

Connah's Quay Low Carbon Power

Report to Inform Habitats Regulations Assessment (Tracked)

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Prepared for:
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Executive Summary

This report has been produced for the purpose of informing a Habitats Regulations Assessment (HRA) in accordance with applicable legislation and Planning Inspectorate (PINS) advice on HRA, discussing impacts on internationally important wildlife sites (Habitats sites) to the extent possible at this stage of scheme development.

The test of Likely Significant Effects (HRA Stage 1) considered the following impact pathways:

- Construction and decommissioning:
  - Direct loss of / damage to qualifying habitats;
  - Noise and visual disturbance;
  - Water quality;
  - Water quantity, level and flow;
  - Loss of functionally linked land;
  - Atmospheric pollution (including dust deposition);
  - Barriers to movement; and
  - Introduction of invasive non-native species (INNS).
- Operation:
  - Noise and visual disturbance;
  - Loss of functionally linked land;
  - Water quality;
  - Water quantity, level and flow; and
  - Atmospheric pollution.

The following impact pathways were assessed in HRA Stage 2 – Appropriate Assessment:

- Direct loss of / damage to qualifying habitats of Dee Estuary Special Area of Conservation (SAC) / Special Protection Area (SPA) / Ramsar site during construction/demolition;
- Noise and visual disturbance of interest features of Dee Estuary SPA/Ramsar site during construction/demolition;
- Loss of functionally linked land for Dee Estuary SPA/Ramsar birds during construction/demolition and/or operation;
- Water quality during both construction and operation on Dee Estuary/ Aber Dyfrdwy SAC/ SPA / Ramsar and River Dee & Bala Lake SAC, due to the need to consider mitigation measures;
- Visual disturbance associated with operational lighting disturbance of Dee Estuary SPA/Ramsar site; and

- Atmospheric pollution of Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar during construction/demolition, and of Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar and Deeside and Buckley Newt Sites SAC during operation.

In the appropriate assessment, it was concluded that no adverse effect on the integrity of any Habitats sites would arise, alone or in combination with other plans or projects. This is based on:

- The assessment of water quality impacts took account of the delivery of the pollution control measures for the Proposed Development during construction, as set out in the **Framework Construction Environment Management Plan** (**CEMP**) (**EN010166/APP/6.5**), as it is an offence to pollute watercourses irrespective of their designation or otherwise as Habitats sites. During operation, the Proposed Development will be designed to provide a drainage system that protects the environment from accidental discharges including segregation of clean water / rainwater and firewater from potentially contaminated water, including chemical storage facilities including a road tanker unloading area(s) and appropriate containment facilities including impermeable concrete surfaces, isolated drainage areas and appropriately designed and sized bunds.
- Provision of acoustic fencing between the Proposed Development and Dee Estuary SPA / Ramsar site during construction and decommissioning, secured in the **Framework CEMP** (**EN010166/APP/6.5**);
- Use of shrouded piling for main works, or the use of quieter piling techniques than driven impact piling, secured in the **Framework CEMP** (**EN010166/APP/6.5**);
- Timing of construction and demolition works for the Water Connection Corridor and the Proposed Surface Water Outfall to take place outside the non-breeding period for SPA, secured the in the **Framework CEMP** (**EN010166/APP/6.5**) which states these works must be completed between April and June;
- Enhancement of land at Prestatyn for curlew, to be delivered prior to loss of functionally linked land within the construction laydown area, and its maintenance until the Proposed Development is decommissioned and the 26 ha of functionally linked land within the Order limits is reinstated to its existing or a materially similar condition that is suitable[1] to function as functionally linked land for curlew, unless otherwise agreed with the relevant discharging authority in consultation with NRW. This is secured through the **Outline Curlew Implementation and Monitoring Plan**(**EN010166/APP/6.13**);
- Extended duration of management of the Conservation Management Plan for the Connah's Quay Nature Reserve for the duration of the operational Proposed Development secured through **Appendix 4-A:**

[1] neutral type grassland with regular sheep grazing to maintain sward height.

Operation and Maintenance Mitigation Register (EN010166/APP/6.4);

- Managed Realignment of the coastal defences south of the existing Connah's Quay Power Station, adjacent to Conservation Area Compartment 3, to allow the natural expansion of 1,300 m^2 of saltmarsh and ensure no net loss of saltmarsh within Dee Estuary SAC/SPA/Ramsar site from the proposed Surface Water Outfall. This is secured through the **Outline Saltmarsh Implementation and Monitoring Plan (EN010166/APP/6.16)**;
- Financial contribution to enhanced management of the saltmarsh at Dee Estuary SAC/SPA/Ramsar to improve the health and quality of saltmarsh within the SAC/SPA/Ramsar site beyond that which would otherwise be achieved by existing management thus rendering the saltmarsh within the Dee Estuary more resilient to other pressures such as atmospheric nitrogen deposition. ~~This will be secured through the **Draft Deed of Development Consent Obligations (Draft Bilateral Deed) (EN01016/APP/9.25)**[2]~~This is secured through the **Deed of Unilateral Undertaking Development Consent Obligations (First Unilateral Undertaking) (EN010166/APP/9.42)**, the **Second Deed of Unilateral Undertaking Development Consent Obligations (Second Unilateral Undertaking) (EN010166/APP/9.48)** and Article 52 (Procedure for habitat mitigation) of the **Draft Development Consent Order (EN010166/APP/3.1).** The **Second Unilateral Undertaking** and Article 52 of the **Draft Development Consent Order** provide that if FCC grants the undertaker a suitable lease, licence or other appropriate land right or interest of the relevant saltmarsh, then the undertaker may deliver the enhanced management directly rather than paying a financial contribution;
- Financial contribution to any enhanced management that may be required at Deeside and Buckley Newt Sites SAC to address the small amount of additional nitrogen deposition due to the Proposed Development. This ~~will be~~is secured through the ~~**Draft Bilateral Deed (EN01016**~~[2]**First Unilateral Undertaking (EN010166/APP/9.~~~~25)~~[2]~~;~~42)** and Article 52 (Procedure for habitat mitigation) of the **Draft Development Consent Order (EN010166/APP/3.1)**; and
- Implementation of construction and operational lighting in accordance with principles set out within the **Lighting Strategy** (**EN010166/APP/7.22**).

[2] ~~As the Draft Bilateral Deed remains in draft at the end of the examination, the Applicant has entered into the **Unilateral Undertaking (EN010166/APP/9.42)** to secure this commitment.~~

1. Introduction

1.1 Overview

1.1.1 This Habitats Regulations Assessment (HRA) Stage 1 (Screening) Report, and Stage 2 (Appropriate Assessment; AA) Report (**EN010166/APP/6.12**) has been prepared on behalf of Uniper UK Limited (the Applicant). It forms part of the application (the Application) for a Development Consent Order (a DCO) from the Secretary of State (the 'SoS') for the Department for Energy Security and Net Zero (DESNZ) that has been submitted under Section 37 of the Planning Act 2008 (the 2008 Act; Ref 1).

1.1.2 The Applicant is seeking a DCO for the construction, operation and maintenance of a proposed low carbon Combined Cycle Gas Turbine (CCGT) Generating Plant fitted with Carbon Capture Plant (CCP) project (the Proposed Development) on land at, and in the vicinity of, the existing Connah's Quay Power Station (Kelsterton Road, Connah's Quay, Flintshire, CH6 5SJ), North Wales (the Proposed Development Site).

1.1.3 The Proposed Development would comprise up to two CCGT with CCP units (and supporting infrastructure) achieving a net electrical output capacity of more than 350 megawatts (MW; referred to as MWe for electrical output) and up to a likely maximum of 1,380 MWe (with CCP operational) onto the national electricity transmission network.

1.1.4 Through a carbon dioxide (CO_2) pipeline, comprising existing and new elements, the Proposed Development would make use of CO_2 transport and storage networks owned and operated by Liverpool Bay CCS Limited, currently under development as part of the HyNet Carbon Dioxide Pipeline project (referred to as the 'HyNet CO_2 Pipeline Project') that will transport CO_2 captured from existing and new industries in North Wales and North-West England, for offshore storage. The captured CO_2 will be permanently stored in depleted offshore gas reservoirs in Liverpool Bay.

1.1.5 For the purposes of the electrical connection, National Grid Electricity Transmission plc (NGET), which builds and maintains the electricity transmission networks, is responsible for the operation and maintenance of the existing 400 kV NGET Substation.

1.1.6 A description of the Proposed Development, including details of maximum parameters, is set out in **Chapter 4: The Proposed Development** (**EN010166/APP/6.2.4**). At this stage in the development, the design of the Proposed Development incorporates a necessary degree of flexibility to allow for ongoing design development.

1.1.7 The Proposed Development falls within the definition of a 'Nationally Significant Infrastructure Project' (NSIP) under Section 14(1)(a) and Sections 15(1) and (3A) of the 2008 Act, as it is for the construction of an onshore generating station in Wales that would have a generating capacity more than 350 MW electrical output (350 MWe). As such, a DCO application is required to authorise the Proposed Development in accordance with Section 31 of the 2008 Act.

1.2 The Applicant

1.2.1 The Applicant is a UK-based company, wholly owned by Uniper SE (Uniper) through Uniper Holding GmbH. Uniper is a European energy company with global reach and activities in more than 40 countries. With around 7,500 employees, the company makes an important contribution to security of supply in Europe, particularly in its core markets of Germany, the UK, Sweden, and the Netherlands. In the UK, Uniper owns and operates a flexible generation portfolio of power stations, a fast-cycle gas storage facility and two high pressure gas pipelines, from Theddlethorpe to Killingholme and from Blyborough to Cottam.

1.2.2 Uniper is committed to investing around €8 billion (~£6.9 billion) in growth and transformation projects by the early 2030s and aims to be carbon-neutral by 2040. To achieve this, the company is transforming its power plants and facilities and investing in flexible, dispatchable power generation units. Uniper is one of Europe's largest operators of hydropower plants and is helping further expand solar and wind power, which are essential for a more sustainable and secure future. Uniper is gradually adding renewable and low-carbon gases such as biomethane to its gas portfolio and is developing a hydrogen portfolio with the aim of a long-term transition. The company plans to offset any remaining CO2 emissions by high-quality CO2-offsets.

1.3 What is Carbon Capture and Storage?

1.3.1 Carbon capture and storage (CCS) is a key part of the process to reduce carbon emissions in energy generation. It involves the removal and capture of carbon dioxide (CO_2) from power plant emissions, transporting it away to be securely stored underground, often in aquifers or depleted oil and gas fields.

1.3.2 CCUS also refers to carbon capture and storage but with the 'U' referring to utilisation of the captured CO_2. Captured CO_2 can be used for a variety of industrial purposes, such as the production of synthetic fuel and low carbon building materials, or in the food and beverage industry.

1.4 The Proposed Development Site

1.4.1 The Proposed Development Site (the 'Order limits') is located approximately 0.6 kilometres (km) north-west of Connah's Quay in Flintshire, north-east Wales. The Main Development Area is centred approximately at national grid reference 327347, 371374, and, together with the Repurposed CO_2 Connection Corridor, Proposed CO_2 Connection Corridor, Water Connection Corridor, Electrical Connection Corridor, Construction and Indicative Enhancement Area (C&IEA), and ancillary works to access roads and minor assets, is wholly within the administrative area of Flintshire County Council (FCC).

1.4.2 The existing Connah's Quay Power Station is a four-unit combined CCG plant providing 1,380 MW of dispatchable power exported to the National Grid.

1.4.3 The Order limits encompass a total area of approximately 105.11 hectares (ha). 86.33 ha of the Order limits is focussed on the 'Construction and Operation Area', comprising the Main Development Area, construction areas and connection corridors necessary for the construction and operation of the Proposed Development shown in **Figure 3-1: Order Limits** (**EN010166/APP/6.3**). A further 18.78 ha of land included for the 'Accommodation Works Areas', comprising areas of works required to facilitate the movement and temporary storage of Abnormal Indivisible Loads (AIL) during construction of the Proposed Development.

1.4.4 The Order limits include the following:

- Construction and Operation Area, including:
  - Main Development Area;
  - Repurposed CO_2 Connection Corridor;
  - Proposed CO_2 Connection Corridor;
  - Water Connection Corridor;
  - Electrical Connection Corridor;
  - Surface Water Outfall Area;
  - Construction and Indicative Enhancement Area (C&IEA):
  - Main Development Area Access Works Area;
  - Access to C&IEA;
  - Alternative Access to Main Development Area;
  - Hardstanding Expansion at the Connah's Quay North Jetty
- Accommodation Works Areas, including:
  - A548 from Port of Mostyn to Greenfield;
  - Tir Glas Roundabout;
  - A548 through Flint to Chester Road Roundabout;
  - AIL Access;
  - Connah's Quay North; and
  - North Road to the A548.

1.5 The Development Consent Process

1.5.1 Because the Proposed Development constitutes an NSIP project, the Applicant is required to seek a DCO to construct and operate the Proposed Development, under Section 31 of the 2008 Act. Section 37 of the 2008 Act also governs the form, content and accompanying documents that are required as part of a DCO application. The requirements are implemented through the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (Ref 2) (the 'APFP Regulations') which state that a DCO application must be accompanied by an ES, where a development is considered to be 'Environmental Impact Assessment (EIA)

development' under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations'; Ref 3).

1.5.2 The Application for development consent for the Proposed Development has been submitted to the Planning Inspectorate (PINS) acting on behalf of the Secretary of State (SoS). Subject to the Application being accepted, PINS will then examine it and make a recommendation to the SoS, who will then decide whether to grant development consent. The acceptance, examination, recommendation and decision stages are subject to fixed timescales, and the decision is therefore anticipated to fall within Q4 2026.

1.6 The Purpose and Structure of this Document

1.6.1 The Conservation of Habitats and Species Regulations 2017 (Ref 4; hereafter referred to as the 'Habitats Regulations') is a key piece of legislation in the UK that governs the protection of habitats and species. Regulation 63 of the Habitats Regulations requires a 'Competent Authority', in this case the SoS (who is informed by recommendations of PINS as the appointed Examining Authority), to undertake an appropriate assessment of any plan or project (both alone and in-combination with other plans and projects) which is likely to have a significant effect on the features of a Habitats site unless the project is directly connected with the management of the site. In light of the conclusions of any such appropriate assessment, the Competent Authority may proceed with or consent to the plan or project only after having ascertained that it would not adversely affect the integrity of the Habitats site.

1.6.2 Whilst the various steps involved in the HRA process must be carried out by the Competent Authority, the Applicant may provide the information that the Competent Authority requires to undertake the HRA (also referred to as the Report to inform HRA). The information needed to conduct an HRA of the Proposed Development is contained within this report. It has been prepared with regard to best scientific knowledge and an examination of all of the potential impacts of the Proposed Development on Habitats sites.

1.6.3 An assessment of the implementation of the off-setting measures defined in the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)** to be delivered at Gronant Fields is provided separately in Appendix C of the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)**.

2. Legislative Framework

2.1 Introduction

2.1.1 As part of the HRA process for a development, it is necessary to consider whether the development is likely to have a 'significant' effect on areas that have been internationally designated for nature conservation purposes, i.e. 'Habitats sites' (formerly referred to as European sites). Habitats sites are protected under the Habitats Regulations (Ref 4).

2.1.2 The UK left the European Union (EU) on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 (termed the 'Withdrawal Act'). However, the most recent amendments to the 'Habitats Regulations' (i.e. the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (Ref 5)) make it clear that the need for HRA continues to apply. These Regulations make changes to the Habitats regime and terminology such as by introducing the term 'national site network' and 'Habitats sites'. As such, in line with current practice, this document uses the term Habitats sites to refer to all Habitats sites in line with current standard practice (comprising Special Areas of Conservation (SAC) and Special Protection Areas (SPA)) potentially affected by the Proposed Development. The Overarching National Policy Statement for Energy (EN-1) (Ref 6) requires proposed SACs and SPAs to be treated as Habitats sites along with Ramsar (wetlands of international importance) sites.

2.1.3 Regulation 63 of the Habitats Regulations requires a 'Competent Authority', in this case the SoS (who is informed by recommendations of PINS as the appointed Examining Authority), to undertake an AA of any plan or project (either alone or in-combination with other plans and projects) which is likely to have a significant effect on the features of a Habitats site unless the project is directly connected with the management of the site. In light of the conclusions of any AA, the Competent Authority may proceed with or consent to the plan or project only after having ascertained that it would not adversely affect the integrity of the Habitats site.

2.1.4 If adverse effects are identified that cannot be sufficiently mitigated, alternatives should be considered to avoid those effects. However, where no alternative solution exists and so an adverse effect remains, the Competent Authority may agree to development if it is satisfied that the proposed project is required for Imperative Reasons of Overriding Public Interest (IROPI) in accordance with Regulation 64 of the Habitats Regulations subject to compensation to preserve the overall coherence of the designated site.

2.1.5 All plans and projects should identify any possible effects early in the plan/project making process and then either alter the plan/project to avoid them or introduce mitigation measures to the point where no adverse effects remain. In the context of the Habitats Regulations, the Proposed Development constitutes a 'project'. Therefore, unless otherwise necessary, for example when considering in-combination effects, no further reference to plans is made.

