

4. Development Specification

Introduction

- 4.1 The purpose of this Chapter is to ensure that the EIA is based on sufficient information to inform a robust assessment of likely significant environmental impacts. This Chapter provides the necessary description of the Proposed Scheme, as well as how it is likely to be constructed (including anticipated timescales).
- 4.2 As noted within **Chapter 1: Introduction**, this ES has been prepared to support a full planning application (the 'Application'). Given the nature of the Proposed Scheme (i.e., an industrial processing facility) it is highly influenced by engineering design which will always continuously evolve up to the point of construction commencing on-site.
- 4.3 Therefore, in response, the ES has been based on the plans listed below^a, a series of committed operational strategies that are integral to the operation of the Proposed Scheme, and a series of assumptions informed by the Project Design Engineer, Technip, as set out within this Chapter.
- 4.4 This Chapter, together with the supporting spatial plans set out below forms the basis of the technical assessments presented in **Technical Chapters 6 – 13**.
- 4.5 The ES is based on the following plans:
- **Figure 4.1: Site Location Plan**
 - **Figure 4.2: Existing Site Key Plan**
 - **Figure 4.3: Existing Site Plan (Area 1)**
 - **Figure 4.4: Existing Site Plan (Area 2)**
 - **Figure 4.5: Existing Site Plan (Area 3)**
 - **Figure 4.6: Existing Site Plan (Area 4)**
 - **Figure 4.7: Proposed Site Plan – PDZ & Temporary Construction Area**
 - **Figure 4.8: Proposed PDZ Layout**
 - **Figure 4.9: Proposed Site Key Plan**
 - **Figure 4.10: Proposed Site Plan (Area 1)**

^a As explained in **Chapter 2: Approach to EIA**, the ES has assessed a wider boundary than the planning application boundary. Therefore, **Figures 4.1 – 4.14** were prepared for the ES to show the full extent of the EIA Study Area Boundary (referred to as the Site), whilst corresponding plans which show only the planning application boundary have been submitted within the planning application for approval. However, beyond the differing boundaries, the content of the plans is the same.

- **Figure 4.11: Proposed Site Plan (Area 2)**
- **Figure 4.12: Proposed Site Plan (Area 3)**
- **Figure 4.13: Proposed Site Plan (Area 4)**
- **Figure 4.14: Proposed PDZ Layout – External Surface Finishes**

- 4.6 All temporary and permanent works will take place within the EIA Study Area Boundary as defined in **Figure 4.1** which is the boundary upon which all technical assessment, as presented in **Technical Chapters 6 – 13**, are based on. As noted within **Chapter 1: Introduction**, the EIA Study Area Boundary, being referred to as ‘Site’ for the remainder of this Chapter and through the ES, is larger than the planning application boundary (also defined on **Figure 4.1**).
- 4.7 The difference relates to the inclusion of an extent of the marine environment of Port Talbot Docks (adjacent to Crown Wharf and Margam Wharf) which is included within the ‘Site’ for EIA purposes but excluded as part of the planning application boundary. This, as stated within **Chapter 1: Introduction**, arises because a marine license under the Marine and Coastal Access Act 2009 (as amended)¹ is required for proposed ‘works’ within the marine environment (more details set out within *Marine Loading Facility* and *Construction Wharf / Jetty*). Given the requirement for a marine license, these works do not form part of the planning application boundary or Application. However, the EIA and therefore this ES, has considered and assessed the ‘works’ required within the marine environment that require a marine licence, to ensure that the full nature of the Proposed Scheme is considered. It should be noted that some of the aspects relating to these works are still not fully understood and will be detailed in full as part of the marine license application and process. Therefore, where there is uncertainty, the ES has been based on assumptions which are considered to be representative of a worst-case scenario. In line with **Chapter 2: Approach to EIA** the marine license application will assess the full details of the marine works, which are expected to fall within the assessment assumptions utilised within the ES. Where a deviation occurs with this ES, these will be addressed through the marine licence application and, where necessary, a verification report to this ES, submitted as supplementary information to NPTCBC.
- 4.8 For completeness, the Application for which full planning consent is being sought is described within the **Planning Statement**.
- 4.9 This Chapter first sets out the description of the Proposed Scheme when completed, followed by how the project is to be constructed.

Updates to Scheme Description Since EIA Scoping Report

- 4.10 Through consultation with Neath Port Talbot County Borough Council (NPTCBC), it was agreed that for the purpose of completeness, where the Development Specification for the purpose of the ES (i.e., this Chapter) provides updated or differing information/data to the High-Level Development Specification (HLDS) provided within the EIA Scoping Report (**Appendix 2.1**) this will be clearly documented.
- 4.11 As such, the summary of updates or deviations in information is set out below:

- **Inclusion of additional temporary construction area land** – the EIA Scoping Report only identified Temporary Construction Area (TCA) 1 (as described below) and did not consider the parcels of land immediately east and west of the PDZ, referred to as TCA East and West (see *'Site overview'* for further details) which have now been included (**Figure 4.7**). Furthermore, because of the inclusions of these additional parcels, there is now the requirement for demolition of existing above ground structures as part of the site preparation works for the TCA East (see *'Preparation of Temporary Construction Areas and Establishing the Construction Compound'* for further details).
- **Activities associated with the construction wharf / jetty** – during the EIA Scoping process it was assumed that the wharf/jetty to be utilised for construction purposes (specifically the offloading of large equipment modules) would be temporary and include no additional works within the marine environment, except for some strengthening of the port wall. Following further technical evaluation, it is now considered necessary to construct a permanent (rather than temporary) construction wharf for the purpose of offloading modules. This is to ensure appropriate loading capacities given the weight of the modules arriving to Site via barge. See *'Construction Wharf / Jetty'* for further details.
- **Points of access from Unnamed Port Road** – the EIA Scoping Report identified only two points of access to the Production Development Zone (PDZ), however, there will now be three due to the inclusion of a dedicated emergency vehicle entrance in addition to the two operational access considered at EIA Scoping (see *'Access and Circulation'* for further details).
- **Amendments in overall heights of the Proposed Scheme** – indicative maximum heights were provided as part of the EIA Scoping Report, in response to the evolving design of the Proposed Scheme. A maximum 45m, above proposed ground level, was identified for the PDZ. A single piece of equipment, Module E1 & E2 (**Figure 4.8**), will exceed this and extend up to 46.3m above proposed ground level (**Table 4.2**). All other plant, equipment and buildings will be within the maximum heights considered within the EIA Scoping Report. All proposed maximum heights are set out **Table 4.2**.

4.12 The implications of the identified changes on the proposed scope of assessment of the ES (i.e., technical topic breadth and individually identified scope of technical topics) has been considered in order to ensure the scope of the ES remains appropriate. Further details of this process and conclusions are set out within **Chapter 2: Approach to EIA**.

The Completed Project/Proposed Scheme

Site Overview

4.13 The Site, as defined within **Figure 4.1**, comprises of the following areas:

- Primary parcel of land for the location of the proposed production facility (approximately 9.1 hectares), comprising bare land adjacent to Crown Wharf (Port Talbot) (referred to as the *'Production Development Zone [PDZ]'*), as defined within **Figure 4.7**;
- Three discrete parcels of land located within the wider Port Talbot Docks, (approximately 7.44ha) (referred to as *'Temporary Construction Areas [TCA] 1, East*

and West') as defined within **Figure 4.7**. TCA West, as defined on **Figure 4.7**, is split into two sub-parcels;

- Approximately 0.87km of the unnamed port road, running adjacent to the northern boundary of the production development zone (referred to as '*Unnamed Port Road Supporting Infrastructure*'); and
- An extent of the marine environment of Port Talbot Docks, located to the north of the PDZ and the unnamed port road (referred to as the '*Marine Unloading/Loading Facility*').

Production Development Zone (PDZ) Layout

4.14 The PDZ, as defined within **Figure 4.7**, defines the area of the Site where the process/production plant/equipment (required for the primary production activities set out in '*Operational Process and Activities*') is contained. The industrial nature of the Proposed Scheme means that the PDZ, specifically the plant and equipment within it, is laid out in a manner to reflect the overall 'process(es)' (set out in '*Operational Process and Activities*') for the Proposed Scheme, including associated storage and transmission of 'feedstock' and 'product(s)'. Furthermore, the requirements of various health and safety regulations (i.e., Control of Major Accidents and Hazards [COMAH] requirements) and the need to provide a safe working environment has directly influenced the layout of the Proposed Scheme.

4.15 The general layout/arrangement of the Site is defined on **Figure 4.7 – 4.13**. and can generally be described as follows:

- The eastern extent of the PDZ (shown in **Figure 4.11** and **4.13**) contains the 'administrative' operational facilities, including an Administration Building, Process Control Room, Electrical Substation, Warehouse, Workshop and Laboratory. This area also includes a new access point (more details are set out within '*Access and Circulation*') and associated gate house, car, and cycle parking provision.
- The southern extent of the PDZ (shown in **Figure 4.12** and **4.13**) is where the main 'processing' equipment and plant is located, laid out in a linear arrangement, made up of a series of modules (Equipment Ref: Module A1, B1, D1, E1 and E2).
- The western extent of the PDZ (shown in **Figure 4.10** and **4.12**) is where the new truck loading facility and associated designated access will be located (more details are set out within '*Access and Circulation*'), as well as the proposed flare (and associated equipment) and a series of equipment / plant that interface with the processing equipment immediately east (described above). There is also a new electrical substation.
- The northern and central extent of the PDZ (shown across **Figures 4.10 – 4.13**) is where the storage tanks for the ethanol feedstock and Sustainable Aviation Fuel (SAF) and Renewable Diesel products^b, and operational utilities are located, including a new

^b As shown within **Figures 4.10 – 4.13**, appropriated bunded enclosures are provided at the base of the storage tanks (and where else required) to ensure any accidental spillages or leaks are appropriately contained.

electrical substation and the hydrogen generation package, which is an electrolyser system that will produce around 1,200 metric tonnes of green hydrogen per year^c.

