

# **Project Dragon – Sustainable Aviation Fuel (SAF) Production Facility: Water Framework Directive Assessment**

**Version C**

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## Contract

This report describes work commissioned by LanzaTech UK Limited, by an email dated 4th September 2023. Linley Hastewell and Jonathan Harrison of JBA Consulting carried out this work.

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## Purpose

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## Abbreviations

|       |                                  |
|-------|----------------------------------|
| DrWPA | Drinking Water Protected Areas   |
| NVZ   | Nitrate Vulnerable Zones         |
| PEA   | Preliminary Ecological Appraisal |
| RBD   | River Basin District             |
| RBMP  | River Basin Management Plan      |
| SAC   | Special Area of Conservation     |
| SPA   | Special Protection Area          |
| WFD   | Water Framework Directive        |

# 1 Introduction

A Screening and Scoping Water Framework Directive (WFD) Assessment was completed for the proposed works on the construction and operation of a Sustainable Aviation Fuel (SAF) production facility at Crown Wharf, Port Talbot Docks. The initial assessment identified a series of potential concerns with regards to the impact of the construction and operational phases of the works on WFD water bodies and designated habitats. These impacts have been addressed and mitigation measures provided to limit any such impacts that may arise. This information is presented in Section 6 - WFD Impact Assessment.

## 1.1 WFD Overview

The Water Framework Directive (WFD) came into force in 2000 and is the most substantial piece of EU water legislation to date. The Directive imposes legal requirements to protect and improve the water environment. All activities in the water environment need to take the Directive into account. The EU Water Framework Directive was transposed into law in England and Wales by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. The 2003 regulations were consolidated and replaced with the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The Floods and Water (Amendment etc.) (EU Exit) Regulations 2019 ensure that floods and water legislation continue to be operable in the United Kingdom following withdrawal from the EU in January 2021. The instrument addresses deficiencies in retained EU law arising from the UK's withdrawal from the EU. The purpose of the instrument is to preserve and protect the existing policy regime rather than to introduce new policy. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, as amended by the Floods and Water (Amendment etc.) (EU exit) Regulations 2019, are hereafter referred to as the WFD Regulations in this report.

### 1.1.1 Scope of WFD Assessment

The WFD Regulations require that Environmental Objectives be set for all surface and ground waters in England and Wales to enable them to achieve Good Status (or Good Ecological Potential for Heavily Modified and Artificial Water Bodies) by a defined date. These Environmental Objectives are listed below:

- Prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters.
- Aim to achieve at least good status/potential for all water bodies by 2021. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve good status/potential by 2027.
- Meet the requirements of Water Framework Directive Protected Areas.
- Promote sustainable use of water as a natural resource.
- Conserve habitats and species that depend directly on water.
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment.
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants.
- Contribute to mitigating the effects of floods and droughts.

### 1.1.2 Preventing Deterioration in Status

Any activity which has the potential to have an impact on the ecology of a water body will need consideration in terms of whether it could cause deterioration in its Ecological Status or Potential (Environment Agency, 2010).

For each water body, three different status objectives are identified within the RBMP. These are the overall status objective, the ecological status or potential objective and the chemical status objective. A default objective for all water bodies is to prevent the deterioration in the Ecological Status (or Ecological Potential for Heavily Modified and Artificial Water Bodies) of the water body. Note, the Ecological Status applies only to surface water bodies, and not ground water bodies. A separate assessment may be required to assess the impacts on the chemical and quantitative status of a ground water body, if the proposed activity is likely to cause impact.

The Ecological Status of a water body is determined through analysis of its constituent Biological Quality Elements. These elements are in turn supported by a series of Physico-Chemical and Hydromorphological Quality Elements. These Quality Elements are taken from Annex V of the WFD Regulations and are listed below. The overall Ecological Status is determined by the lowest element status.

The Biological Quality Elements assessed in the WFD include:

- Fish
- Invertebrates
- Macrophytes
- Phytobenthos

The WFD defines the flow, shape and physical characteristics of a watercourse as its 'hydromorphology'. Any in-channel works can impact upon the shape of a watercourse and the natural processes that occur within it, including, but not limited to:

- Hydrological flow patterns (tidal regime)
- Variation in channel depth
- Modification to bed structure and substrate
- Sediment availability / transport
- Ecology and biology (i.e., habitats which support plants and animals)
- The WFD considers the chemistry of a watercourse through general water quality (physico-chemical measurements) and chemical pollutants. All three environmental components; morphology, hydrology and chemistry, support the biology of a water body.

Any activity that has the potential to have an impact upon any of the quality elements will need consideration in terms of whether it could cause a deterioration in the status of a water body. The activity will also need to be considered in terms of whether it will compromise the ability of the water body to reach "Good" ecological status or "Good" ecological potential by the date specified in the Natural Resources Wales (NRW) Water Watch Wales Map Gallery website.

Any adverse impacts can cause a water body's ecology to deteriorate and prevent environmental improvements from being undertaken. Nevertheless, in-channel works can also be beneficial if they can be designed to help achieve environmental improvements included in the RBMP, thus enhancing the water environment for plants and animals.

### 1.1.3 Artificial or Heavily Modified Water Bodies

Whilst good ecological status is defined as a slight variation from undisturbed natural conditions in natural water bodies, artificial and heavily modified water bodies are unable to achieve natural conditions. Instead, artificial, and heavily modified water bodies have a target to achieve "Good" Ecological Potential, which recognises their important uses, whilst making sure ecology is protected as far as possible. Ecological potential is also measured on the scale high, good, moderate, poor and bad. The chemical status of these water bodies is measured in the same way as for natural water bodies.

Specific mitigation measures have been identified for each Artificial and Heavily Modified Water body and are listed in the RBMP. These mitigation measures are necessary to reduce the existing hydromorphological impacts on the water body and all measures need to be in place in order for the water body to achieve "Good" Ecological Status or Potential.

## 1.2 Purpose of this WFD Assessment

JBA Consulting were commissioned by LanzaTech UK Limited to undertake a WFD Screening and Scoping assessment to assess the potential impacts to WFD water bodies arising from the proposed works and associated infrastructure at Crown Wharf, Port Talbot Docks. The Proposed Scheme will comprises:

*Demolition of existing structures and erection of a Sustainable Aviation Fuel (SAF) production facility, including 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 infrastructure including a truck loading area and associated works, hard and soft landscaping, areas for temporary construction laydown, and associated development.*

This WFD assessment aims to determine the effects of the proposed works on ecological, hydromorphological and chemical quality elements and identify any potential impacts that could cause deterioration in the current status of the water body or could hinder the water body from meeting its WFD objectives in the future.

The proposed works are located at Crown Wharf, Port Talbot Docks which is located in the Afon Estuary transitional water body, within the Western Wales River Basin District. The environmental objectives, together with specific actions (mitigation measures) necessary to enable the water body to meet these objectives, are set out in the Natural Resources Wales (NRW) Western Wales River Basin Management Plan (RBMP) (NRW, 2022) and via data available on the NRW Water Watch Wales Map Gallery web-based interface (NRW, 2023).

## 2 Assessment Methodology

Figure 2-1 summarises the WFD Assessment process.

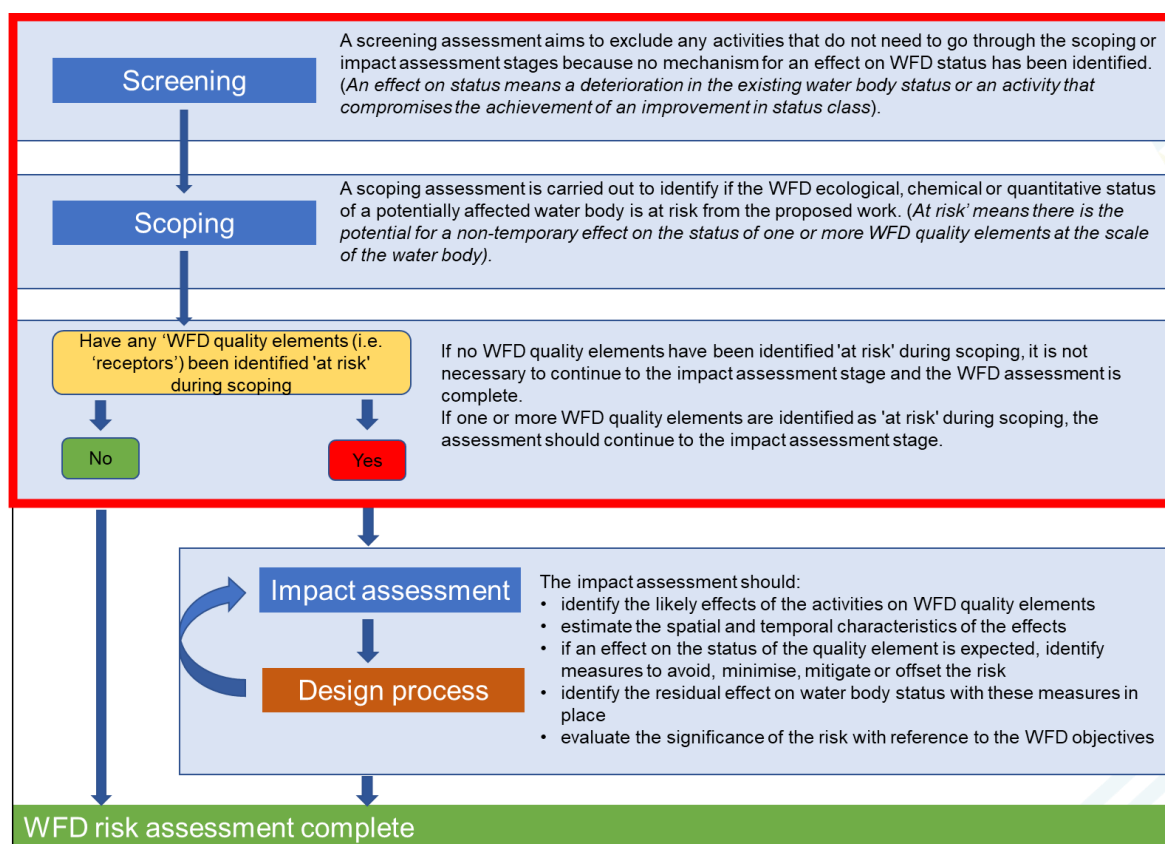


Figure 2-1: WFD assessment process flow chart

### 2.1 Screening Assessment

The Screening Assessment aims to exclude any activities that do not need to go through the scoping or impact assessment stages. The Water Watch Wales web-based data explorer website was used to determine which water bodies could be potentially affected by the proposed works. The names, ID numbers, designation, status classification and objectives for all relevant water bodies were obtained and downloaded from the Water Watch Wales Map Gallery website (NRW, 2023).