2.1.6 In coming to its conclusion, the Competent Authority must consult with the Statutory Nature Conservation Body (in this case, Natural Resources Wales

in particular since most impacts apply to sites in Wales, but also Natural England as sites that cross the border with England (Dee Estuary SAC/SPA/Ramsar site and River Dee & Bala Lake SAC) are affected) and have regard to their comments. They may also consult the general public if considered appropriate.

2.2 Relevant Case Law

2.2.1 Although the UK is no longer part of the EU, a series of rulings of the Court of Justice of the European Union (CJEU) are still relevant. Relevant CJEU and UK High Court rulings and their implications for this HRA include those summarised in **Table 2-1** and this HRA is in character of these rulings.

Table 2-1: Case Law Relevant to the HRA of the Proposed Development

Case	Summary	Relevance to HRA in this case
People Over Wind and Sweetman v Coillte Teoranta (C-323/17)	Any conclusion of 'no likely significant effect' on a Habitats site at the screening stage must be made prior to any consideration of measures to avoid or reduce harm to the Habitats site. The determination of LSE at the screening stage should not constitute an attempt at detailed technical analyses. This should be conducted as part of the AA.	This ruling clarified that 'mitigation' (i.e., measures that are specifically introduced to avoid or reduce a harmful effect on a Habitats site that would otherwise arise) should not be taken into account when forming a view on LSE at the screening stage. Mitigation should instead only be considered at the AA stage unless it is an integral part of the development design or is required to comply with other legislation unrelated to Habitats sites.
Waddenzee (C-127/02)	AA must be conducted using best scientific knowledge, and the Competent Authority must be satisfied that there is no reasonable doubt as to the absence of adverse effects on the integrity of a Habitats site. Any effect from a plan or project on the	Adopting the precautionary principle, a 'likely' significant effect in this HRA is interpreted as one which is 'possible' and cannot be objectively ruled out. The test of significance of effects has been conducted with reference to the

Case	Summary	Relevance to HRA in this case
	conservation objectives of any Habitats site will be a significant effect.	conservation objectives of relevant Habitats sites.
Holohan and Others v An Bord Pleanála (C-461/17)	Consideration must be given during AA to: • effects on qualifying habitats and/or species of a SAC or SPA, even when occurring outside of the boundary of a Habitats site, if these are relevant to the site meeting its conservation objectives effects on non-qualifying habitats and/or species on which the qualifying habitats and/or species depend and which could result in adverse effects on the integrity of the Habitats site.	This relates to the concept of 'functionally-linked land' (i.e., areas outside of the boundary of a Habitats site which supports its qualifying feature(s)). In addition, consideration must be given to non-qualifying features upon which qualifying habitats and/or species rely. This HRA has taken the use of functionally linked lands into account, including in particular in relation to non-breeding birds, fish and otter *Luta lutra.*
T.C Briels and Others v Minister van Infrastructuur en Milieu (C-521/12)	Compensatory measures cannot be used to support a conclusion of no adverse effect on site integrity.	Compensation can only be considered at the IROPI stage of HRA and not during AA. Compensation must be delivered when AA concludes that there will be adverse effects on site integrity.
Langton, R (on the Application of) v Secretary of State for Environment, Food and Rural Affairs & Anor. (CO/2062/2020) (Ref 2.7)	Conditions on badger cull licences preventing badger culling near an SPA or at certain times of year were not classed as mitigation measures as described in the People over Wind ruling.	Restrictions on the timing of works which are part of the proponent's proposal can be taken into account in HRA Stage 1.

3. Assessment Methodology

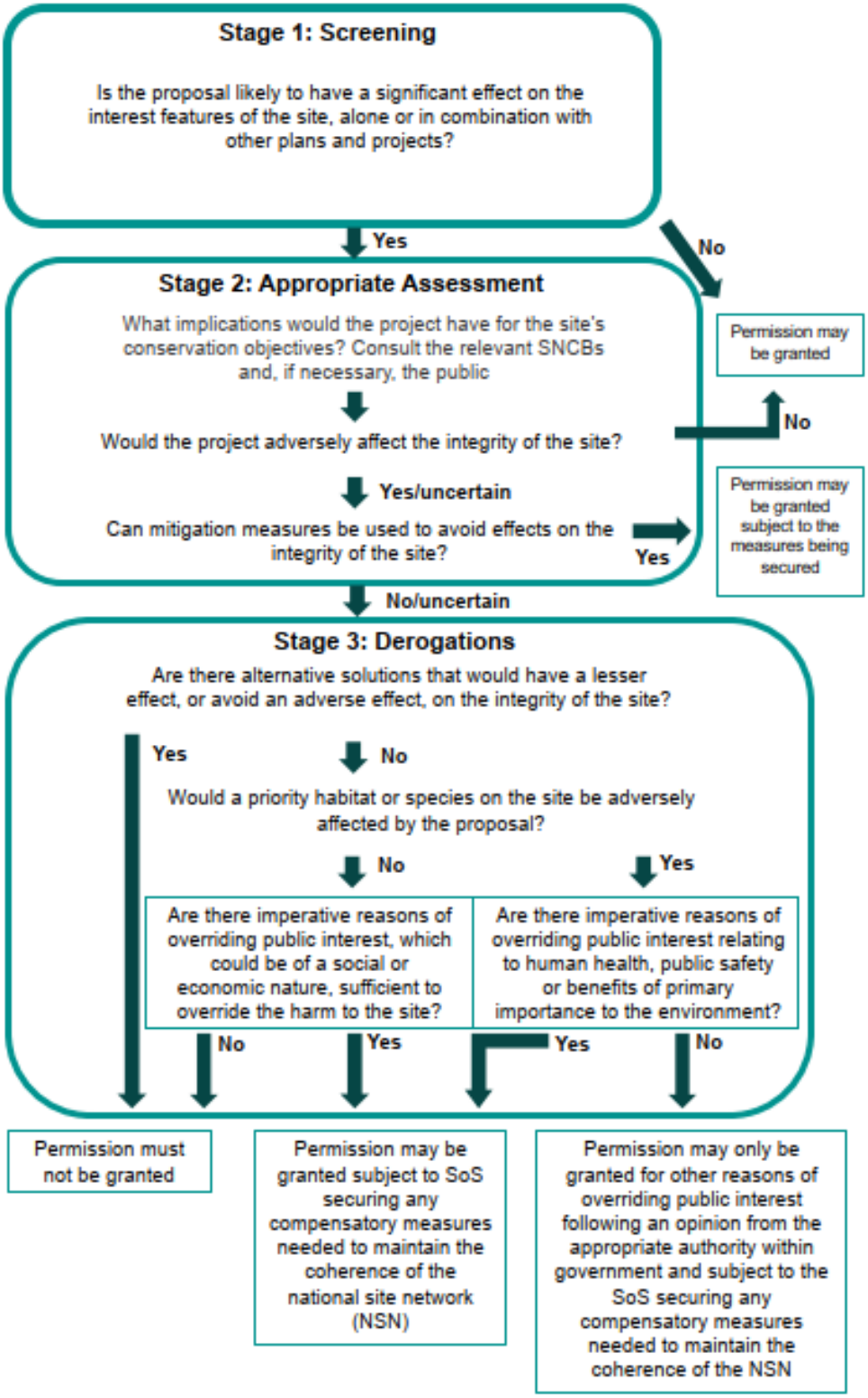
3.1 Introduction

3.1.1 This HRA has been undertaken with reference to the general European Commission (EC) guidance on HRA (Ref 7), general guidance on AA and the use of HRA published by the UK Government in July 2019 (Ref 8) and PINS' guidance on HRA (Ref 9).

3.1.2 Note that while **Plate 1** shows all the stages of the HRA process, this document only discusses Stage 1 and Stage 2 in further detail (see below).

3.1.3 Whilst the HRA decisions must be taken by the Competent Authority the information needed to support this decision-making must be provided by the Applicant. The information needed for the Competent Authority to establish whether there are any LSE or adverse effects on integrity from the Proposed Development is therefore provided in this HRA Report.

Plate 1: Three Stage Approach to HRA of Projects



3.2 HRA Stage 1 – Screening for Likely Significant Effects

3.2.1 The objective of the test of Likely Significant Effects (LSE) is to 'screen out' those aspects of a proposed project and / or the Habitats sites that can, without any detailed appraisal, be deemed unlikely to result in significant adverse effects, typically because there is no mechanism for an adverse interaction (i.e., a pathway) with Habitats sites. The remaining aspects are then taken forward to an AA. The HRA must consider the potential for effects 'in combination' with other plans and projects.

3.2.2 This HRA has been prepared in accordance with all principles set out in relevant case law and guidance relating to the Habitats Regulations (Ref 4), the Habitats Directive (Ref 10) and Birds Directive (Ref 11). This includes the ruling by the CJEU in the case of 'People Over Wind', Peter Sweetman v Coillte Teoranta (C-323/17) (Ref 12). This case held that: *"it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site"* (Paragraph 40). This establishes that mitigation measures intended to avoid or reduce the harmful effects of a project cannot be taken into account at the screening stage, but they can be taken into account in an AA. The effect of this is that the screening stage must be undertaken on a precautionary basis with no regard to mitigation measures. For the purposes of the Proposed Development, measures that are integral to the design and operation of the facility (e.g. stack height or treatment processes) are considered an embedded part of the design, rather than mitigation.

3.2.3 On 15 August 2018, in the case of Langton (Ref 13), the High Court ruled that conditions on badger cull licenses preventing badger culling near an SPA or at certain times of year should not be classed as mitigation measures as described in the People over Wind ruling. The judge ruled that these licence conditions were properly characterised as *"integral features of the project"* and could therefore be relied on for the purposes of habitats screening. His reasoning was that it would be *"contrary to common sense for Natural England to assume that culling would take place at times and places where the applicants did not propose to do so".* Therefore, restrictions on the timing of works which are part of the proponent's proposal can be taken into account in HRA Stage 1 – Screening for Likely Significant Effects.

3.2.4 The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 (Ref 14) and the Environmental Permitting (England and Wales) Regulations 2016 (Ref 15) make it an offence to pollute watercourses, irrespective of whether they are designated as Habitats sites or not. While the Proposed Development is in Wales the Dee Estuary is split between England and Wales and therefore English pollution regulations are also relevant. Therefore pollution control measures can also be considered at Stage 1.

3.3 HRA Stage 2 – Appropriate Assessment

3.3.1 If at the HRA Screening stage one cannot rule out the possibility of LSE on the qualifying features of any Habitats site then the second stage in the HRA process – AA – is required.

3.3.2 AA considers in more detail the possibility of the impacts of a project identified at the HRA Screening stage resulting in adverse effects on the integrity of the Habitats sites, in view of the Conservation Objectives of those sites. It introduces to the assessment mitigation measures designed specifically to avoid or reduce adverse effects on Habitats sites – the HRA Screening stage must be carried out without consideration of mitigation measures.

3.4 In Combination Scope

3.4.1 It is a requirement of the Habitats Regulations that the impacts and effects of any proposed development being assessed are not only considered in isolation but also in combination with other plans and projects that may also have effects on the Habitats site(s) in question.

3.4.2 When undertaking this part of the assessment it is essential to consider the principal intention behind the legislation, i.e., to ensure that those projects or plans (which in themselves may have minor impacts) are not simply dismissed on that basis but are evaluated for any cumulative contribution they may make to an overall significant effect. In practice, in-combination assessment is therefore of greatest relevance when a proposed development would otherwise be screened out because its individual contribution is inconsequential.

3.4.3 The in-combination assessment is discussed further in Chapter 8 of this HRA.

3.5 The Rochdale Envelope

3.5.1 In July 2018, PINS published Advice Note Nine: Rochdale Envelope (Ref 16) explaining how the principles of the Rochdale Envelope should be used in the EIA of NSIPs.

3.5.2 The Rochdale Envelope[3] is applicable where some of the details of a project have not been confirmed when an application is submitted, and flexibility is sought to address uncertainty. Notwithstanding this, all significant potential effects of a project must be properly addressed.

3.5.3 It encompasses three key principles:

- the assessment should use a cautious worst-case approach;
- the level of information assessed should be sufficient to enable the LSE of a project to be assessed; and

[3] The Rochdale Envelope arises from two cases: R. v Rochdale MBC ex parte Milne (No.1) and R. v Rochdale MBC ex parte Tew [1999], which are cases that dealt with outline planning applications for a proposed business park in Rochdale.

- the allowance for flexibility should not be abused to provide inadequate descriptions of projects.

3.5.4 This HRA has given due consideration to the Rochdale Envelope in the screening process for LSE. The worst-case (i.e., the potentially most impactful) construction, decommissioning and operational scenarios have been assessed in relation to impact pathways.

4. Data Gathering

4.1 Sources of Data

4.1.1 Information on relevant Habitats sites, including qualifying features and the Conservation Objectives for each site, was obtained from the Natural Resources Wales website (Ref 17) and the Joint Nature Conservation Committee website (Ref 18). Consultation on the Environmental Statement and HRA with Natural Resources Wales has been undertaken throughout 2024 and 2025. A log of this correspondence is presented in Appendix F.

4.2 Desk Study and Field Surveys

4.2.1 A desk study was carried out to identify Habitats sites that may be relevant to the Proposed Development. The desk study was carried out using the data sources detailed in **Table 4-1**.

Table 4-1: Desk Study Data Sources

Data Source	Data Obtained
Multi-Agency Geographic Information for the Countryside (MAGIC) website https://magic.defra.gov.uk/	Locations of and information on international and national statutory designations relevant to the Proposed Development.
Joint Nature Conservation Committee website https://jncc.gov.uk/	
Natural England website https://www.gov.uk/government/organisations/natural-england	
Ordnance Survey (OS) 1:25,000 maps	
Bing Maps aerial imagery https://www.bing.com/maps	Habitats and habitat connectivity and potential presence of important ornithological features.
Natural Resources Wales (NRW) Protected Areas of Land and Sea https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en	
Aspect Ecology Reports: Connah's Quay Power Station: Northern Land Parcel. Phase 1 Habitat and Faunal Surveys Connah's Quay Power Station: Southern Land Parcel. Phase 1 Habitat and Faunal Survey	Habitats and habitat connectivity and potential presence of important ornithological features.

Data Source	Data Obtained
Connah's Quay Power Station: Northern Land Parcel. Breeding, Passage and Wintering Bird Surveys Connah's Quay Power Station: Southern Land Parcel. Breeding, Passage and Wintering Bird Surveys	Potential for protected species i.e., otter.
Deeside Naturalists Society	January 2013 to December 2023 – Monthly wetland bird survey data.

4.3 Field Surveys

4.3.1 The scope of works for habitat and protected species surveys was determined through the Preliminary Environmental Assessment (PEA) Report as described in Annex A of **Appendix 11-C: Botanical Technical Appendix** (**EN010166/APP/6.4**) of the ES and engagement with FCC (as described in Section 11.2 of **Chapter 11: Terrestrial and Aquatic** (**EN010166/APP/6.2.11**)). The PEA Report identified potential ecological and environmental constraints for the Proposed Development early on in its design phase to inform planning and decision-making. and **Appendix 5-B: Environmental Screening of the Hardstanding Expansion at Connah's Quay North Jetty** (**EN010166/APP/6.4), Annex B – Ecological Walkover** provides the findings ecological walkover survey of the Hardstanding Expansion at Connah's Quay North Jetty.

4.3.2 The purpose of the field surveys was to provide information on the presence of notable habitats and protected species within the vicinity of the Proposed Development Site. This information has been used to inform this HRA Report. The scope of the field surveys completed to inform this HRA is summarised in **Table 4-2.** Note that bird survey data and WeBS data for the Development Site and Gronant Field mitigation area are reported in the Outline Curlew Implementation and Monitoring Plan.

Table 4-2: Summary of ecological field surveys relevant to this HRA

Ecological Survey	Survey area / Scope	Date
UK Habitat Classification (UKHab) survey, and habitat condition assessment to inform NBB	Terrestrial habitats surveyed within the Main Development Area, Construction and Indicative Enhancement Area, plus up to 50 m (included desk-based assessment for areas not accessible i.e. Proposed CO_2 Connection Corridor and Repurposed CO_2 Connection Corridor).	Completed June 2024 to October 2024

Ecological Survey	Survey area / Scope	Date
UKHab survey, and habitat condition assessment to inform NBB	Hardstanding Expansion at Connah's Quay North Jetty	Completed November 2025
National Vegetation Classification (NVC) survey	Adjacent saltmarsh within the Water Connection Corridor.	July 2024
Wetland and breeding bird surveys	All land within the Proposed Development Site (specifically the Main Development Area incl. Water Connection Corridor, C&IEA, Proposed CO_2 Connection Corridor and Repurposed CO_2 Connection Corridor) and estuary / saltmarsh habitats up to 1.5 km (as visibility allows).	November 2023 to October 2024
Otter surveys	The Construction and Operation Area, focused on the River Dee and adjacent habitat extending up to 200 m up and downstream.	Completed June to September 2024

5. Establishing the Zone of Influence

5.1 Approach

5.1.1 There is no pre-defined guidance on the physical scope of an HRA in all circumstances. When seeking to identify relevant Habitats sites, consideration was therefore given primarily to potential impact pathways and the source-pathway-receptor approach, rather than adopting a purely 'zones'-based approach. The source-pathway-receptor model is a standard tool in environmental assessment. In order for an impact to occur, all three elements of this mechanism must be in place.