- 4.16 A full list of the plant / equipment required for the Proposed Scheme, and its location within the PDZ, is provided in **Figure 4.8** and detailed in **Table 4.2**. Across the PDZ plant and equipment will be connected, where necessary, with industrial grade pipe rack systems, also defined on **Figure 4.8**.
- 4.17 The PDZ also includes a primary internal road, with associated service roads, to allow access to the relevant areas of the PDZ and associated equipment and plant. The internal road system is suitable for use by emergency services vehicles if required, with a designated emergency access point at the western extent of the Site (see **Figure 4.10**) (see 'Access and Circulation' for more details).

Operational Process and Activities

Primary Process

- 4.18 The primary production activity of the Proposed Scheme is the conversion of ethanol (the primary feedstock) into a Sustainable Aviation Fuel (SAF), specifically Alcohol To Jet Synthetic Paraffinic Kerosene (SAF), as well as a sustainable diesel, specifically Alcohol To Renewable Diesel (ATJ RD). The Proposed Scheme has the ability to shift the overall production levels of each product, to produce more or less of one of the products in response to market demands. However, the primary focus of the facility and Proposed Scheme is the production of the SAF, with 90:10 split between it and the Renewable Diesel (ATJ RD), which has been used as the basis of assumptions within the ES regarding product generation. Regardless of the product generated, the process remains the same, up to the point of fractionation (discussed further below).
- 4.19 The process also generates an element of other 'light' hydrocarbon products as part of the process, however, these are captured and recycled on-site within the on-site boiler(s) for required process heating.
- 4.20 The overarching primary process required to chemically convert the ethanol feedstock into the SAF and/or Renewable Diesel comprises five principal stages/steps as follows, all of which occur within the 'processing' area of the PDZ (see 'Production Development Zone (PDZ) Layout' for more details);
- **Feed pre-treatment** – essentially the process of removing impurities within the ethanol feedstock to reach a required suitable 'purity'.
 - **Catalytic Dehydration^d** – required to convert the ethanol (C₂H₅OH) feedstock into ethylene (C₂H₄) with the use of a catalyst^e.

^c No hydrogen will be stored on-site, instead generated in line with demand within the primary process.

^d A dehydration reaction is a chemical conversion process that involves the loss of water (H₂O) from the reacting molecule or ion.

^e A substance that increases the rate of a chemical reaction without itself undergoing any permanent chemical change

- **Oligomerisation** – a process of converting the ethylene monomers into oligomers^f through a finite degree of polymerisation^g.
- **Hydrogenation** – the process of ‘saturating’ the macromolecular complexes above using hydrogen (H₂), in the presence of a catalyst. Ultimately this converts the various length oligomers into paraffins^h.
- **Fractionation** – a separation process used to divide the hydrocarbons during a phase transition, into a number of smaller quantities (fractions) in which the composition varies according to ‘length’ of hydrocarbon. The SAF and Renewable Diesel products are hydrocarbons of differing lengths and once achieved are sent to on-site storage.

4.21 All plant / equipment required to undertake each stage of the process, or to facilitate it, will be located within the PDZ. As noted above, a full list of the plant / equipment required for the Proposed Scheme, and its location within the PDZ, is provided in **Figure 4.8** and **Table 4.2**.

Primary Process Inputs and Outputs

4.22 As noted above the primary input to the process is the ethanol feedstock, whilst the primary output (i.e., product) is the SAF and Renewable Diesel. Nonetheless, the process also has a series of additional inputs / outputs, either to facilitate one or multiple stages of the process set out above (see ‘Primary Process’) or arising from the chemical process. All inputs / outputs, including the ethanol feedstock, SAF and Renewable Diesel, associated with the Proposed Scheme are set out in **Table 4.1**.

4.23 **Table 4.1** also includes estimated annual quantum of each input and output, and in most cases as ranges. This is due to the fact that the exact annual quantum would vary depending on operational capacity of the Proposed Scheme which can vary across a year and on a year-to-year basis.

Table 4.1: Process Scheme Inputs and Outputs

Input / Output	Form/State and Estimated Quantum (per annum)	Notes
Input		
Ethanol	Liquid 100,000 – 160,000 tonnes	The primary feedstock used in the primary process. The Ethanol will be brought to the Site via ship utilising the Marine Unloading/Loading Facility from various sustainable sources, as set out within Chapter 2: Approach to EIA .

^f Low molecular weight polymers.

^g A process of reacting monomer molecules together in a chemical reaction to form polymer chains

^h A combustible hydrocarbon liquid.

Input / Output	Form/State and Estimated Quantum (per annum)	Notes
		The ethanol will be stored on-site in 4 Ethanol Storage Tanks as defined in Figure 4.8 (Equipment Ref: T-6000A/B/C/D).
Raw Water	Liquid 600,000 - 700,000 m ³	Extracted from Port Talbot Docks (see ' <i>Operational Water Strategy - Process Water</i> ' for more details) and required for various aspects across the primary process.
Electricity	n/a 227 GWh ⁱ	Required for the operation of the Proposed Scheme Further details regarding electricity connection are set out within ' <i>Utilities Strategy</i> '.
Natural Gas	Gas 15,000 – 18,000 tonnes	Utilised as fuel as part of the primary process. Mains gas will be imported on demand via pipeline from a connection point with Wales and West Utilities (WU) existing high pressure gas network, with no on-site storage. Further details regarding natural gas connection are set out within ' <i>Utilities Strategy</i> '.
Nitrogen		Utilised within the primary process. Nitrogen will be procured and brought to the Site via cryogenic road tanker by an appointed supplier. Nitrogen will be stored on-site within the Liquid Nitrogen Package as defined in Figure 4.8 (Equipment Ref: Z-3750).
Caustic		Utilised within a stage of the primary process. Caustic will be procured and brought to the site via road tanker by the appointed supplier and stored on-site in dedicated storage tanks.
Sulphuric Acid	Liquid 100 – 150 tonnes	Utilised for wastewater treatment and treatment of cooling water, demineralised water, and neutralised spent caustic. Sulphuric acid will be procured and brought to the site via road tanker by the appointed supplier. Sulphuric acid will be stored on-site within a dedicated storage tank.

ⁱ This is an estimated annual consumption, based on an import limit of 28.4 MW, multiplied by an assumed operating 8000 hours per year.

Input / Output	Form/State and Estimated Quantum (per annum)	Notes
Product Additives		<p>Standard fuel performance enhancing, handling and maintenance additives for SAF^j and Renewable Diesel^k.</p> <p>Product additives will be procured and brought to site via road by an appointed supplier. Product additives are typically supplied and stored in drums.</p>
Water Treatment Chemicals		<p>Standard water treatment chemicals required for dosing cooling water system and boiler feed water for steam generation including dispersant, oxidising biocide, antifoulant, antiscalant, oxygen scavenger, phosphate and corrosion inhibitor.</p> <p>Water treatment additives will be procured and transported to site via road by the appointed supplier. Water treatment additives are typically supplied and stored in drums.</p>
Catalysts, Resins & Absorbents	Solid 40 - 60 tonnes	<p>Required to support a series of steps within the primary process. The catalysts, resins and absorbents can be reused with the primary process for several cycles, before becoming 'spent' chemically.</p> <p>Catalysts, resins and absorbents will be stored and used across the primary process.</p> <p>Where practical the spent catalysts, resins and absorbents will be regenerated <i>in situ</i>. Where this is not practical, spent catalysts, resins and absorbents will be unloaded and replaced. During loading and unloading activities, fresh and spent catalysts, resins and absorbents are temporarily stored on-site in drums/bags and handled by a specialist catalyst handling contractor.</p> <p>Catalysts, resins and absorbents will be procured and brought to site via road by appointed suppliers. Where practical, the supplier will also transport the spent catalyst from the Site when</p>

^j Specified as part of ASTM D7566-21: Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons

^k Specified as part of ASTM D975: Standard Specification for Diesel Fuel; BS EN 590:2022 Automotive fuels. Diesel. Requirements and test methods - (Withdrawn Standard); and BS EN 15940:2023 Automotive fuels. Paraffinic diesel fuel from synthesis or hydrotreatment. Requirements and test methods

Input / Output	Form/State and Estimated Quantum (per annum)	Notes
		required back to their own facility for onward processing ^l .
Output		
Sustainable Aviation Fuels (specifically SAF)	Liquid 79,100 tonnes	Product generated through the primary process. The SAF will be stored on site within 4 storage tanks as defined in Figure 4.8 (Equipment Ref: T-6400A/B/C/D), before being transported from Site via ship.
Renewable Diesel (ATJ RD)	Liquid 8,800 tonnes	Product generated through the primary process. The ATJ RD will be stored on-site within 3 storage tanks as defined in Figure 4.8 (Equipment Ref: T-6431A/B/C) before being transport from Site via road tanker.
Treated Effluent Water (from process)	Liquid 320,000 m ³	Concentrate generated from stages within the process, such as reverse osmosis of combined raw water and recycled treated process water, which is then discharged to Port Talbot Dock, via a new discharge point.
On-site effluent treatment	Solid / Liquid / Gas streams 25,000 tonnes	Waste stream generated through the treatment of process water. Transport off-site via road tanker for third party disposal. Treated process water is recycled to reduce raw water demand.
Oxygen		By-product of hydrogen generation process on-site.
Flue Gas	Gas 2.3x10 ⁸ Nm ³	Composition of flue gas varies ^m . Flue gas is monitored for emissions of CO, NO _x , SO _x and particulate matter (PM) and will be subject to an Environmental permit ⁿ .