The initial stage of the assessment screens the proposed works against the ecological, hydromorphological and chemical status objectives for the water bodies potentially affected by the works, together with their quality elements. The aim of this process is to determine whether the works could have an impact upon any of these criteria. Those criteria for which no potential adverse effects are identified are not considered further in the assessment. Any potential adverse effects are screened into the assessment and are carried forward to a more detailed assessment.

### 2.2 Scoping Assessment

A detailed assessment is then undertaken to determine the effects that the proposed works could have upon those quality elements screened into the assessment. Any impacts identified are then considered in relation to the ecological status of the water body, which comprises biology, hydrology, hydromorphology and water chemistry, and the water body objectives.

The following assessment objectives are then used to determine whether the proposed works comply with the overarching objectives of the WFD. These objectives were therefore derived from the Environmental Objectives of the Directive (as listed in section 1.1.2).

- Objective 1: The proposed scheme does not cause deterioration in the Status of the Ecological Elements of the water body.
- Objective 2: The proposed scheme does not compromise the ability of the water body to achieve its WFD status objectives.
- Objective 3: The proposed scheme does not cause a permanent exclusion or compromised achievement of the WFD objectives in other bodies of water within the same RBD.
- Objective 4: The proposed scheme contributes to the delivery of the WFD objectives.

In order to establish whether the proposed works comply with the WFD it is necessary to ascertain whether the works have the potential to result in:

- Failure of a water body to achieve "Good" Ecological Status or Potential; or
- Failure to prevent a deterioration in the Ecological Status or Potential of a water body

If the answer to these questions is 'no' the proposed works can be considered WFD compliant. If either of these failures is identified and if any receptors are identified as 'at risk', further assessment may be required to identify if the proposed works meet all of the conditions set out by the WFD Legislation.

## 2.3 Impact Assessment

The third stage of the WFD Assessment, if determined as necessary from the Screening and Scoping Assessments, is to undertake an Impact Assessment to consider the impacts of the proposed scheme in more detail and recommend necessary mitigation measures. An impact assessment must be carried out for each receptor identified during scoping as being at risk from the proposed activity.

The Impact Assessment describes how any identified impacts from the proposed works will be mitigated, to either avoid or minimise the impacts. The assessment shows how any impact on a WFD receptor caused by the proposed activity fits with the objectives of any affected WFD water bodies. After the works have been amended to try and avoid, minimise, mitigate or compensate for the risks to WFD receptors the following questions will need to be answered:

- Could the activity still cause a water body to deteriorate from one WFD status class to another or cause significant localised impacts that could contribute to this happening?
- Could the activity prevent or undermine action to get water bodies to "Good" status?

When these questions are answered, the following should be borne in mind:

- A water body deteriorates in status when one WFD receptor (an "element") is affected such that it drops from one WFD status class to another.
- A significant localised impact on an element is one that is either long-lasting; causes severe harm; or affects a wide area within a water body. These are likely to contribute to a water body dropping from one status to another and highly likely to prevent action to get water bodies to good status.

- Elements at high status are very sensitive. The assessment will need to demonstrate that there will be a negligible impact on those aspects of the water environment.
- Elements at bad status must not be made worse.

If it cannot be demonstrated with a high level of confidence that the activity supports the water body objectives, then in order for the Environment Agency to permit the activity it must be shown that the activity meets the criteria set out in Article 4(7) of the WFD. Article 4(7) sets out stringent environmental and socio-economic tests to assess if a scheme meets strict environmental and sustainability criteria.

## 3 Project Description

### 3.1 Project overview

The proposed development site is located on land at Crown Wharf, south of Port Talbot docks. As shown in Figure 3-1, the site is set within an established, heavily industrialised area and is bound to the north and east by a private road, a disused railway line section to the south, and existing industrial development to the west. Further to the east and south of the proposed development site lies the operational Port Talbot Steelworks, and Hanson Cement Works lies to the north. The development site forms part of the wider dock facilities of Port Talbot operated by Associated British Ports (ABP).

The red line boundary includes:

- Primary parcel of land for the location of the proposed production facility (approximately 9.12ha), comprising bare land adjacent to Crown Wharf (Port Talbot) (referred to as the Production Development Zone [PDZ]);
- Temporary Construction Areas located within the wider Port Talbot Docks, approximately 7.44ha in total (referred to as the Temporary Construction Areas); and
- An extent of the Phoenix Way, running adjacent to the northern boundary of the PDZ (referred to as Phoenix Way Supporting Infrastructure)

The PDZ comprises brownfield industrial land that has slowly re-greened over a prolonged period of no use. A significant area of hardstanding (associated with historical uses and now demolished buildings) lies in the centre of the site and connects to the main access point to the north. The site is accessed via the Phoenix Way Supporting Infrastructure from Harbour Way and the M4 to the east.

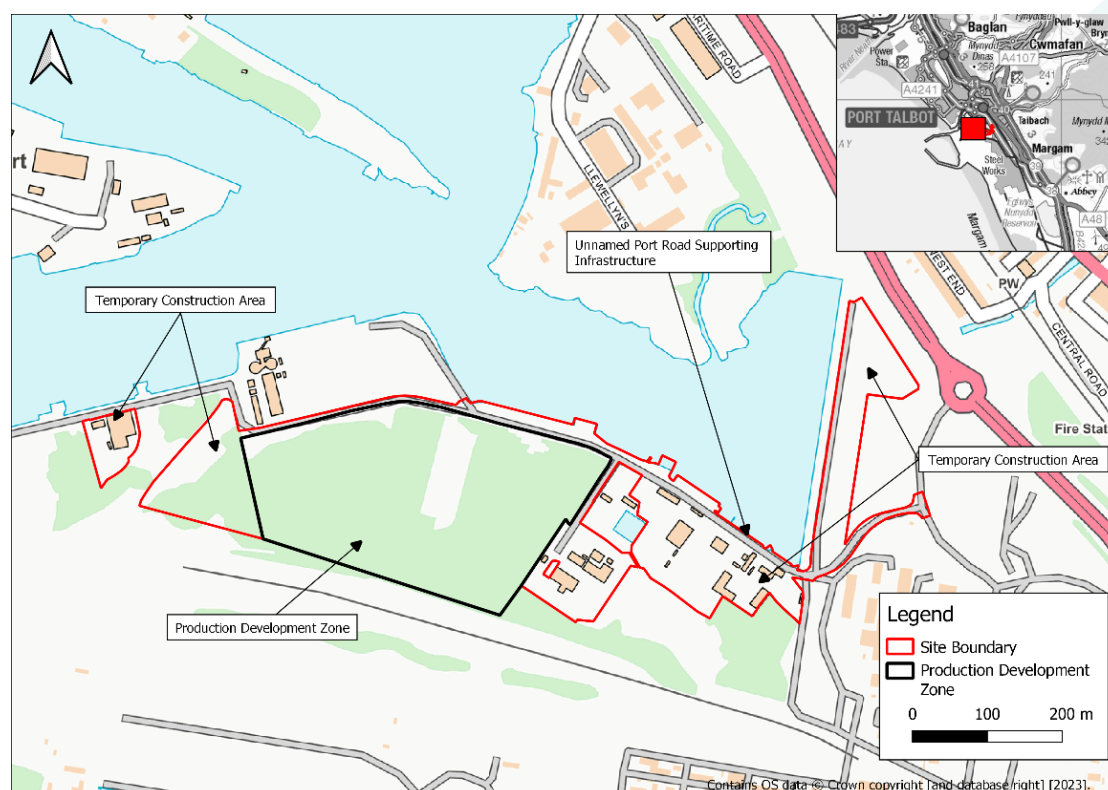


Figure 3-1: Site location, Port Talbot with area of works highlighted (red line boundary). Construction details regarding the proposed wharf/jetty are yet to be finalised.

### 3.2 Proposed Works

Development proposals for the site are as follows:

*Demolition of existing structures and erection of a Sustainable Aviation Fuel (SAF) production facility, including 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 infrastructure including a truck loading area and associated works, hard and soft landscaping, areas for temporary construction laydown, and associated development.*

Further works are required to construct a jetty to allow for an unloading/loading facility which will be located within Crown Wharf. The new jetty will extend from the existing port wall out into dock area a suitable distance to align with the relevant Health and Safety Executive (HSE) requirements, given the flammable nature of fuel. The jetty will be required to extend a suitable distance into Crown Wharf to allow for safe passage of vessels being used to transport the fuel. The jetty will need to be a suitable width to accommodate the transfer pipe work connecting the ship unloading/loading arms to the onshore pipeline infrastructure associated with the Production Development Zone, (i.e., to connect to the fuel storage tanks).

The precise details relating to the proposed construction of the wharf/jetty are yet to be fully determined. However, for the purpose of Environmental Statement and WFD Assessment it was assumed that the structure was assumed to comprise a rectangular 'quay' approximately 15 m wide and 2 – 4 m deep. Construction details utilised for the underwater noise assessment have been adopted to provide some means of understanding regarding the construction process.