5.1.2 The absence or removal of one of the elements of the mechanism means there is no possibility for an effect to occur. Furthermore, even where an impact is predicted to occur, it may not result in significant effects. It is also important to distinguish between an 'impact' and an 'effect'. An impact is defined as an action resulting in changes to an ecological feature, while an effect is the outcome to an ecological feature arising from an impact (Ref 17). For example, an impact may be the disturbance of a roost of wintering waders as a result of construction activities; the effect would be how the population or conservation status of the species disturbed by the works changes as a consequence.

5.1.3 The likely zone of impact (also referred to as the likely 'zone of influence') (ZoI) of a project is the geographic extent over which ecological effects are likely to occur. The ZoI of a project will vary depending on the specifics of a particular proposal and must be determined on a case-by-case basis with reference to a variety of criteria, including:

- the nature, size / scale and location of the plan or project;
- the connectivity between the plan or project and Habitats sites, for example through hydrological connections or because of the natural movement of qualifying species;
- the sensitivity of ecological features under consideration; and
- the potential for in-combination effects.

5.1.4 There is no geographical limit beyond which Habitats sites need not be considered by HRA of a project.

5.1.5 The process of determining which (if any) Habitats sites are within the ZoI of the Proposed Development was therefore a progressive appraisal of the potential for each impact source which could arise from its construction, operation and decommissioning to affect the qualifying features of such sites.

Impact Sources

5.1.6 Applying the source-pathway-receptor approach, the potential impacts that could arise from the Proposed Development were considered. The broad categories of impact sources which could arise are set out in **Table 5-1**.

Table 5-1: Impact pathways that could arise from the Proposed Development

Impact Category	Brief Description
Direct loss of / damage to qualifying habitats or habitats of qualifying species	The direct loss of habitat from within the boundary of a Habitats site. This may include the loss of a habitat type which is itself a qualifying feature of a site, or the loss of habitat that is used by qualifying species for commuting, foraging and/or sheltering, which would pose implications for the site conservation objectives.
Loss of functionally-linked land	The loss of habitat which is outside of the boundary of a Habitats site, but which is critical to its functioning. For example, the loss of habitat outside of an SPA which is used for foraging purposes by qualifying bird species which nest within the SPA.
Waterborne pollution (water quality)	Including, for example, suspended sediment or run-off of water containing other pollutants such as hydrocarbons or chemicals. Effluent discharges would also be included in this category.
Atmospheric pollution	This encompasses both dust (i.e., particles of sufficiently large size to coat vegetation and interfere with photosynthesis) and atmospheric pollutants that can be toxic to vegetation or contribute to nitrogen deposition and thus eutrophication. The latter mainly constitutes oxides of nitrogen (NOx) associated with combustion such as vehicle exhausts, and ammonia (NH_3) associated particularly with industrial processes and agriculture, but also with vehicle exhausts.
Hydrological changes (water quantity, level and flow)	Impacts which alter the hydrological conditions either within a Habitats site or in an area used by the qualifying features of a Habitats site. For example, reduced flows in a watercourse due to impoundment, or changes to groundwater flows or volumes due to abstraction. These changes can have multiple effects on habitats and species.
Noise and Visual disturbance of qualifying species	This could be physical disturbance, for example, due to the movement of vehicles in proximity to qualifying species, or due to noise and/or vibration. The latter may occur at greater distances. Disturbance could arise either during the construction or operational phase of a development.
Barriers and/or disturbance displacement	Barriers to the movement of qualifying species, which can either be physical (for example, a dam in a river) or physiological (for example, the attraction of migratory fish towards the outflow of a hydro-electric scheme). Disturbance displacement may

Impact Category	Brief Description
	also occur due to the presence of new infrastructure that interrupt open vistas preferred by some qualifying bird species.
Injury or mortality	The direct injury or mortality of a qualifying species, either during the construction or operation of a new development. For example, birds may suffer injury or mortality when colliding with new infrastructure. For the purposes of the Proposed Development, the only possibility for injury of Habitats site fauna relates to construction noise related impacts on fish associated with Dee Estuary SAC and River Dee and Bala Lake SAC. Therefore, this is covered in the sections on noise.
Introduction of invasive non-native species	Invasive non-native species can have detrimental impacts on native species and habitats. Their spread can occur during construction and operation of a development, and via multiple pathways (for example via watercourses or on the treads of construction machinery).

Impact Pathways

5.1.7 Briefly defined, impact pathways are routes by which the implementation of a project or plan can lead to an effect upon a Habitats site. In order for an impact to have an effect on a qualifying feature of a Habitats site, a pathway between the impact source and that feature must exist. An example of this would be visual and noise disturbance arising from the construction work or operational phase associated with a project. If there are sensitive ecological receptors within a nearby Habitats site (e.g., non-breeding overwintering birds), this could alter their foraging and roosting behaviour and potentially affect the site's integrity. For some impact pathways (notably air pollution) there is guidance that sets out distance-based zones required for assessment. These are discussed below where relevant.

5.1.8 For each of the types of impact which could arise (as set out in **Table 5-1**) the maximum distance at which an effect could occur was assessed based on the pathway(s) by which such impact(s) could reach a Habitats site or its qualifying feature(s). These 'impact pathway buffers' were based on published guidance or best available research, wherever possible. The adopted impact pathway buffers are set out in **Table 5-2**.

Table 5-2: Impact pathway buffer distance

Impact Category	Buffer Distance
Direct loss of / damage to qualifying habitats or habitats of qualifying species	Habitats within the Order limits.
Loss of functionally-linked land	Depends on the species in question.

Impact Category	Buffer Distance
	NatureScot's (formerly Scottish Natural Heritage (SNH)) guidance on 'Assessing Connectivity with Special Protection Areas (SPAs)' (Ref 20) suggest that certain species of geese may forage up to 15-20 km from the boundary of SPAs for which they are qualifying features (e.g. for species such as pink-footed goose, lapwing and golden plover). This is likely to be the largest distance at which functionally-linked land may be located inland from a Habitats site. More generally, functionally-linked land for most species is likely to be within 2 km from the Habitats site boundary according to Natural England guidance.
Waterborne pollution	No buffer used – relies on there being a hydrological connection to a Habitats site according to the source-pathway-receptor model.
Airborne pollution	50 m for dust generation (Ref 21) and 200 m for emissions from road traffic (Ref 22). Up to 15 km from the Main Development Area for stack emissions.
Hydrological changes	No buffer used – relies on there being a hydrological connection to a Habitats site according to the source-pathway-receptor model.
Noise and visual disturbance of qualifying species	Based on the published guidance referenced below, the following distances were used when considering how far construction, operational and decommissioning activities may cause visual disturbance to qualifying species: • non-breeding waterbirds – the Waterbird Disturbance Mitigation Toolkit (Ref 23) provides species-specific information on the sensitivity of several bird species which are qualifying features of SPAs. However, it suggests that, in general, disturbance of non-breeding waterbirds can occur up to distances of up to 500 m from construction works; and • breeding birds – 1 km, this being the maximum distance at which Goodship and Furness (2022) (Ref 24) consider

Impact Category	Buffer Distance
	disturbance could occur on the most sensitive species for which SPAs are designated. These are both considered to be very precautionary distances. Regarding noise disturbance, a precautionary 60dB LAmax threshold has been agreed on other DCOs where baseline levels do not already exceed this threshold[4].
Barriers and/or disturbance displacement	Not possible to set buffer. Depends on movements of species, which may be very long-distance for those which migrate.
Injury or mortality	Injury or mortality only likely to occur within Habitats site boundary or when species are using functionally-linked land. Therefore, refer to criteria for 'Direct loss of habitat' and 'Loss of functionally-linked land'. For the purposes of the Proposed Development, the only possibility for injury of Habitats site fauna relates to construction noise related impacts on fish associated with Dee Estuary SAC and River Dee and Bala Lake SAC. Therefore, this is covered in the sections on noise.
Introduction of invasive non-native species	Generally within 100 m, except where hydrological connectivity could result in spread further afield.

5.1.9 Impact categories associated with the implementation of the off-setting measures defined in the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)** to be delivered at Gronant Fields are outlined in Appendix C of the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)**.

5.2 Relevant Habitats Sites

5.2.1 To identify which Habitats sites should be scoped into the HRA, the impact pathway buffers set out in **Table 5-2** and professional judgement were used. It can be seen from **Table 5-2** that the impacts which could occur over the largest distance (excluding instances where there is a hydrological connection and those where no buffer can be set) are the loss of functionally-linked land used by foraging non-breeding goose species (up to 20 km). **Table 6** shows the distance of each Habitats site from the Proposed Development.

[4] For example, East Yorkshire Solar Farm (EN010143), Sea Link (EN020026) and Fenwick Solar Farm (EN010152).

5.2.2 Guidance published by the Environment Agency (there is no formal published Natural Resources Wales guidance on the issue) recommends that for large power generation developments greater than 50 MW (Ref 25), a radius search of 15 km should be used as the screening distance for air emissions when identifying relevant Habitats sites which may be affected by the development. The same approach is used by Natural Resources Wales.

5.2.3 Based on the impact pathway buffers set out in **Table 5-2**, guidance and professional judgement, a search radius of 15 km from the Main Development Area (the source of operational air emissions) has been used for this HRA. Although the Order limits extend beyond the Construction and Operation Area, the Accommodation Works Areas are related to highways improvements to support abnormal loads for example, the temporary removal of street furniture. The assessment of air quality impacts as a result of construction traffic is determined by the Active Road Network (ARN) and distance from Habitats sites. This 15 km distance also allows for the identification of Habitats sites where there is a pathway by which hydrological impact might occur through river or stream connectivity and encompasses the Proposed Development Site as a whole. It is considered that any potential for an effect at greater distances is likely to be negligible and below the level of detection, due to the size of any dilution factors relative to the likely scale of any pollution event at source.

5.2.4 In order to assess air quality impacts that may arise from the Proposed Development, all Habitats sites within 15 km of the Main Development Area were identified using Geographic Information System data from datasets downloaded from the JNCC and the MAGIC website.

5.2.5 The following Habitats sites lie within 15 km Main Development Area of the, and are shown in **Appendix A** of this report:

- Dee Estuary / Aber Dyfrdwy SAC (UK0030131);
- Dee Estuary / Aber Dyfrdwy SPA (UK9013011);
- Dee Estuary / Aber Dyfrdwy Ramsar (UK11082);
- River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC (UK0030252);
- Deeside and Buckley Newt Sites SAC (UK0030132);
- Halkyn Mountain / Mynydd Helygain SAC (UK0030163);
- Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC (UK0030078);
- Mersey Estuary SPA (UK9005131); and
- Mersey Estuary Ramsar (UK11041).

5.2.6 No future Habitats sites (potential SPAs or candidate SACs) are relevant to the Proposed Development. Additionally, a radius of 30 km has been used for any Habitats site for which bats are a qualifying feature, with regard to potential disruption of commuting activities through habitat severance. This is based on precautionary guidance originally developed for National Highways in England (Ref 24); there is no Welsh equivalent. However, it can be confirmed in this case that there are no Habitats sites designated for bats within 30 km of the Construction and Operation Area.

5.2.7 A summary of the qualifying features for each Habitats site taken through to screening, and their distance from the Construction and Operation Area, is provided in **Table C-1 Appendix C**.

5.2.8 The Conservation Objectives and current threats / pressures to site integrity for each Habitats site are summarised in **Table C-1, Appendix C**.

5.2.9 With cognisance of the impact sources described above, the ZoI for the Construction and Operation Area, and all of the Habitats sites within it, was determined. This is set out in **Table 5-2**.

5.2.10 It should be noted that not all impacts will have pathways for effects on the qualifying features of all Habitats sites within the ZoI. Consequently, some sites may be within the ZoI for certain impacts, but not for others.

Table 5-3: Relevant Habitats Sites and Potential Impact Pathways

Habitats Site	Distance from the Proposed Development (at closest point)	Potential Impact Pathway
Dee Estuary / Aber Dyfrdwy SAC	Within	• direct loss of / damage to qualifying habitat • noise and visual disturbance – fish[5] • water quality • water quantity, level and flow • atmospheric pollution (and dust deposition) • introduction of INNS
Dee Estuary / Aber Dyfrdwy SPA / Ramsar	Within	• noise and visual disturbance • direct loss of / damage to qualifying habitat • loss of functionally linked land • water quality • water quantity, level and flow • atmospheric pollution (and dust deposition) • barriers to movement - fish • introduction of INNS

[5] While noise and visual disturbance to qualifying fish is considered, the Proposed Development will not result in the permanent loss of freshwater and bankside habitat. Therefore, permanent habitat loss in relation to this qualifying feature is not considered.

Habitats Site	Distance from the Proposed Development (at closest point)	Potential Impact Pathway
River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC	Located approximately 0.076 km north-east of the Order limits and 0.52 km east of the Main Development Area.	• noise and visual disturbance – fish and otter[6] • water quality • water quantity, level and flow • atmospheric pollution (and dust deposition) • temporary loss of/damage to qualifying habitat • barriers to movement • introduction of INNS
Deeside and Buckley Newt Sites SAC	Located approximately 1.5 km south of the Order limits and 2.1 km south of the Main Development Area.	• atmospheric pollution (and dust deposition) • loss of functionally linked land • barriers to movement
Halkyn Mountain / Mynydd Helygain SAC	3.6 km west of the Order limits and 5.3 km west of the Main Development Area.	• atmospheric pollution (and dust deposition) • loss of functionally linked land • barriers to movement
Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC	Located approximately 6.8 km south-west of the Order limits and 8.5 km south-west of the Main Development Area.	• atmospheric pollution (and dust deposition)
Mersey Estuary SPA / Ramsar	Located approximately 12.7 km north-east of the Order limits and 13.0 km north-east of the Main Development Area.	• atmospheric pollution

5.2.11 PINS advice on Habitats Regulations Assessments requires an evaluation of the potential for the Proposed Development to require other consents which could also require HRA by different competent authorities, and a statement to identify whether significant effects are considered likely regarding Habitats

[6] While noise and visual disturbance to qualifying fish and otter is considered, the Proposed Development will not result in the permanent loss of freshwater and bankside habitat. Therefore, permanent habitat loss in relation to these qualifying features is not considered.

Sites in devolved administrations or European Economic Area (EEA) States. It is confirmed that the Order limits, and identified ZoI, do not overlap with other EEA States. The air quality impact zone in particular crosses the Welsh and English border as do two of the Habitats sites in this report (Dee Estuary SAC/SPA/Ramsar and River Dee & Bala Lake SAC).

5.2.12 The Proposed Development will require a Marine Licence and this will require an additional HRA to be carried out in order to support the application.

5.2.13 An assessment of the implementation of the off-setting measures defined in the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)** to be delivered at Gronant Fields is provided separately in Appendix C of the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)**.

6. Background to Impact Pathways

6.1 Introduction

6.1.1 This section provides an introduction to the science behind the impact pathways that are covered in the HRA report. **Appendix B** of this HRA provides a table presenting the impact pathways assessment for each Habitats site as required by PINS guidance.

6.1.2 An assessment of the implementation of the off-setting measures defined in the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)** to be delivered at Gronant Fields is provided separately in Appendix C of the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)**.

6.2 Direct Loss of / Damage to Qualifying Habitat

6.2.1 The purpose of the Habitats Regulations is to protect Habitats sites, including some of the country's most important habitats and species.

6.2.2 Generally, the temporary (or permanent) loss of designated habitat must be avoided or mitigated, provided that the habitat in question is itself a designated feature or critical for the Habitats site to meet its Conservation Objectives. However, temporary habitat loss within designated site boundaries is permissible where this solely encompasses habitat that is part of the 'site fabric' (Ref 27).

6.2.3 Any permanent, irreversible, habitat loss from a Habitats site that involves the loss of qualifying features will be adverse, although to affect the integrity of the Habitats site (the coherence of its structure and function) the loss must be greater than trivial i.e. sufficient to materially impair the achievement of the Habitats site's Conservation Objectives when considered in combination with other plans and projects.

6.2.4 Various developments can result in the loss of habitat in Habitats sites, either temporarily or permanently. Temporary habitat loss (e.g., such as that potentially resulting from usage of temporary access tracks and vegetation clearance for visibility splays) is typically reversible. Furthermore, there is the potential for deploying mitigation measures to avoid adverse effects on site integrity. In contrast, the permanent loss of designated habitat would result in a reduction of coverage of a potentially very rare ecosystem, with potential knock-on impacts on dependent qualifying species.

