and monitoring requirements to on outfall.
- 15.10.9 As a result, the cumulative risk of significant impacts from major accidents and disasters involving this development and the Proposed Development is expected to be not significant.

Project Dragon SAF: Crown Wharf Port Talbot Docks

- 15.10.10 If approved, this proposed SAF facility is expected to involve the use hazardous substances associated with the production of SAF. Similarly to the Proposed Development, there is therefore potential for major accidents and disasters such as fires or explosions.

- 15.10.11 A major cumulative fire event may generate smoke generation which may negatively impact residents at Margam estate, which will likely be a common residential receptor. While this development is slightly further away from Margam estate, than the previous cumulative development discussed prior, eastward/northward winds may fan cumulative smoke towards residential receptors, posing the potential for health risks.
- 15.10.12 Similarly to the aforementioned metal processing development, this proposed SAF will be subject to a host of hazard prevention and control measures not dissimilar to those outlined in **Table 15.1**, thereby reducing the risk of major accidents and disasters.
- 15.10.13 The SAF facility proposes to discharge effluent water into Port Talbot docks which flows into Swansea Bay; the same outfall location as the Proposed Development. There is therefore potential for cumulative effects on water quality in the event of a major pollution event. While this may exacerbate pollution to Swansea Bay and cause a coastal major pollution event, controls imposed by an environmental permit are expected to reduce the risk of such an incident.
- 15.10.14 With the implementation of mitigation and legislative requirements, the cumulative risk of significant impacts from major accidents and disasters involving this development and the Proposed Development is expected to be not significant.

15.11 Summary of effects

- 15.11.1 This chapter has assessed the potential risks and effects of major accidents and disasters associated with the Proposed Development. The key hazards identified include industrial accidents caused by process, equipment or electrical failure, resulting in fires, explosions or environmental contamination. Other hazards such as flooding, transport incidents malicious attacks and loss of critical infrastructure also have the potential to result in fires, explosions or environmental contamination.
- 15.11.2 The potential for major accidents and disasters is actively managed on the Site not only through measures embedded into project design, but also through statutory requirements (see **Table 15.5**).

Table 15.5: Summary of residual significant effects

Hazard/Disaster	Receptors	Mitigation	Residual effect
Flooding	Human Environmental Infrastructure	Ground raising Bunding SuDS	Not significant
Severe Weather	Human Environmental Infrastructure	Emergency preparedness plans Regular maintenance Well-equipped work environments	Not significant

Hazard/Disaster	Receptors	Mitigation	Residual effect
Pandemic	Human	Site safety induction Identification of key workers	Not significant
Animal diseases	Human	Secure delivery and storage of construction materials and scrap	Not significant
Coastal pollution	Environmental	Wastewater treatment Environmental permit limits	Not significant
Transport incidents	Human Environmental	Transport plan Transport risk assessments	Not significant
Industrial accidents (fire/explosion)	Human Environmental Infrastructure Historic	Fire suppression systems Various management and control regulations	Not significant.
Industrial accidents (pollution event)	Human Environment	Hazardous spill response plans Various management and control regulations	Not significant.
Loss of critical infrastructure	Human Environmental Infrastructure	Emergency power generation.	Not significant.
Malicious attacks	Human Infrastructure	Layered systems Gated access Civil Contingencies Act	Not significant.

15.11.3 EAF steelmaking will remove or significantly reduce many of the established sources of hazard at the Site. The Proposed Development also presents opportunity for renewal of

aged infrastructure to incorporate modern day standards of safe working. Whilst some sources of major accident risk will persist, the overall level of hazard presented by the Proposed Development is considered to be much reduced when compared with the established baseline.

- 15.11.4 With the presence of embedded mitigation measures and statutory requirements, no impact pathways have been identified in the ES requiring further assessment. Therefore, no likely significant effects of the Proposed Development resulting from major accidents and disasters is concluded.

15.12 References

- Cabinet Office. (2023). 'National Risk Register (2023 edition)'. Available at: <https://www.gov.uk/government/publications/national-risk-register-2023> (Accessed October 2024).
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