It is suggested that up to 60 tubular and sheet piles will be installed during the construction phase of the wharf/jetty. These will back up to the existing dock wall, which may require reinforcement. The area behind the installed tubular piles and sheet piles will then be backfilled with hardcore and concrete as required to support the expected weight of plant/equipment to be offloaded. The tubular piles and sheet piles will not be installed concurrently as each method is specific to the type of jetty/wharf under construction.

Construction detail relating to the installation is assumed to be as per below:

- Tubular piles:
  - 400 mm diameter steel tubular piles to be installed within 60 days;
  - A maximum of 2 installs per day;
  - A strike rate of 60 per minute over a 5-minute period for each pile;
- Sheet piles:
  - 0.6 m sheet piles to be installed within 60 days;
  - A maximum of 10 installs per day;
  - A strike rate of 60 per minute over a 10-minute period for each pile.

## 4 WFD Screening Assessment

### 4.1 Overview

This screening assessment aims to screen in any works that require WFD Assessment and to identify which WFD water bodies are within and/or near to the proposed works and may be subject to the impacts associated with their construction and operation.

The results of the screening assessment are presented below. The baseline status of the quality elements within the water bodies screened into the assessment are discussed in this chapter. As mentioned in the Introduction and Methodology, if this section finds there is potential for the proposed works to cause deterioration in the status of a water body, or prevent it from achieving its status objectives, the relevant water body and its quality elements should be taken forward and considered further in the Scoping Assessment chapter.

### 4.2 WFD Water Bodies

The proposed site is located within Port Talbot Docks, the following water bodies are considered and identified in Figure 4-1:

- Swansea Bay (Water Body ID - GB641008260000) - Coastal water body
- Afan Estuary inc. Docks (Water Body ID - GB541005800600) - Transitional water body
- Afan - confluence with Pelenna to tidal limit (Water Body ID - GB110058026110) - River water body
- Ffrwd Wylt - headwaters to tidal limit (Water Body ID - GB110058026100) - River water body
- Swansea Carboniferous Coal Measures (Water Body ID - GB41002G201000) - Groundwater water body

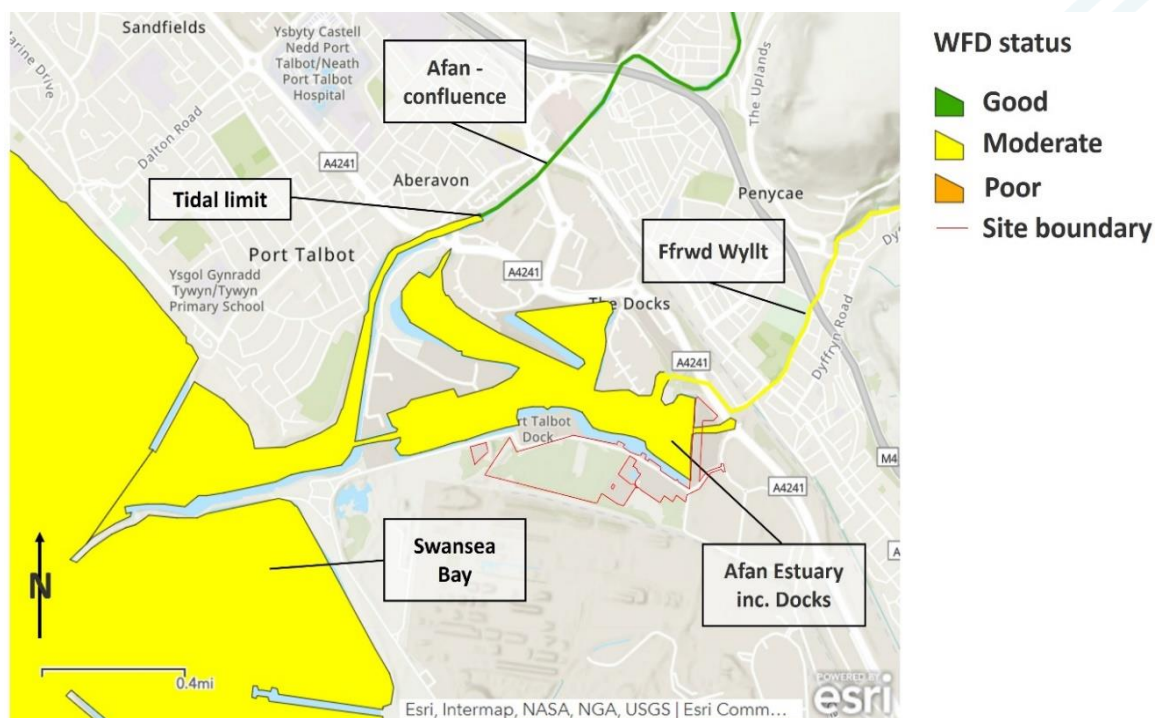


Figure 4-1: WFD water bodies and current WFD status and site boundary

#### 4.2.1 Current Status

Details of the 2021 WFD status of the considered water bodies, as described by the Natural Resources Wales Water Watch Map Gallery, are summarised in Table 4-1.

Table 4-1: Current WFD Status

| Water Body Name (and ID)                                       | Hydromorphological Designation | Current Ecological Status | Overall Water body Status | Objective Water body Status |
|----------------------------------------------------------------|--------------------------------|---------------------------|---------------------------|-----------------------------|
| Swansea Bay (GB641008260000)                                   | Heavily modified               | Moderate                  | Moderate                  | Good by 2033                |
| Afan Estuary incl. Docks (GB5410058006000)                     | Heavily modified               | Moderate                  | Moderate                  | Good by 2027                |
| Afan - confluence with Pelenna to tidal limit (GB110058026110) | Natural                        | Good                      | Good                      | Good by 2027                |
| Ffrwd Wylt - headwaters to tidal limit (GB110058026100)        | Heavily modified               | Moderate                  | Moderate                  | Good by 2027                |
| Swansea Carboniferous Coal Measures (GB41002G201000)           | Natural                        | N/A                       | Poor                      | Good by 2027                |

#### 4.3 Screening Outcome: Water Bodies

Table 4-2 indicates which water bodies have been screened in or out of the assessment and the reasons for this decision.

Table 4-2: Water Body Screening Outcome

| Water Body (Type)                                     | Reason                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Screening Outcome |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Swansea Bay (Coastal)                                 | The proposed works are to be conducted adjacent to the coastal waterbody. It is considered any impacts arising from the works may enter the coastal environment via mixing between water bodies. The impacts of the works are to be further assessed relative to their ability to impact on WFD quality elements.                                                                                                                                         | Screened In       |
| Afan Estuary inc. Docks (Transitional)                | The proposed works are to be conducted within the Afan Estuary which includes the Port Talbot docks area. Given the enclosed nature of docks the impacts of both the construction and operational phases of the works are expected to present potential opportunity to impact on WFD quality elements.                                                                                                                                                    | Screened In       |
| Afan - confluence with Pelenna to tidal limit (River) | <p>The Afan - confluence is adjoined to the Afan Estuary transitional water body via the dock feeder channel. However, given that the dock feeder will not allow for upstream transfer this element does not require further consideration.</p> <p>The Afan is separated from the downstream Afan Estuary by a large tidal weir which prevents upstream interaction between water bodies. However, it is considered that the works may impact on fish</p> | Screened In       |

| Water Body (Type)                                 | Reason                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Screening Outcome |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
|                                                   | populations downstream that are able to migrate between water bodies via the fish passes that are incorporated into the tidal weir.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| Ffrwd Wyllt - headwaters to tidal limit (River)   | The Ffrwd Wyllt is located next to the Afan Estuary transitional water body, approximately 0.5 km from the proposed construction site. There is lack of connectivity between the water bodies relating to connection via a single outfall pipe. The limited tidal influence within the Afan Estuary inc. docks means that interaction between the two water bodies is not expected to be sufficient enough to have a detrimental impact on the WFD quality elements of the Ffrwd Wyllt. This is considered to be applicable during both the construction and operational phases of the work. | Screened Out      |
| Swansea Carboniferous Coal Measures (Groundwater) | The proposed works are to take place in an area that is located upon the Swansea Carboniferous Coal Measures groundwater water body. Given the nature of the chemical processing and product transportation there is the potential for impacts to groundwater source during the construction and operational phases of the works.                                                                                                                                                                                                                                                            | Screened In       |

#### 4.4 Baseline Status of Screened in Water Bodies

For the water body screened into the assessment, details on the status of each element, as described by the Natural Resources Wales Water Watch Map Gallery, are given below.

##### 4.4.1 Swansea Bay - GB641008260000

Table 4-3 to Table 4-6 describe the current status of the key classification elements according to the most recent WFD cycle for the Swansea Bay water body (2021).

Table 4-3: Biological Quality Elements Status (Swansea Bay)

| Biological Quality Element | Current Status (2021) |
|----------------------------|-----------------------|
| Ecology                    | Good                  |
| Angiosperms                | Not assessed          |
| Fish                       | Not assessed          |
| Invertebrates              | Good                  |
| Macroalgae                 | High                  |
| Opportunistic macroalgae   | High                  |
| Imposex                    | Not assessed          |
| Phytoplankton              | Good                  |
| Infaunal Quality Index     | Good                  |

Table 4-4: Hydromorphological Quality Element Status (Swansea Bay)

| Hydromorphological Quality Element | Current Status (2021) |
|------------------------------------|-----------------------|
| Hydrological Regime                | Not assessed          |
| Morphology                         | Not assessed          |

Table 4-5: Physico-Chemical Quality Elements Status (Swansea Bay)

| Physico-Chemical Quality Element   | Current Status (2021) |
|------------------------------------|-----------------------|
| Dissolved Inorganic Nitrogen (DIN) | Moderate              |
| Dissolved Oxygen (DO)              | High                  |

Table 4-6: Chemical substances status (Swansea Bay)

| Chemical substances           | Current Status (2021) |
|-------------------------------|-----------------------|
| Priority hazardous substances | Moderate              |
| Specific Pollutants           | High                  |

#### 4.4.2 Afan Estuary inc. Docks - GB541005800600

Table 4-7 to Table 4-10 describe the current status of the water body classifications according to the most recent WFD cycle for the Afan Estuary inc. Docks water body (2021).