6.2.5 Plans or projects that result in the loss of land from a Habitats site that has an adverse effect on integrity can be approved in certain situations (Ref 27), even if the loss is sufficient to result in adverse effects on site integrity, if three tests are met:

- no feasible alternative solutions to the plan or project exist that are less damaging;
- there are IROPI for the plan or project; and

- compensatory measures are secured to ensure that the overall coherence of the Habitats site network (the National Site Network) is maintained.

6.2.6 Overall, the following Habitats sites within the ZoI of the Proposed Development are sensitive to the direct temporary loss of habitat and close enough to potentially be affected (**these sites are taken forward into the proceeding chapters**):

- **Dee Estuary / Aber Dyfrdwy SAC**;
- **Dee Estuary / Aber Dyfrdwy SPA / Ramsar**; and
- **River Dee & Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC.**

6.2.7 This pathway is screened out for Deeside and Buckley Newt Sites SAC, Halkyn Mountain / Mynydd Helygain SAC, Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC and Mersey Estuary SPA/Ramsar due to the distances from the Construction and Operation Area, being 1.5 km, 3.6 km, 6.8 km and 12.7 km respectively. **As there is no linking pathway, there can be no LSEs on these Habitats sites from direct habitat loss, either alone or in-combination.**

6.3 Noise and Visual Disturbance

6.3.1 Construction, operational and decommissioning activities have the potential to cause disturbance of qualifying animal species. Disturbance can be caused visually (for example by the presence of personnel and plant, or as a result of artificial illumination of habitats) and/or by the noise and vibration generated by works. This could impact qualifying species when inside the boundary of a Habitats site, or outside of a Habitats site when using functionally-linked land. For example, noise and visual disturbance arising from construction or decommissioning may result in temporary behavioural changes in otter, such as disturbance in holts and displacement from specific stretches of the river. Furthermore, disturbance from construction or decommissioning may result in temporary behavioural changes in qualifying birds (e.g., interruption or cessation foraging, minor and major flight responses).

6.3.2 The potential for disturbance to be caused will depend on the location and nature of construction / operational / decommissioning activities, the distribution of the qualifying species, and the sensitivity of the species to noise and visual disturbance from human activities. This may need to be determined through detailed study, including field survey, to establish the distribution of the relevant species. However, where disturbance is caused, it can have multiple adverse effects on species, including increased energy expenditure, reduced feeding time, behavioural changes, and displacement.

6.3.3 Both noise and visual stimuli may elicit disturbance responses, potentially affecting the fitness and survival of qualifying birds. Noise is a complex disturbance parameter requiring the consideration of multiple factors, including its non-linear scale, non-additive effect and source-receptor distance. Evidence such as the Waterbird Disturbance Mitigation Toolkit suggests that a high level of noise disturbance constitutes a sudden noise event of over 60dB (decibels) or prolonged noise of over 72dB. Bird

responses to high noise levels include major flight or the cessation of feeding, both of which might affect the survival of birds, particularly if other stressors are also present (e.g., cold weather, food scarcity).

6.3.4 Generally, research has shown that above noise levels of 84dB waterfowl show a flight response, while at levels below 55dB there is no effect on their behaviour (Ref 28). Therefore, these two thresholds are considered useful as defining two extremes.

6.3.5 Natural Resources Wales in discussion over noise disturbance of ornithology receptors for the Proposed Development on 08/05/25 agreed to the use of the Waterbird Disturbance Mitigation Toolkit (~~TIDE toolbox - TIDE tools~~TIDE toolbox - TIDE tools) which generally uses a 70 dB threshold for significant disturbance. However, it is known that Natural England does not subscribe to a 70dB threshold and therefore a more precautionary approach has been taken given the cross-boundary nature of the Dee Estuary. The following parameters for the assessment of noise disturbance impacts have been identified in discussions with Natural England on other DCO projects[7]:

- 55dB is a reasonable 'no effect' level i.e. birds don't react to sounds quieter than this;
- a 3dB change is the minimum change that is considered perceptible as a change (which would raise the acceptable noise threshold to 58dB); and
- there is a difference between a change in noise being perceptible and being disturbing; it was therefore agreed with Natural England on the other projects referenced that 5dB above 55dB (60dB) was a suitably precautionary threshold for disturbance, unless baseline noise levels already exceed 60dB.

6.3.6 Generally, visual stimuli are considered to have a higher disturbance potential than noise stimuli as, in most instances, visual stimuli will elicit a disturbance response at much greater distances than noise (Ref 29). For example, a flight response is triggered in most bird species when they are approached to within 150 m across a mudflat.

6.3.7 Visual disturbance can be caused by workers moving across open habitats undertaking sudden movements and using large machinery. Several species are particularly sensitive to visual disturbance including curlew (taking flight at 275 m), redshank (at 250 m), shelduck (at 199 m) and bar-tailed godwit (at 163 m) (Ref 30). As a general rule, a displacement distance of 300 m from the disturbing activity has been used in this HRA to indicate the ZoI within which possible disturbance of SPA birds may arise.

6.3.8 Fish can be impacted by underwater sound which can either be impulsive or continuous in nature and can cause a variety of impacts to fish, ranging from severe physical injury (e.g., rupture of the swim bladder), physical damage to the auditory system (e.g., temporary shifts in hearing thresholds) to behavioural changes, such as disruption of migratory behaviours.

6.3.9 Fish that rely on acoustic communication may be the most obvious to be affected by anthropogenic noise (Ref 31, Ref 32). However, all fish have the

[7] Discussions over noise disturbance to SPA/Ramsar took place over several projects, including the Sea Link and Viking CCS Pipeline developments.

capability to hear low-frequency sounds (< 500 Hz) and, consequently, can be disturbed by noisy human activities (Ref 34).

6.3.10 General effects of noise on aquatic life have been reviewed extensively (Ref 35). These reviews highlight a critical need for data on population level effects, including reproduction, as successful reproduction is essential for population viability. For many fish species, the spawning period may be highly sensitive to impacts from noise if individuals gather in dense, localised spawning aggregations (Ref 36). A disturbance during spawning may thus hamper a much larger fraction of the population compared to other periods of the year. Additionally, during this critical period, fish may also be most vulnerable to external stressors (Ref 37), because fish are often in their poorest body condition during the spawning period (Ref 38, Ref 39).

6.3.11 Based on the published guidance referenced below, the following distances from the source of disturbance were used when considering how far construction, operational and decommissioning activities may disturb qualifying species:

- otter – 200 m in accordance with SNH (undated(b)) (Ref 40) which suggests this distance for otter breeding sites, reduced to 30 m for other resting sites not used for breeding purposes; and
- waterbirds, waterfowl and waders - In general, disturbance of non-breeding waterbirds can occur up to distances of around 300 m from the disturbing activity.

6.3.12 Overall, the available baseline information suggests that the following Habitats sites within the ZoI of the Proposed Development are sensitive to potential noise and visual disturbance (**these sites are taken forward into the proceeding chapters**):

- **Dee Estuary / Aber Dyfrdwy SAC**;
- **Dee Estuary / Aber Dyfrdwy SPA / Ramsar**; and
- **River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC**.

6.3.13 This pathway is screened out for Deeside and Buckley Newt Sites SAC, Halkyn Mountain / Mynydd Helygain SAC and Mersey Estuary SPA/Ramsar due to the distance from the Proposed Development Site (1.5 km, 3.6 km and 12.7 km respectively), with no unobstructed suitable habitat for great crested newts being within 250 m of the Habitats site and also being designated for non-mobile features. This pathway is screened out for Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC as it is designated for non-mobile features. **As there are no linking pathways there can be no LSE, either alone or in-combination.**

6.4 Water Quality

6.4.1 Construction, operational (including maintenance) and decommissioning activities have the potential to pollute watercourses and/or waterbodies. These could themselves represent qualifying features of a Habitats site, be within a Habitats site and support the qualifying features of that site or be outside of a Habitats site but be functionally-linked to such a site if used by the qualifying animals.

6.4.2 The quality of the water that feeds a Habitats site is an important determinant of the condition of the habitats and species it supports. Poor water quality can have a range of environmental impacts:

- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour;
- Construction activities that involve ground excavations and the stripping of topsoil are associated with a high risk of sediment release in surface runoff. Excessive sedimentation can smother aquatic habitats and plants, increase turbidity and accelerate eutrophication;
- Eutrophication, the enrichment of water with nutrients, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In freshwater ecosystems, plant growth is primarily determined by phosphorus (P) concentrations, which are determined by a wide range of sources, including treated sewage effluent from Wastewater Treatment Works and urban surfaces such as roads; and
- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

6.4.3 Under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref 41) the government is legally required to maintain and/or improve the ecological and chemical status of the water environment, which includes rivers, lakes, wetlands, groundwater, estuaries and coastal waters. There should be no deterioration or prevention of future improvement in the status of waterbodies. Water Framework Directive (WFD) assessments are directly linked to HRA in that consideration must also be given when undertaking a WFD assessment to the Conservation Objectives of designated sites, including SACs, SPAs and Ramsar sites. A WFD assessment has been prepared for the Proposed Development. This is presented within **Appendix 13-B: Water Framework Directive Report (EN010166/APP/6.4)**.

6.4.4 The magnitude of water quality impacts primarily depends on the appropriate treatment of process water and/or surface runoff. Furthermore, the severity of potential construction and operational water quality impacts is partially determined by the distance between development sites and ecological receptor sites. In this instance, the Proposed Development adjoins the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and lies at a relatively short distance from the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC, implying that there is little buffer distance for dilution or attenuation processes to take place.

6.4.5 Overall, the available baseline information suggests that the following Habitats sites within the ZoI of the Proposed Development are sensitive to

potential water quality impacts (**these sites are taken forward into the proceeding chapters)**:

- **Dee Estuary / Aber Dyfrdwy SAC**;
- **Dee Estuary / Aber Dyfrdwy SPA / Ramsar**; and
- **River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC**.

6.4.6 This pathway is screened out for Deeside and Buckley Newt Sites SAC, Halkyn Mountain / Mynydd Helygain SAC, Mersey Estuary SPA/Ramsar, and Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC as there is no hydrological connection between these Habitats sites and the Proposed Development Site. **As there is no linking pathway there is no potential for LSE, either alone or in-combination.**

6.5 Water Quantity, Level and Flow

6.5.1 The water level, its flow rates and the mixing conditions are important determinants of the conditions present within Habitats sites and the state of their qualifying features. Hydrological processes are critical in influencing habitat characteristics in coastal waters, including parameters such as current velocity, water depth, dissolved oxygen (DO) concentrations, salinity and water temperature. In turn these parameters determine the short- and long-term viability of plant and animal species, as well as overall ecosystem composition. Changes to the water flow rate within an estuary can be associated with a multitude of knock-on impacts, including substratum loss, smothering and changes in wave exposure.

6.5.2 Changes to surface water hydrology can occur as a result of engineering activities during the construction / decommissioning phase. For example, the construction or replacement of water crossings can change hydrological conditions within a watercourse. Abstraction of water (e.g. for use in dust suppression or other construction works) can also reduce water levels, as can changes to the existing flows of surface water to a watercourse. These impacts can occur either within a Habitats site or can impact on the qualifying species of a Habitats site if they pass through or occur within the relevant part of the watercourse. Therefore, any Habitats site with direct freshwater hydrological connectivity (i.e. not including marine sites) could be impacted by changes to surface water hydrology.

6.5.3 Changes to groundwater conditions can occur as a result of excavations or the installation of piled structures (for example by interrupting groundwater flows). Guidance published by the Scottish Environment Protection Agency (SEPA) suggests that such activities could impact on groundwater dependent terrestrial ecosystems (GWDTE) up to 100 m from excavations less than 1 m in depth, extending up to 250 m for deeper excavations (Ref 42). Therefore, any Habitats site within a 250 m buffer is considered to be within the potential ZoI of this impact.

6.5.4 Overall, the available baseline information suggests that the following Habitats sites within the ZoI of the Proposed Development are sensitive to potential hydrological changes (**the following sites are taken forward into the proceeding chapters**):

- **Dee Estuary / Aber Dyfrdwy SAC**;
- **Dee Estuary / Aber Dyfrdwy SPA / Ramsar**; and
- **River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC**.

6.5.5 This pathway is screened out for Deeside and Buckley Newt Sites SAC, Halkyn Mountain / Mynydd Helygain SAC, Mersey Estuary SPA/Ramsar and Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC as there is no hydrological connection between these Habitats sites and the Proposed Development Site. **As there is no linking pathway there is no potential for LSE on these Habitats sites, either alone or in-combination.**

6.6 Loss of Functionally Linked Land

6.6.1 While most Habitats sites have been geographically defined to encompass the key features that are necessary for coherence of their structure and function, and the support of their qualifying features, this is not necessarily the case. A diverse array of qualifying species including birds, bats and amphibians are not always confined to the boundary of designated sites.

6.6.2 Due to the highly mobile nature of waterfowl, it is inevitable that areas of habitat of crucial importance to the maintenance of their populations are outside the physical limits of the Habitats site for which they are an interest feature. However, this area will still be essential for maintenance of the structure and function of the interest feature for which the site was designated and land use plans that may affect this land should still therefore be subject to further assessment. This has been underlined by a CJEU ruling C-461/17 (paragraphs 37 to 40), known as the Holohan ruling, which confirms the need for an AA to consider the implications of a plan or project on habitats and species outside the Habitats site boundary provided that those implications are liable to affect the conservation objectives of the site.

6.6.3 To determine whether habitat may be functionally linked to a Habitats site requires some level of detailed study, often including targeted field survey. However, this impact can only occur on mobile animal species which could be present outside of the Habitats site for which they are designated. Natural England has published guidance on SSSI Impact Risk Zones (IRZs) (Ref 43) associated with different types of development on various functional groups of birds (see Table 5-1). There appears to be no equivalent published guidance from Natural Resources Wales.

6.6.4 These IRZs provide a high-level screening tool for assessing the risk of planning applications affecting important habitats outside Habitats site boundaries. The guidance identifies that functionally linked land may extend up to the maximum foraging distances from roost locations, although it also notes that the proportion of designated foraging birds will decrease with distance from the Habitats site. Importantly, the IRZ guidance note does not define the required abundance threshold needed to meet the criterion of functional habitat linkage. In broad terms, usage of a land parcel by 1% of the qualifying SPA/Ramsar population is needed for that parcel to be defined as 'functionally linked land'. However, this is not a hard rule and depends on the species in question.

6.6.5 NatureScot has also published guidance on the distances up to which qualifying species may use functionally linked land outside of Habitats sites (Ref 44). The distances given in this guidance were used when searching for SPAs designated for waterfowl and waders that may be within the ZoI of the Proposed Development. Accordingly, SPAs up to 20 km were searched for, as this is given as the largest core foraging range for any species (non-breeding pink-footed goose *Anser brachyrhynchus* and greylag goose *Anser anser*).

6.6.6 The identification of an area as functionally linked land is not always a straightforward process. The importance of non-designated land parcels may not be apparent and thus might require the analysis of existing data sources (e.g., Bird Atlases or data from record centres) to be firmly established. In some instances, data may not be available at all, requiring further survey work. Generally, using professional judgment it is reasonable to assume that a site of under 2 ha in size is unlikely to support a large enough population of birds (taking sightlines and other factors into account) to constitute 1% of an SPA/Ramsar population.

6.6.7 For other mobile terrestrial, aquatic or amphibious animals for which SACs are designated in Wales and which are relevant to this assessment, the following distances were used when searching for sites which could be impacted by loss of functionally linked land:

- great crested newt *Triturus cristatus* – it is generally considered that great crested newts can occur up to 500 m from breeding ponds (Ref 45, Ref 46). Therefore, on the assumption that any SAC designated for this species would encompass all breeding ponds used by a meta-population, a buffer of 500 m surrounding the SAC should be sufficient to account for all terrestrial habitat which may be functionally-linked to these features;
- otter – studies quoted in Harris and Yalden (2008) (Ref 47) suggest that the mean linear range size for four male otters in north-east Scotland was 48 km. For one male in Perthshire the maximum range was 39 km and for another male in Suffolk the range was also 39 km. Female otters generally have smaller ranges, quoted in Harris and Yalden (2008) as being between 16-21 km. For the purposes of this HRA it is reasonable to assume that any otter that could be affected by the Proposed Development could be part of the River Dee and Bala Lake SAC population; and
- all fish species – no set distance was used when considering potential impacts on fish species. Where a direct hydrological link exists between the Proposed Development and an SAC designated for fish species, and there was evidence of use of that watercourse by the species in question, it was considered that there could be impacts on these qualifying features.

6.6.8 Overall, the available baseline information suggests that the following Habitats sites within the ZoI of the Proposed Development are sensitive to the potential loss of functionally linked land (**these sites are taken forward into the proceeding chapters**):

- **Dee Estuary / Aber Dyfrdwy SPA / Ramsar**; and
- **River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC**.