^l The appointed supplier will take responsibility of the spent catalyst in line with their existing operational activities/permissions.

^m **Chapter 11: Air Quality** has assessed operational emissions to air, including from the flare. Assumptions regarding the specific composition of the flare gases are set out within the Chapter and considered representative of a worst case scenario. **Chapter 10: Climate Change** has considered the overall GHG emission from the Proposed Scheme.

ⁿ As per **Chapter 1: Introduction** an Environmental permit is being sought from Natural Resources Wales (NRW) with respect to the emission to air from the flue.

Input / Output	Form/State and Estimated Quantum (per annum)	Notes
Spent Catalysts, Resins & Absorbents	Solid 40 - 60 tonnes	Generated once the catalysts have been chemically exhausted and requires replacement. Spent catalyst will be decontaminated, prior to be transport off-site by road. As stated earlier the supplier will be responsible for the transportation of spent catalyst from the Site back to their own facility for onward processing.

4.24 Additional 'inputs' are required by the Proposed Scheme as a whole, beyond those required for the primary process and defined within **Table 4.1**, as defined below:

- Propane – refrigerant utilised for product cooling.
- Propanol – heat transfer fluid utilised for product heating.
- Potable Water – required for the ancillary operational facilities (see '*Ancillary Operational Facilities*') for the provision of potable water for consumption, washrooms, etc.

4.25 Additional 'outputs' will be created by the Proposed Scheme as a whole, beyond those arising from the primary process and defined within **Table 4.1**, as defined below:

- General waste / dry recycling waste – arising from the ancillary operational facilities (see '*Operational Waste Strategy*' for more details).
- General effluent/sewage – arising from the ancillary operational facilities, to be discharged to local sewage network (see '*Utilities Strategy*' for more details).

Flare

4.26 As is common with chemical industrial facilities, the Proposed Scheme includes a flare. The Proposed Scheme will require a single enclosed ground flare which will be in the western extent of the Site, as defined on **Figure 4.7** and **4.10**. The ground flare is made up of multiple 'burners' at ground level, surrounded by a circular enclosure.

4.27 The enclosure surrounding the burners will extend up to 20m in height (see **Table 4.2**) from the proposed ground level (set at approximately 8m AOD). As such, the flare will be approximately 28m AOD in total.

4.28 The flare is provided for essential operational safety purposes or the 'venting/clearing' of material during 'start-up' and 'shut-down' stages, which would largely occur when catalytic material in the process is to be renewed (approximately every 2 years) and for other maintenance activities. As such, intense use of the flare is expected to be limited and not common practice.

- 4.29 There will be instances where more intense or emergency flaring will be necessary, albeit these are expected to be infrequent and generally short-term.

Administrative operational facilities

- 4.30 Beyond the primary processes the Proposed Scheme includes a number of structures/buildings, as defined on **Figure 4.8**, which will house supporting administrative operational facilities, including:

- Administrative Building – will house 'non-operator' support functions together with any visitors to the Site. This building will contain office space, meeting rooms, small kitchen/break area, and reception area.
- Process Control Room – building will house the operators for the unit(s), including telecom room, main control room, instrument room, battery room, first aid room, supervisors' office, and additional meeting/office space and amenity features.
- Warehouse – general warehouse for spares for unit operation and other storage.
- Workshop – contains tools/work benching sufficient for the general maintenance of the plant
- Laboratory – contains testing equipment and area for onsite sample for unit operation.
- Gatehouse 1 and 2 – security buildings located at site entrances for security staff, with accompanying toilet and kitchen facilities.

Marine Unloading/Loading Facility

- 4.31 Ethanol feedstock and SAF product will be transported to and from the Site via ship, to be located within Talbot Docks to the north of the PDZ.
- 4.32 The marine unloading/loading facility will comprise a rectangular 'island' berth (approximately 20m by 30m), located approximately 30m out from the dock wall. Mooring dolphins will be provided either side, staged at appropriate distances, extending up to a maximum of 70m to the side of the island berth. The berth will be connected back to the dock wall via a 'jetty', suitable width (approximately 10m) for service and access road to the island berth and docked ships. 'Loading arms', extending up to approximately 40m in height, will be located atop of the island berth, to pump ethanol and SAF to/from the docked ship, via connected pipe rack system which will connect back to the PDZ, passing under the Unnamed Port Road as necessary.

Plant, Equipment and Building Footprint and Maximum Heights

- 4.33 All plant, equipment and buildings associated with the Proposed Scheme are defined on **Figure 4.7 – 4.13**, including their location and footprint.
- 4.34 Maximum heights of all plant, equipment and buildings are defined within **Table 4.2** below. Plant / equipment and buildings mentioned within **Table 4.2** includes the corresponding equipment reference utilised (where applicable) and defined within **Figure 4.8**.
- 4.35 Associated with several of the plant/equipment identified within **Table 4.2** are emission stacks. The stacks are generally slender features (approximately 1-2m wide) and extend up to varying heights. Therefore, where plant/equipment has a corresponding stack which extends

beyond the maximum height of the associated plant/equipment, this has been clearly identified. In all other instances it can be assumed that any 'stack' would be within the maximum height specified.

Table 4.2: Equipment / Plant/ Facility / Building maximum heights

Equipment / plant and/or Building	Equipment Ref (see Figure 4.8)	Maximum Height (m)	Maximum Overall Height (m AOD) ^o
Filters	F-4711A/B/C	6	14
Water Filters	F-4712A/B/C	6	14
Exchanger	HE-4011	8	16
Heat Exchanger	HE-5451	8	16
Heat Exchanger	HE-5452	8	16
Heat Exchanger	HE-7301	6	14
Heat Exchanger	HE-7310	6	14
Heat Exchanger	HE-7311	6	14
Pumps	P-4251A/B; P-4530A/B; P-4540A/B/C; P-4601A/B/C; P-4610A/B; P-4710A/B/C; P-4740A/B; P-5011A/B; P-5030A/B; P-5040A/B; P-5401; P-5460A/B; P-5500; P-5510A/B; P-5671A/B; P-5800; P-5810A/B; P-6020A/B; P-6110A/B; P-6170A/B; P-6420A/B; P-6480A/B; P-6450A/B; P-6601; P-6911A/B; P-6912A/B; P-7001A/B; P-7151A/B; P-7951; and P-7961.	3	11
Sump	S-6910	4	12
Storage Tank	T-4250	4	12
Water Tank	T-4520	17	25
Water Tank	T-4600	20	28
Water Tank	T-5010	14.5	22.58
Storage Tank	T-5450	17.4	25.4
Storage Tank	T-5501	5	13

^o Derived from the maximum height(s) and the assumed 8m AOD development plateau created across the PDZ, as per 'Earthworks and Levels'

Equipment / plant and/or Building	Equipment Ref (see Figure 4.8)	Maximum Height (m)	Maximum Overall Height (m AOD) ^o
Tank	T-5670	9.4	17.4
Storage Tank	T-5801	5	13
Storage Tank	T-6000A/B/C/D	20	28
Tank	T-6160	13	21
Tank	T-6400A/B/C/D	20	28
Tank	T-6431A/B/C	9	17
Receiver	V-3510	6	14
Receiver	V-3530	6	14
Drum	V-4010	5	13
Drum	V-4750	7	15
Drum	V-5400	7	15
Hydrocarbon Vessel	V-6100A/B	15	23
Drum	V-6600	8	16
Drum	V-7000	5	13
Drum	V-7150	5	13
Drum	V-7300	6	14
Drum	V-7950 / V-7960	8	16
Air Compressor Package	Z-3500 / Z-3520	4	12
Liquid Nitrogen Package	Z-3750	12	20
Hydrogen Generation Package	Z-4300	20	28
Metering Package	Z-4500	5	13
Treatment Package	Z-4510	4	12
Cooling Tower Package	Z-4700	6.9	14.9
Package	Z-4760	3	11
Package	Z-5000	8	16
Package	Z-5020	8	16

Equipment / plant and/or Building	Equipment Ref (see Figure 4.8)	Maximum Height (m)	Maximum Overall Height (m AOD) ^o
Dosing System	Z-5050	6	14
Boiler Package	Z-5100 (Stack)	4.4 (40)	12.4 (48)
Boiler Package	Z-5200	4.4	12.4
Package	Z-5461	8	16
Package	Z-5660	10	18
Package	Z-6421	7	15
Package	Z-6451	7	15
Collection Basin	Z-6900	5	13
Package	Z-6950	4	12
Package	Z-7320	6	14
Package	Z-7450	4	12
Ground Flare Package	Z-7460 ^p	20	28
Tanker Loading Package	Z-7710	5	13
Package	Z-7910	6	14
Module A1	n/a	27.5	35.5
Module B1	n/a	22.5	30.5
Module C1	n/a	20.5	28.5
Module D1	n/a	16.7	24.7
Module E1 & E2	n/a	46.3	54.3
Compressor House 1	n/a	10	18
Compressor House 2	n/a	10	18
Gatehouse 1	n/a	3.5	11.5
Gatehouse 2	n/a	3.5	11.5
National Grid Switchroom	n/a	10	18

^p For **Chapter 11: Air Quality** the Ground Flare Package (Z-7460) has been modelled as a 'stack' point source emission at 20m, in line with the overall height of the enclosure that surrounds the ground mounted gas burners (see 'Flare' for more details)

Equipment / plant and/or Building	Equipment Ref (see Figure 4.8)	Maximum Height (m)	Maximum Overall Height (m AOD) ^o
Administration Building	n/a	15	23
Process Control Room	n/a	6	14
Electrical Substation (Substation 1000)	n/a	10	18
Warehouse	n/a	10	18
Workshop	n/a	10	18
Laboratory	n/a	10	18
Substation 2000	n/a	10	18
Substation 3000	n/a	10	18

4.36 Alongside the above equipment / plant listed in **Table 4.2**, industrial grade pipe racking system will be in place, as defined on **Figure 4.8**, which will extend up to a maximum height of 14m above finished ground level.