Table 4-7: Biological Quality Elements Status (Afan Estuary)

| Biological Quality Element | Current Status (2021) |
|----------------------------|-----------------------|
| Ecology                    | Moderate              |
| Angiosperms                | Not assessed          |
| Fish                       | Not assessed          |
| Invertebrates              | Good                  |
| Macroalgae                 | High                  |
| Opportunistic macroalgae   | High                  |
| Infaunal Quality Index     | Good                  |

Table 4-8: Hydromorphological Quality Element Status (Afan Estuary)

| Hydromorphological Quality Element | Current Status (2021) |
|------------------------------------|-----------------------|
| Hydrological Regime                | High                  |
| Morphology                         | Not High              |

Table 4-9: Physico-Chemical Quality Elements Status (Afan Estuary)

| Physico-Chemical Quality Element   | Current Status (2021) |
|------------------------------------|-----------------------|
| Dissolved Inorganic Nitrogen (DIN) | Good                  |
| Dissolved Oxygen (DO)              | High                  |

Table 4-10: Chemical substances status (Afan Estuary)

| Chemical substances           | Current Status (2021) |
|-------------------------------|-----------------------|
| Priority hazardous substances | Not Assessed          |
| Specific Pollutants           | High                  |

#### 4.4.3 Afan - confluence with Pelenna to tidal limit - GB110058026110

Table 4-11 to Table 4-14 describe the current status of the water body classifications according to the most recent WFD cycle for the Afan - confluence water body (2021).

Table 4-11: Biological Quality Elements Status (Afan - confluence)

| Biological Quality Element | Current Status (2021) |
|----------------------------|-----------------------|
| Ecology                    | Good                  |
| Angiosperms                | Not assessed          |
| Fish                       | Not assessed          |

| Biological Quality Element           | Current Status (2021) |
|--------------------------------------|-----------------------|
| Invertebrates                        | Good                  |
| Macroalgae                           | Not assessed          |
| Opportunistic macroalgae             | Not assessed          |
| Macrophyte and phytobenthos combined | Not assessed          |

Table 4-12: Hydromorphological Quality Element Status (Afan - confluence)

| Hydromorphological Quality Element | Current Status (2021) |
|------------------------------------|-----------------------|
| Hydrological Regime                | Moderate              |
| Morphology                         | Not assessed          |

Table 4-13: Physico-Chemical Quality Elements Status (Afan - confluence)

| Physico-Chemical Quality Element   | Current Status (2021) |
|------------------------------------|-----------------------|
| Dissolved Inorganic Nitrogen (DIN) | High                  |
| Dissolved Oxygen (DO)              | High                  |

Table 4-14: Chemical substances status (Afan - confluence)

| Chemical substances           | Current Status (2021) |
|-------------------------------|-----------------------|
| Priority hazardous substances | Not Assessed          |
| Specific Pollutants           | Not Assessed          |

#### 4.4.4 Swansea Carboniferous Coal Measures - GB110058026100

Table 4-15 and Table 4-16 describe the current status of the water body classifications according to the most recent WFD cycle for the Swansea Carboniferous Coal Measures water body (2021).

Table 4-15: Groundwater Quantitative Quality Elements Status (Swansea Carboniferous Coal Measures)

| Groundwater Quantitative Element                               | Current Status (2021) |
|----------------------------------------------------------------|-----------------------|
| Groundwater quantitative tests                                 | Low                   |
| Quantitative Groundwater Dependent Terrestrial Ecosystems test | Low                   |
| Quantitative Dependent Surface Water Body Status               | High                  |
| Quantitative Saline Intrusion                                  | Low                   |
| Quantitative Water Balance                                     | High                  |

Table 4-16: Groundwater Chemical Quality Elements Status (Swansea Carboniferous Coal Measures)

| Groundwater Chemical Element                               | Current Status (2021) |
|------------------------------------------------------------|-----------------------|
| Chemical Groundwater tests                                 | High                  |
| Chemical Drinking Water Protected Area                     | Low                   |
| General Chemical Test                                      | Low                   |
| Chemical Groundwater Dependent Terrestrial Ecosystems test | Low                   |
| Chemical Dependent Surface Water Body Status               | High                  |
| Chemical Saline Intrusion                                  | Low                   |

| Groundwater Chemical Element                      | Current Status (2021) |
|---------------------------------------------------|-----------------------|
| Trend Assessment - Groundwater supporting element | Low                   |

## 4.5 Protected Areas

The WFD specifies that areas requiring special protection under other retained EC Directive and waters used for the abstraction of drinking water are identified as protected areas. These areas have their own objectives and standards. Article 4 of the WFD requires Member States to achieve compliance with the standards and objectives set for each protected area by 22nd December 2015, unless otherwise specified in the legislation under which the protected area was established. WFD Protected Areas include Nitrate Vulnerable Zones (NVZ), Drinking Water Protected Areas (DrWPA) and European Sites (designated for the conservation of habitats and species).

### 4.5.1 Designated Nature Conservation sites

There are no statutorily designated conservation sites within 2 km of the proposed works.

### 4.5.2 WFD Habitats

Downstream of the harbour a number of higher sensitivity WFD habitats have been identified, including, polychaete reefs, native oyster beds and mussel beds. Lower sensitivity habitats of intertidal rocky shore, intertidal soft sediments and intertidal gravel and cobbles are also present and bound the River Afan immediately downstream of the confluence with the harbour.

### 4.5.3 Nitrate Vulnerable Zones (NVZ)

The retained European Commission Nitrates Directive requires areas of land that drain into waters polluted by nitrates to be designated as Nitrate Vulnerable Zones (NVZs). There are no reported NVZ's within the vicinity of the proposed works.

### 4.5.4 Drinking Water Protected Areas (DrWPA)

Drinking Water Protected Areas (DrWPA) are designated under the Water Framework Directive, with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water. The proposed works are located within the Swansea Carboniferous Coal Measures DrWPA. The DrWPA was considered not at risk at the time of its most recent assessment conducted in 2020. The proposed works are not expected to cause significant impact on the current or future status of the DrWPA.

### 4.5.5 Designated Bathing Waters

The area of the proposed works is located approximately 3.0 km from the nearest bathing area, at Aberafan. This site is designated under the Bathing Water Regulations 2013 (2013/1675). The distance of the Aberafan bathing water location from the site of proposed works is considered to be beyond the zone of influence of any associated impacts and is therefore screened out and not considered further. The current bathing water classification is indicated in Table 4-17.

Table 4-17: Bathing Waters within the Zone of Influence

| Designated Bathing Water | Current Classification (2021) | Distance from scheme |
|--------------------------|-------------------------------|----------------------|
| Aberafan                 | Good                          | 3.0 km               |

## 4.6 Summary

To conclude, the screening assessment has identified the following water bodies as needing further consideration within the Scoping Assessment.

- Swansea Bay (Water Body ID - GB641008260000) - Coastal water body
- Afan Estuary inc. Docks (Water Body ID - GB541005800600) - Transitional water body
- Afan - confluence with Pelenna to tidal limit (Water Body ID - GB110058026110) - River water body
- Swansea Carboniferous Coal Measures (Water Body ID - GB41002G201000) - Groundwater water body

The coastal, transitional and river water bodies will be considered in terms of the potential impacts to the following WFD quality elements:

- Biological Elements
- Hydromorphological Elements\*
- Physico-chemical Elements\*
- Chemical Substances\*

\* These WFD quality elements do not require consideration for the Afan - confluence with Pelenna to tidal limit as the large tidal weir separates the water bodies preventing such impacts.

## 5 WFD Scoping Assessment

### 5.1 Overview

This scoping assessment identifies whether the water body's receptors, identified during the screening assessment, are at risk from the proposed works discussed in Section 3. The proposed development works are being appraised in terms of their impact on WFD status and objectives. If any quality elements are found to be at risk of detrimental impact, further assessment and/or mitigation may be required. However, this additional assessment and the stating of appropriate mitigation is beyond the scope of this screening and scoping assessment.

Some WFD quality elements have not been formally assessed as part of the classification for this water body. However, due to the scale and nature of the proposed works, all WFD quality elements have been included in the previous screening and any identified impacts have been considered in relation to the status of the water body and the status objectives.

Article 4.7 of the Directive defends deterioration in status or failure to meet WFD objectives resulting from new modifications or sustainable human development activities (if all conditions set out under this Article are met). If the assessment procedure predicts that an activity will cause deterioration in water body status or prevent a water body from meeting its ecological objectives, then an assessment is also required against the conditions listed in Article 4.7 of the WFD. If all the assessment conditions are met, there will not be a breach of the WFD and compliance will be attained.

### 5.2 Scoping Assessment

As part of the Scoping Assessment the impacts associated with the proposed works on the WFD status of the previously stated water bodies are to be considered further.

#### 5.2.1 Swansea Bay - Biological Quality Assessment

Table 5-1 presents an assessment of the proposed works against the biological quality elements of the Swansea Bay coastal water body.