6.6.9 This pathway is screened out for Deeside and Buckley Newt Sites SAC, Halkyn Mountain / Mynydd Helygain SAC and Mersey Estuary SPA/Ramsar due to the distance from the Proposed Development Site (1.5 km, 3.6 km and 12.7 km respectively), with no unobstructed suitable habitat for great crested newts being within 250 m of the Proposed Development Site. This pathway is also screened out for Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC as it is designated for non-mobile features. **As there is no linking pathway there can be no LSE on these Habitats sites, either alone or in-combination.**

6.7 Atmospheric Pollution

Emissions

6.7.1 Construction and decommissioning of the Proposed Development has the potential to affect air quality. This is primarily expected due to emissions associated with exhaust emissions from construction vehicles and equipment.

6.7.2 The main pollutants of concern for Habitats sites are nitrogen oxides (NOx), ammonia (NH_3) and sulphur dioxide (SO_2) – see **Table 6-1**. NH_3 can have a directly toxic effect upon vegetation, particularly at close distances to the source such as near road verges (Ref 48). NO_x can also be toxic to vegetation at very high concentrations (far above the annual average Critical Level). Furthermore, high levels of NO_x and NH_3 are likely to increase the total nitrogen (N) deposition, potentially leading to deleterious knock-on effects in recipient ecosystems.

6.7.3 An increase in nitrogen deposition from the atmosphere is widely known to enhance soil fertility and to lead to eutrophication. This often has adverse effects on plant community composition and the overall quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats (Ref 49, Ref 50).

Table 6-1: Main Sources and Effects of Air Pollution on Habitats and Species

Pollutant	Source	Effects on Habitats and Species
SO_2	The current main source of SO_2 is the combustion of coal, heavy fuel oil and petroleum coke within the refinery, industrial and domestic sectors. Total SO_2 emissions in the UK have decreased by 97% since 1990 adriven by a reduction in coal use, particularly in the power sector and legislation	Wet and dry deposition of SO_2 acidifies soils and freshwater and may alter the composition of plant and animal communities. The magnitude of effects depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species.

Pollutant	Source	Effects on Habitats and Species
	restricting emissions and the sulphur content of other fuels. Another origin of SO_2 is the shipping industry and high atmospheric concentrations of SO_2 have been documented in busy ports. In future years shipping is likely to become one of the most important contributors to SO_2 emissions in the UK.	However, SO_2 background levels have fallen considerably since the 1970s and are now not regarded a threat to plant communities. For example, decreases in SO_2 concentrations have been linked to returning lichen species and improved tree health across the UK.
Acid deposition	Leads to acidification of soils and freshwater via atmospheric deposition of SO_2, NOx, NH_3 and hydrochloric acid (HCl). Acid deposition from rain has declined by 85% in the last 20 years, with most of this reduction attributable to reductions in SO_2 emissions and hence reduced sulphate levels.	Gaseous precursors (e.g., SO_2) can cause direct damage to sensitive vegetation, such as lichen, upon deposition. Can affect habitats and species through both wet (acid rain) and dry deposition. The effects of acidification include lowering of soil pH, leaf chlorosis, reduced decomposition rates, and compromised reproduction in birds/plants. Not all sites are equally susceptible to acidification. This varies depending on soil type, bed rock geology, weathering rate and buffering capacity. For example, sites with an underlying geology of granite, gneiss and quartz rich rocks tend to be more susceptible.
Ammonia (NH_3)	Ammonia is a reactive, soluble alkaline gas that is released following decomposition and volatilisation of animal wastes and from some chemical processes and vehicle exhausts. It is a naturally occurring trace gas, but ammonia concentrations are	The negative effect of NH_4^+ may occur via direct toxicity when uptake exceeds detoxification capacity and via N accumulation. Its main adverse effect is eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from

Pollutant	Source	Effects on Habitats and Species
	directly related to the distribution of livestock. Ammonia reacts with acid pollutants such as the products of SO_2 and NOx emissions to produce fine ammonium (NH_4+) – containing aerosol. Due to its significantly longer lifetime than ammonia, NH_4+ may be transferred much longer distances (and can therefore be a significant trans-boundary issue). While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.	heath species (lichens, mosses) to grasses is often seen. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small nature reserves located in intensive agricultural landscapes.
NOx	Nitrogen oxides are mostly produced in combustion processes. Half of NOx emissions in the UK derive from motor vehicles, approximately 10% from power stations and the rest from other industrial and domestic combustion processes.	Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g., roadside verges). A critical level of NOx for all vegetation types has been set to 30 µg/m^3 (micrograms per cubic metre). Deposition of nitrogen compounds (nitrates (NO_3), NO_2 and nitric acid (HNO_3)) contributes to the total N deposition and may lead to both soil and freshwater acidification. In addition, NOx contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.
Nitrogen (N) deposition	The pollutants that contribute to the total nitrogen deposition derive mainly from oxidised (e.g., NO_X) or reduced (e.g., NH_3) N emissions (described	All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally.

Pollutant	Source	Effects on Habitats and Species
	separately above). While oxidised nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices. The N pollutants together are a large contributor to acidification (see above).	Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication. This is because many semi-natural plants cannot assimilate the surplus N as well as many graminoid (grass) species. N deposition can also increase the risk of damage from abiotic factors, e.g., drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions involving NOx, volatile organic compounds (VOCs) and sunlight. These precursors are mainly released by the combustion of fossil fuels (as discussed above). Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when ozone levels rise above 40 ppb (parts per billion) ('episodes' or 'smog'). Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	Concentrations of O_3 above 40 ppb can be toxic to both humans and wildlife and can affect buildings. High O_3 concentrations are widely documented to cause damage to vegetation, including visible leaf damage, reduction in floral biomass, reduction in crop yield (e.g., cereal grains, tomato, potato), reduction in the number of flowers, decrease in forest production and altered species composition in semi-natural plant communities.

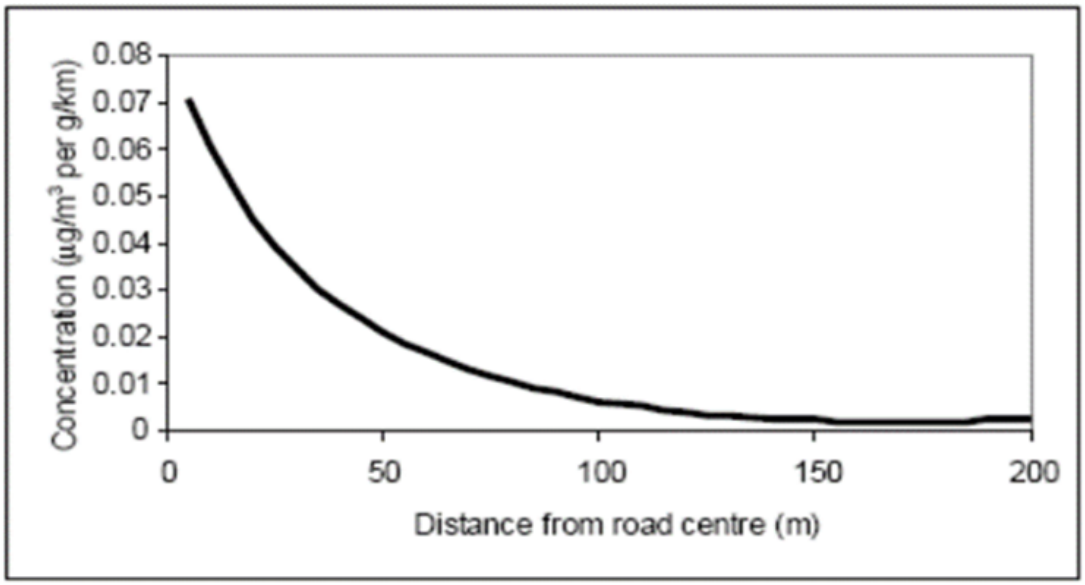
6.7.4 SO_2 emissions overwhelmingly derive from the refinery sector and domestic combustion of coal and oil, as well as shipping (particularly on a local scale). There will be no material release of SO_2 in the construction, operational or decommissioning phases of the Proposed Development. Therefore, this atmospheric pollutant is not considered further in this HRA.

6.7.5 NO_x emissions are dominated by the output of vehicle exhausts (more than half of all emissions) and some vehicles also emit NH_3. The main air quality impact of the Proposed Development is likely to occur in the construction and decommissioning phases, when construction traffic will lead to the temporary emission of NO_x, NH_3 and, likely, an overall increase in total N deposition. According to the World Health Organization (WHO), the Critical Level for NOx for the protection of vegetation is 30 μgm^{-3} (micrograms per

cubic metre) and the Critical Level for NH_3 when lower plants are present is 1 μgm^{-3} (Ref 48). In addition, ecological studies have determined Critical Loads for atmospheric nitrogen deposition (NOx combined with NH_3).

6.7.6 The Department of Transport's Transport Analysis Guidance (Ref 51) states that beyond 200 m, the contribution of vehicle emissions from the roadside to local pollution levels is insignificant (refer to **Plate 2**). This is the distance that is used in this HRA to screen for potential atmospheric pollution impacts associated with the Proposed Development.

Plate 2: Traffic contribution to concentrations of pollutant at different distances from a road



6.7.7 Air quality impacts may also occur as a result of operational emissions resulting from the Proposed Development carbon capture plant (CCP) stack(s), in particular for NOx, (comprising NO and NO_2) and carbon monoxide (CO) from any combustion activities carried out and amine and amine degradation products (nitrosamines and nitramine, referred to as 'N-amines') and ammonia from post-combustion CCP technology.

6.7.8 Overall, the available baseline information suggests that the following Habitats sites within the ZoI of the Proposed Development are sensitive to atmospheric pollution (**all sites are taken forward into the proceeding chapters**):

- **Dee Estuary / Aber Dyfrdwy SAC**;
- **Dee Estuary / Aber Dyfrdwy SPA / Ramsar**;
- **River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC**;
- **Deeside and Buckley Newt Sites SAC**;
- **Halkyn Mountain / Mynydd Helygain SAC**;
- **Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC**; and
- **Mersey Estuary SPA / Ramsar**.

Dust Deposition

6.7.9 Construction and decommissioning activities can generate dust emissions from operating machinery that can cause localised smothering of vegetation or potential health issues in fauna. The effects of dust will depend on the prevailing wind direction, and the transport distance is related to particle size. Dust particle size and chemical composition is important as smaller particles can enter or block stomata and thus interfere with gas exchange, while sufficient coverage may prevent light penetration to the chloroplasts.

6.7.10 For the purposes of screening, according to guidance from the Institute of Air Quality Management (IAQM) (Ref 21), with respect to possible effects due to dust, *"…an assessment will normally be required where there is…an 'ecological receptor' within: 50 m of the boundary of the site; or 50 m of the route(s) used by construction vehicles on the public highway."*

6.7.11 Overall, the available baseline information suggests that the following Habitats sites within the ZoI of the Proposed Development are sensitive to dust emissions (**these sites are taken forward into the proceeding chapters**):

- **Dee Estuary / Aber Dyfrdwy SAC**;
- **Dee Estuary / Aber Dyfrdwy SPA / Ramsar**; and
- **River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC**.

6.7.12 This pathway is screened out for Deeside and Buckley Newt Sites SAC, Halkyn Mountain / Mynydd Helygain SAC, Mersey Estuary SPA/Ramsar and Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC as they are greater than 50 m away from the Proposed Development. **As there is no linking pathway to these other Habitats sites, there can be no LSE, either alone or in-combination.**

6.8 Barriers to Movement

6.8.1 The creation of permanent or temporary barriers in a watercourse (e.g. a new culvert), pollution of a watercourse, or noise / visual disturbance could all act to prevent the migratory movement of the qualifying fish species of SACs. Entrainment of fish on inlet / outlet structures, or the possibility of fish being attracted to the flow of water out of outlets could interfere with or prevent the normal migratory movement of these species.

6.8.2 Although otter could be impacted by works in watercourses or waterbodies, this species is readily able to navigate overland. There is consequently no mechanism by which the Proposed Development could prevent the regular movements, including migration, of qualifying species other than fish.

6.8.3 The ZoI for this impact was therefore taken to be any SAC designated for fish species for which a direct hydrological connection to the Proposed Development exists.

6.8.4 Overall, the available baseline information suggests that the following Habitats sites within the ZoI of the Proposed Development could be sensitive to the prevention of migratory movements of qualifying species (**these sites are taken forward into the proceeding chapters**):

- **River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC**; and
- **Dee Estuary / Aber Dyfrdwy SAC**.

6.8.5 This pathway is screened out for all other Habitats sites as they are greater than 100 m away from the Proposed Development and not designated for fish. **As there is no linking pathway there can be no LSE on these Habitats sites, either alone or in-combination.**

6.9 Introduction of INNS

6.9.1 An 'invasive species' is a species that is: 1) non-native (or alien) to the ecosystem under consideration, and 2) whose introduction causes or is likely to cause economic or environmental harm, or harm to human health (Ref 52). They can be introduced to an area by, for example, ship ballast water, accidental release, and most often, by people. Invasive species can lead to the extinction of native plants and animals, destroy biodiversity, and permanently alter habitats. Any construction project can introduce INNS if inadequate biosecurity protocols are followed, particularly when working in the riverine environment.

6.9.2 Overall, the available baseline information suggests that the following Habitats sites within the ZoI of the Proposed Development are sensitive to the introduction of INNS (**these sites are taken forward into the proceeding chapters**):

- **Dee Estuary / Aber Dyfrdwy SAC**;
- **Dee Estuary / Aber Dyfrdwy SPA / Ramsar**; and
- **River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC**.

6.9.3 This pathway is screened out for Deeside and Buckley Newt Sites SAC, Halkyn Mountain / Mynydd Helygain SAC, Mersey Estuary SPA/Ramsar and Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC as they are greater than 100 m away from the Proposed Development. **As there is no linking pathway there can be no LSE on these Habitats sites, either alone or in-combination.**

7. HRA Stage 1: Test of Likely Significant Effects

7.1 Introduction

7.1.1 This section evaluates whether the Proposed Development would result in LSEs on the qualifying features of the Dee Estuary / Aber Dyfrdwy SAC, Dee Estuary / Aber Dyfrdwy SPA / Ramsar, River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC, Mersey Estuary SPA/Ramsar, Deeside and Buckley Newt Sites SAC, Halkyn Mountain / Mynydd Helygain SAC and Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC. This section only considers impact pathways for which any or all of these Habitats sites have been identified to lie within the ZoI of the Proposed Development.

7.1.2 An assessment of the implementation of the off-setting measures defined in the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)** to be delivered at Gronant Fields is provided separately in Appendix C of the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)**.

7.1.3 In line with case law (People Over Wind and Sweetman v Coillte Teoranta (C-323/17)), consideration cannot be given at this stage to specific mitigation measures designed to avoid significant effects on a Habitats site. However, as discussed in section 3.2, it is reasonable to consider the 'intrinsic elements' of a development (such as stack height) at the screening stage, including those which can be regarded as 'good practice' or 'best practice' for development of that type. It is also appropriate to consider those measures which are required to comply with other legislation.

7.1.4 Standard good practice works methods which would be adopted by the Proposed Development, regardless of the presence of Habitats sites, would include the implementation of pollution prevention measures following Department for Environment, Food and Rural Affairs (Defra) and Environment Agency guidance for pollution prevention (Ref 53) and those of Natural Resources Wales. For example, it would be an offence to pollute watercourses under the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and the Environmental Permitting (England and Wales) Regulations 2016, irrespective of whether those watercourses have any particular designation, therefore it is permissible to take these measures into account in HRA Stage 1 (Screening). Such measures are set out in the **Framework CEMP (EN010166/APP/6.5).**

7.1.5 Equally, under the Wildlife and Countryside Act 1981 (the 'WCA') (Ref 54), it is an offence in England and Wales to cause any animal or plant to spread or grow in the wild outside of its native range. Appropriate biosecurity measures will therefore be implemented during the construction, decommissioning and operational phases to prevent the spread of invasive non-native species. Such measures are set out in the **Framework CEMP** (**EN010166/APP/6.5**).

7.1.6 The test of LSE in this section is necessarily a high-level appraisal, with a precautionary approach adopted when reaching a conclusion. For those impacts for which LSE cannot be 'screened out', further appraisal at Stage 2 (AA) will be carried out.

7.1.7 To aid the Examining Authority in confirming that all designated features of all European sites have been considered in this HRA, Appendix G contains a series of matrices setting out the Likely Significant Effects assessment for each feature of each European site and referencing the relevant assessment text.

7.2 Construction and Decommissioning Phases

7.2.1 For the purposes of this assessment decommissioning impacts are considered to be very similar to construction period impacts, though potentially of a lower magnitude. This is because many of the same processes and potential disturbances are involved, such as noise, waste generation, and habitat disruption, although some impacts may be modified or require additional mitigation measures during decommissioning.

7.2.2 Similarities include, although are not limited to, the following:

- Noise - both construction and decommissioning involve the use of heavy machinery and equipment, which generate noise that can impact wildlife and potentially disrupt human activities.
- Habitat disturbance - decommissioning, like construction, can involve physical disturbance of the seabed or land, potentially impacting habitats and species.
- Waste generation - both phases generate waste, although the types and quantities may differ.
- Water quality - construction and decommissioning activities can both impact water quality through sediment disturbance, runoff, and potential leaks or spills.