Operational Employment

4.37 The Proposed Scheme is anticipated to generate approximately 85 FTE jobs.

Operational Hours / Shift Pattern

4.38 The Proposed Scheme will be operational 24 hours a day, 365 days a year.

4.39 When operating in normal capacity, staff working at the Site will adopt a 'shift' working pattern, as set out in **Table 4.3**. There may be periods within the lifetime of the Proposed Scheme where multiple shifts are required on-site, however, these are expected to be infrequent.

Table 4.3: Estimated shift patterns and associated workforce

Shift	Indicative Working Hours	Associated Workforce (persons)
Day Support Staff	0800 – 1700	9
Day Shift	0000 – 0800	12
Evening Shift	0800 – 1600	41
Night Shift	1600 – 0000	17

Access and Circulation

Marine Vessel

- 4.40 Ethanol feedstock and SAF product will be transported to and from the Site via ship using the marine unloading/loading facility. As such, vessels will access Port Talbot Docks via the existing lock entrance at the western end of Port Talbot Docks, further connecting to Swansea Bay and strategic shipping routes.
- 4.41 Port Talbot Docks is an existing deep-water dock operated by Associated British Ports (ABP). As such there are on average approximately eight vessel movements a month. The Proposed Scheme will result in approximately 110 (two-way) additional vessel movement a year^q. The frequency of the movements will vary across the year; however, this is equivalent to approximately 2 (two-way) movements a week^r.

Vehicular

- 4.42 Once operational, vehicular access to the Site will be required by the operational workforce as well as deliveries/collections (i.e., commercial refuse and relevant input chemicals supply), servicing and maintenance purposes. Vehicular access will also be required for the transportation of Renewable Diesel and process waste materials from the site as well as chemicals and catalysts to the Site.
- 4.43 The Site is inclusive of an extent of Unnamed Port Road, which in-turn links into the wider strategic road network via North Road and Harbour Way (A4241), both to the east of the PDZ. Access off North Road onto Unnamed Port Road is controlled via an existing ABP security gate which will be retained (and which will become operational by ABP in late 2023).
- 4.44 As defined on **Figure 4.8** three new accesses will be created on Unnamed Port Road to allow access to the PDZ.
- 4.45 The main gate access (**Figure 4.11**), referred to as the 'East Access', will be located at the north-east corner of the PDZ (controlled via Gatehouse 1). This access will comprise a dual access simple priority turning junction into the Site, with two specified entrances/exits for those accessing the administrative operational facilities (including car park) and a separate entrance for direct access to the primary internal road. As such, this access will be utilised by staff and visitors, as well as for deliveries, maintenance, and collections. This access will also provide access for pedestrians and cyclists (see '*Pedestrian / Cycle*').
- 4.46 The road tanker loading access (**Figure 4.10**), referred to as the 'West Access', will be located at the north-west corner of the PDZ (controlled via Gatehouse 2). This access will comprise a simple priority turning junction into the truck loading facility. As such it will be solely utilised by HGV associated with the collection of Renewable Diesel product.
- 4.47 A final gated access, comprising an emergency vehicle access (principally for firefighting purposes) will be located next to the West Access (set out above) (**Figure 4.10**).

^q This has been based on information provided by the Applicant on the basis of the 'smallest' likely ship to be utilised for the transportation of ethanol or SAF (thus creating the most frequent movements in a year) and knowledge of likely usage/production rates from the Proposed Scheme.

^r Rounded to nearest whole number, on the assumption that the overall annual vessel movements are distributed equally across a 52-week calendar year.

- 4.48 The primary internal road and associated service road(s) will provide vehicular access around the PDZ and only accessible via the first access and the emergency access described above.
- 4.49 When operating under normal circumstances, it is expected that the Proposed Scheme would create a total of 876 – 992 weekly two-way vehicular movements, split into the various aspects set out within **Table 4.4**.

Table 4.4: Expected vehicular movements by vehicular type

Vehicular Type	Weekly Trip Rate (two-way)	Notes
HGV / Tanker	36 – 152	Required for import / export of a number of inputs / outputs reported in Table 4.1 .
LGV (i.e., cars and vans)	840	Comprising principally of operational staff and contractors.

Pedestrian / Cycle

- 4.50 In the short term, pedestrian and cycle access will not be permitted within the ABP area for safety reasons. However, the applicant proposes to provide a free EV shuttle service with a cycle rack and a system will be implemented to allow staff to walk/cycle to the site, whereby they call to be picked up from in the vicinity of the ABP security gate and transported to the site. Staff will then be provided with/request a pickup time for transport back to the gate. Cycle storage has been provided within the car parking area in and around the administrative building.
- 4.51 Cycle storage has been provided within the car parking area in and around the administrative building (**Figure 4.11**).

Operational Lighting Strategy

- 4.52 A Preliminary Lighting Strategy has been prepared and submitted as a standalone Application Report. This sets out a preliminary operational lighting design across the Site, specifically within the PDZ, where the concentration of operational lighting will be located.
- 4.53 A **Lighting Assessment** has been undertaken and submitted as a standalone Application Report. As part of this assessment the preliminary lighting design was subject to modelling using DIALux software to calculate exterior lighting scenes and evaluate the design against standard good practice guidance for the minimisation of obtrusive light. The outputs of the modelling indicated the absence of light spill beyond the PDZ.

Landscape and Biodiversity Strategy

- 4.54 As an industrial facility the Proposed Scheme has been designed and laid out to ensure compliance with relevant health and safety regulations and remove potential risks, including fire risk. As such, there has been limited areas within which to allocate 'landscaping' features, forcing much of the available land for landscaping purposes to the boundaries. It has also been necessary to ensure that any landscaping also has biodiversity value/function. Furthermore, proposed SuDS features (see '*Drainage Strategy*' for more details) have been

considerate of biodiversity function and value. Such an approach ensures that all features incorporated have multiple functions and values.

- 4.55 **Figure 4.14** sets out the finished external surfaces, including position/location of proposed 'landscaping'. As identified in **Figure 4.14**, the largest landscaped spaces are located within and around the Administrative Building and Eastern Access, between the truck loading area and unnamed port road, and towards the western boundary alongside the primary internal road. The main proposed habitat is flower-rich grassland and pioneer vegetation which will be established on nutrient-poor substrates, features that should be equivalent to habitats of biodiversity value in the wider dock. The vegetation proposed is associated with industrial sites which can support key foodplants for invertebrates and provide sources of pollen and nectar. Both habitat types are suitable for periodic disturbance, with low maintenance requirements. To facilitate the establishment of the proposed landscape areas, site-won substrates will be used where possible (subject to the results of ground investigations), or alternatively similar inert post-industrial substrates will be sourced from the wider dock or will be imported.
- 4.56 As such, the landscaping features within the PDZ will include, and defined on **Figure 4.14**, are as follows:
- Flower-rich grassland/pioneer vegetation.
 - Modular biodiversity (bespoke gabion) walls.
 - Gravel substrate rain gardens (adjoining hard landscaping).
 - Insect hotels.
 - Large rock features.
- 4.57 Biodiverse green/brown roof has been incorporated into the design of the Administrative Building and Gatehouse 1.
- 4.58 The Proposed Scheme will include permeable paving (staff car parking areas), trapezoidal ditches (gravel based swales) along the Unnamed Port Road / primary internal road (where applicable) and macro-permeable paving (frontage of warehouses).

Invasive species management strategy

- 4.59 Japanese Knotweed is present within the PDZ and is currently subject to active management by ABP (the landowner), managed through routine herbicide spraying. The practice of herbicide spraying will continue on-site as a form of long-term management of Japanese Knotweed.

Flood Risk Strategy

- 4.60 Baseline flood risk data, obtained from the TAN-15 Development Advice Map (DAM), and the Flood Map for Planning (FMfP), indicates that a small portion in the north of the PDZ, where the ground levels are lower, is located within Flood Zone 2 for flooding from rivers, this equates to between a 0.1% and 1% Annual Exceedance Probability (AEP). The rest of the PDZ is located in Flood Zone 1 with very low risk of flooding from rivers (less than a 0.1% AEP). The Temporary Construction Areas and areas of the Marine Unloading/Loading Facility are located in Flood Zone C2 of the DAM, and Flood Zone 3 for rivers. Flood Zone 3 identifies

areas with more than a 1% chance of flooding from rivers in a given year, including the effects of climate change.

