

## 3 EIA Methodology

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### 3.1 Introduction

3.1.1 This chapter sets out the scope and approach taken to the EIA process. It explains how the scope of the EIA was informed and defined, the baseline assumptions, general methods used to assess the environmental effects and criteria used to evaluate their significance. Further details of topic specific methodologies, such as survey methods and impact prediction, are provided in each topic chapter of the ES (Chapters 7 – 10, and Volume II).

3.1.2 This chapter is accompanied by the following appendices:

- Appendix 3.1: Barry Biomass Facility Environmental Statement Adequacy Report (WSP, November 2019);
- Appendix 3.2: Sol Environment Scoping Opinion Correspondence;
- Appendix 3.3: Welsh Government Scoping Response Letter (2<sup>nd</sup> February 2021);
- Appendix 3.4: PEDW Letter to Appellant (28<sup>th</sup> January 2022);
- Appendix 3.5: Location of Specified Information in the ES;
- Appendix 3.6: List of Cumulative Schemes;
- Appendix 3.7: Archaeological Desk-Based Assessment;
- Appendix 3.8: Built Heritage Statement;
- Appendix 3.9: Socio-Economics Statement;
- Appendix 3.10: Transport Technical Note;
- Appendix 3.11: Ecology Technical Note;
- Appendix 3.12: Habitats Regulation Assessment: Stage 1 Screening Report;
- Appendix 3.13: Ground Conditions: Technical Review;
- Appendix 3.14: Flood Risk and Drainage Technical Note;
- Appendix 3.15: Major Accidents and Disasters Technical Note;
- Appendix 3.16: Waste and Materials Technical Note; and
- Appendix 3.17: Lighting Impact Assessment - Illumination Impact Profile (IIP).

### 3.2 Regulatory Requirements and Good Practice

3.2.1 This ES has been prepared in compliance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017<sup>1</sup> (as amended)<sup>2,3</sup> (the 'EIA Regulations'). The information required for inclusion in an ES is prescribed by regulation 17(3) and (4) and Schedule 4 of the EIA Regulations.

3.2.2 Schedule 4 cross-refers to regulation 4(2) of the EIA Regulations states that:

*“The environmental impact assessment must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of proposed development on the following-*

*(a) population and human health;*

*(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC F2 and Directive 2009/147/ECF3;*

*(c) land, soil, water, air and climate;*

*(d) material assets, cultural heritage and the landscape; and*

*(e) the interaction between the factors listed in sub-paragraphs (a) to (d).”*

3.2.3 Appendix 3.5 sets out where the information required by regulation 17 of the EIA Regulations can be located within this ES.

3.2.4 Good practice guidance documents were also considered when undertaking this EIA including:

- Circular 11/99: Environmental Impact Assessment (Welsh Office)<sup>4</sup>;
- Development Management Manual (Welsh Government)<sup>5</sup>;
- Guidelines for Environmental Impact Assessment: Institute of Environmental Management and Assessment (‘IEMA’)<sup>6</sup>;
- Special Report: The State of Environmental Impact Assessment Practice in the UK (IEMA)<sup>7</sup>;
- EIA – Shaping and Delivering Quality Development (IEMA)<sup>8</sup>;
- Delivering Proportionate EIA (IEMA)<sup>9</sup>; and
- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Report (European Commission)<sup>10</sup>.

3.2.5 Each topic chapter and the supporting appendices set out what legislation, planning and best practice guidance was considered appropriate to the discipline.

### **3.3 EIA Interface**

3.3.1 As the Development has already been constructed but is not currently operational, the EIA process undertaken by the competent experts (‘EIA Topic Leads’) set out in Chapter 1: Introduction (Table 1.1) was undertaken retrospectively to some extent.

3.3.2 All EIA Topic Leads were asked to carefully review the Development, planning conditions and the Permit (Appendix 1.2) and consider whether any additional mitigation or monitoring measures are necessary. These measures are identified under the ‘Mitigation, Monitoring and Residual Effects’ sections of each topic chapter, as appropriate.

### 3.4 Scope of the EIA

- 3.4.1 As set out in Chapter 1: Introduction, this ES has been prepared in response to the Screening Direction issued by PEDW on behalf of Welsh Ministers on 13<sup>th</sup> January 2022 (included at Appendix 1.3).
- 3.4.2 In accordance with the Screening Direction, the ‘EIA development’, for the purposes of this ES, is the alleged unauthorised development to which the Enforcement Notice relates. This is the as constructed renewable energy plant and its associated operational areas. VoGC’s alleged concern in the Enforcement Notice is about a potential inability to enforce the conditions of the 2015 Permission against the Development (as built). Without prejudice to its position in the Appeal, the Appellant considers the conditions attached to the 2015 Permission to be enforceable against the Development and accordingly, the EIA assumes that the Facility would operate within the operating restrictions and requirements imposed by the 2015 Permission as well as the Permit, subject to some minor amendments to a few conditions to reflect mitigation measures.
- 3.4.3 Scoping is the process of identifying the issues to be addressed during the EIA process. The EIA Regulations require the ES to consider only the likely significant environmental effects of a development. Best practice in EIA highlights the expectation that the ES should be proportionate and focus on the main or significant environmental effects only.
- 3.4.4 There is no requirement or provision under Part 10: Unauthorised Development of the EIA Regulations for an appellant to request, or, for the determining authority to provide an EIA scoping opinion. However, in their letter of 28<sup>th</sup> January 2022 (Appendix 3.4), PEDW offered that a scoping direction could be sought under the provisions of Regulation 33(2) of the EIA Regulations through submission of a Scoping Report.
- 3.4.5 Given the extensive history of EIA work undertaken for the Development (including the 2021 VES), the guidance given by PEDW in its letter and the timeframes set by PEDW for the preparation of this ES, the Appellant elected not to make a request for a scoping direction. Nevertheless, the scope of the ES has had regard to the points stated in PEDW’s letter of 28<sup>th</sup> January 2022 as explained in Table 3.1.