Direct Loss of / Damage to Qualifying Habitat

7.2.3 Most SACs and many Ramsar sites are designated for habitats of international conservation importance, many of which have been subject to encroachment from development and gradual loss. Therefore, the Conservation Objectives for most Habitats sites include a target to maintain or restore the extent of qualifying habitats to achieve favourable conservation status. Any construction activities associated with the temporary and/or permanent loss of designated habitat, by definition, would result in LSEs on a SAC or Ramsar site. Similarly, while SPAs are not directly designated for habitats, habitat loss from an SPA can affect the birds for which the SPA is designated.

7.2.4 The following elements of the construction or decommissioning stages of the Proposed Development with the potential for direct loss of / damage to qualifying habitats, or habitats of SPA/Ramsar birds, have been identified, since they would be located within a Habitats site:

- Offloading of materials at Connah's Quay North;
- Works within the Water Connection Corridor; and
- Works to the Existing Surface Water Outfall and construction of a Proposed Surface Water Outfall.

7.2.5 The Habitats sites that may be impacted by these activities are the River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC and Dee Estuary / Aber Dyfrdwy SPA/ SAC/ Ramsar.

Offloading of materials at Connah's Quay North

7.2.6 The offloading of materials at Connah's Quay North would make use of an existing quay that is already periodically used for offloading by large vessels and may involve use of a crane. The area in which vessels would be moored is part of River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC. No capital works in the river would be required, but the frequency of use (approximately 60 times per annum during construction, as a worse case forecast) would be notably greater than the normal situation where only a small number of ships berth there a year. Moreover, since barges would be used, these would be left to ground out on the riverbed at low tide until they are then floated off the quay.

7.2.7 However, while there may be some temporary disturbance or temporary loss of benthic habitat due to physical interaction with the seabed, the impact is likely to be very limited in scale and duration. The soft sediment habitats that characterise much of the area are considered to have a high resilience[8] to direct physical disturbance, such as penetration or abrasion from vessel grounding. Furthermore, as the barges would be grounding at low tide, sediment disturbance is likely to be minimal and short-term. This is especially relevant given that the area is a highly dynamic intertidal environment, where natural sediment movement and disturbance occur regularly.

7.2.8 **Therefore, it is concluded that no LSE would arise on the River Dee & Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC.**

Works within the Water Connection Corridor

7.2.9 The Proposed Development will utilise the existing Connah's Quay Power Station cooling water abstraction and discharge infrastructure located within the River Dee with minor additions and refurbishment at the intake to meet current legislative requirements, including The Eels (England and Wales) Regulations 2009 (Ref 52).

7.2.10 Refurbishment and upgrades to the existing intake structure would be undertaken by divers and a support boat and/or barge, or similar, and foot-only access via the saltmarsh itself over an estimated three to five month period. Such work may include boat or shore-led pre-works surveys along the Dee Estuary, including diving operations where required. Eel screen upgrade works would comprise the removal of one existing 3 mm screen and the installation of one new 2 mm screen on each of the existing 28 intakes to mitigate impacts on aquatic ecology and to comply with the Eels

[8] Based on the Marine Life Information Network (MarLIN) Marine Evidence-Based Sensitivity Assessment (MARESA).

Regulations, in addition to minor repairs to surface concrete, metalwork, and timbers.

7.2.11 The Proposed Surface Water Outfall would connect to and be downstream of a surface water drainage network within the Main Development Area. These working areas for the Proposed Surface Water Outfall and Water Connection Corridor lie directly within the Dee Estuary/ Aber Dyfrdwy SAC/SPA/Ramsar and a review of MAGIC website (Ref 56) and NRW Protected Areas of Land and Sea (Ref 57) shows the area to be saltmarsh (*1330* Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)) and intertidal mudflat (*1140* Mudflats and sandflats not covered by seawater at low tide), both of which are qualifying habitat features. This has been confirmed through a National Vegetation Survey (NVC) undertaken by AECOM in July 2024 (**Appendix 11-C Botanical Technical Appendix** of the ES(**EN010166/APP/6.4**)).

7.2.12 However, materials would be supplied by boat as there is a concrete plinth, and workers would access by foot across the saltmarsh, which is current practice for inspections. The actual engineering work to refurbish/upgrade the existing intake structures would be located outside of the saltmarsh within the Dee Estuary, although support boats would be present for safety reasons. Therefore, no loss of saltmarsh or intertidal mudflat habitat would arise. **As such, no LSE would arise.**

Works to Surface Water Outfalls

7.2.13 Works may be required to, or in the immediate vicinity of, the Existing Surface Water Outfall adjacent to the Main Development Area at Kelsterton Brook. The Existing Surface Water Outfall may require maintenance / minor upgrade works, including clearing debris / repair so that it is suitable for continued use alongside the Proposed Development. Additionally, construction of a new permanent outfall structure for surface water drainage discharge from the Main Development Area (the 'Proposed Surface Water Outfall') would be undertaken adjacent to the Existing Surface Water Outfall.

7.2.14 The Existing Surface Water Outfall and Proposed Surface Water Outfall are both located within areas confirmed during the NVC survey by AECOM in 2024 to be saltmarsh (*1330* Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)).

7.2.15 **Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar regarding loss of / damage to qualifying habitat in the construction and / or decommissioning phases cannot be excluded specifically regarding the Proposed Surface Water Outfall. This impact pathway is screened in for further consideration as part of HRA Stage 2 (AA), which is informed by the NVC survey carried out by AECOM in 2024.**

Noise and Visual Disturbance

7.2.16 A range of construction and decommissioning activities would be required for the Proposed Development, which would involve the presence of site staff and usage of heavy machinery within the Proposed Development Site. These activities have the potential to result in noise and visual disturbance to

sensitive ecological receptors, both within Habitats sites and functionally linked lands outside Habitats site boundaries.

7.2.17 Most of the disturbance elements can be introduced or exacerbated by construction and decommissioning activities, carried out in proximity to key foraging or roosting habitats of SPA/Ramsar bird species and qualifying SAC species.

7.2.18 A noise and vibration assessment has been undertaken and reported in the ES (**Chapter 9: Noise and Vibration** (**EN010166/APP/6.2.9**)). The study area was defined to include the spatial extent of identified noise and vibration sensitive receptors (NSRs) with the potential to be significantly affected by direct or indirect impacts that might arise from the Proposed Development, i.e., the ZoI.

7.2.19 The monitoring locations relevant to this HRA are named Ecology 1, 2, 3 and 4 and are shown in **Appendix D** of this report. The existing baseline sound survey results are shown in **Table 8.** Applying 60dB as the threshold for potential disturbance, it can be seen that baseline L_{Aeq} (average) noise levels fall below this threshold, but baseline L_{Amax} (maximum) noise levels notably exceed this threshold at all monitoring locations. This illustrates that the existing noise environment at the section of Dee Estuary/ Aber Dyfrdwy SAC/SPA/Ramsar is highly variable; generally relatively quiet but with loud noise events even at night.

Table 7-1: Baseline Sound Survey Results

Monitoring Location	Representative of NSRs	Time Period	$L_{Aeq,T}$ dB	Highest L_{Amax} dB
Ecology 1	Ecological receptors	Daytime	49	90
		Night-time	47	78
Ecology 2	Ecological receptors	Daytime	51	87
		Night-time	48	84
Ecology 3	Ecological receptors	Daytime	56	90
		Night-time	56	92
Ecology 4	Ecological receptors	Daytime	49	82
		Night-time	47	73

Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar

7.2.20 The Site Improvement Plan (SIP) for the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar (Ref 58) specifies disturbance as a threat to the integrity of the site, mainly due to public access recreation activities affecting SPA/Ramsar birds.

7.2.21 The Proposed Development lies immediately adjacent to, and partially within, the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and therefore close enough that construction and decommissioning could lead to noise and visual disturbance. In order to access the screens most easily, works within the Water Connection Corridor and around the Proposed Surface Water Outfall would generally take place at low tide when the infrastructure

is exposed. It would thus generally be accessed from the shore but may also involve some use of divers to avoid restricting the temporal window for works too much. Only eels have been recorded during surveys in the Kelsterton Brook (into which the Proposed Surface Water Outfall would discharge), with no evidence of lamprey from eDNA sampling. Therefore, there is no evidence SAC fish species would likely be present in Kelsterton Brook. Therefore, little noise would be carried through the water column since most works would be undertaken around low tide, lamprey are a species of low sensitivity to underwater noise, and there is no evidence of SAC fish being present beyond the River Dee itself. Moreover, the localised scale and intermittent nature of these upgrading works are highly unlikely to act as barriers to movement of anadromous fish such as lamprey, with the majority of the water column being free from any disruptions.

7.2.22 Natterjack toads are not widespread across the Dee Estuary / Aber Dyfrdwy Ramsar. They are restricted to a small number of coastal dune systems and slack habitats, mainly at the mouth of the estuary, where suitable early-successional sand dune conditions occur. The primary Dee Estuary population is located on the north-east Welsh coast at Gronant Dunes between Prestatyn and Point of Ayr, over 20 km from the Main Development Area. As such, this impact pathway is screened out, both alone and in-combination, from Appropriate Assessment and is not considered further in this report.

7.2.23 **Therefore, LSEs of the Proposed Development regarding noise and visual disturbance in and adjacent to the SPA / Ramsar in the construction and / or decommissioning periods cannot be excluded. This impact pathway is screened in for further consideration as part of HRA Stage 2 (AA). Noise disturbance of other SAC and Ramsar features including lamprey and natterjack toad can be screened out as no LSE.**

River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC

7.2.24 The River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC is designated for a range of aquatic and/or semi-aquatic species, including sea lamprey, river lamprey, Atlantic salmon and otter. All these species are mobile and may well be using the riverbanks and River Dee water column past the Proposed Development Site. Otters are known to have extensive home ranges, while both lamprey species are anadromous and expected to use the entire continuum of watercourses from the Dee Estuary to the upper reaches of the River Dee. Disturbance to migratory fish and otter is also highlighted as a risk in the Core Management Plan (CMP) for the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC (Ref 59).

7.2.25 The habitat use of otter is largely limited to river water channels and adjoining banks, where holts and couches represent the most sensitive features. Otters are known to be relatively tolerant to noisy environments and, moreover, construction activities would be carried out during daylight hours when otters are less likely to be active. Moreover, surveys for the Proposed Development indicate no holts or couches within 300 m of the Proposed Development Site. **Therefore, it is concluded that there is no potential for the Proposed Development to result in LSEs on the River**

Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC regarding noise disturbance to otter in the construction or decommissioning phases.

7.2.26 Qualifying fish from the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC can be impacted by underwater sound which can either be impulsive or continuous in nature and can cause a variety of impacts to fish, ranging from severe physical injury (e.g., rupture of the swim bladder), physical damage to the auditory system (e.g., temporary shifts in hearing thresholds) to behavioural changes, such as disruption of migratory behaviours. All lamprey species lack swim bladders and are considered to be low hearing sensitivity fish. Generally, they are less susceptible to barotrauma because they detect particle motion rather than sound pressure.

7.2.27 In order to access the screens most easily, works within the Water Connection Corridor and around the Proposed Surface Water Outfall would generally take place at low tide when the infrastructure is exposed. It would thus generally be accessed from the shore but may also involve some use of divers to avoid restricting the temporal window for works too much. Only eels have been recorded during surveys in the Kelsterton Brook (into which the Proposed Surface Water Outfall would discharge), with no evidence of lamprey from eDNA sampling. Therefore, there is no evidence SAC fish species would likely be present in Kelsterton Brook. Therefore, little noise would be carried through the water column since most works would be undertaken around low tide, lamprey are a species of low sensitivity to underwater noise, and there is no evidence of SAC fish being present beyond the River Dee itself. With regard to Atlantic salmon, the localised scale and intermittent nature of these upgrading works are highly unlikely to act as barriers to movement of anadromous fish, with the majority of the water column being free from any disruptions.

7.2.28 **Therefore, it is concluded that there is no potential for the Proposed Development to result in LSEs on the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC regarding noise disturbance to lamprey or Atlantic salmon in the construction or decommissioning phases.**

Water Quality

Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC

7.2.29 All aquatic ecosystems are sensitive to water pollution from a wide range of substances, including toxic contaminants, non-toxic contaminants (e.g., nutrients) and sediments. Negative changes in water quality have the potential to directly impact on SAC habitats and species, as well as resulting in cascading effects on SPA / Ramsar wildfowl. The Proposed Development Site overlaps with the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and is adjacent to the River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC.s

7.2.30 Two of the most important factors influencing the likelihood of potential water quality impacts of developments are the presence of a hydrological connection with and flowpath distance to Habitats sites. Clearly, there is a definitive hydrological connection between the Proposed Development and Habitats sites, particularly the Water Connection Corridor.

7.2.31 The Site Improvement Plan for the Dee Estuary / Aber Dyfrdwy SAC / SPA (Ref 58) specifies water pollution as one of the main threats to site integrity and states that *"The Dee Estuary may be nutrient enriched (there are currently failures for dissolved inorganic nitrogen and macro algae) and is affected by both diffuse and point sources. The Lower River Dee may also be nutrient enriched, with high phosphate levels and possibly elevated nitrate levels (associated with agricultural sources). There are a number of outfalls (stormwater and industrial overflows) within the vicinity of this site which could have an impact on the site. Industrial sites (including historic sites) surrounding the Estuary pose a risk of diffuse and point source pollution."*

7.2.32 The CMP for the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC (Ref 59) states *"Water is clearly fundamental to a riverine SAC. Therefore, the quality …. will be maintained or adjusted to a level necessary to maintain the features in favourable condition for the foreseeable future."*

7.2.33 The CMP goes on to provide further background on the sensitivity of its qualifying features to water pollution, particularly sedimentation. For example, the excessive delivery of fine sediment from the wider catchment can cause siltation of egg-laying sites and juvenile/adult refugia for sea lamprey, river lamprey and bullhead. Furthermore, it should be noted that high sedimentation rates also increase the organic matter content, which in turn accelerates oxygen depletion in the water column.

7.2.34 Direct water quality impacts on qualifying waterfowl and waders in the Dee Estuary / Aber Dyfrdwy SPA / Ramsar are unlikely. Water pollution impacts on birds are primarily mediated indirectly through impacts on foraging resources. For example, sedimentation of the riverbed can decrease interstitial flows, reducing oxygen availability for sediment-dwelling invertebrates and, potentially, the pool of foraging resources to non-breeding birds. Furthermore, most bird species are visual predators, meaning they must visually locate their prey in the riverbed and/or water column.

7.2.35 Due to the geographic overlap and overall proximity of the Proposed Development to the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC and the short flowpath distances there is virtually no potential for attenuation and/or dilution processes that would provide a natural buffer against aquatic contaminants. **Therefore likely significant effects on these Habitats sites cannot be dismissed and impacts are taken forward to Appropriate Assessment.**

Water Quantity, Level and Flow

River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC

7.2.36 Being a riverine ecosystem the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC and its 'water courses' feature are sensitive to changes in flow regime beyond natural limits. Natural flow regimes are important in sustaining its characteristic biotope mosaic through prevailing abiotic conditions, including riverbed hydraulics, water depth, wetted area, temperature and DO concentrations.

7.2.37 Maintaining a natural flow regime is also critical to all aspects of the life cycle of designated fish (i.e., sea lamprey, river lamprey and bullhead) and otter.

Adequate river flows are particularly important for anadromous sea lamprey, which spawn in freshwater habitats and complete their life cycle at sea. Significantly reduced or increased river flows may impede sea lamprey from reaching their historic spawning grounds in upstream river stretches, potentially affecting reproductive success.

7.2.38 To a large extent, water flow in the Dee and certain of its tributaries is regulated by NRW under a set of rules called the Dee General Directions, a requirement of the Dee and Clwyd River Authority Act 1973 (Ref 60). The Dee was made a SAC with these directions in place. As a result of the Dee General Directions operational limits are in place with an upper limit of +10% of recent actual flow and a lower limit of -10% recent actual flow. The meaning of "recent actual flow" is as described by Bethune (2006)[9].

7.2.39 With the Dee General Directions in place no additional water supplies beyond existing consents and licensed volumes would be required for the Proposed Development.

7.2.40 Furthermore, to manage activities within floodplains effectively and comply with requirements to minimise flood risk (unrelated to presence of Habitats sites), materials (such as earth and topsoil etc.) would be stored outside the 1 in 100-year flood extent, and permits would be obtained for storage in Flood Zone 3 if required. These requirements are secured through the **Framework CEMP** (**EN010166/APP/6.5**).