Table 5-1: Assessment of the proposed works against the Biological quality elements of the Swansea Bay water body

| WFD Biological Quality Element | Current Status | Potential Impact                                                                                                                                                                      | Further Assessment and/or Mitigation Required? |
|--------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Ecology                        | Good           | All of the biological quality elements of the coastal water body have the potential to be affected by the proposed scheme, indirectly through release of pollution or spread of INNS. | Yes                                            |
| Angiosperms                    | Not assessed   |                                                                                                                                                                                       |                                                |
| Fish                           | Not assessed   |                                                                                                                                                                                       |                                                |
| Invertebrates                  | Good           |                                                                                                                                                                                       |                                                |
| Macroalgae                     | High           |                                                                                                                                                                                       |                                                |
| Opportunistic macroalgae       | High           |                                                                                                                                                                                       |                                                |
| Imposex                        | Not assessed   |                                                                                                                                                                                       |                                                |
| Phytoplankton                  | Good           |                                                                                                                                                                                       |                                                |
| Infaunal Quality Index         | Good           |                                                                                                                                                                                       |                                                |

#### 5.2.2 Swansea Bay - Hydromorphological Quality Assessment

Table 5-2 presents an assessment of the proposed works against the hydromorphological quality elements of the Swansea Bay coastal water body.

Table 5-2: Assessment of the proposed works against the Hydromorphological quality elements of the Swansea Bay water body

| WFD Hydromorphological Quality Element     | Current Status | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Further Assessment and/or Mitigation Required? |
|--------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Depth variation                            | Not assessed   | The WFD hydromorphological quality elements are not expected to be significantly modified by the proposed works being undertaken in the adjacent Afan Estuary inc. Docks water body.<br><br>The scale of the coastal water body relative to the proposed works being undertaken in the docks are expected to have a negligible impact on the WFD quality elements.<br><br>It is assumed that any additional vessel transportation that enters the dock via the dock gates will not require additional channel dredging and maintenance above that which is already undertaken to ensure safe passage. | No                                             |
| Structure and substrate of the coastal bed | Not assessed   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                |
| Structure of the intertidal zone           | Not assessed   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                |
| Direction of dominant currents             | Not assessed   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                |
| Wave exposure                              | Not assessed   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                |

### 5.2.3 Swansea Bay - Physico-Chemical Quality Assessment

Table 5-3 presents an assessment of the proposed works against the physico-chemical quality elements of the Swansea Bay coastal water body.

Table 5-3: Assessment of the Proposed Works against the Physico-Chemical quality elements of the Swansea Bay water body

| WFD Physico-Chemical Element       | Current Status | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Further Assessment and/or Mitigation Required?                                                                                                                                                                                                                                 |
|------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dissolved Inorganic Nitrogen (DIN) | Moderate       | The construction and operational phases of the proposed works are not expected to result in increased concentrations of DIN or a change to the WFD status that may lead to nutrient enrichment of the water body.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | No                                                                                                                                                                                                                                                                             |
| Dissolved Oxygen (DO)              | High           | <p>The proposed works being undertaken within the docks are not expected to have a significant impact on the DO levels in the adjoining coastal water body. However, there is the potential for indirect impacts via accidental pollution spillages from plant machinery operating in the vicinity of the docks during the construction phase. Additionally, the operation of the jetty and the transfer of potentially harmful contaminants to/from the production plant has the potential to accidentally transfer contaminants that may impact on DO concentrations within the water body.</p> <p>Any such contamination may be transferred to the coastal water body via dispersal and mixing between water bodies subsequently impacting on the physico-chemical status of the coastal water body.</p> | Yes - appropriate mitigation measures are to be included within the Construction Environmental Management Plan (CEMP) . Any spillages into the dock which is operated by ABP shall also need to follow the protocols set out in the ABP South Wales Oil Spill Contingency Plan |

### 5.2.4 Swansea Bay - Swansea Bay - Swansea Bay - Chemical substances status

Table 5-4 presents an assessment of the proposed works against the Chemical substance status of the Swansea Bay coastal water body.

Table 5-4: Assessment of the Proposed Works against the Chemical substance status of the Swansea Bay water body

| WFD Chemical Substances       | Current Status | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Further Assessment and/or Mitigation Required?                                                                                                                                                                                   |
|-------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Priority hazardous substances | Moderate       | Although the proposed works are to be conducted in the adjoining water body (Afan Estuary) there is the potential for impacts on the chemical status of the coastal water body via dispersal of accidental pollution spillages from plant machinery operating in the vicinity of the Afan Estuary water body during the construction phase. Additionally, the operation of the jetty and the transfer of potentially harmful contaminants to/from the production plant presents an opportunity for the input of hazardous substances and/or pollutants into the water body that may be transferred to the coastal water body via dispersal and mixing between water bodies, potentially impacting on the chemical status of the water body. | Yes - appropriate mitigation measures are to be included within the CEMP. Any spillages into the dock which is operated by ABP shall also need to follow the protocols set out in the ABP South Wales Oil Spill Contingency Plan |
| Specific Pollutants           | High           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                  |

#### 5.2.5 Afan Estuary inc. Docks - Biological Quality Assessment

Table 5-5 presents an assessment of the proposed works against the Afan Estuary inc. Docks transitional water body.

Table 5-5: Assessment of the proposed works against the Biological quality elements of the Afan Estuary water body

| WFD Biological Quality Element | Current Status | Potential Impact                                                                                                                                                                                                                                                                               | Further Assessment and/or Mitigation Required?      |
|--------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Ecology                        | Moderate       | All of the biological quality elements of the transitional water body have the potential to be affected by the proposed scheme, indirectly through release of pollution or spread of INNS. Underwater noise assessments have identified a low potential for damage to fish within the harbour. | Yes - Pollution prevention and biosecurity measures |
| Angiosperms                    | Not assessed   |                                                                                                                                                                                                                                                                                                |                                                     |
| Fish                           | Not assessed   |                                                                                                                                                                                                                                                                                                |                                                     |
| Invertebrates                  | Good           |                                                                                                                                                                                                                                                                                                |                                                     |
| Macroalgae                     | High           |                                                                                                                                                                                                                                                                                                |                                                     |
| Opportunistic macroalgae       | High           |                                                                                                                                                                                                                                                                                                |                                                     |
| Infaunal Quality Index         | Good           |                                                                                                                                                                                                                                                                                                |                                                     |

| WFD Biological Quality Element | Current Status | Potential Impact                           | Further Assessment and/or Mitigation Required? |
|--------------------------------|----------------|--------------------------------------------|------------------------------------------------|
|                                |                | Further assessments have been recommended. |                                                |

#### 5.2.6 Afan Estuary inc. Docks - Hydromorphological Quality Assessment

Table 5-6 presents an assessment of the proposed works against the hydromorphological quality elements of the Afan Estuary inc. Docks transitional water body.

Table 5-6: Assessment of the proposed works against the Hydromorphological quality elements of the Afan Estuary water body

| WFD Hydromorphological Quality Element | Current Status | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                      | Further Assessment and/or Mitigation Required?                                                                                 |
|----------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Depth variation                        | Not assessed   | The majority of the listed WFD hydromorphological quality elements are not expected to be significantly modified by the proposed works being undertaken in the water body.<br>However, although localised in terms of possible impact, the piling works required to accommodate the proposed jetty may have the potential to alter the structure and substrate of the bed during the construction phase of the works. | No                                                                                                                             |
| Structure and substrate of the bed     | Not assessed   |                                                                                                                                                                                                                                                                                                                                                                                                                       | Yes - appropriate mitigation measures are to be included within the CEMP and incorporated in to a future WFD Impact Assessment |
| Structure of the intertidal zone       | Not assessed   |                                                                                                                                                                                                                                                                                                                                                                                                                       | No                                                                                                                             |
| Freshwater flow                        | Not assessed   |                                                                                                                                                                                                                                                                                                                                                                                                                       | No                                                                                                                             |
| Wave exposure                          | Not assessed   |                                                                                                                                                                                                                                                                                                                                                                                                                       | No                                                                                                                             |

#### 5.2.7 Afan Estuary inc. Docks - Physico-Chemical Quality Assessment

Table 5-7 presents an assessment of the proposed works against the physico-chemical quality elements of the Afan Estuary inc. Docks transitional water body.

Table 5-7: Assessment of the Proposed Works against the Physico-Chemical quality elements of the Afan Estuary water body

| WFD Physico-Chemical Element       | Current Status | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Further Assessment and/or Mitigation Required?                                                                                                                                                                                   |
|------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dissolved Inorganic Nitrogen (DIN) | Good           | The construction and operational phases of the proposed works are not expected to result in increased concentrations of DIN or a change to the WFD status that may lead to nutrient enrichment of the water body.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | No                                                                                                                                                                                                                               |
| Dissolved Oxygen (DO)              | High           | <p>The proposed works being undertaken within the docks have the potential to impact on the DO concentrations within the water body.</p> <p>Increased turbidity, as a result of piling operations, may increase water turbidity having a detrimental impact on DO.</p> <p>The discharge of processed water into the dock following treatment may have an impact of DO concentration in the water body.</p> <p>Furthermore, there is the potential for indirect impacts via accidental pollution spillages from plant machinery operating in the vicinity of the water body during the construction phase.</p> <p>The operation of the jetty and the transfer of potentially harmful contaminants to/from the production plant has the potential to accidentally transfer contaminants that may impact on DO concentrations within the water body.</p> | Yes - appropriate mitigation measures are to be included within the CEMP. Any spillages into the dock which is operated by ABP shall also need to follow the protocols set out in the ABP South Wales Oil Spill Contingency Plan |

#### 5.2.8 Afan Estuary inc. Docks - Chemical substances status

Table 5-8 presents an assessment of the proposed works against the Chemical substance status of the Afan Estuary transitional water body.