**Table 3.1: Points raised by PEDW (28<sup>th</sup> January 2022) and how they are addressed in the ES**

Comment	How the issue has been addressed in the ES
The ES will need to address the entirety of the development as specified in the notice, as built.	The ES considers the effects of the Development as a whole, as constructed.
The baseline should be taken as the point before any unauthorised development commenced. Any deviation from this should be supported by a robust rationale.	The approach to the definition of baseline conditions is presented in Section 3.8 of this chapter. All construction effects have been assessed against a Pre-Construction baseline. For most topics, assessment of the operational Development against a Pre-Construction baseline would not provide a robust or realistic assessment of the likely

	<p>environmental effects of the Development or sensitive receptors. This is due to two main reasons:</p> <ul style="list-style-type: none"> <li>i) The Pre-Construction baseline would not capture sensitive receptors which are currently present (or will be present soon).</li> <li>ii) An assessment of operational effects against a Pre-Construction baseline would not present an accurate assessment of the magnitude of change for operational impacts. This is because the Facility is not currently operational and the magnitude of change should be assessed against a Current Baseline to ensure that the predicted outcomes are accurate and based on the most up-to-date baseline information.</li> </ul> <p>Additional structures cited in the Enforcement Notice (Appendix 1.1) were installed during the overall construction and therefore it is not possible to define and assess effects against a scenario which pre-dates their installation.</p> <p>For the reasons set out above, operational effects of the as-built Development are assessed against the Current Baseline conditions.</p>
<p>The Scoping Report should be prepared considering all relevant matters specified in Regulation 17 and Schedule 4 of the EIA Regulations, in relation to all aspects of the environment likely to have been significantly impacted by the construction and operation of the plant as built.</p>	<p>The scope of the ES has been defined by a thorough evidenced based review of all environmental factors included in the EIA Regulations. Section 3.5 titled 'Topics Scoped Out of the EIA Process' is supported by appendices which provide technical evidence to support the cited justification where topics have been scoped out of the ES. All scoped in topics consider effects of construction, operation and decommissioning of the Development in line with good practice and the EIA Regulations.</p>
<p>The Scoping Report should not assume that any aspect of the environment can be excluded on the basis of any previous Scoping correspondence. Where an aspect of the environment is proposed to be scoped out, a clear rationale and sufficient evidence should be provided in the Scoping request.</p>	<p>The scope of the ES has not been defined by previous scoping discussions with Welsh Government as these were undertaken in a different context to the forthcoming Appeal (albeit the purposes of identifying likely significant effects of the development was the same). The ES scope has been informed by a thorough evidenced based review of baseline conditions and potential environmental effects of the Development. Where topics are scoped out, justification provided in</p>

	Section 3.5 is supported by technical evidence (Appendices 3.7 – 3.17).
Consideration should be given to any inter-relationships between aspects of the environment affected by the development subject of the notice.	The potential for effect interactions is considered in each topic chapters (where relevant) and in Chapter 11: Effect Interactions.
PEDW is aware that National Resources Wales (NRW) have adopted the stance that their 'Flood Map for Planning' may be used by them as the data which provides the 'best available information' on flood risk to inform their consultation responses.	NRW flood mapping for the Site has been reviewed by flood engineers at SLR and potential flood risks associated with the Development are considered in detail in Appendix 3.14.

- 3.4.6 In line with good practice, where it becomes evident during the assessment process, that a particular environment factor is unlikely to be significantly affected by a proposed development, there should be no need for further assessment of that factor. In such cases, the reasons for not undertaking further, more detailed assessment should be clearly set out in the ES.
- 3.4.7 Detailed justification for scoping out Waste and Materials and other environmental factors from the ES is provided in Section 3.5 below. This section is supported by technical evidence provided by competent experts which is provided in Appendices 3.7 to 3.17.
- 3.4.8 The scope of the ES has been informed by:
- An evidenced based review of baseline conditions and potential environmental construction, operation and future decommissioning effects of the Development by competent experts;
  - Previous EIA scoping discussions as documented by the 2019 VES and 2021 VES; and
  - An independent review of the 2010 VES and 2019 VES undertaken by WSP on behalf of the Welsh Government in November 2019 (Appendix 3.1: Barry Biomass Facility Environmental Statement Adequacy Report, November 2019).
- 3.4.9 The ES considers the potential for likely significant environmental effects of all stages of the Development, including construction, operation and decommissioning in line with good practice and the EIA Regulations. Further information on the approach to these assessments is provided in the following sections.
- 3.4.10 Topic specific cumulative inter-project effects and, where relevant, in-combination effects are assessed in each topic chapter. Combined effects on receptor groups from multiple topics (intra-project effects) are considered within Chapter 11: Effect Interactions.

## 3.5 Topics Scoped out of the EIA Process

- 3.5.1 The following sections provide justification for scoping out topics from further consideration in the ES.

### Cultural Heritage (Archaeology)

- 3.5.2 An Archaeological Desk-Based Assessment (DBA) (dated April 2022) (Appendix 3.7) has been prepared by competent experts (RPS) in line with best practice published by the Chartered Institute for Archaeologists. This included a comprehensive review of historical maps and records information within a 750m radius of the Site and considered the retrospective impacts which could have arisen from construction of the Development.
- 3.5.3 In terms of relevant designated archaeological historic assets, no World Heritage Sites, Registered Historic Battlefields, Registered Parks and Gardens or Historic Wreck sites lie within the immediate vicinity of the Site. A Scheduled Ancient Monument, Round Barrow 612m North of Bendrick Rock (ref.3295), lies c.500m to the south east of the Site.
- 3.5.4 The Site is considered to have a low potential for all forms of archaeological evidence predating the late 19th Century. The Site has a high potential to contain evidence made ground and building debris dating from the late 19th Century onwards of limited local significance only.
- 3.5.5 The Archaeological DBA concludes that it highly unlikely that the Development has had any impact on archaeological remains. No archaeological impacts are identified as arising from the operation of the Development and the decommissioning of the Facility is also considered highly unlikely to have any archaeological impact.
- 3.5.6 As such, no significant effects on archaeology have been identified and this topic has been scoped out of the ES.

### Built Heritage

- 3.5.7 A Built Heritage Statement (dated April 2022) (Appendix 3.8) has been prepared by competent experts (RPS) in line with best practice. This included a comprehensive review of historical maps and records information within a 750m radius of the Site and considered the retrospective impacts which could have arisen from construction of the Development. A site visit was also undertaken in February 2022. Section 5.2 of the Built Heritage Statement considers the impacts of the Development on the significance of designated and non-designated built heritage assets through the alteration of their settings.
- 3.5.8 There are no designated or non-designated built heritage assets located within the Site. The Site is not located within or close to a conservation area. A group of eight listed structures, concentrated around the Grade II\* Former Docks Offices, is located c.300m to the west of the Site. This group of designated heritage assets includes the Pedestal and Statue of David Davies (Grade II\*), the Former Barry Docks Offices, and six Grade II Listed Lampstands.
- 3.5.9 The Built Heritage Statement concludes that construction and operation of the Development has had, and will have, no impact on the significance of relevant built heritage assets. The

Site continues, as prior to development, to represent a minor element of the wider, much altered industrial commercial character and built context of the relevant built heritage assets.

- 3.5.10 As such, no significant effects on built heritage have been identified and this topic has been scoped out of the ES.

### **Socio-economics**

- 3.5.11 A Socio-economics Statement has been prepared by competent experts from Quod's Socio-economic team (Appendix 3.9). This statement reviews baseline conditions relevant to the topic and considers the potential for likely significant effects relating to construction related employment, operational employment, supply chain impacts and impacts on recreation, tourism and visitors.
- 3.5.12 The Socio-economics Statement identifies that 14 jobs will be created by the Development which will be beneficial to the local labour market, but not at a scale considered to be significant in EIA terms. No significant effects are identified in relation to other social or economic factors and therefore this topic has been scoped out of the ES.