7.2.41 **As such there is no potential for the Proposed Development to result in LSEs on the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC and regarding water supply in the construction and decommissioning phases.**

Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar

7.2.42 The SIP for the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar does not identify change in water quantity, level and flow as a threat to site integrity as it is a tidal ecosystem. **As such there is no potential for the Proposed Development to result in LSEs on the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar regarding water supply in the construction and decommissioning phases.**

Loss of Functionally linked land

7.2.43 The Dee Estuary / Aber Dyfrdwy SPA / Ramsar and the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC are both designated for mobile species. These species, to varying degrees, will forage or roost / rest beyond their respective designated site boundaries. Deeside & Buckley Newt Sites SAC is also designated for a mobile species (great crested newts). However, regarding the Hynet DCO Natural Resources Wales advised the applicant that functionally-linked land for the newt populations lay within 1.6 km of the SAC. The areas of suitable habitat within the Main Development Area are beyond this distance from the SAC. There are habitat connections through the surrounding landscape between other parts of the Construction and Operation Area and the Deeside and Buckley Newt Sites SAC; however, the

[9] "Recent actual flow" is stated in the Conservation Objectives; however, full details of Bethune (2006) as a source of this term are not included, and as such cannot be provided here.

A548 acts as a significant barrier to great crested newt movement and severs the permanent habitat loss generated by the Proposed Development from the SAC. Therefore, Deeside & Buckley Newt Sites SAC is not discussed further regarding this impact pathway.

Dee Estuary / Aber Dyfrdwy SPA / Ramsar

7.2.44 Phase 1 habitat surveys of the Proposed Development Site undertaken by Aspect Ecology in August 2021 and April 2023 identified areas of rough grassland, improved grassland and pasture equating to around 24.76 ha to the north of the Proposed Development Site. AECOM carried out follow-up walkover surveys in November 2023 and between April to September 2024 to ground truth the existing survey data and inform the PEA Report (included as Annex A of **Appendix 11-C: Botanical Technical Appendix** of the **ES** (**EN010166/APP/6.4**)). This walkover survey confirmed the presence of large areas of grassland habitat to the north of the Proposed Development Site. Such habitat offers foraging opportunities for several qualifying Dee Estuary / Aber Dyfrdwy SPA / Ramsar bird species, most notably curlew *Numenius arquata.*

7.2.45 This area of grassland has been identified as the construction laydown area. At 24.76 ha it is large enough to act as functionally linked land and, being adjacent to the SPA, is within the 500 m IRZ for wintering waders (Ref 62) and could be regularly used by significant proportions of the relevant qualifying populations / species. **Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SPA / Ramsar regarding the potential loss of functionally linked land in the construction and / or decommissioning phase cannot be excluded. This impact pathway is screened in for further consideration as part of HRA Stage 2 (AA).**

River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC

7.2.46 Survey work was undertaken by Aspect Ecology in 2021 and 2023 (Ref 63). They identified the Dee Estuary as highly suitable for commuting and foraging otters. However, otter surveys for the ES (**Appendix 11-J: Otter Technical Appendix CONFIDENTIAL** of the **ES (EN010166/APP/6.4)**) have found no evidence of otter within the vicinity of the Proposed Development. **Therefore, LSEs of the Proposed Development on the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC regarding the potential loss of functionally linked land in the construction and / or decommissioning phase can be excluded.**

Atmospheric Pollution – dust deposition

7.2.47 Operating machinery and techniques employed in the construction and/or demolition phases of the Proposed Development have the potential to increase local dust levels with knock-on effects on ecological receptors. Dust deposition is of particular concern for plants, due to its direct interference with gaseous exchange by blocking stomata. The closest Habitats sites with sensitivity to dust deposition are the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC.

7.2.48 IAQM guidance (Ref 21) states that an assessment of dust impacts is usually required where there is an ecological receptor within 50 m of the boundary of a construction (or decommissioning) site or within 50 m of the Affected Road Network used by construction or decommissioning vehicles. Therefore, only Habitats sites within 50 m are discussed below.

Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC

7.2.49 The Proposed Development is adjacent to, and overlaps with, the Dee Estuary/ Aber Dyfrdwy SAC/ SPA/ Ramsar at the Water Connection Corridor and Connah's Quay North (for offloading of materials) lies immediately adjacent to the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC. All of these locations are within Wales. There is no work proposed to take place within 50 m of any English sections of Habitats sites. This clearly falls within the 50 m screening distance for potential dust-related ecological impacts. In the absence of mitigation measures, any construction or decommissioning activities carried out within 50 m of the SAC, particularly those requiring earthworks and the use of construction materials, may result in increased dust deposition to terrestrial habitats, floating aquatic vegetation and the water column.

7.2.50 An assessment of the likely impacts of construction dust deposition has been undertaken and concluded that *"with good practice dust control measures embedded through the Framework CEMP, the generation of fugitive dust emissions from potentially dust generating activities (earthworks, trackout and construction) would be sufficiently controlled through decision making that minimises the potential for emissions to occur near to sensitive receptors, by:*

- *minimising the magnitude and frequency of emissions at source;*
- *providing clear responsibilities to proactively consider the performance of routine control measures; and*
- *responding promptly when additional short-term measures are also required.*

This leads to the overall conclusion that the frequency and duration of dust impacts would not give rise to significant effects on any sensitive features within designated ecological sites." (**Chapter 8: Air Quality** (**EN010166/APP/6.2.8**) of the ES. These requirements have not been included as a result of the HRA but were included already as part of standard good practice controls for all construction projects.

7.2.51 **It can therefore be concluded that there would be no LSE on the qualifying features of the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar or River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC as a result of dust deposition during the construction / decommissioning phases.**

Atmospheric Pollution – exhaust emissions

7.2.52 Mersey Estuary SPA/Ramsar site is located 26 km from the Proposed Development at the only point the SPA/Ramsar site lies within 200 m of a

significant road (the A557 Silver Jubilee Bridge between Runcorn and Widnes). This is remote from the M56 which would be the main route for construction traffic to reach the Proposed Development and is also a toll bridge. Construction or demolition traffic to the Proposed Development will therefore not be located within 200 m of this SPA/Ramsar site and no assessment is required.

Halkyn Mountain / Mynydd Helygain SAC and Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC

7.2.53 The Halkyn Mountain / Mynydd Helvgain SAC and Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC are both designated for qualifying habitats that are sensitive to atmospheric pollution impacts. However, the Affected Road Network modelled for the Proposed Development does not include the major traffic arteries closest to the two SACs (i.e. the A55 or A5026 that adjoins component parcels of the Halkyn Mountain / Mynydd Helvgain SAC, or the A494 bisecting the Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC). Given that the Proposed Development will not result in a temporary traffic increase within 200 m of these Habitats sites, LSE can be dismissed.

River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC

7.2.54 The Air Pollution Information System (APIS) Site Relevant Critical Load app identifies that none of the SAC interest features of River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC are sensitive to air quality impacts except for its population of *Luronium natans*. However, *Luronium natans* is known to be confined to Bala Lake and associated slow flowing sections of the River Dee, approximately 50 km from the stretch of River Dee relevant to the Proposed Development, and much further than this following the river meanders. It is unrealistic to assume *Luronium natans* may spread through the river system to the lowland sections which are within the zone of influence of the Proposed Development; the lower stretches of the River Dee are of an entirely different character to the upper stretches and apart from being too far from the existing populations for colonization, are also too fast flowing for the species to establish. The River Dee / Afon Dyfrdwy SSSI Restoration Technical Report concludes that the Lower Dee has "*Limited suitable habitat present in areas of slower flows. High turbidity may be a limiting factor*"[10].The *Luronium natans* population of the SAC is therefore beyond the ZoI for the Proposed Development. While the interest feature 'Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation' is identified as having an ammonia and NOx sensitivity, modelling for the Proposed Development shows that the relevant critical levels (3 μgm^{-3} for ammonia and 30 μgm^{-3} for NOx) would not be exceeded even in combination with other projects and plans. Therefore, LSE can be dismissed.

Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and Deeside and Buckley Newt Sites SAC

7.2.55 The Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and Deeside and Buckley Newt Sites SAC both lie within 200 m of the proposed construction traffic route. The Deeside & Buckley Newts SAC lies entirely within Wales. The only place where the Dee Estuary SAC/SPA/Ramsar site lies within

[10] Jacobs (2023), River Dee/ Afon Dyfrdwy SSSI Restoration Technical Report

200 m of a road to be used by construction or demolition traffic is located entirely in the Welsh part of the site where the A548 Weighbridge Road crosses the River Dee (Flintshire Bridge). The Dee Estuary SAC/SPA/Ramsar site is the only English (or cross-border) Habitats site within 10 km of the Proposed Development. On the English side of the border, the site is well over 200 m from the nearest through-route from the M56 to the Proposed Development. Therefore, there is no potential for construction related air quality impacts on those parts of the Dee Estuary SAC/SPA/Ramsar site in England. The rest of this construction and demolition air quality assessment therefore focusses entirely on the section of the Dee Estuary SAC/SPA/Ramsar site in Wales.

7.2.56 The construction and decommissioning phases of the Proposed Development are likely to lead to an increase in the number of vehicles on the local highway network for the duration of the works.

7.2.57 In line with the IAQM (Ref 21) and Natural England guidance (Ref 61) a traffic air quality assessment has been undertaken. This has modelled the air quality impact on all affected roads within 200 m of Habitats sites. There are two future scenarios modelled (called the '2034 Construction Scenario' and the '2034 Construction + Maintenance Scenario'). However, the 2034 Construction + Maintenance Scenario would be indicative of a single year if construction happens to coincide with maintenance of the existing power station. Since this would apply to a single year, whereas traffic-related air quality is a long-term issue for ecology (affecting annual averages), that scenario is not considered representative of the typical construction impact. Therefore, the 2034 Construction Scenario has been used in this HRA interpretation.

7.2.58 Table 17 (NOx), Table 19 (ammonia) and Table 21 (nitrogen deposition) in **Appendix 8-C: Air Quality Traffic Assessment** (**EN010166/APP/6.4**) of the ES, display the relevant information and assessment results for the designated ecological sites. Transects TE7a to TE7c are all transects into Deeside and Buckley Newt Sites SAC. This site is designated for its great crested newts (which have low sensitivity to changes in vegetation and habitat structure and thus to air quality impacts) but also for its oak woodland, which is sensitive. Oak woodland can support a diverse lower plant flora and therefore the most stringent ammonia critical level of 1 μgm^{-3} is appropriate. The lowest nitrogen deposition critical load for oak woodland is 10 kgN/ha/yr. While APIS lists other habitats within the SAC that have lower critical loads, these are not reasons for SAC designation.

7.2.59 Transects TE8a to TE8c are all into Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar site in Wales on the A548 Flintshire Bridge, this being the only place where the Habitats site lies within 200 m of roads that would be used by construction/demolition traffic. The Habitats site is designated for a range of coastal habitats sensitive to air quality. While the most sensitive habitat for which the SAC is designated is its sand dunes, these are not located within the vicinity of the modelled road network. Rather the sensitive habitat within 200 m of transects TE8a to TE8c is saltmarsh. Saltmarsh does not typically support a notable lower plant assemblage and therefore an ammonia critical level of 3 μgm^{-3} is appropriate. The lowest nitrogen deposition critical load for saltmarsh is 10 kgN/ha/yr.

7.2.60 The full data are presented in **Appendix 8-C: Air Quality Traffic Assessment** (**EN010166/APP/6.4**) of the ES. In summary, for NOx there is no link within 200 m of a Habitats site where the difference between the 2034 Baseline and 2034 Construction Scenario (this being the worst-case construction year) would exceed 1% of the critical level. Nor would the critical level of 30 μgm^{-3} be exceeded when all traffic growth is considered in combination.

7.2.61 For ammonia, at no point would the difference between the 2034 Baseline and 2034 Construction Scenario exceed 1% of the critical level at Deeside and Buckley Newt Sites SAC (transects TE7a to TE7c). The contribution of Proposed Development construction traffic is 0.1% of the critical level or 'less than 0.01 μgm^{-3}'. This means it is not visible in the model when reported to two decimal places. Air quality modelling data are never reported to more than two decimal places to avoid false precision. Therefore, the ammonia contribution of construction traffic is effectively zero.

7.2.62 Regarding Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar site (transects TE8a to TE8c) the modelling has used the lowest critical level for that site. However, as explained above this is the critical level for sand dunes; saltmarsh does not have a notable lower plant flora and therefore the higher critical level of 3 μm^{-3} is more appropriate. Using this critical level, ammonia contribution under the construction scenario would be between 0.3% and 2.3% of the critical level depending on transect. However, the critical level of 3 μm^{-3} would not be exceeded on any transect. Therefore, LSE would not arise.

7.2.63 For nitrogen deposition, at no point would the difference between the 2034 Baseline and 2034 Construction Scenario (this being the worst-case construction year) exceed 1% of the critical load (0.1 kgN/ha/yr) at Deeside and Buckley Newt Sites SAC (transects TE7a to TE7c). The maximum contribution at the roadside is 0.01 kgN/ha/yr which means the contribution of the Proposed Development becomes too small to be identified in the model beyond the immediate roadside. It is therefore considered that the effect on the SAC is effectively zero and no LSE would arise on Deeside and Buckley Newt Sites SAC from nitrogen deposition due to the Proposed Development.

7.2.64 Regarding Dee Estuary SAC / SPA / Ramsar site (transects TE8a to TE8c) the modelling has used the lowest critical load on APIS for that site. However, as explained above this is the critical load for sand dunes; for saltmarsh a critical load of 10 kgN/ha/yr is more appropriate. Using this critical load, nitrogen contribution under the construction scenario would be between 0.5% and 6.8% of the critical load depending on transect. Therefore, LSE cannot be dismissed.

7.2.65 On the basis of the air quality modelling, it can be concluded that there would be no LSE on the qualifying features of Deeside and Buckley Newt Sites SAC and the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar as a result of NOx and ammonia from construction traffic emissions. It can also be concluded there would be no LSE on Deeside and Buckley Newt Sites SAC from nitrogen deposition. **However, nitrogen deposition on the Welsh part of Dee Estuary SAC / SPA / Ramsar site within 200 m of the A548**

Flintshire Bridge cannot be dismissed and therefore requires further consideration in the AA.

Barriers to Movement

River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC and Dee Estuary SAC

7.2.66 The upgrading of the Water Connection Corridor would take place in the Dee Estuary. Mobile and migratory interest features of River Dee & Bala Lake SAC (otter, sea lamprey, river lamprey and Atlantic salmon) will make use of the Dee Estuary to travel to and from the River Dee & Bala Lake SAC. Water Connection Corridor works will occur during the day when otters are less likely to be active, and they will not block movement along the banks of the Dee. As such, they will not constitute a barrier to dispersal of otter interest features of the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC.

7.2.67 The Dee Estuary/ Aber Dyfrdwy SAC and River Dee & Bala Lake SAC are both designated for sea lamprey and river lamprey, while the River Dee & Bala Lake SAC is also designated for Atlantic salmon. All of these species undertake annual migrations from the estuary to upstream spawning grounds. Where significant construction / decommissioning works are undertaken within the water column, there is a potential for the disruption of these migratory movements. The Proposed Development will encompass refurbishment and upgrading works to the existing water cooling infrastructure serving the existing Connah's Quay Power Station. These works will generally be undertaken around low tide in order to most easily access the screens and this will involve foot access across the saltmarsh, in line with existing monitoring and management activities. In addition to direct foot-only access via the saltmarsh, these works (e.g. eel screen upgrades) may be undertaken by divers (and accompanying support boats) over a period of three to five months. However, the localised scale and intermittent nature of these upgrading works are highly unlikely to act as barriers to movement of anadromous fish, with the majority of the water column being free from any disruptions.

7.2.68 **Overall, it is concluded that no LSE on these Habitats sites would arise either alone or in combination with other plans or projects.**

Introduction of INNS

Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC

7.2.69 There are several legislative instruments relating to INNS. The purpose of this legislation is to prevent and reduce the negative economic and environmental impacts of these species. Key legislation identifies species for which mitigation is required, specifically:

- species listed in Schedule 9 of the WCA (Ref 54); and
- species of special concern and Schedule 2 species as per the Invasive Alien Species (Enforcement and Permitting) Order 2019 (Ref 64).

7.2.70 Taken together, the relevant legislation makes it an offence to plant or otherwise cause to grow (including allowing to spread) listed species in the wild. If transported off-site, there is a duty of care with regards to the disposal of any part of the plant that may facilitate establishment in the wild and cause environmental harm (as per the Environmental Protection Act 1990) (Ref 65).

7.2.71 While it is not illegal to have any of the identified INNS on a property, even when growing on managed land, the spread of Schedule 9 WCA species should be kept under control such that the species is not having an appreciable adverse impact on habitats and their native biodiversity.

7.2.72 Therefore, appropriate biosecurity measures would be implemented during works carried out during the construction and decommissioning phases of any scheme to prevent the spread of INNS, irrespective of whether there are Habitats sites in the vicinity. These requirements have not been included as a result of the HRA but were included already as part of standard good practice controls for all construction projects. **Overall, it is concluded no LSE on these Habitats sites will arise either alone or in combination with other plans or projects.**

7.3 Operational Phase

Direct Loss of / Damage to Qualifying Habitat

7.3.1 As discussed in Section 7.2 (Construction and Decommissioning), construction of a new permanent outfall structure for surface water drainage discharge from the Main Development Area (the 'Proposed Surface Water Outfall') would be undertaken adjacent to the Existing Surface Water Outfall. While most losses are in the construction phase and would be reinstated, there would be a small permanent loss of saltmarsh (*1330* Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)).