Table 5-8: Assessment of the Proposed Works against the Chemical substance status of the Afan Estuary water body

| WFD Chemical Substances       | Current Status | Potential Impact                                                                                   | Further Assessment and/or Mitigation Required? |
|-------------------------------|----------------|----------------------------------------------------------------------------------------------------|------------------------------------------------|
| Priority hazardous substances | Not Assessed   | The proposed works within the Afan Estuary water body have the potential to impact on the chemical | Yes - appropriate mitigation measures are to   |

| WFD Chemical Substances | Current Status | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                                                 | Further Assessment and/or Mitigation Required?                                                                                                                                      |
|-------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Specific Pollutants     | High           | status via accidental pollution spillages from plant machinery operating in the vicinity of the water body during the construction phase. Additionally, the operation of the jetty and the transfer of potentially harmful contaminants to/from the production plant presents an opportunity for the input of hazardous substances and/or pollutants directly into the water body impacting negatively on the chemical status of the water body. | be included within the CEMP. Any spillages into the dock which is operated by ABP shall also need to follow the protocols set out in the ABP South Wales Oil Spill Contingency Plan |

#### 5.2.9 Swansea Carboniferous Coal Measures - Quantitative and Chemical Assessment

Table 5-9 presents an assessment of the proposed works against the Swansea Carboniferous Coal Measures groundwater water body.

Table 5-9: Assessment of the proposed works against the groundwater quality elements of the Swansea Carboniferous Coal Measures water body

| WFD Groundwater Quality Elements | Current Status | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Further Assessment and/or Mitigation Required?                                                                                                                                                                                          |
|----------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quantitative Status Element      | Low            | <p>Contamination and reduced groundwater quality may result from intrusion to the groundwater body as a result of piling works required to accommodate construction of the jetty.</p> <p>Accidental pollution spillages from plant machinery operating in the vicinity of the docks during the construction phase may also act to transfer pollutants to the groundwater source.</p> <p>Additionally, the operation of the production plant and any accidental leaks during the operational phase have potential to transfer harmful contaminants to the groundwater aquifer.</p> | <p>Yes - appropriate mitigation measures are to be included within the CEMP. Any spillages into the dock which is operated by ABP shall also need to follow the protocols set out in the ABP South Wales Oil Spill Contingency Plan</p> |
| Chemical Status element          | High           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                         |

## 6 WFD Impact Assessment

### 6.1 Overview

The Scoping Assessment presented in Section 5 identified some receptors may potentially be at risk from the proposed works. A WFD Impact Assessment is therefore required to describe how these identified impacts will be mitigated.

The Impact Assessment needs to consider if there is a pathway linking the pressure to the receptor. If there is no pathway there can be no impact on the receptor and there is no need for any further assessment of that receptor to be carried out. If there is a potential pathway the assessment should consider if the activity, and the pressure it creates, may cause deterioration of the receptor.

In order to effectively assess the potential impacts of the proposed works and decide upon suitable mitigation measures, a good understanding of the proposed scheme and design is required. Should any revisions be made to the proposed works that could impact any of the WFD Quality Elements, this section of the assessment should be revised.

### 6.2 WFD Habitats - Impacts of works on WFD Sensitive Habitats

| Name                                                                                                        | Sensitivity | Potential Impact                                                                                                                                                                                           | Further assessment and/or mitigation required |
|-------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Mussel Beds<br>(D_00247_175053)                                                                             | Higher      | These habitats are all located outside of the harbour. There will be no direct impacts upon these habitats, however, there is the potential for impacts through pollution events or increases in sediment. | Yes                                           |
| Intertidal Soft Sediments<br>(D_00376_176506)                                                               | Lower       |                                                                                                                                                                                                            | Yes                                           |
| Subtidal Soft Sediment<br>(D_00247_175801)                                                                  | Lower       |                                                                                                                                                                                                            | Yes                                           |
| Subtidal Rocky Reef<br>(NE_1848_6448;<br>NE_1848_6465;<br>NE_1848_6466;<br>NE_1848_6475;<br>NE_1848_220640) | Lower       |                                                                                                                                                                                                            | Yes                                           |

Downstream of the harbour a number of higher sensitivity WFD habitats have been identified, including, polychaete reefs, native oyster beds and mussel beds. Lower sensitivity habitats of intertidal rocky shore, intertidal soft sediments and intertidal gravel and cobbles are also present and bound the River Afan immediately downstream of the confluence with the harbour.

### 6.3 Impact Assessment

Table 6-1 to Table 6-3 discuss the receptors identified as being potentially at risk in the scoping assessment. Mitigation measures are recommended to eliminate and/or reduce the effects of the proposed works. It should be noted that these mitigation measures

differ to the Mitigation Measures identified for any Heavily Modified water body, as detailed in section 6.4.

Table 6-1: Impacts and Mitigation Measures - Swansea Bay coastal water body

| WFD Quality Element                                                        | Pathway (Direct/Indirect) | Potential Impact / Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Biological - Invertebrates                                                 | Indirect                  | <p><b>Temporary impact:</b> The works could have an indirect impact on invertebrate habitat through pollution events or spread of INNS.</p> <p><b>Mitigation:</b> Pollution prevention measures will be required to be implemented throughout construction in order to prevent a pollution event (e.g., sediment release, fuel leaks etc.). A biosecurity management plan will be developed to ensure that INNS are not spread</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Fish                                                                       | Indirect                  | <p><b>Temporary impact:</b> The temporary works may impact fish, macroalgae and phytoplankton through pollution events.</p> <p><b>Mitigation:</b> Pollution prevention measures will be required to be implemented via a Construction Environmental Management Plan (CEMP) throughout construction in order to prevent a pollution event (e.g. sediment release, fuel leaks etc.).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Macroalgae                                                                 |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Phytoplankton                                                              |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Physico-chemical (DO), Priority Hazardous Substances & Specific Pollutants | Direct & Indirect         | <p><b>Temporary Direct Impact</b></p> <p>The coastal water body (Swansea Bay) is connected to the transitional water body (Afan Estuary) where the proposed works are being conducted. Depending on tidal conditions and the flow of water through the dock gates there is potential for the transfer of suspended sediment from the Afan Estuary into the adjacent Swansea Bay.</p> <p>The primary source of sediment is expected from the construction work for the jetty/wharf. This has the potential to mobilise sediments that may present a direct impact on turbidity and DO concentrations within the docks. This bed material may also harbour specific pollutants and/or hazardous substances adsorbed to the sediment surfaces. The resuspension of potentially contaminated sediments could act as an active pathway for the dispersion of pollutants into the adjoining Swansea Bay.</p> <p>Tidal conditions and water flow via the dock gates will influence dispersal from the Afan Estuary into Swansea Bay. However, whilst it is anticipated that any suspended and/or contaminated sediments would be readily dispersed in the wider coastal water body</p> |

| WFD Quality Element | Pathway (Direct/Indirect) | Potential Impact / Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                           | <p>measures should be taken to mitigate the potential for (re)suspension of sediments during construction. This should be addressed within the CEMP and the implementation of an appropriate sediment management plan (e.g., the use of a suitable membrane barrier which will limit/reduce sediment dispersal).</p> <p><b>Temporary Indirect Impact</b><br/>           Accidental pollution events are possible during the construction phase and could lead to chemical pollutants (e.g., fuel) entering the Afan Estuary and subsequently being transferred to Swansea Bay resulting in a temporary reduction in DO concentrations and/or increased concentrations of hazardous substances &amp; specific pollutants.</p> <p>Depending on tidal conditions and the flow of water through the dock gates mobilisation of any pollutants have the potential to impact on DO concentrations. Whilst it is anticipated that any pollutants would be readily dispersed within the wider coastal water body measures should be taken to mitigate the potential for contaminants entering the water.</p> <p>Mitigation should include the implementation of standard industry practices such as pollution prevention measures and additional measures as detailed:</p> <ul style="list-style-type: none"> <li>• All fuel will be kept securely in the works compound and will be stored in bunded fuel bowers.</li> <li>• The works compound will be securely fenced off using Heras fencing which will be double clipped and securely locked.</li> <li>• Spill kits will be available on site in the event of any fuel/chemical spillage.</li> <li>• Daily machinery checks will be undertaken to ensure any plant used is in good working condition.</li> <li>• Contractors should also comply with the latest version of the Guidance for Pollution Prevention GPP 5 - Works and maintenance in or near water.</li> <li>• Larger-scale pollution events and/or spillages may be contained within the docks by ensuring the two dock gates remain closed until such time that the spill has been remediated. This will require cooperation and coordination with</li> </ul> |

| WFD Quality Element | Pathway (Direct/Indirect) | Potential Impact / Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                           | <p>other dock users and relevant harbour authorities.</p> <p>Impacts associated with the operational phase of the facility are likely to arise from chemical spillages. The operators of the facility will be required to implement and adhere to the relevant health and safety protocols and legislation for dealing with large-scale industrial spillages (e.g., Control of Major Accidents and Hazards [COMAH] requirements) and the implementation and adherence to the appropriate risk assessments and safe system of works.</p> <p>Furthermore, as above, extensive pollution events and/or spillages may be contained within the docks by ensuring the two dock gates remain closed until such time that the spill has been remediated. This will require cooperation and coordination with other dock users and relevant harbour authorities.</p> <p><b>Permanent Impact</b><br/>It is not anticipated that there will be any permanent impacts on the WFD status of physico-chemical quality elements (namely DO), Priority Hazardous Substances and/or Specific Pollutants during the construction and operational phase of the facility.</p> |