### **Transport and Access**

- 3.5.13 A Transport Technical Note (July 2022) has been prepared by competent experts at Vectos (Appendix 3.10) which considers the potential for traffic and highways impacts associated with the Development. The Note includes information on the baseline conditions, forecasts the construction and operational traffic generation, assesses the traffic arising from the Development and considers the effects of the Development on other receptors. The Note was prepared with reference to best practice guidance.
- 3.5.14 The Transport Technical Note concludes that the worst-case forecasts for total traffic and HGV movements associated with the Development, for both construction and operation, represent a negligible impact on the surrounding local and strategic highways (19 HGVs per day). In addition, implementation of a Green Travel Plan, required by planning condition under the 2015 Permission, and its associated initiatives will help to reduce staff dependence on private vehicles over time.
- 3.5.15 No significant effects on transport or highways receptors are likely, and as such the topic has not been considered further in the ES.

### **Ecology**

- 3.5.16 An Ecology Technical Note (July 2022) and Habitats Regulations Assessment (HRA) Stage 1 Screening Report (July 2022) have been prepared by competent experts at SLR (Appendix 3.11 and 3.12, respectively) which consider the potential for ecological effects associated with the Development. The Ecology Technical Note includes a desk-based study of data from South Wales Biodiversity Records Centre within a 2km radius of the Site and other information sources within a 15km radius of the Site. SLR also reviewed the findings of this ES in terms of air quality emissions, noise and visual disturbance with regard to ecological receptors.

- 3.5.17 Appendices 3.11 concludes that construction of the Development is unlikely to have significant adverse effects with regard to ecological receptors including flora, fauna and designated sites.
- 3.5.18 The 2015 Permission was subject to review by VoGC's ecologist who indicated that the potential presence of rough marsh-mallow *Althaea hirsuta* (a rare plant) was the only possible likely significant effect relating to on-site ecology. All necessary ecological survey work was undertaken prior to the construction of the Site to the satisfaction of the VoGC ecologist who was satisfied that the Development would not give rise to likely significant effects on this species.
- 3.5.19 An HRA Stage 1 Screening (Appendix 13.12) was undertaken by SLR to identify any aspects of the Development that would be likely to lead to significant effects upon sites afforded protection under the Conservation of Habitats and Species Regulations 2017 (as amended) ('Habitats Regulations'). The HRA Stage 1 Screening concludes that the Development would not give rise to likely significant effects upon the Severn Estuary Ramsar site, Severn Estuary Special Protection Areas (SPA) and Severn Estuary Special Area of Conservation (SAC) as a result of the operation of the Facility. Due to the absence of likely significant effects, no additional reporting against the Habitat Regulations is considered necessary.

### Ground Conditions

- 3.5.20 A Ground Conditions Technical Review (July 2022) has been prepared by competent experts at SLR (Appendix 3.13) which considers the potential for effects associated with the Development in relation to ground conditions and contamination. The review has had regard to previous technical reports relating to the site condition and contamination including ground investigations.
- 3.5.21 Prior to construction, the Site was previously developed (i.e. brownfield) as it has previously been utilised for dockside storage. The Site was developed by the Appellant in accordance with Condition 8 of the 2015 Permission which stated *"...No development approved by this permission shall be commenced until a contaminated land assessment and associated remedial strategy have been submitted to and approved by the Local Planning Authority."*
- 3.5.22 Pre-commencement planning conditions relating to contaminated land were fully discharged by VoGC under the 2015 Permission, with no outstanding issues identified. The Site has been designed with a fully capped concrete cover and benefitted from a sealed drainage system, therefore the likelihood of discharges to land are considered low. There are no point source releases of process effluents to controlled waters from the Site as all process effluents are discharged to the sewer system.
- 3.5.23 A Site Condition Report (prepared by WYG, dated January 2018) was submitted to NRW as part of the Permit application which reports the findings of a desk study and intrusive site investigation. The Site Condition Report concluded the soils on the development site were unlikely to pose a risk of significant harm to controlled waters or other offsite receptors. As such, no remediation was considered necessary. NRW were satisfied that the Site Condition Report adequately described the condition of the soil and groundwater prior to the start of operations.



- 3.5.24 The Ground Conditions Review concludes that, any fugitive residual contaminant impacts in soil or groundwater beneath the existing hardstanding are effectively sealed off from direct contact with people working on the Site. In addition, that the pathway and driving head gradient for percolation or migration off-Site is limited. Therefore, whilst it is not possible to confirm that no residual impact exists, it is reasonable to assume that any contaminant is unlikely to present a risk of adverse impact for the operational use of the Site.
- 3.5.25 Under the requirements of the Permit, the Development is required to store and manage all chemicals and potentially polluting materials in accordance with best practice requirements and ensure that adequate primary, secondary and tertiary containment is provided. All drainage systems are designed in accordance with NRW required and sealed to prevent any contamination migration. In their Permit Decision Notice, NRW were satisfied that the site infrastructure is adequate to prevent pollution occurring. This assessment is set out by NRW in page 19 onwards of the Permit Decision Notice (February 2018) (Appendix 1.2).
- 3.5.26 All pre-commencement conditions relating to contaminated land have been fully discharged by VoGC officers, with no outstanding issues identified.
- 3.5.27 Further ground investigations will be required once the permitted activity ceases at the Site to verify the ground conditions.
- 3.5.28 For these reasons, no significant effects are likely and ground conditions and contamination are scoped out of the ES.

### **Water Resources, Flood Risk and Drainage**

- 3.5.29 A Flood Risk and Drainage Technical Note (July 2022) has been prepared by competent experts at SLR (Appendix 3.14) which considers the potential for effects associated with the Development in relation to water resources, flood risk and drainage. The Review considered available flood maps and other technical information. The impact of climate change over the lifetime of the Facility was also evaluated and considered in the Technical Note. For assessment purposes the Technical Note assumed an operational lifetime period of 25 years.
- 3.5.30 Drainage calculations were updated in March 2022 by GHD to take account of an additional parcel of land in the northern part of the Site. The Technical Note was prepared with reference to current guidance, specifically the Technical Advice Note 15: Development and Flood Risk (TAN15) and the accompanying Development Advice Maps (DAM).
- 3.5.31 SLR concluded that there is a relatively low risk of flooding from a 0.1% Annual Exceedance Probability (AEP) tidal flood over the lifetime of the Development and if such an extreme flood event were to occur it would be to a depth of no more than 0.25m. In this rare event, there would be a controlled closure of the Development and all staff on Site would be evacuated. The Appellant has signed up to the NRW Flood Warning Service and also has a Flood Emergency Plan in place.
- 3.5.32 The drainage system serving the Development has been constructed to a design that did not account for the latest advice on the impact of climate change, or the runoff from the vehicle turning area at the northern part of the Site. However, the analysis of the drainage system has been re-run to consider both these issues. This analysis confirms that the

attenuation storage provided by the existing system can cater for the additional runoff from this land parcel with climate change allowances.