- 4.61 With regards to flood risk from the sea, a larger section of the north of the PDZ is located in Flood Zone 2 (with between 0.5 and 0.1% AEP) and Flood Zone 3 (more than 0.5% AEP), with the rest of the PDZ at very low risk of flooding from the sea. Furthermore, approximately one third of the Unnamed Port Road located on the northern boundary of the PDZ is within Flood Zone 2 for flooding from rivers and Flood Zone 3 for flooding from the sea. The Temporary Construction Area and areas of the Marine Unloading/Loading Facility are located in Flood Zone 3 for flooding from the sea. Flood Zone 3 identified areas with more than a 1% chance of flooding from seas in a given year, including the effects of climate change (for a 100-year lifetime of development).
- 4.62 Detailed baseline flooding modelling of the Site (as provided in the **Flood Consequences Assessment**), inclusive of 75 years of climate change^s, identifies that most of the areas identified to be at risk in the FMfP are flood free in the baseline up to the 0.1% AEP fluvial event and the 0.1% AEP tidal event, allowing for the application of climate change. Most of the Site is, therefore, at very low flood risk.
- 4.63 The detailed baseline flood modelling shows that all site areas, with the exception of the Marine Unloading/Loading Facility, are flood free in the 1% AEP fluvial event with climate change and in the 0.5% AEP tidal event with climate change. In the Marine Unloading/Loading Facility, water compatible dockside structure within or immediately adjacent to the dock may be flooded in these events. The frequency of flooding therefore satisfies the criteria of TAN15 (A1.14).
- 4.64 In the 0.1% AEP fluvial event and 0.1% AEP tidal event with climate change, the detailed modelling also shows a vastly reduced extent of flood risk. Shallow flooding is limited to the water compatible dockside structures within or immediately adjacent to the dock, limited areas of the Unnamed Port Road and the northern low-lying areas of the PDZ. The flood risk in these extreme design events is therefore limited in extent and severity, well within the tolerable conditions recommended in TAN15 (A1.15).
- 4.65 Nonetheless, to safeguard the PDZ from flooding in all design events, ground levels will be raised to a minimum of 7.5m AOD for all areas required for operational/process plant, equipment and buildings, as well as the primary internal road and associated service roads. The majority of the PDZ is already above the minimum level (**Chapter 3: Site Context**), However, the Proposed Scheme will implement a singular development platform of 8m AOD across the PDZ, thereby ensuring all necessary elements of the Proposed Scheme are on a singular level and mitigated against flood risk.
- 4.66 The existing Unnamed Port Road will be retained at existing levels and therefore, a minor gradient will be present at the site access (see '*Access and Circulation*' for more details), with levels rising into the PDZ. Although this would result in an area of the Unnamed Port Road remaining at risk of flooding, detailed modelling (as set out in the **Flood Consequences Assessment**) shows the Unnamed Port Road would meet the flood frequency and severity of

^s Assumed lifetime of the Proposed Scheme, for the purpose of evaluation.

the Acceptability Criteria^t as stated in TAN-15. As such, no remedial works are considered necessary.

- 4.67 In the area of the Marine Unloading/Loading Facility dockside structures within or immediately adjacent to the dock may be flooded. However, these shall be water compatible structures designed to cope with these conditions. By virtue of the nature and location^u of such water compatible development the Justification Tests of TAN15 do not apply. All new structures within the zone will be designed to safely tolerate the extreme water levels provided in the **Flood Consequences Assessment**.

Drainage Strategy

- 4.68 To manage surface water runoff quantities (and risk of associated flooding impacts) arising from increased hard standing across the Site, an **Outline Drainage Strategy** has been prepared for the PDZ^v and submitted in support of the Application. The outline drainage strategy shall also be submitted to NPTCBC Sustainable Drainage System (SuDS) Approval Body (SAB) for pre-application consultation advice. This in turn will inform a full detailed drainage strategy for approval by the SAB. The **Outline Drainage Strategy** utilises the application of SuDS and has been developed to meet the requirements of the Welsh Government Statutory Standards for Sustainable Drainage Systems and SuDS Manual (C753).
- 4.69 The Proposed Scheme will adopt two main water streams, separated into the 'clean water' drain and the 'Contaminated drain'. The 'contaminated' drain system will be installed for the management of contaminated water arising from the process of the Proposed Scheme and bunded areas of the PDZ. This drainage system will discharge to an on-site effluent waste water facility in the western extent of the PDZ, as defined on **Figure 4.8** (see the '*Operational Water Strategy – Process Water*' section below) for more details.
- 4.70 The 'clean water drain' shall be managed through the use of a SuDS system where possible. This shall consist of rain gardens, gravel-based swales and permeable paving. The use of vegetated SuDS is dependent upon the associated fire hazard and risk arising from the nature of the development, resulting in planting required to be sited at a suitable distance away from the processing areas of the Site to not be impacted by the thermal radiation level capable of igniting plants.
- 4.71 The Simple Index Approach has been utilised across the 'Clean Water Drain' as an indicator as to sufficient water quality treatment being provided across the PDZ. Due to the 'Medium' risk category for utility and truck loading areas of the PDZ, it is proposed to locate a separator upstream of the outfall of the system in line with the Guidance for Pollution Prevention 3² and CIRIA SuDS Manual.

^t Welsh Government TAN15 Acceptability Criteria (TAN15 A1.14) states that sites should be flood free in the 0.5% AEP tidal event with an allowance for climate change and the 1% AEP fluvial event with an allowance climate change. Residual flood risk during the 0.1% AEP tidal event with climate change and 0.1% AEP present day fluvial event should not exceed 1m for industrial developments (TAN15 A1.15).

^u Welsh Government TAN15 (5.3) outline water compatible development, such as 'boatyards, marinas, essential works required at mooring basins'. Such development is not subject to the Justification Tests of TAN15.

^v There are no proposed amendments to the drainage infrastructure on the Unnamed Port Road and therefore no requirement to include within the **Outline Drainage Strategy**.

- 4.72 The 'Clean Water Drain' shall discharge to Port Talbot dock, at an unattenuated discharge rate and will be subject to a permit from NRW. A new outfall shall be required. The outfall shall be sited at a level allowing for the 'Clean Water Drain' to discharge via gravity, if possible.

Operational Water Strategy

Process Water

- 4.73 Raw water input required for the process of the Proposed Scheme (as specified within **Table 4.1**) will be taken from Port Talbot Docks via a new abstraction point, at a rate of 150m³ an hour, and in line with a water abstraction license. The Proposed Scheme has been designed to recycle and reuse water input in order to minimise water loss.
- 4.74 An intake screen mesh grade of 1mm will be included in the design of water intakes used for abstraction activities during the operational stage, in line with NRW guidance on prevention of entrainment during water abstraction activities.
- 4.75 In line with 'Drainages Strategy' waste process water will be directed to an on-site effluent waste water facility, located in the western extent of the PDZ. At which point the water will be treated and process for discharge back to Port Talbot Dock via a new outfall. Discharge to the dock will require a permit from NRW which will define the necessary 'treatment' levels and restrictions in terms of chemical consistency of any discharge.

Foul Water

- 4.76 All foul water arising from the on-site ancillary operational facilities (i.e., administration building) will be discharged directly to the local sewage network operated by Welsh Water (WW). See 'Utilities Strategy' for more details on proposed connection points.

Operational Waste Strategy

Process Waste Arisings

- 4.77 The nature, approximate quantity and means of disposal of process related waste arising from the Proposed Scheme are set out within **Table 4.5** and informed by the **Framework Waste Management Plan** submitted with the Application. A full Waste Management Plan will be prepared and submitted to NPTBC for approval.

Table 4.5: Process Waste arisings from the operation of the Proposed Scheme

Waste Type	Approximate Quantity per annum	Form of removal from Site	Destination
Organic waste containing hazardous substances	30 tonnes	Tanker	Off-site Incineration
Aqueous liquid waste containing hazardous substances	500 tonnes	Tanker	Specialist third party responsibility
Sludge from on-site effluent treatment	8000 tonnes	Tanker	Landfill

Waste Type	Approximate Quantity per annum	Form of removal from Site	Destination
Spent catalyst	20 tonnes	Closed container	Specialist third party for metals recovery
Spent catalysts, resins and absorbents	40 tonnes	Closed containers	Landfill

Non-Process Waste Arisings

- 4.78 Additional waste will arise from the administrative operational facilities (see ‘*Administrative operational facilities*’) will also generate waste. The Applicant expects non-process waste arisings to be approximately 3 tonnes per month. This accounts for waste destined for landfill as well as waste that would be diverted from landfill (i.e., recyclables).
- 4.79 In line with statutory legislation [i.e., The Waste (England and Wales) Regulations 2011³, Environmental Protection Act 1990⁴ and the Environmental Protection (Duty of Care) Regulations 1991⁵], the Applicant is responsible for the arrangement of refuse and recycling to be collected from their premises, with the specific type of collections dependent on the nature of the activities and expected waste arisings. It is expected that waste arisings associated with the ancillary operational facilities will include general waste and general recyclable waste (i.e., plastic bottles, paper etc).
- 4.80 Waste collection frequency will be dependent upon the volume of waste generated, the storage method (i.e., whether balers and waste compactors are used) and the collection schedule of the appointed waste contractor. Nevertheless, the Proposed Scheme has been designed in order to take account of appropriate provision for waste storage and handling facilities/areas, inclusive of areas for segregation of waste and recycling, all designed in accordance with British Standard (BS) 5906:2005 Waste Management in Building – Code of Practice.