Table 6-2: Impacts and Mitigation Measures - Afan Estuary inc. Docks transitional water body

| WFD Quality Element | Pathway (Direct/Indirect) | Potential Impact / Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Angiosperms         | Indirect                  | <p><b>Temporary impact:</b> The works could have an indirect impact on Angiosperms through pollution events or spread of INNS.</p> <p><b>Mitigation:</b> Pollution prevention measures will be required to be implemented throughout construction in order to prevent a pollution event (e.g., sediment release, fuel leaks etc.). A biosecurity management plan will be developed to ensure that INNS are not spread</p> |

| WFD Quality Element                                 | Pathway (Direct/Indirect) | Potential Impact / Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fish                                                | Indirect and Direct       | <p><b>Temporary Direct Impact</b><br/>The proposed work for the construction (piling/sheet pile) of the jetty/wharf is expected to result in localised noise disturbance. An underwater noise study has been undertaken to inform the works. This study concluded that the impacts to fish are likely to be negligible, however, it has recommended that this conclusion is reviewed in line with any changes in equipment.</p> <p><b>Temporary impact:</b> The works could have an indirect impact on fish through pollution events or spread of INNS.</p> <p><b>Mitigation:</b> Pollution prevention measures will be required to be implemented throughout construction in order to prevent a pollution event (e.g., sediment release, fuel leaks etc.). A biosecurity management plan will be developed to ensure that INNS are not spread</p> |
| Invertebrates                                       | Indirect                  | <p><b>Temporary impact:</b> The works could have an indirect impact on invertebrate, macroalgae, and infaunal species through pollution events or spread of INNS.</p> <p><b>Mitigation:</b> Pollution prevention measures will be required to be implemented throughout construction in order to prevent a pollution event (e.g., sediment release, fuel leaks etc.). A biosecurity management plan will be developed to ensure that INNS are not spread</p>                                                                                                                                                                                                                                                                                                                                                                                       |
| Macroalgae                                          | Indirect                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Opportunistic macroalgae                            | Indirect                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Infaunal Quality Index                              | Indirect                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Hydromorphology: Structure and substrate of the bed | Direct                    | <p><b>Temporary Direct Impact</b><br/>The proposed work for the construction (piling/sheet pile) of the jetty/wharf is expected to result in localised, temporary modification to the structure and substrate of the bed. Whilst the bed of the dock area has already been subject to extensive geomorphic modification from previous harbour/dock construction and existing structures mitigation should still be applied where possible.</p>                                                                                                                                                                                                                                                                                                                                                                                                     |

| WFD Quality Element | Pathway (Direct/Indirect) | Potential Impact / Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                           | <p>Mitigation should include the implementation of standard industry practices and should aim to minimise disturbance of the bed at the time of installation.</p> <p>The operational impact of the structure and substrate of the bed is not expected to alter significantly in the long term. The limited flow within the dock area is not expected to be significant enough to create sufficient shear stress forces to generate scour and further modification of the bed and/or substrate.</p> |

|                                                                                                        |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Physico-chemical:<br/>(DO), Priority<br/>Hazardous<br/>Substances &amp;<br/>Specific Pollutants</p> | <p>Direct &amp;<br/>Indirect</p> | <p><b>Temporary Direct Impact</b><br/>The proposed works required to complete the construction of the facility are taking place adjacent to the transitional water body (Afon Estuary inc. Docks). Construction of the jetty/wharf will be conducted within the water body.</p> <p>The jetty/wharf construction, specifically the insertion of pilings and sheet piles, is considered to be the primary source of remobilised sediments that may lead to increased turbidity impacting on DO concentrations within the docks. The bed material disturbed during piling works may also harbour specific pollutants and/or hazardous substances adsorbed to the sediment surfaces. The resuspension of potentially contaminated sediments could act as an active pathway for increasing the concentration of specific pollutants and/or hazardous substances within the water body.</p> <p>Mitigation measures should be implemented to reduce the potential for (re)suspension of sediments during construction phase of the operation. These measures should be addressed within the CEMP and the implementation of an appropriate sediment management plan (e.g., the use of a suitable membrane barrier which will limit/reduce sediment dispersal). Contractors should also comply with the latest version of the Guidance for Pollution Prevention GPP 5 - Works and maintenance in or near water.</p> <p><b>Temporary Indirect Impact</b><br/>The proposed works present an indirect impact to the Afon Estuary inc. Docks water body via the potential for diffuse accidental pollution spillages from plant machinery during the construction phase of the works. Should these contaminants enter the water body this may lead to a temporary reduction in DO concentrations and/or increased concentrations of hazardous substances &amp; specific pollutants within the water body. Mitigation measures should be adopted to reduce the potential for contaminants entering the water body. These should include the implementation of standard industry practices and pollution prevention measures in addition to the following:</p> |
|--------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- All fuel will be kept securely in the works compound and will be stored in bunded fuel bowzers.
- The works compound will be securely fenced off using Heras fencing which will be double clipped and securely locked.
- Spill kits will be available on site in the event of any fuel/chemical spillage.
- Daily machinery checks will be undertaken to ensure any plant used is in good working condition.
- Contractors should also comply with the latest version of the Guidance for Pollution Prevention GPP 5 - Works and maintenance in or near water.
- Larger-scale pollution events and/or spillages may be contained within the docks by ensuring the two dock gates remain closed until such time that the spill has been remediated. This will require cooperation and coordination with other dock users and relevant harbour authorities.

The industrial nature of the facility also presents opportunity for contaminants to enter the water body during the operational phase. Mitigation is proposed via the measures outlined in the site drainage strategy. In areas, where contamination risk is low, SuDS will be used for water quality treatment of runoff. This includes hardstanding around operational buildings, roads, amenity spaces and all areas outside of bunded storage. Following SuDS water quality treatment, the site surface water will be discharged to the Afan Estuary. Water treatment processes have been designed to meet the Welsh Government Statutory Standards for Sustainable Drainage Systems and The SuDS Manual (C753) as appropriate for the industrial nature of the Site. In areas where contamination is anticipated, surface water shall be directed to the on-site wastewater treatment works.

Water with the potential to be significantly contaminated by process operations will be treated as process water. This will require treatment via an on-site wastewater treatment works and will not be discharged as surface water into the SuDS surface water drainage system. The Proposed Scheme will include pollution prevention and control measures to mitigate the risk of acute water pollution from spillage events. These include

| WFD Quality Element | Pathway (Direct/Indirect) | Potential Impact / Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                           | <p>bunding of hydrocarbon tanks and storage equipment used for potentially contaminating substances and the use of sumps or bunds for all equipment with the potential for leaks.</p> <p>The operators of the facility will be required to implement and adhere to the relevant health and safety protocols and legislation for dealing with large-scale industrial spillages (e.g., Control of Major Accidents and Hazards [COMAH] requirements) and the implementation and adherence to the appropriate risk assessments and safe system of works.</p> <p>Furthermore, extensive pollution events and/or spillages may be contained within the docks by ensuring the two dock gates remain closed until such time that the spill has been remediated. This will require cooperation and coordination with other dock users and relevant harbour authorities. Any spillages into the dock which is operated by ABP shall also need to follow the protocols set out in the ABP South Wales Oil Spill Contingency Plan.</p> <p><b>Permanent Impact</b><br/>It is not anticipated that there will be any permanent impacts on the WFD status of physico-chemical quality elements (namely DO), priority hazardous substances and/or specific pollutants for the Afan Estuary Inc. Docks during the construction and operational phase of the facility.</p> |

Table 6-3: Impacts and Mitigation Measures - Swansea Carboniferous Coal Measures water body

| WFD Quality Element                    | Pathway (Direct/Indirect) | Potential Impact / Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quantitative & Chemical Status Element | Direct/Indirect           | <p><b>Temporary Direct/Indirect Impact</b><br/>The Swansea Carboniferous Coal Measures water body is identified as a potential receptor as it is hydrologically linked to the site as a result of the potential infiltration of pollutants and/or contaminated surface runoff into the underlying superficial and bedrock aquifers.</p> <p>Accidental pollution events during the construction phase could lead to chemical</p> |

| WFD Quality Element | Pathway (Direct/Indirect) | Potential Impact / Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                           | <p>pollutants (e.g., fuel) being transferred via surface infiltration to the Swansea Carboniferous Coal Measures ground water body. This has the potential to result in a deterioration of the groundwater quantitative &amp; chemical status elements. Mitigation measures should be adopted to reduce the potential for mobilisation of contaminants. These should include the implementation and adherence to standard industry practices and pollution prevention measures to be detailed in the CEMP. Additional measures should also be applied including:</p> <ul style="list-style-type: none"> <li>• All fuel to be kept securely in the works compound and stored in bunded fuel bowsters.</li> <li>• The works compound will be securely fenced off using Heras fencing which will be double clipped and securely locked.</li> <li>• Spill kits will be available on site in the event of any fuel/chemical spillage.</li> <li>• Daily machinery checks will be undertaken to ensure any plant used is in good working condition.</li> <li>• Contractors will comply with the latest version of the Guidance for Pollution Prevention GPP 5 - Works and maintenance in or near water.</li> </ul> <p>It is anticipated that much of the site will be laid to hardstanding thus reducing permeability and subsequently infiltration. This will limit access to potential pollution pathways and reduce the likelihood of contaminants reaching the underlying groundwater source.</p> <p>Additional consideration should be given to mitigating potential pathways via storage of surface water in SuDS. This should involve the lining of SuDS assets to reduce infiltration in the underlying groundwater body.</p> <p>The storage of chemicals on-site should be compliant with the necessary regulations. Additionally, the bunding of all chemicals on-site will mitigate the spread of any potential pollutants in the event of a spillage limiting infiltration to groundwater sources.</p> <p><b>Permanent Impact</b></p> <p>It is not anticipated that there will be any permanent impacts on the WFD status of Quantitative &amp; Chemical Status Elements of the Swansea Carboniferous Coal Measures water</p> |

| WFD Quality Element | Pathway (Direct/Indirect) | Potential Impact / Mitigation Measures                              |
|---------------------|---------------------------|---------------------------------------------------------------------|
|                     |                           | body during the construction and operational phase of the facility. |

In addition to the above mitigation measures work undertaken during the construction phase should also comply with the latest version of the following:

- Guidance for Pollution Prevention GPP 5 - Works and maintenance in or near water
- CIRIA guidance for consultants and contractors (C532) - Control of water pollution from construction sites

#### 6.4 Water Body Mitigation Measures

Specific mitigation measures are applied to each Artificial (AWB) and Heavily Modified Water (HMWB) Water Body. These are water bodies where the following conditions are met:

- Water body characteristics are substantially changed as a result of physical alterations to hydromorphology by human activity;
- Restoration measures required to achieve GES would have had a significant adverse effect on the human activity (use);
- There were no other (environmentally better) means of undertaking the activity, and;
- Changes to the hydromorphology were long-term

Mitigation measures are necessary to reduce the existing impacts on the water body and all measures need to be adopted in order for the water body to achieve "Good" Ecological Status or Potential. Both water bodies are listed as 'Moderate' meaning at least one Mitigation Measure that is required in the water body is yet to be implemented. Therefore, the Mitigation Measure Assessment has not achieved 'Good' status. It is not possible for a water body to achieve Good Ecological Potential even if all the other relevant elements in the water body are 'Good'. The best it can achieve is Moderate Ecological Potential.