- 3.5.33 Process effluent from the Development discharges to the sewer system is subsequently subject to treatment by Dŵr Cymru / Welsh Water. Boiler blowdown consists of demineralised water and chemicals to prevent corrosion. The water is non-hazardous, has a pH of 7 and is cooled prior to discharge.
- 3.5.34 The Site has been designed to ensure that all surface water discharge points are adequately protected and cannot adversely impact controlled surface or groundwater. All discharges and drainage controls and pollution control procedures are regulated by NRW as part of the Permit. As such, significant water quality effects are not expected to arise.
- 3.5.35 Water is used in the operational processes although not in volumes which would give risk to a significant effect in terms of water demand.
- 3.5.36 All of the site drains have the ability to be isolated in the event of an emergency for the purposes of preventing any off site release of fire water or contamination.
- 3.5.37 The following has been designed in the event of a fire:
- An actuated penstock to isolate the surface water drainage system in the event of a fire;
  - All fire water will enter the drainage system and overflow into the attenuation tank;
  - The fire water will be tested to allow discharge to the surface water connection point;
  - If not suitable, all fire water is to be pumped and tankered away to a suitable water treatment facility.
- 3.5.38 In conclusion, significant water resources, drainage and flood risk impacts are not anticipated, and it is deemed appropriate to scope these issues out of the ES.

### **Vulnerability to Major Accidents and Disasters**

- 3.5.39 The EIA Regulations state that the EIA must identify, describe and assess in an appropriate manner the direct and indirect significant effects arising from the vulnerability of the Development to risks of major accidents or disasters. Vulnerability of the Development to major accidents introduced by the location should be considered as well as risks that are an inherent characteristic of the development. A Major Accidents and Disasters Technical Note (July 2022) has been prepared by Quod with input from the wider EIA team (Appendix 3.15).
- 3.5.40 The objective of the Note was to assess whether the Development increases risks to existing receptors or increases the sensitivity of those receptors to the consequences of the hazard. For example, by introducing new links/pathways between a possible hazard and a receptor.
- 3.5.41 A review of risks associated with major accidents and disasters has been undertaken based on Environmental Risk Assessment undertaken by Sol Environment as part of the Permit application and included in the Accident Management Plan (Annex to Appendix 3.15) and Emergency Plan. This review considers the relevant management protocols and practices which are already in place at the Site and concludes that residual effects from major

accidents and disasters during all stages of the Development will not be significant and it is deemed appropriate to scope these issues out of the ES.

### **Light Pollution**

- 3.5.42 Following a baseline site survey in March 2022 by lighting engineers at Hoare Lea, opportunities were identified to improve the installed exterior site lighting scheme at the Site. A revised lighting scheme has therefore been designed in line with the latest industry guidance and standards which is detailed in Chapter 5: Description of the Development and presented in Appendix 5.5. The Appellant has committed to installing the revised lighting scheme prior to bringing the Facility into operational use.
- 3.5.43 Hoare Lea have conducted a lighting impact assessment of the revised lighting scheme which includes quantitative information regarding the proposals, i.e. Impact Illumination Profiles. This assessment is included in Appendix 3.17. From the results it can be demonstrated that the resultant values will be well within the guidelines for obtrusive light as referenced in the Institution of Lighting Professionals (ILP) Guidance Note GN01/21. As such adverse effects on receptors have not been identified and light pollution effects have not been considered further in the ES.

### **Materials and Waste**

- 3.5.44 A chapter on 'Waste Management' was scoped into the 2021 VES. A Materials and Waste Technical Note has been prepared by Quod with input from the wider EIA team and is provided at Appendix 3.16. This Note considers the whether the Development would give rise to significant environmental effects in relation to the use of materials and generation of waste during both the construction and operational stages of the Development.
- 3.5.45 The Technical Note considers the use of materials and control measures incorporated into the design of the Development combined with the maintenance of the relevant management protocols and ongoing monitoring and testing of waste and raw materials. The Technical Note concludes that the potential environmental effects relating to waste and materials associated with the Development would not be significant and therefore they have not been considered further in the ES.

## **3.6 Consultation**

- 3.6.1 There has been no specific consultation exercise in relation to the preparation of this ES. However, the Development has undergone extensive consultation as part of previous planning and Permit application processes. For ease of reference, a summary of key stages of consultation and comments or objections made is provided below.

### **2015 Planning Application**

- 3.6.2 Planning consultation undertaken in relation to the 2015 application prior to the 2015 Permission being granted is summarised below.
- Barry Town Council - made objections in relation to stack height, proximity to residential properties and potential traffic congestion impacts.

- Environmental Health (Pollution) – no objections were made; however conditions were recommended in relation to quality control on the source material, requirement for Construction Environmental Management Plans, and on-site lighting which were incorporated in the 2015 Permission;
- Cardiff Airport (Safeguarding) – no objections made.
- Glamorgan Gwent Archaeological Trust – no objections made.
- Policy Section (Planning) - No objection to the proposed development, subject to the proposal being considered acceptable under key relevant planning policy.
- Local ward members – no objection made.
- Dŵr Cymru (Welsh Water) - no objections or comments made.
- Internal Council Consultation (Council's Ecology Officer, Waste Management team, Finance, ICT and Estates, Energy Manager) - no comments received, or objections made.
- Highways and Engineering - no objection subject to conditions on visibility splays, parking provision and cycle provision within the site;
- NRW - NRW initially objected to the Facility outlining that insufficient information had been submitted for the matter to be properly considered and that an updated Air Quality Assessment (AQA) would be required, including further assessment. Following submission of a revised AQA, no objections were made.
- Public Health Wales - no objections made, however some initial concerns identified in relation to applications for nearby industrial uses (which subsequently expired or were withdrawn) and nearby future residential receptors.
- Health and Safety Executive - no objections or comments received.
- Associated British Ports - no comments.
- Local Representation - considerable representations (>104 letters/ emails) objections made on grounds of potential environmental impacts, amenity, transport and health issues.

### Environmental Permit

- 3.6.3 NRW carried out extensive consultation on the Development as part of the Permit application which was submitted to NRW in November 2016. The consultation process was entirely independent of the planning process and was completed in accordance with the Environmental Permitting (England and Wales) Regulations 2016, the Industrial Emissions Directive (IED), NRW's statutory Public Participation Statement and NRW's Regulatory Guidance Note RGN 6 for Determinations involving Sites of High Public Interest.