Utilities Strategy

- 4.81 The below sections identify the necessary utilities required for the Proposed Scheme and proposed connections (where applicable). Engagement with relevant utilities providers and network operators are at varying stages of engagement and therefore information presented below is based on understanding at the time of writing.
- 4.82 In line with **Chapter 2: Approach to EIA**, the Proposed Scheme for the purpose of the ES does not include works to deliver the below utilities connections as these will be undertaken by the respective network operators. Instead, the below is presented for information purposes only. Nonetheless, the EIA has considered these works/activities associated with the electricity and gas supply (see ‘*Electricity*’ and ‘*Natural Gas*’ below) cumulatively with the Proposed Scheme, as part of **Chapter 14: Assessment of Cumulative Effects**, as far as reasonably possible to identify any potential cumulative effects

Electricity

- 4.83 The Proposed Scheme will require a new 33kV cable connection from the National Grid primary substation located at Pyle to the new on-site National Grid Switchroom identified on **Figure 4.8**. A connection agreement with National Grid has been signed by the Applicant.

- 4.84 Engagement with National Grid Electricity Distribution (NGED) to date has identified a preliminary route for the new cable, which is expected to route along the A48, various streets with Margam, passing under the railway lines at Central Road, then onto Harbour Way, North Road and then on Unnamed Port Road. All works for the provision of the new cable will be undertaken by NGED or an approved contractor on behalf of NGED.

Natural Gas

- 4.85 Preliminary connection enquiries have been sent to Wales and West Utilities (WWU) for a gas connection for the Proposed Scheme. WWU have confirmed the presence of two connection points, one to the north-east of the Site within the vicinity of TATA Steelworks and a second connection point to the north within Port Talbot. The Applicants preferred connection point is to the north-east. Continued engagement with WWU is being undertaken to finalise the connection point.

Potable and Foul Water

- 4.86 A preliminary connection application has been submitted to Welsh Water (WW). It is understood connection points and sewage connection points are available within the Unnamed Port Road or immediate locality of the Site but requires confirmation with WW including any need for the upgrades to the supply within the Unnamed Port Road.
- 4.87 It should be noted that the new connection for potable water will serve the ancillary operational facilities and will not be used for process water requires. Further details pertaining to sourcing of raw water for process purposes is set out within '*Operational Water Strategy – Process Water*'.

Telecoms

- 4.88 No engagement with telecoms providers has been undertaken to date. However, it is envisaged that a suitable connection will be achievable within the immediate locality of the Site.

Climate Resilience

- 4.89 Consideration of the evolving climate has been considered throughout the design of the Proposed Scheme. The evolving climate can include an increase in mean summer and winter temperatures, increase in annual precipitation, decrease in mean summery precipitation and extreme weather events. Full details of climate resilience aspects of the Proposed Scheme have been set out within a **Sustainability and Energy Statement** application report and considered as part of **Chapter 10: Climate Chage**.
- 4.90 The following key climate resilience measures are integral to the Proposed Scheme:
- The Proposed Scheme has been designed to ensure it is resilient to future flood events occurring, including an allowance for climate change. Further details are set out within '*Flood Risk Strategy*'.
 - Water efficiency measures have been incorporated into the design of the Proposed Scheme, with knowledge of the various stages of the primary process. Where water is a by-product of one stage of a process, the design has looked to 'recycle' this for an additional stage of the process.

- Additionally, the proposed development is targeting potable water efficiency in occupied buildings equivalent to a minimum of 2 credits under BREEAM issue *Wat 01 Water Consumption*, which requires a 25% reduction on baseline water consumption.
- The Proposed Scheme will accord with the 'cooling hierarchy' which aims to reduce any potential overheating in buildings. This means buildings will be better equipped to manage their cooling needs and to adapt to and mitigate climate change. The Applicant has confirmed that dynamic modelling for thermal comfort will be undertaken for occupied buildings in accordance with BREEAM credit *Hea 04 Thermal Comfort*. The assessment will take account of building design and occupation and establish what, if any, mitigation measures are necessary to ensure suitable internal thermal conditions through the year.

Risk Management Strategies

- 4.91 The design of the Proposed Scheme has been undertaken in line with the Applicants HSE Design Philosophy (**Appendix 6.1**).
- 4.92 The principle of inherently safer design has been applied by the project engineers throughout the Front End Engineering Design (FEED) stage^w. This has been informed by both the project specific HSE Design Philosophy (**Appendix 6.1**), as well as the HSE Measures Documents⁶, which establish guidance and principles for all facilities/projects that fall within the COMAH Regulations, such as the Proposed Scheme. The FEED stage for the Proposed Scheme has considered the hierarchy of controls in determining feasible and effective control solutions to reduce exposure to occupational hazards for on-site users (and thus limiting implications beyond the Site). The hierarchy of controls from most effective to least effective strategy is:
- Elimination;
 - Substitution;
 - Engineering controls;
 - Administrative controls; and
 - PPE.
- 4.93 Through the application of the above, measures incorporated into the design of the Proposed Scheme limit risk of major accidents and disasters to As Low As Reasonably Practicable (ALARP).

Construction of the Proposed Scheme

- 4.94 For the ES, the construction stage accounts for all enabling works (including demolition) and construction activities and commissioning, up until the point the operational plant is signed off for operation. This section provides a description of anticipated works required to construct the Proposed Scheme.

^w The FEED stage is an engineering design stage used to define and plan a project in advance of requesting fix bids quotes for the construction of the project.

Construction Programme / Timescales

4.95 Site preparation is expected to commence in 2024 at the earliest (i.e., site preparation works) and require up to 2.5 years to construct, inclusive of commissioning of the processing plant and overall facility. As such, the Proposed Scheme is expected to be operational by late 2026.

Overview of Construction Activities

4.96 Construction works are anticipated to comprise the following key stages, broadly in chronological order:

- Securement of the Site, including Temporary Construction Areas (TCAs).
- Site preparation works within PDZ, including (where applicable) protection of retained features, invasive species management practices, clearance works, ground investigation works, localised remediation activities, utilities diversions, etc.
- Preparation of Temporary Construction Areas (i.e., ground conditions survey and report, vegetation clearance and lay down of ground protective measures where necessary) and formation of associated construction compound(s), amenities and associated material stores/pre-fabrication areas.
- Construction of construction jetty.
- Formation of construction access(s) to PDZ and implementation of associated road traffic management practices on Unnamed Port Road (if required).
- Construction of new operational vehicular access junctions to PDZ and marine unloading/loading facility.
- Earthworks (including levelling), material management and establishment of foundations.
- Construction of internal road(s) infrastructure.
- Delivery of process equipment modules by ship via new temporary jetty
- Construction and installation of plant/equipment, buildings and associated infrastructure (i.e., services, utilities and plant).
- Implementation of proposed landscaping (including boundary features), lighting, internal and external finishing.
- Returning of TCAs to previous condition or alternative agreed position (see '*Preparation of Temporary Construction Areas and Establishing the Construction Compound*' for more details)

4.97 Where appropriate, the above activities are discussed in further detail below. Where assumptions have been made these have been clearly stated.

4.98 Prior to occupation and operational use, all plant/equipment will require commissioning to ensure its functions in line with engineering design and plans as expected. This phase may

include activities in relation to plant and/or equipment replacement or amendments (should any plant/equipment not operate as expected), albeit this is expected to be unlikely.

Securement of the Site

- 4.99 Securement will be provided through hoarding / fencing, as appropriate. Temporary secure access gates may be utilised at the PDZ and/or the Temporary Construction Areas, to manage the movement of vehicles, plant, equipment, and personnel required for construction. In addition, the principal contractor will be responsible for the provision of construction staff at key interfaces if appropriate (i.e., road traffic management areas).
- 4.100 The site security arrangements during construction will be in line with the requirements set out in the Construction (Design and Management) Regulations 2015 and appropriate levels of security (personnel / CCTV) will be provided.

PDZ Site Preparation

Invasive Species Management

- 4.101 Japanese Knotweed is extensively present within the PDZ and has will be the subject of continuous management in the form of herbicide spraying, and other containment means. This form of management will continue throughout the construction stage and through to operation.

Features for Removal

- 4.102 Within the PDZ there are areas of existing hardstanding, associated with former buildings/structures and foundations. As part of the site preparation works, these areas of hardstanding will be broken up and 'scrubbed out'. Where the resulting hard-core is suitable for reuse (i.e., been through a screening process to ensure absence of contamination or hazardous materials associated with historic use) within the Site, it will be crushed and stored on-site until required. Where material is not considered suitable for reuse on-site it will be disposed of in line with relevant waste legislation, or, if applicable, hazardous materials regulations (i.e., if contaminated), see '*Materials Management*' for more details.
- 4.103 In addition, vegetation clearance works will be undertaken across the Site to create clear areas for earthworks (see '*Earthworks and Levels*' for more details) and associated foundation construction (see '*Foundations*' for more details).
- 4.104 An existing sub-station, located at the north-east of the PDZ (**Figure 4.4**) will be relocated by ABP.

Ground Investigation, Remediation and Verification Strategy

- 4.105 Targeted exploratory ground investigation works (within accessible areas of the PDZ) were undertaken in 2022 and 2023 in order to establish a preliminary understanding of ground conditions. Nonetheless, it is necessary for further, ground investigation(s) which will be undertaken prior to the commencement of construction works in accordance with relevant guidance, including British Standard 5930:2015+A1:2020 Code of Practice for Site Investigations and British Standard 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites - Code of Practice. This ground investigation(s) will determine the absence or presence, type and distribution of any forms of ground contamination and confirm the ground conditions. Where relevant, this will include further chemical analysis, geotechnical testing, and groundwater monitoring / sampling as well as a detailed risk

assessment to be completed in accordance with DEFRA Land Contamination: Risk Management (LCRM 2021). Further ground gas risk assessment will also be undertaken in line with BS8485:2015+A1:2019.