Swansea Bay and the Afan Estuary are both considered Heavily Modified water bodies. They are designated due to 'Coast protection use' and 'Navigation, ports and harbours use' respectively. The mitigation measures highlighted for Swansea Bay are reported as either 'Not in Place' or 'Not Applicable'. The key mitigation measures relative to the proposed works within the Afan Estuary, including Docks are:

- Reduce sediment resuspension;
- Sediment management, and;
- Manage disturbance

By adhering to best working practices, a robust sediment management plan and the stated mitigation measures detailed in Table 6-1 to Table 6-3 the impacts on the water bodies in question will be significantly reduced. Subsequently, any short-term impacts associated with the works should not prevent the implementation of the key mitigation measures stated above.

The Afan - confluence with Pelenna and Swansea Carboniferous Coal Measures are considered Natural water bodies and are therefore not subject to designated mitigation measures.

#### 6.5 WFD Assessment Objectives

Following consideration of the potential impacts and proposed mitigation measures,

Table 6-4 assesses whether the proposed works comply with the overarching objectives of the WFD.

Table 6-4: Assessment of the Proposed Works against the WFD Objectives

| WFD Assessment Objective                                                                                                                                         | Assessment of the Proposed Works                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Objective 1: The proposed works do not cause deterioration in the status of the ecological elements of the water body                                            | By adopting good working practices, adhering to the relevant legislation/ regulation, implementing the measures detailed in the CEMP and the stated mitigation measures highlighted herein the proposed works are not expected to cause a deterioration of the status of the ecological elements of the scoped in water bodies. |
| Objective 2: The proposed works do not compromise the ability of the water body to achieve its WFD status objectives                                             | By adopting the measures detailed above in Objective 1, the proposed works are not expected to compromise the ability of the scoped in water bodies to achieve their WFD status objectives.                                                                                                                                     |
| Objective 3: The proposed works do not cause a permanent exclusion or compromised achievement of the WFD objectives in other bodies of water within the same RBD | The proposed works will not result in exclusion or compromise the current and/or future WFD status of water bodies within the Western Wales River Basin Management Plan District.                                                                                                                                               |
| Objective 4: The proposed works contribute to the delivery of the WFD objectives                                                                                 | By adhering to the proposed mitigation measures highlighted herein the works are not expected to impact on the delivery and/or prevent the achievement of the WFD objectives of the scoped in water bodies.                                                                                                                     |

## 7 Conclusions and Recommendations

JBA Consulting were commissioned by LanzaTech UK Limited to undertake a WFD Assessment to establish the potential impacts to WFD water bodies arising from the proposed works and associated infrastructure at Crown Wharf, Port Talbot Docks. The works also includes the construction of a wharf/jetty to facilitate the unloading/loading of materials during the construction and operational phase of the works. The Proposed Scheme will comprise a new facility for the production of sustainable aviation fuel (SAF).

### 7.1.1 Screening & Scoping Assessment

The Screening Assessment identified elements of the proposed works that require WFD Assessment and the local water bodies that may be subject to the impacts associated with construction and operation phase of the works. The Screening Assessment identified the following water bodies as needing further consideration, this was addressed within the Scoping Assessment.

- Swansea Bay (Water Body ID - GB641008260000) - Coastal water body
- Afan Estuary inc. Docks (Water Body ID - GB541005800600) - Transitional water body
- Afan - confluence with Pelenna to tidal limit (Water Body ID - GB110058026110) - River water body
- Swansea Carboniferous Coal Measures (Water Body ID - GB41002G201000)

The Scoping Assessment identified various receptors that were considered to be at risk from the proposed works at Crown Wharf, Port Talbot. The Scoping Assessment details how these impacts may arise and the subsequent impact on a range of WFD Quality Elements. The coastal, transitional and river water bodies were considered in terms of the potential impacts to the following WFD quality elements:

- Biological Elements
- Hydromorphological Elements\*
- Physico-chemical Elements\*
- Chemical Substances\*

\* These WFD quality elements do not require consideration for the Afan - confluence with Pelenna to tidal limit as a large tidal weir separates the water bodies preventing such impacts.

The Swansea Carboniferous Coal Measures water body was also considered in terms of WFD impacts and status.

In addition, Protected Areas and WFD sensitive habitats were also identified and subsequently assessed accordingly.

### 7.1.2 Impact Assessment

This assessment has been undertaken based on the most recent scheme information. The proposed works were appraised for potential impacts upon the water bodies' quality elements and Protected Areas. A summary of these assessments is provided in the sections below.

### 7.1.3 Ecological Quality Elements

Adopting the recommendations detailed will ensure that any impacts are localised and temporary in nature. As such, no significant impact on the WFD water body status for hydromorphology is expected during either during the construction or operational phases of the scheme.

#### 7.1.4 Hydromorphological Quality Elements

An assessment has identified that given the distance and the scale of the works relative to the size of the Swansea Bay coastal water body there is not likely to be a significant risk to the status of hydromorphology quality elements. Conversely, the proposed construction methodology required for the wharf/jetty (i.e., installation of tubular piles and sheet piles) within the Afan Estuary inc. Docks water body has the potential to modify the structure and substrate of the bed due to disturbance of bed sediments. However, all construction work will be undertaken in accordance with best practice and adherence to a robust sediment management plan, as detailed in a CEMP. This will reduce the extent of sediment mobilisation and bed modification which may impact on WFD hydromorphological supporting elements. Furthermore, the proposed mitigation measures will also act to reduce the associated impacts identified herein during the construction phase of the scheme.

Adopting the recommendations detailed will ensure that any impacts are localised and temporary in nature. As such, no significant impact on the WFD water body status for hydromorphology is expected during either during the construction or operational phases of the scheme.

#### 7.1.5 Chemical Quality Elements

An assessment has identified that there is potential for the mobilisation of chemical contaminants from the construction and operational phases of the proposed works. Any such impacts arising have the potential to impact on both the Swansea Bay and Afan Estuary inc. Docks water bodies. Although the scale of the works relative to the size of the Swansea Bay coastal water body are considered insignificant construction of the jetty/wharf has the potential to remobilise contaminated sediments. Additionally, the operational nature of the facility and use of potentially harmful chemicals presents an opportunity for pollutants to enter and be transferred between water bodies.

As such, a series of mitigation measures are to be implemented to reduce any impacts. These involve implementing and adhering to construction best practices and a robust sediment management plan, as detailed in a CEMP. Additional measures have also been recommended to reduce the likelihood of creating a pathway for contamination to the identified receptors. These proposed measures are applicable to both impacted water bodies, Swansea Bay and Afan Estuary inc. Docks.

Furthermore, the Swansea Carboniferous Coal Measures groundwater water body was also identified as being at risk from the mobilisation of contaminants. A range of mitigation measures have been detailed which are expected to reduce any impacts that may arise during the construction and operational phases of the project.

By adhering to the stated mitigation measures any impacts to the chemical status of the mentioned WFD water bodies will be reduced. This is not expected to result in any significant change in chemical quality elements and as such, no significant impact on water body status is expected during either the construction or operational phases of the scheme.

#### 7.1.6 Protected Areas

There are no statutory designated sites located within 2km of the proposed scheme.

#### 7.1.7 Recommendations

This WFD Impact Assessment has aimed to address the potential impacts that may arise during the construction and operational phases of the proposed works at Crown Wharf, Port Talbot. The assessment presents a broad range of mitigation measures that should be employed to reduce any of the potential impacts highlighted herein.

If the appropriate mitigation measures are not implemented there is the potential that the impacts arising from either the construction and/or operational phases of the works may lead to a deterioration in the current status of the WFD Quality Elements.

Key to the recommended mitigation measures is the completion of the Construction Environmental Management Plan (CEMP). This should set out the actions that will be implemented to control construction of the proposed scheme to avoid adverse impacts on the wider environment. The CEMP should be completed in accordance with construction best practice and include a robust sediment management plan.

In addition to the mitigation measures identified within the assessment work undertaken during the construction phase should also comply with the following:

- Guidance for Pollution Prevention GPP 5 - Works and maintenance in or near water
- CIRIA guidance for consultants and contractors (C532) - Control of water pollution from construction sites

This WFD Assessment has drawn conclusions based on the information available to date. Should the design of the proposed works alter significantly, this report would require revision to ensure the specified mitigation measures and recommendations outlined remain relevant and appropriate and the final scheme remains WFD-compliant.

## References

- ABP (2018) Oil Spill Contingency Plan  
[https://www.southwalesports.co.uk/Marine\\_Information/Emergency\\_Plans/Oil\\_Spill\\_Co ntingency\\_Plan/](https://www.southwalesports.co.uk/Marine_Information/Emergency_Plans/Oil_Spill_Co ntingency_Plan/) Accessed 26<sup>th</sup> October 2023
- Environment Agency (2010) Assessing new modifications for compliance with WFD: detailed supplementary guidance: 488\_10\_SD01
- Natural Resources Wales (2022) Western Wales River Basin Management Plan 2021 – 2027
- Natural Resources Wales (2023) <https://environment.data.gov.uk/catchment-planning> Water Watch Wales Map Gallery. Accessed 1st August 2023 via: <https://waterwatchwales.naturalresourceswales.gov.uk/en>

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