- 3.6.4 In determining the Permit application, NRW carried out assessments of the operational effects of the Facility in relation to the air, noise, dust, odour, greenhouse gas and waste management impacts.
- 3.6.5 In total, the NRW ran four phases of consultation in relation to the Permit from 5<sup>th</sup> December 2016 to 22<sup>nd</sup> January 2018. The consultation phases provided a total of 29 weeks for interested parties to prepare and participate.
- 3.6.6 A summary of all consultation comments and the related responses to the representations were provided by NRW in Annex 4 of the Permit Decision Notice (Appendix 1.2). In their Decision Note, NRW stated that took all relevant representations into consideration in reaching their final determination to issue a Permit.

### 2021 VES

- 3.6.7 Consultation on the VES 2021 was conducted over a period of 3 months from 18<sup>th</sup> October 2021 to 17<sup>th</sup> January 2021. At the time of writing this ES, no report of the consultation responses or adequacy of the 2021 VES had been published by the Welsh Government. Consultation responses had been published by the Welsh Government following a request by a third party to them under the Freedom of Information Act.

## 3.7 General EIA Approach

- 3.7.1 For the purposes of this ES, the EIA Development is the alleged unauthorised development to which the Enforcement Notice relates, which is essentially the renewable energy plant as it has been constructed and exists at the time of writing (July 2022) and as described in Chapter 5: Description of the Development. The ES considers the effects of the Development during construction (a retrospective assessment), operation and decommissioning. The general approach to defining the baseline conditions and assessing the effects of the Development during each stage is described below.

## 3.8 Defining the Baseline

### Study Area

- 3.8.1 The study area, also known as the spatial Zone of Influence (Zol), for each topic is based on the geographical scope of the potential impacts relevant to the topic or the information required to assess the likely significant effects, as well as topic specific guidance and agreements with stakeholders during the preparation of previous ESs. The study area is defined for each topic chapter as appropriate as the Zol varies from topic to topic and between construction and operational phases in some cases. The Zol for decommissioning is taken as the same as that for the construction phase.
- 3.8.2 A summary of the Zol applied to each topic in this ES is provided in Table 3..

Table 3.2: Construction (and Decommissioning) and Operational Stage Zols

Topic	Construction (and Decommissioning) Stage Zol	Operational Stage Zol
Landscape and Visual	Approximately 5km radius from the centre of the Site.	
Noise and Vibration	Existing and future noise sensitive receptors nearest to the Site were assessed.	Existing and future noise sensitive receptors were up to 380m from the Site were assessed.
Air Quality	The immediate vicinity of the Site (up to 2.5km) and a cartesian grid of 65m resolution (1.5 times the stack height) centred on the Site. Ecological receptors (designated sites) – up to 10km from the Site.	
Population and Human Health	Barry and the administrative area of the Vale of Glamorgan.	
Climate Change and Greenhouse Gas Emissions	Climate change is a global environmental effect and as such the study area for the assessment is not limited by any specific geographical scope. The assessment considers the release of greenhouse gases from activities associated with the Development which the Appellant has some ability to control or influence.	

### Baseline

3.8.3 Under the EIA Regulations, the ES is required to include a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge. The latter is also known as the 'future baseline'. The following sections explain the approach to defining baseline conditions which are appropriate for assessing the effects of each phase of the Development.

### Pre-Construction Baseline

3.8.4 The environmental conditions prior to construction of the Development in 2016 have been established to enable an accurate assessment of the potential changes that may have occurred and to assess the resultant environmental effects of the existing as built Development. This has been defined as the 'Pre-Construction Baseline'.

3.8.5 The Pre-Construction Baseline has been informed by available information sources, including the 2009 planning application and 2010 VES, 2021 VES and other technical studies.

3.8.6 All topics assess effects against a Pre-Construction Baseline unless otherwise explained in the topic chapter.

### Current Baseline

- 3.8.7 The Current Baseline is defined as current conditions of the environment at the time of ES preparation (2022). The Current Baseline has been used to assess the operational phase effects of the Development. This is a robust approach as whilst the Facility has been constructed, it is not yet operating. Operational effects of the Facility are therefore not currently occurring.
- 3.8.8 The Current Baseline was informed by published data sets, surveys/site visits and monitoring undertaken by the Project Team in 2022. Where environmental information is not available for 2022, data has been used which pre-dates 2022. However, this is clearly stated and the rationale for use and validity is provided.

### Future Baseline

- 3.8.9 Where appropriate, a Future Baseline condition is described in each topic chapter which explains how the baseline could change in the absence of the Development. This section is used to inform the assessment of decommissioning stage effects. Consideration is given to committed development schemes (as detailed in Appendix 3.6) as part of the Future Baseline where they could be relevant to the assessment.

### Sensitive Receptors

- 3.8.10 As part of the EIA process, the environmental effects of a development are typically assessed in relation to sensitive receptors, including human beings (e.g. future site users), built resources (e.g. buildings) and natural resources (e.g. controlled waters). The criteria used for identifying potentially sensitive receptors include:
- Proximity to the Site;
  - Presence or absence of impact pathways;
  - Extent and duration of potential exposure to environmental impacts; and,
  - Vulnerability and ability to respond to change.
- 3.8.11 Further details on sensitive receptors are provided in the Baseline Conditions section of each topic chapter of the ES (i.e. Chapters 7 to 10 and Volume II). The chapters consider both existing and future sensitive receptors within the Zol of the Development. A summary of the receptors and their sensitivity is provided in each technical chapter.

## 3.9 Assessment of Effects

### Construction

- 3.9.1 The Development has been constructed, although for completeness and in line with the EIA Regulations the ES considers the effects of the construction stage of the project. The assessment is retrospective and is based on the best available information about the methods and activities during the construction stage, as set out in Chapter 6: Construction and Decommissioning.
- 3.9.2 The ES considers and assesses the effects of the construction phase of the Development. Construction of the Development commenced in February 2016, following the granting of the 2015 Permission, and reached completion in Quarter 1 (Q1) 2018. Construction of the

Development did not take place continuously over the period from February 2016 to Q1 2018. However, for the purposes of the EIA, a worst-case assumption was taken that the Development was constructed over a single phase during this period. This provides a reasonable worst-case basis for the assessments.

- 3.9.3 Each topic chapter assumes a notional 'likely-worst case' scenario with respect to the construction methods, location (proximity to sensitive receptors) and timing as outlined in Chapter 6: Construction and Decommissioning. These assumptions may vary between the topic specific assessments. Both permanent and temporary construction effects are identified, where relevant.
- 3.9.4 The key activities during the construction phase which informed the technical assessments of the ES are described within each chapter as relevant.