- 4.106 The preliminary risk assessments undertaken to-date as part of the targeted exploratory ground investigation works have identified low to moderate and moderate risks of contaminants and the presence of contamination has been confirmed in locations during the exploratory investigation. As such, remediation activities will be required on-site to mitigate risks.
- 4.107 The specifics of the Remediation Strategy, to be submitted to NPTCBC for approval, will be determined following the completion of the full suite of ground investigation works and associated reporting. Operationally, the majority of the PDZ will be subject to levelling, laid to hardstanding and/or within the footprint of proposed structures, which will effectively mitigate the potential pollution pathways to future users of the Site (i.e., effectively capping any remaining contamination). Within areas of soft landscaping (although such areas are limited) or where made ground remains once finished levels have been achieved, a suitable cover system will be implemented to remove potential exposure to contamination and meet the standards for the proposed land uses as defined by the site-specific risk assessment developed in accordance with LCRM 2021. Where in-situ / ex-situ remediation is required, this will be undertaken in consultation with the NRW within an associated permit.
- 4.108 Verification of remedial works will be undertaken to ensure that the required thresholds / criteria have been achieved as defined within the remediation strategy. This will be submitted to NPTCBC. This will ensure that the Site is not classified as 'contaminated land' under Part 2a of the Environmental Protection Act.
- 4.109 If further unexpected contamination is encountered during construction works following remediation, appropriate measures, which may include additional assessment as defined in the Remediation Strategy, will be implemented, and will be incorporated within the CEMP to deal with such circumstances.
- 4.110 Measures to protect construction workers from exposure to any unexpected or known, contamination, will be set out by the principal contractor as part of the CEMP, in line with Construction (Design and Management) Regulations 2015 and other health and safety legislation. All strategies / protocols put in place will be in line with relevant legislation (such as the Control of Asbestos Regulations) and best practice (CIRIA 733 Asbestos in Soil and Made Ground). Measures will be incorporated into the CEMP, including the use of Personal Protective Equipment (PPE), the preparation of method statements and provision of environmental awareness training, in order to ensure that construction activities are undertaken in line with best practice measures (such as CIRIA Handbook C741 Environmental Good Practice on Site, 2015) accounting for the identified CoPCs.

Earthworks and Levels

- 4.111 Existing topography within the PDZ ranges from 9.64m AOD to 6.86m AOD, from south to north. As noted under '*Flood Risk Strategy*' partial reprofiling of the PDZ will be required to raise ground levels to a minimum of 7.5m AOD to safeguard the Site from flooding in all TAN15 design event. Furthermore, for operational and engineering considerations, all areas required for operational/process plant and equipment; internal road infrastructure; and ancillary operational facilities of the Site shall be levelled to a consistent 8.00m AOD ground

level. This is expected to be achieved using material already present within the Site (i.e., some areas of cut and some areas of fill). Preliminary cut and fill calculations indicate there will be a greater level of cut to fill requirement (c.1,400m² of surplus cut material), requiring the removal of excess cut for off-site disposal. Finished levels within the PDZ are specified on **Figure 4.10 – 4.13**. Existing levels across the remainder of the Site will be retained.

- 4.112 Local excavation and trenching works will be required to install services, drainage runs and shallow foundations for structures (where being applied). Basements are not proposed as part of the Proposed Scheme.
- 4.113 The presence of unstable and compressible ground may also be identified during the ground investigations and enabling works prior to the commencement of the main construction activities. The results of the ground investigation(s) will be used to design appropriate remedial measures to address any issues with unstable and compressible ground during the construction stage.
- 4.114 All earthworks will be undertaken in accordance with relevant industry guidance including CIRIA Report C572: Treated ground engineering properties and performance, British Research Establishment document FB75: Building on Fill - Geotechnical Aspects and British Standard 6031:2009: Code of Practice for Earthworks, and Health and Safety Executive (HSE) standards for such facilities. In addition, all proposed buildings and their foundations will be designed in accordance with Building Regulations Approved Document A –Structure and HSE requirements for such facilities.

Materials Management

- 4.115 A material management plan (MMP) will be prepared and included as part of the CEMP. This will set out the necessary procedures for the handling, crushing, storing and re-use of any hard-core obtained from the removal of the existing hardstanding within the Site. Any movement of materials will adhere to the guidance set out in the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Nonetheless, as specified under '*Earthworks and Levels*' there is an assumed cut and fill balance within the Site.

Sitewide Temporary Drainage

- 4.116 A temporary drainage strategy will be implemented to manage surface water runoff volumes and quality across the PDZ during the construction stage. It is anticipated that the temporary drainage strategies will incorporate features which will remain part of the operational surface water drainage system and take advantage of any post-development SuDS without compromising the long-term operation of the SuDS features.
- 4.117 Where components of the permanent drainage strategy are used during construction, all silt and debris build-up will be removed, and the permanent components fully reinstated on completion of construction.
- 4.118 The temporary drainage strategy will take account of industry best practice and guidance (i.e., British Standard 8582:2013 – Code of practice for surface water management for development sites, Site handbook for the construction of SuDS (CIRIA C698) and CIRIA's Control of water pollution from construction sites).
- 4.119 Where necessary the temporary drainage solution during construction will include measures to remove silt, sediment, and debris.

- 4.120 The Temporary Construction Areas shall require draining for their lifetime. To facilitate use as a construction area, preliminary works to this area shall comprise gravel surfacing. The final slope of the area shall be realised to direct surface water from the Temporary Construction Area to ditches with drainage pumps to manage silt laden runoff and build up of materials across the area.
- 4.121 All surface water run-off generated during construction will be controlled on the Site to prevent pollution in accordance with Guidance for Pollution Prevention (GPPs) measures, ensuring that the risk to surrounding properties and the local watercourse network is proactively managed throughout the construction stage. Such measures will be set out by the principal contractor (when appointed) as part of the CEMP (**Volume 3: Environmental Management Plan**).

Foundations

- 4.122 Piled foundations are expected to be required across the Site for all buildings, plant and structures.

Preparation of Temporary Construction Areas and Establishing the Construction Compound

- 4.123 The Temporary Construction Areas will be utilised throughout the construction stage. Given the temporary use, it will be necessary to undertake a ground conditions assessment and report, to ensure that following use of the TCAs they are returned to their previous condition or agreed alternative position^x. This assessment may require a degree of ground investigations (i.e., boreholes) to establish existing contamination conditions. It is expected that TCA 1 will be allowed to regenerate naturally or taken up for other uses by the landowner, ABP. whilst TCA East will be left as cleared land (in line with the proposed demolition of existing buildings/structures). TCA west will be allowed to regenerate naturally.
- 4.124 It is anticipated that one of the TCAs will house the main principal contractor compound and associated amenities, whilst all TCAs will be used for a combination of car parking, welfare facilities, material delivery, drop off and storage and potential pre-fabrication stations. Smaller satellite compounds may be located within TCAs where required.
- 4.125 Following the establishment of the existing site conditions a degree of site preparation will be required, including:
- Within TCA East existing buildings and above ground structures will be demolished to slab level. This will include soft strip of buildings and structure where necessary, with waste arisings separated out for recycling or disposal. It is considered that given the age of some of the buildings and structures and their former uses, there is the high potential for asbestos and other potential contaminated/hazardous materials to be present. As such, prior to demolition appropriate surveys will be undertaken to establish the presence of asbestos and/or contamination/hazardous materials. Any requirement for specialist removal will be undertaken in line with relevant guidance and legislation and by appropriate qualified specialise where necessary. Full demolition will then occur using manual demolition method (i.e., demolition from height down suing appropriate plant). Hardcore material will be retained on-site for crushing and re-use. The suitability of hardcore for reuse will be determined using

^x To be agreed with Associated British Ports (ABP) as landowner.

standard screening methods. All waste arisings will be removed from Site for correct disposal, in line with the nature of the waste^y;

- Identification and removal of Japanese Knotweed (considered likely to be present within TCA East and West), followed by the implementation of a medium-term management plan to ensure control of Japanese Knotweed throughout the construction stage. All works will be undertaken by an appropriately licensed contractor and in line with CIRIA's 'Invasive species management for infrastructure managers and the construction industry (C679)';
- Vegetation clearance and removal. Where vegetation is to be retained, appropriate fencing/hoarding will be implemented to ensure its not disturbed;
- Installation of protective fencing in and around any other features to be retained within or adjacent to the Temporary Construction Areas; and
- Implementation of any ground protection management strategies (where applicable).

4.126 Once site preparation works are completed, the construction compound and associated amenities/facilities will be established. This is expected to include provisions of relevant utilities (i.e., power, potable water, etc.) and applicable on-going site needs (i.e., portable toilets). A satellite construction compound and facilities may be established within the PDZ for the purposes of coordinating construction activities within the PDZ.