### Operational Development

- 3.9.5 The assessment of operational effects of the Development are based on the as-built Facility and have been informed by site photographs, plans, a 3D model (based on a drone survey) (Appendix 5.3) and topographic survey (Appendix 5.2). The drone survey and topographic survey were both undertaken in March 2022 and are therefore accurate representations of the as-built Development. The assessments assume the Facility operates 24/7 with restricted delivery times as defined by the 2015 Permission and detailed in Chapter 5: Description of the Development.
- 3.9.6 A description of the physical and operational aspects of the Development is provided in ES Chapter 5: Description of Development. 2022 is taken as the assessment year for the purposes of assessing operational effects as this is representative of an 'opening year' given that the Facility is not currently active. Effects of the Development are considered over its operating lifetime which is assumed as 25 years for the purposes of assessment. The operating lifetime may longer, although this is unlikely to materially affect the outcome of the assessments.

### Decommissioning

- 3.9.7 An assessment of any decommissioning effects is not specifically required under Schedule 4 of the EIA Regulations, although item (5)a) refers to the "*the construction and existence of the development, including, where relevant, demolition works*". 'EU guidance on the preparation of Environmental Impact Reports' (2017) also refers to the inclusion of decommissioning as part of good practice. As such, the effects of a future decommissioning stage of the project (in the event of its cessation) have been considered in each topic chapter. It should be noted that decommissioning would be subject to regulatory control through the Permit in the form of a Site Closure Plan.

### Cumulative Effects

- 3.9.8 The EIA Regulations require that, in assessing the effects of a particular development proposal, consideration should also be given to any cumulative effects. Potential cumulative effects are categorised into two types:



- **Intra-project effects:** The combined effects of individual effects resultant from the Development upon a set of defined sensitive receptors, for example, noise, dust and visual effects; and
- **Inter-project effects:** The combined effects arising from another development site(s), which individually might be insignificant, but when considered together, could create a significant cumulative effect.

3.9.9 An explanation of the methodology and approach of the cumulative effects assessment for intra-project effects and inter-project effects of the Development is provided below.

#### Intra-Project Effects Assessment Methodology

3.9.10 There is no consistent guidance or standardised approach to the assessment of effect interactions, however it is recognised that the Development has the potential to give rise to a variety of impacts upon a number of different receptors, some of which may combine to become significant effects. As a result, a receptor group-based approach was adopted. The methodology used for the assessment of effect interactions as well as the results of the assessment are set out in Chapter 11: Effect Interactions.

#### Inter-Project Effects Assessment Methodology

3.9.11 There is currently no industry standard guidance on how to define an appropriate study area for considering cumulative effects. Therefore, a set of screening criteria has been developed to identify which reasonably foreseeable developments in the vicinity of the Site should be subject to assessment. As there is no specific guidance in Wales on cumulative assessment, the screening approach was informed by the UK Government's PPG<sup>11</sup> 'When should cumulative effects be assessed?' and the PINS Advice Note 17<sup>12</sup>. Schemes to be considered have been identified based on the following criteria:

- Expected to be built-out at the same time as the Development and with a defined planning and construction programme;
- Spatially linked to the Development (10km Study Area);
- Considered an EIA development and for which an ES was submitted with the planning application;
- Those which have received planning consent from the planning authority (granted or resolution to grant); and/ or,
- Introduce sensitive receptors within proximity to the Site boundary (but are not EIA development).

3.9.12 The development schemes which meet the above criteria, and which were included within the cumulative assessment are identified in Figure 3.1 and 3.2. Each technical chapter assesses and presents the potential for inter-project effects arising from the cumulative schemes under the heading 'Cumulative Effects'.

3.9.13 Appendix 3.6 provides further details of the cumulative schemes and their status. The list of cumulative schemes was kept under review during the preparation of the ES and a final check completed in July 2022. The cumulative schemes are considered to be up-to-date the time of writing (i.e. July 2022).

Figure 3.1: Barry Waterfront Cumulative Schemes

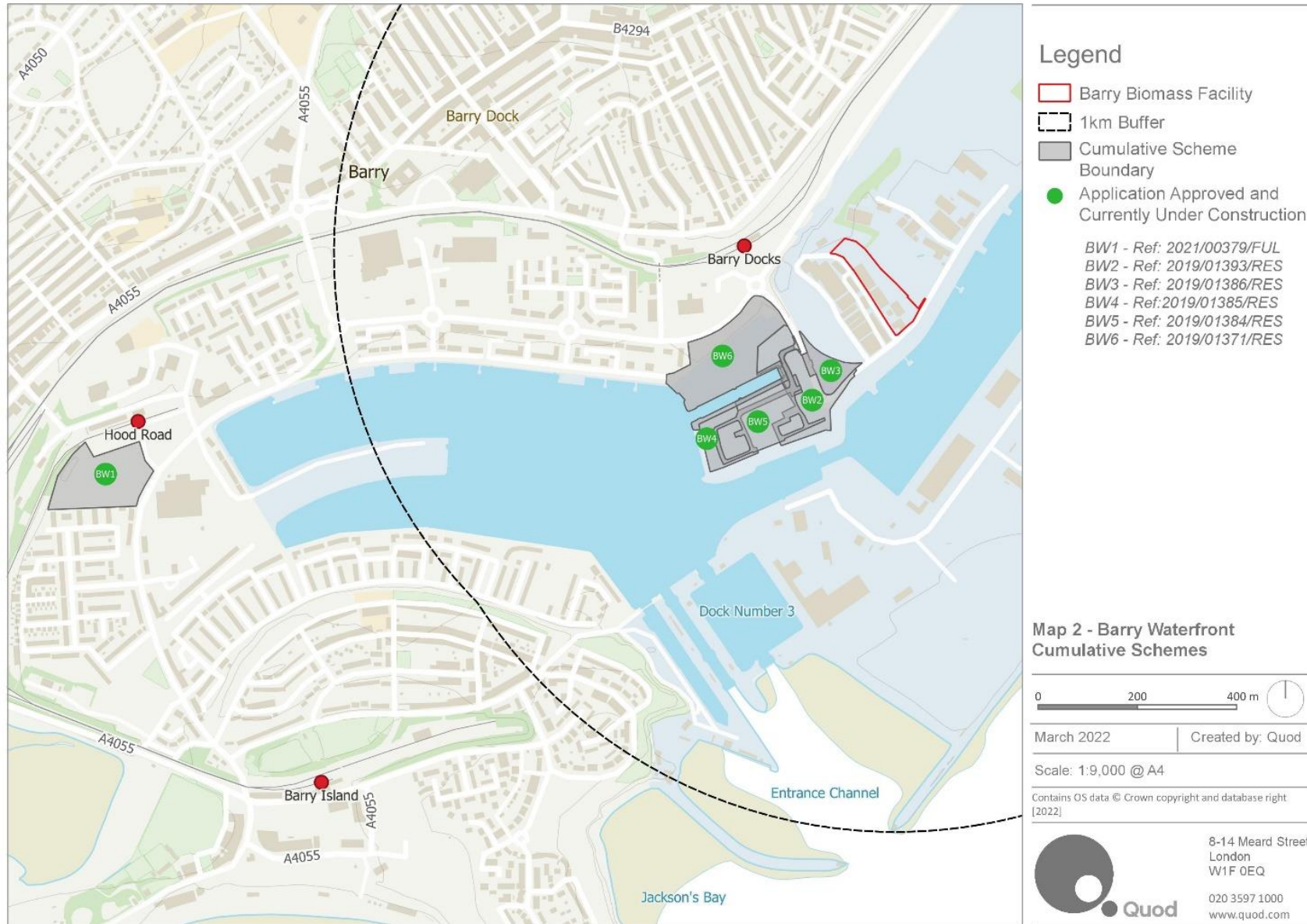
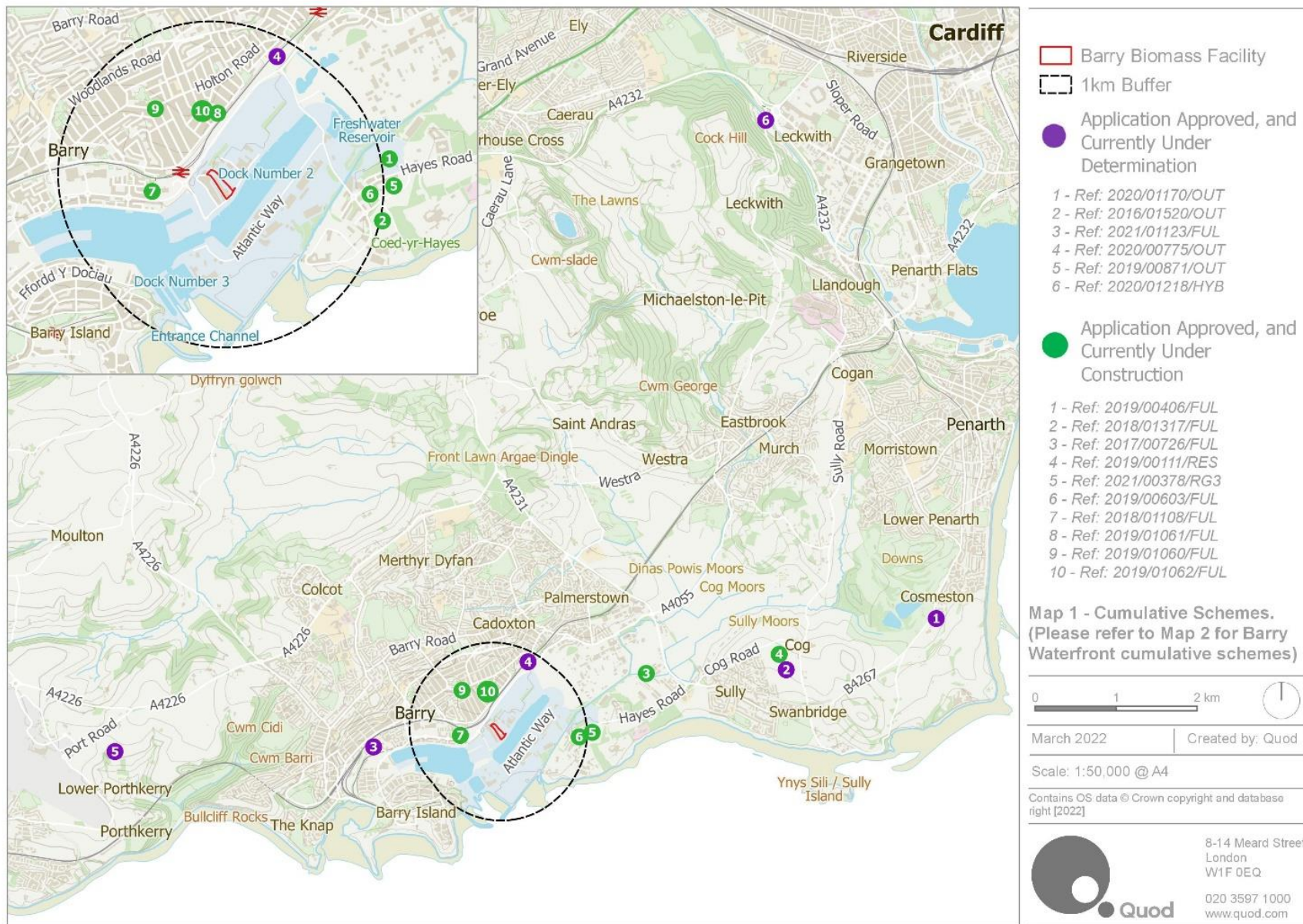


Figure 3.2: Cumulative Schemes in the wider area



## 3.10 Identifying and Determining the Significance of Environmental Effects

### Identifying Impacts and Effects

3.10.1 The Development has the potential to create a range of 'impacts' and 'effects' with regard to the physical, biological and human environment. The definitions of impact and effect used in this assessment are drawn from the general assessment methodology developed by Design Manual for Roads and Bridges (DMRB)<sup>13</sup> as follows:

- **Impact** - a change that is caused by an action. For example, road traffic from the Development would result in increased levels of noise (impact). Impacts can be classified as direct, indirect, secondary, cumulative and inter-related. They can be either positive (beneficial) or negative (adverse); and
- **Effect** - is used to express the consequence of an impact. For example, increased levels of road traffic noise (impact) have the potential to disturb local noise sensitive receptors (effect).

3.10.2 For consistency, the findings of the various studies undertaken as part of the EIA adopt the following terminology to express the nature of the effect:

- Adverse: Detrimental or negative effect to an environmental resource or receptor;
- Negligible: No significant effect to an environmental resource or receptor; and
- Beneficial: Advantageous or positive effect to an environmental resource or receptor.

3.10.3 Following their identification, beneficial or adverse impacts are classified based on their nature and duration as follows:

- Temporary: Effects that persist for a limited period only (due, for example, to activities taking place for a short period of time);
- Permanent: Effects that result from an irreversible change to the baseline environment (e.g. land-take) or which will persist for the foreseeable future (e.g. noise from regular or continuous operations or activities);
- Direct: Effects that arise from the effect of the project itself (e.g. removal of vegetation);
- Indirect: Effects that arise which are not a direct result of the project but are closely linked (e.g. changes to surface water quality due to change in land use and urbanisation);
- Secondary: Effects that arise as a consequence of an initial effect of the scheme (e.g. induced employment elsewhere);
- Cumulative: Effects that can arise from a combination of different effects at a specific location or the interaction of different effects over different periods of time.

3.10.4 In the context of the Development, short (up to 24 months duration) to medium (up to 48 months duration) term effects are determined to be those associated with construction activities, and beyond this, the long-term effects are those associated with the operational Development during its lifetime.