Construction of Construction Wharf / Jetty and Marine Unloading/Loading Facility

4.127 Given the scale and size of some of the process plant/equipment (i.e., process equipment modules, storage tanks) there is a requirement to utilise barge/ships to transport them to Site for installation. As such, a new construction wharf/jetty will be constructed at Crown Wharf. The exact design of the construction wharf is still to be finalised, however, as a worst case and for the purpose of assessment within the ES it is assumed to comprise a rectangular 'quay' approximately 15m wide and 2-4m deep. It is expected the quay will be constructed using sheet piles backing up to the existing dock wall, which may require reinforcement. The area behind the sheet piles^z will then be backfilled with hardcore and concrete as required to support the expected weight of plant/equipment to be offloaded. Following use the construction wharf/jetty will remain in-situ.

4.128 It is assumed that the construction wharf/jetty will be located at Crown Wharf and as such require the partial or full removal of the former derelict wood quay present adjacent to Crown Wharf.

4.129 The primary purpose of the construction wharf/jetty is for transportation of the 'process modules' to Site, identified as Module A1, B1, D1, E1 and E2. It is expected that the process models will be transported to site via barge/ship and offloaded at the construction

^y Total potential waste arisings associated with demolition would be 1,358.7m³. This has been informed by the overall footprint of existing buildings (approximately 4,529m²) and commonly applied factor to determine potential waste arisings. This quantity also make no assumption for any form of recycling or reuse and therefore represents an absolute waste arisings quantity.

^z The required number of piles is subject to finalisation, however, for the purposes of assessment within **Chapter 13: Marine Ecology** assumptions have been made in order to undertake a worst-case assessment.

wharf/jetty, being transported into location with the PDZ with on-site construction plant/machinery. The construction wharf/jetty may be used to bring other equipment or plant to site, if considered appropriate, but its use will be limited and therefore overall there is expected to be approximately 10 barge/ship movements across the entire construction stage.

- 4.130 The Marine Unloading/Loading Facility, will also be located within Port Talbot Docks, as set out within '*Marine Unloading/Loading Facility*'. The construction of the new facility, and associated wharf/jetty and berth upon which it is located, will also require some degree of clearance of existing derelict wood quay present adjacent to Crown Wharf. The Marine Unloading/Loading Facility will also require piling^{aa}.
- 4.131 The steel lock gates at the entrance of Port Talbot Docks will be closed during any piling activities within the marine environment associated with the construction of the Proposed Scheme, to isolate underwater noise and vibration associated with the Proposed Scheme from the mouth of the river Afan and the subsequent marine environment.

Construction Access, Flows, Routing and Parking

Vehicle Construction Access and Traffic Management Requirements

- 4.132 Construction access to the Temporary Construction Areas will be taken from Unnamed Port Road, the PDZ (with respect to a sub-parcel of TCA West) and/or Wharf Road, utilising existing private road infrastructure. Construction access to the PDZ will be taken from Unnamed Port Road.
- 4.133 Construction access creation may require a degree of temporary closures, however, as the roads are currently restricted public access, implications of any such closures are expected to be minimal.
- 4.134 During construction all provisions for construction vehicle parking will occur across the PDZ and Temporary Construction Areas as necessary. Deliveries and off-loading of vehicles will occur across the Temporary Construction Areas or PDZ as required. There may be a requirement for some materials to be transported to the PDZ from the Temporary Construction Areas, which will utilise 'on-site' construction plant/machinery.
- 4.135 Peak construction is anticipated to generate up to 804 two-way construction vehicle movements^{bb} over the day and this will include HGVs, LGVs and cars (further details are provided within the **Transport Statement**). HGV movements are anticipated to account for 240 two-way movements over the day.
- 4.136 Construction traffic will route along Harbour Way (A4241) and access the relevant areas of the Site via the existing secure access gate on North Road. Harbour Way (A4241) provides connections to the wider strategic road network, specifically connections to the M4 (i.e. Junctions 38 and 41) via the A48. All HGVs will be requested to route via the M4 Junction 38,

^{aa} The required number of piles is subject to finalisation, however, for the purposes of assessment within **Chapter 13: Marine Ecology** assumptions have been made in order to undertake a worst-case assessment.

^{bb} As set out within the **Transport Assessment** these movements accounts for all forms of potential construction vehicle movements.

and not through Port Talbot, through the implementation of a Construction Traffic Management Plan (CTMP), to reduce any potential impact in the vicinity of the town centre.

4.137 The principal contractor will prepare a CTMP, as part of a Construction Environmental Management Plan (CEMP) for submission and approval (see '*Construction Environmental Management Practices*' below for more details), to include the following traffic management controls to be implemented during construction:

- Appropriate signage of the routes to ensure vehicles use the approved routes to and from the Site;
- Installation of temporary signage, where appropriate, in the vicinity of the accesses for highway users;
- Management of construction parking and implementation of protocols for construction staff;
- Ensuring all construction related vehicles are well maintained;
- Temporary traffic management for short periods when delivery of abnormal / oversized loads may cause obstruction to the public highway;
- Use of wheel washing facilities;
- Design of the temporary accesses to ensure that vehicles have appropriate visibility;
- HGV speed limits to be applied on Unnamed Port Road and any additional access routes created on-site;
- Routes and road surfaces will be regularly maintained;
- Layout of construction working areas to allow adequate space for vehicles to unload / manoeuvre on-site; and
- Construction traffic will be controlled by means of a vehicle arrival and departure management plan to achieve an even spread of vehicle movements during the working day.

Construction Waste Strategy

4.138 General construction waste can occur from a number of sources, including over ordering of construction materials, accidental damage of materials during transit / movement and more general construction waste (i.e., material off-cuts, packaging, etc.).

4.139 There are several measures that will be adopted throughout the construction stage, which would help to minimise and reduce waste arisings. The appointed principal contractor will be responsible produce a Site Waste Management Plan (SWMP) which will include, as a minimum:

- Show adherence to waste provisions of the Environmental Protection Act 1990 and the Environmental Protection (Duty of Care) Regulations 1991, setting out the principles and legal requirements relating to waste (including hazardous waste);

- Outline details of material and waste storage / handling on-site and procedures for the removal of waste off-site in line with appropriate licensed handling procedures, especially with respect to hazardous waste;
- Methods for the efficient management of materials, including the ability to source sustainable construction materials (where possible);
- Identify targets for the reduction of construction waste (where possible) and monitoring procedure for targets throughout the construction stage; and
- Outline further best practice measures to be adopted in order to achieve identified targets, taking account of the waste hierarchy of reduce, reuse, recycle, recovery and disposal.

4.140 Where there is a requirement to export material off-site, materials will be Waste Acceptance Criteria tested and disposed of at the appropriate facility. Any hazardous materials (including asbestos) will be removed, handled and disposed of in line with appropriate guidance and regulations.

Site Working Hours and Days

4.141 Given the nature of the surrounding area (i.e., an industrial complex with restricted public access), construction working hours will not be restricted and therefore could occur between 07:00 to 19:00 across all days.

4.142 There may be requirements to work beyond these hours, however, if required these will be agreed with NPTCBC in advance.

4.143 Nonetheless, to minimise disturbance from construction traffic, the following limitations on construction traffic will be implemented, controlled via the Construction Traffic Management Plan (see '*Vehicle Construction Access and Traffic Management Requirements*').

- All HGVs will be requested to route via the M4 Junction 38, and not through Port Talbot, to reduce any potential impact in the vicinity of the town centre;
- Off-site pre-construction/pre-fabrication will be utilised where possible;
- Process equipment modules will be delivered via barge;
- Travel via minibus instead of personal vehicles will be incentivised and car sharing will be encouraged; and
- Adaptation of working time to avoid peak hours, if necessary.

Construction Environmental Management Practices (CEMP)

4.144 The proposed construction works will be carried out by a competent contractor, who will comply with current legislation (including the Health and Safety at Work etc. Act 1974, the Control of Pollution Act 1974 and Construction (Design and Management) Regulations 2015). This will be captured within the CEMP, the contract documents, methods statement and risk assessments issued by the appointed contractor(s) ahead of the works.

4.145 A commitment has been made to a number of environmental measures and management practices during the construction stage and, where appropriate, these have been set out as part of the CEMP and will be agreed with NPTCBC.

4.146 The CEMP will include the following:

- Programme and phasing details of proposed construction works;
- A plan of site preparation and construction works, highlighting the various stages and their context within the project, including a full schedule of materials, manpower resources, and plant and equipment schedules;
- Detailed layout arrangements, plans for storage, accommodation, vehicular movements, delivery and access;
- Prohibition or restricted operations;
- Details of plant used;
- Identification of roles and responsibilities of key staff in relation to environmental management;
- Details of operations that are likely to result in disturbance, with an indication of the expected duration of each phase with key dates; and
- A mechanism for the public to register complaints and procedures for handling complaints and requirements for monitoring and record-keeping.

4.147 Full details of the measures committed to are provided within **Volume 4: Environmental Management Plan (EMP)**, inclusive of measures identified within the Preliminary EMP provided as part of the EIA Scoping Report (**Appendix 2.1**) in order to suitably manage environmental effects during the construction stage.

References

¹ The Marine and Coastal Access Act 2009 Available at: Marine and Coastal Access Act 2009 (legislation.gov.uk) [Accessed 07/06/2023]

² Guidance for Pollution Prevention 3 (2022) Available at: <https://www.netregs.org.uk/media/1899/guidance-for-pollution-prevention-3-2022-update-v2.pdf>

³ <https://www.legislation.gov.uk/uksi/2011/988/contents/made>

⁴ <https://www.legislation.gov.uk/ukpga/1990/43/contents>

⁵ <https://www.legislation.gov.uk/uksi/1991/2839/made>

⁶ <https://www.hse.gov.uk/comah/sragtech/techmeasindex.htm>