3.10.5 Local effects are those effects affecting receptors within and in close proximity to the Site, whilst effects on receptors in the wider study area are considered to be at a local authority and/ or regional level.

## Defining Magnitude of Impact and Sensitivity of Receptor

### Magnitude of Impact

3.10.6 For impacts assessed in this ES, a magnitude of impact was assigned, considering the spatial extent, duration, frequency and reversibility of the impact, where relevant. Scales of magnitude of impact were defined in each chapter of this ES where this is possible, otherwise professional judgement was applied to the following scale:

- No change;
- Negligible;
- Low;
- Medium; and
- High.

### Sensitivity of Receptor

3.10.7 Sensitive receptors are defined as the physical or biological resources or user groups that would be affected by the potential impacts of the Development. The identification of sensitive receptors was informed by baseline studies carried out as part of the EIA. The sensitivity of a receptor is based on the relative importance of the receptor considering:

- Legislative/designated status;
- The number of individual receptors;
- The characteristics/rarity; and
- Ability to absorb change.

3.10.8 A summary of sensitive receptors is provided within each baseline assessment sections of the ES topic chapters. Sensitivity was defined within each topic according to the following scale:

- Negligible;
- Low;
- Medium; and
- High.

### Evaluation of Significance of Effect

3.10.9 The assessment of environmental effects was undertaken in accordance with relevant industry standards and legislation where such material is available. In cases where it is not possible to quantify effects, qualitative assessments were carried out and based on the available knowledge of the Site and potential effect, alongside professional judgement. Where uncertainty exists, this was detailed in the 'Assumptions and Limitations' section under 'Assessment Methodology' in the respective technical chapters.

3.10.10 Each technical chapter provides the specific criteria, including sources and justifications, for quantifying the level of effect significance. Where possible, this was based upon quantitative and accepted criteria, together with the use of value judgements and expert interpretations to establish to what extent an effect is significant.

3.10.11 There is no statutory definition of what constitutes a significant effect and guidance is of a generic nature. However, it is widely recognised that ‘significance’ reflects the relationship between the magnitude of an impact and the sensitivity (or value) of the affected resource or receptor. Statutory designations and any potential breaches of environmental law take precedence in determining significance because the protection afforded to a particular receptor or resource is already established as a matter of law, rather than requiring a project or site-specific evaluation.

3.10.12 Specific criteria for the assessment of each potential effect were developed giving due regard to the following:

- Extent and magnitude of the effect;
- Effect duration (whether short, medium or long term);
- Nature of effect (whether direct or indirect, reversible or irreversible);
- Performance against environmental quality standards;
- Whether the effect occurs in isolation or cumulatively;
- Sensitivity of the receptor; and
- Compatibility with environmental policies.

3.10.13 Where adverse or beneficial effects were identified, these were assessed against the scale set out in Table 3..

Table 3.3: Description of the Level of Significance of Environmental Effects

Level of Significance	Description
Major	Large effects (by extent, duration or magnitude) and/ or a highly pronounced change in environmental conditions. Effects, both adverse and beneficial, which are likely to be important considerations at a regional level because they contribute to achieving regional or council wide objectives or could result in exceedance of statutory objectives and/or breaches of legislation.
Moderate	Intermediate effects (by extent, duration or magnitude) and/ or pronounced change in environmental conditions. Effect that is likely to be an important consideration at a local level.
Minor	Noticeable but small effect or change in environmental conditions. These effects may be raised as local issues but are unlikely to be of importance in the decision-making process. Typically, ‘Minor’ effects are considered ‘Not Significant’ in EIA terms unless otherwise stated within the technical chapter.
Negligible	No discernible change or neutral effect on environmental conditions. An effect that is likely to have a negligible influence, irrespective of other effects.

3.10.14 The matrix presented in Table 3.4 was generally applied throughout this ES to determine the scale or magnitude of effects. Where different assessment criteria were used, this is clearly stated within the relevant chapter.

Table 3.4: Significance of Effects Matrix

Sensitivity / Value of Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major / Moderate	Moderate	Negligible
Medium	Major / Moderate	Moderate	Moderate / Minor	Negligible
Low	Moderate	Moderate / Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

### Mitigation, Monitoring and Residual Effects

- 3.10.15 Inherent mitigation measures which are ‘designed in’ or embedded to the constructed Facility are assessed as part of the Development. Where assessments identify a need for a additional mitigation measures to those already inherent in the as-built Development, these are identified in the topic chapter under the heading ‘Mitigation, Monitoring and Residual Effects’.
- 3.10.16 Residual effects are those that remain following the consideration of mitigation within the assessment. When applying the matrix set out in Table 3.4, these are defined as either ‘significant’ (i.e. major or moderate residual effect) or ‘not significant’ (i.e. minor residual effect or negligible).
- 3.10.17 A detailed description of the Facility and how it complies with the published EU Sector BREF ‘Best Available Techniques – Reference’ document as defined by the European IPPC Bureau<sup>14</sup> is been provided within the Permit application documentation and fully assessed and determined by NRW. This assessment formed part of an extensive public consultation as part of the Permit determination process and considered to meet all legislative requirements.

## References

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- <sup>1</sup> HMSO, (2017). The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017. The Stationary Office.
- <sup>2</sup> HMSO, (2019). The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Wales) (Amendment) Regulations 2019. The Stationary Office.
- <sup>3</sup> HMSO (2020). The Planning Applications (Temporary Modifications and Disapplication (Wales) (Coronavirus) Order 2020. The Stationary Office.
- <sup>4</sup> Welsh Government (1999). Circular 11/99: Environmental Impact Assessment (EIA). Welsh Office.
- <sup>5</sup> Welsh Government (May 2017). Development Management Manual (Revision 2).
- <sup>6</sup> Institute of Environmental Impact and Assessment (IEMA), (2004). Guidelines for Environmental Impact Assessment. IEMA.
- <sup>7</sup> IEMA, (2011). Special Report: The State of Environmental Impact Assessment Practice in the UK. IEMA.
- <sup>8</sup> IEMA, (2016). EIA – Shaping and Delivering Quality Development. July 2016.
- <sup>9</sup> IEMA, (2017). Delivering Proportionate EIA: A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice. July 2017.
- <sup>10</sup> European Commission (2017). Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Report.
- <sup>11</sup> Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, (2021). National Planning Practice Guidance. Available online at: <http://planningguidance.planningportal.gov.uk/blog/guidance/environmental-impact-assessment/>
- <sup>12</sup> Planning Inspectorate. (2019). Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects. August 2019.
- <sup>13</sup> Highways England. (2020). Design Manual for Roads and Bridges (2020). LA104 Environmental Assessment and Monitoring. August 2020.
- <sup>14</sup> Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration. (notified under document C (2019) 7987)