7.3.2 **Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar regarding loss of / damage to qualifying habitat in the construction, operation and / or decommissioning phases cannot be excluded specifically regarding the Proposed Surface Water Outfall. This impact pathway is screened in for further consideration as part of HRA Stage 2 (AA), which is informed by the NVC survey carried out by AECOM in 2024.**

Noise and Visual Disturbance (Within Site Boundaries and Functionally linked land)

Dee Estuary / Aber Dyfrdwy SAC/ SPA / Ramsar and the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC

7.3.3 The Applicant is not aware of any evidence of conflicts between the infrastructure associated with the existing Connah's Quay Power Station (including the emissions stacks) and the qualifying features of the Dee Estuary SPA/Ramsar site. All bird species for which the SPA and Ramsar site are designated are migratory species which may travel vast distances between breeding and non-breeding grounds negotiating an array of man-

made structures and urban environments. There is also no potential for noise and visual disturbance of Dee Estuary SAC fish species during operation of the Proposed Development.

7.3.4 The operational phase of the Proposed Development, including any maintenance activities required, has the potential to result in visual and noise disturbance to mobile qualifying birds overflying or utilising the estuary and functionally linked lands adjoining the Site. The Proposed Development would also be manned for 24hrs a day, so there is the potential for night staff to disturb foraging and commuting otter and roosting birds.

7.3.5 However, noise modelling for the Proposed Development shows that at no point within any Habitats site are noise levels forecast to exceed 60dB LAeq, even in the absence of acoustic fencing or any other form of mitigation. With regard to visual disturbance, there is already human activity along the boundary of the SPA/Ramsar site for the existing Connah's Quay Power Station. The new development would slightly increase the frontage over which this activity occurs, but not to a significant degree. Moreover, in the long term the existing facility will cease to operate thus reducing human activity to close to current levels. **It is therefore possible to conclude that no likely significant noise or human activity disturbance effect would arise either alone or in combination with other plans or projects.**

7.3.6 The Proposed Development would increase the overall built area at Connah's Quay and extend the frontage of SPA/Ramsar that will be close to an operational facility. There would therefore be a net increase in operational lighting. While this can be easily managed, controls on lighting have been deemed mitigation for the purposes of this HRA and are therefore discussed further in the AA. **As such, it is considered that operational lighting disturbance of Dee Estuary/ Aber Dyfrdwy SPA/Ramsar site needs to be taken forward to AA.**

7.3.7 There will also be no noise and vibration impacts on otter or fish qualifying interest features of River Dee & Bala Lake SAC or Dee Estuary SAC during operation because there are no 'in river' activities during operation and no evidence of otter holts or resting places within the vicinity of the Proposed Development. **Therefore, likely significant effects on River Dee & Bala Lake SAC can be dismissed.**

Loss of Functionally linked land

7.3.8 The Dee Estuary / Aber Dyfrdwy SPA / Ramsar is designated for mobile bird species. These species, to varying degrees, will forage and / or roost beyond the designated site boundaries.

Dee Estuary / Aber Dyfrdwy SPA / Ramsar

7.3.9 The current design would result in the permanent loss of approximately 15 ha of the rough grassland, improved grassland and pasture area to the west. This is the same location that would be used as a construction laydown area. Such habitat offers foraging opportunities for several qualifying Dee Estuary/ Aber Dyfrdwy SPA / Ramsar bird species, most notably curlew *Numenius arquata* and is of sufficient area to serve as functionally-linked land for qualifying features of the SPA.

7.3.10 **Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SPA / Ramsar regarding the potential loss of functionally linked land in the operational phase cannot be excluded. This impact pathway is screened in for further consideration as part of HRA Stage 2 (AA).**

Water Quality

Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar and River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC

7.3.11 Water quality impacts may arise from several sources in the operational phase of the Proposed Development, including:

- from the discharged cooling water;
- runoff from hardstanding associated with the Proposed Development;
- maintenance activities, such as routine cleaning operations; and
- sewage generated by operational site staff.

7.3.12 During the operational phase, it is envisaged that around 66 permanent operational roles would be created (as a worse case). During major outages, which are likely to occur approximately every four years (per unit), it is envisaged that there could be up to 300 additional staff although these are short-term requirements (approximately two months).

7.3.13 The Proposed Development is situated in the supply area of Welsh Water which has a statutory obligation to deliver potable water to new developments and for taking away, treating and properly disposing of the wastewater that is produced without negatively impacting the environment (including Habitats sites). However, in this instance, black and grey wastewater (i.e. non-cooling and non-process wastewater) from the existing Connah's Quay Power Station is currently directed to an underground septic tank system for storage and settling, which is emptied periodically by a specialist contractor (approximately once per six-month period) due to ongoing plant malfunction. Current permitted practice is to treat sewage on site and discharge treated sewage waters with main cooling water purge discharge to the River Dee. It is expected that the Proposed Development will utilise a new similar system for black and grey wastewater including foul drainage from permanent welfare facilities.

7.3.14 However, in order to consider measures to protect water quality that would be implemented as standard, **a conclusion of likely significant effects is drawn, and water quality is taken forward to appropriate assessment.**

Water Quantity Level and Flow

Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar

7.3.15 The preferred cooling method, for reasons of operational functionality and performance, is recirculating hybrid cooling of both the CCGT and CCP. Cooling water would be abstracted from and discharged to the section of the River Dee that lies within the Dee Estuary SAC / SPA / Ramsar, in line with the current process for the existing Connah's Quay Power Station.

7.3.16 It is anticipated that abstraction will be intermittent and limited to no more than three hours per tide around high water. Purge discharge would be no more than three hours commencing on the ebb tide one hour after high water. This would be consistent with current arrangements for cooling water abstraction and discharge at the existing Connah's Quay Power Station.

7.3.17 The Applicant proposes to maintain the permitted abstraction and discharge parameters as far as reasonably practicable, i.e. abstraction would continue to be limited to periods around high water in line with the current abstraction licence.

7.3.18 **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP/6.2.13**) of the ES assesses the impact on flood risk of potential impact of land raising, above ground structures, and below ground structures, including changes to flow paths, levels, and groundwater flooding, which could increase flood risk to the surrounding areas. Any increase in impermeable surface area could affect runoff volumes into the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar site.

7.3.19 In addition to cooling water (discussed in the section above) the Proposed Development drainage system includes:

- open drain system for surface water runoff which would discharge to the surface water outfall via interceptors and monitoring;
- oily water drains which would run to a common interceptor tank;
- chemical drains which would discharge to drains tanks and neutralisation;
- amine closed drain system; and
- foul sewerage for sanitary wastewater.

7.3.20 Surface water would be appropriately segregated from potentially higher risk water sources and treated prior to discharge. **Appendix 13-D: Outline Surface Water Drainage Strategy** (**EN010166/APP/6.4**) of the ES details drainage arrangements for the Main Development Area.

7.3.21 **Appendix 13-D: Outline Surface Water Drainage Strategy** (**EN010166/APP/6.4**) of the ES incorporates the use of SuDS and potentially will include limitations on the discharge rate in line with NRW and FCC guidelines. It would be designed to accommodate the 1 in 100-year (1% Annual Exceedance Probability (AEP)) storm plus climate change, with no unacceptable consequences to operation or flood risk receptors. The surface water drainage network will also incorporate appropriate pollution control measures to manage the risk from diffuse urban pollutants that may be present, noting that there would be no connection between the surface water drainage and process water (closed drain waste collection) or foul water networks.

7.3.22 Furthermore, the SIP for the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar does not identify change in water quantity, level and flow as a threat to site integrity as it is a tidal ecosystem. **As such there is no potential for the Proposed Development to result in LSEs on the Dee Estuary / Aber**

Dyfrdwy SAC / SPA / Ramsar regarding water supply in the operational phase.

River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC

7.3.23 The qualifying fish that are present in the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC have a clear dependency on adequate flow regimes, which safeguard their ability to undertake upstream migrations as well as maintaining the balance of freshwater and seawater in their estuarine environment. While the Proposed Development is situated downstream from the SAC, its qualifying fish species and otter are likely to use the entire continuum of hydrologically connected watercourses including the area around the existing abstraction location for Connah's Quay Power Station.

7.3.24 Notwithstanding this, as highlighted in paragraphs 7.3.16 and 7.3.17, the currently consented abstraction and discharge volumes at the intake / outfall locations will be maintained. Furthermore, the anticipated abstraction regime (including any deviation thereof) must be agreed with NRW as part of their licensing regime, which will ensure that no material negative impacts on the qualifying habitats and species of the SAC will occur. **Overall, there is no potential for the Proposed Development to result in LSEs on the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC regarding water supply in the operational phase.**

Atmospheric Pollution – Operational traffic and stack emissions

7.3.25 Once operational, it is anticipated that 66 permanent roles would be created once Trains 1 and 2 are operating. Staff would be required on a shift basis to be spread over a 24-hour period. Applying a Census car driver mode share of 83% (based on those who currently work in 'Flintshire 004' & 'Flintshire 007'), this could equate to around an additional 55 cars accessing the Main Development Area per day (110 two-way vehicle movements in a 24-hour period). Approximately 12 two-way HGV movements are estimated to and from the Main Development Area each day, associated with deliveries (**Appendix 10-A: Transport Assessment** (**EN010166/APP/6.4**) of the ES).

7.3.26 Emissions associated with the stacks of the Proposed Development also have the potential to affect sensitive ecosystems. Emissions from the new CCP include oxides of nitrogen (NOx) which is also emitted by the existing power station, and ammonia (NH_3), which is not emitted by the existing power station. Emissions of amines and their breakdown products are also likely due to their potential to be present in the emissions from the CCP Absorber stacks. Breakdown products include ammonia, and this has been factored into the ammonia emissions of the Proposed Development. During normal operation, the CCP absorber stack(s) would be the primary source of emissions from both the combustion and carbon capture processes associated with the Proposed Development.

7.3.27 An operational air quality assessment has been undertaken (**Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**) of the ES~~).~~ and supplemented by the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales** (**EN010166/APP/9.45**) report). Two potential Front-End Engineering Design (FEED) options have been

modelled; FEED 1 and FEED 2. These have been modelled as both abated and unabated scenarios.

7.3.28 With regard to ammonia and acid deposition, the unabated scenarios are no worse than the abated scenarios when the data are reported to two decimal places. For annual NOx the unabated scenarios are worse than either abated FEED scenario. For nitrogen deposition FEED 2 abated is the worst-case scenario for both Dee Estuary SAC/SPA/Ramsar site (receptor OE2) and Deeside and Buckley Newts SAC (receptors OE11 and OE13). The data for the worst-case scenario at each receptor are used in this HRA.

7.3.29 Tables 36 and 37 (Abated FEED1), 42 and 43 (Abated FEED2), 48 and 49 (Unabated FEED 1) and 55 and 56 (Unabated FEED 2) of **Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**) show that the critical level for NOx would not be exceeded under any scenario at any Habitats site (both regarding annual mean and 24-hour maximum NOx concentrations). Therefore, no LSE would arise on any Habitats site. NOx is therefore not discussed further in this HRA.

7.3.30 The tables relevant to ecological receptors are Tables 36 to 61 of **Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**) of the ES, with the ~~in combination results shown in Tables D-4 to D-23.~~abated in combination results shown in Tables 20 to 27 of **Appendix B** of the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales** (**EN010166/APP/9.45**) report and unabated in combination results shown in Tables D14 to D22 of **Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**). They are not reproduced in this report, but a summary of the results applicable to Habitats sites is provided. The following Habitats sites would lie within 15 km of the Main Development Area and have therefore been modelled. The modelled receptor location is the closest part of the Habitats site to the Proposed Development:

- Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar (receptor OE2);
- Mersey Estuary SPA / Ramsar (receptor OE6);
- River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC (receptor OE10);
- Deeside and Buckley Newt Sites SAC (receptors OE11 and OE13);
- Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC (receptor OE17); and
- Halkyn Mountain/ Mynydd Helygain SAC (receptor OE18).

7.3.31 As with the construction traffic assessment, there are also six operational traffic air quality transects into Deeside and Buckley Newt Sites SAC (transects TE7a to TE7c) and Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar site (transects TE8a to TE8c).

Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar site (receptor OE2)

7.3.32 Receptor OE2 reflects the worst-case air quality impact on this Habitats site and has therefore been used to provide worst case results. Receptor OE2 is located in Wales. The areas of SAC/SPA/Ramsar site in England are more

distant from the Proposed Development, being approximately 2.5 km away, on the north side of the Dee, and on the other side of the Welsh parts of the Habitats site. Table 44 (Abated FEED 2) of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4**) shows that the contribution of the Proposed Development to ammonia at receptor OE2 (0.02 μgm^{-3}) would represent 2% of the lowest critical level for the SAC of 1 μgm^{-3}. However, as discussed earlier, a higher critical level of 3 μgm^{-3} is more appropriate for saltmarsh, which would mean the contribution of the Proposed Development was 0.7% of the critical level. Moreover, this higher critical level is not forecast to be exceeded by total ammonia concentrations (the Predicted Environmental Concentration) so no LSE would arise. The only notable source of ammonia within the grid square used for background ammonia is the A548. It is therefore reasonable to assume background concentrations of ammonia are homogenous across the remainder of the square. At the time of modelling, ~~no~~two other new point sources of ammonia have been identified to be modelled in combination with the Proposed Development.

7.3.33 The **Consideration of ~~Operational Air Quality Considerations~~ Additional Emerging Schemes Identified by Natural Resources Wales** (**EN010166/APP/9.~~38~~45**) report has been prepared to ~~qualitatively~~ consider applications that were submitted or brought to the Applicant's attention after the cumulative cut off date of the end of March 2026 as set out in paragraph 24.4.22 of **Chapter 24: Cumulative and Combine Effects** (**EN010166/APP/6.2.24**). Based on the analysis undertaken in the **Consideration of ~~Operational Air Quality Considerations~~ Additional Emerging Schemes Identified by Natural Resources Wales** (**EN010166/APP/9.~~38),~~45**) report, no new or different likely significant cumulative effects have been identified beyond those set out within **Chapter 24: Cumulative and Combined Effects (EN010166/APP/6.2.24)**.

7.3.34 Table ~~D-12~~26 (Abated FEED 2) of the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales (EN010166/APP/9.45**) report shows that 'in combination' nitrogen deposition would reach a maximum of 0.~~23~~58 kg N/ha/yr at receptor OE2. This equates to ~~2.3~~5.8% of the lowest (most stringent) critical load for saltmarsh of 10 kg N/ha/yr (the most sensitive habitat in Dee Estuary is its sand dune. However, that is not within the affected area). The contribution of the Proposed Development (see Table 45~~)~~ of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4**)) would be relatively small, being a maximum of 0.13 kg N/ha/yr (1.3% of the critical load). **Since the critical load for nitrogen deposition would also be exceeded by total nitrogen deposition rates (the Predicted Environmental Concentration) LSE cannot be dismissed and AA is required**.

7.3.35 Regarding acid deposition ~~Tables D-8, D-13, D-18 and D-23 show that 'in combination'~~the affected habitats of the SAC (saltmarsh) are not identified on APIS as being sensitive. The only SAC habitat identified as being sensitive to acid deposition ~~does~~is the sand dunes, which are not ~~exceed 1%~~within the impact footprint of the ~~critical load equivalent under any scenario~~Proposed Development.

Mersey Estuary SPA / Ramsar site (receptor OE6)

7.3.36 Mersey Estuary SPA / Ramsar site is designated solely for its non-breeding bird interest. For all SPA birds APIS indicates that they are either not sensitive to air quality impacts on their habitats, or air quality impacts are as likely to be positive (e.g. through increasing prey abundance) as negative. The exceptions are *Numenius arquata* and *Pluvialis apricaria* which are listed as being sensitive to nitrogen deposition in hay meadow habitat. However, that habitat is not present within Mersey Estuary SPA/Ramsar.

7.3.37 *Podiceps cristatus* (great crested grebe) is identified as being potentially negatively affected by nitrogen deposition on saltmarsh habitat. Critical loads are primarily set to protect botanical criteria of habitats, such as species richness and percentage grass cover. The reasons for lowering the critical load for saltmarsh to 10 kgN/ha/yr are provided in the document '*Review and revision of empirical critical loads of nitrogen for Europe'* (Ref 74). In Table 3.1, this document states that the effect of nitrogen deposition on upper-mid saltmarsh is '*increase in dominance of graminoids* [grasses]; *decline positive indicator species* [i.e. certain plant species indicative of good botanical quality saltmarsh]' and the preceding text suggests this reduction of the critical load arose because an Irish study found a reduction in positive indicator species (i.e. plant species that can be found in a good quality saltmarsh) at deposition rates lower than the previous minimum critical load of 20 kgN/ha/yr.

7.3.38 Therefore, the lowest nitrogen critical load for saltmarsh of 10 kgN/ha/yr is driven by botanical criteria and in particular the desire to preserve or maximise the number of positive indicator plant species. However, great crested grebes are large wading birds that forage on fish and aquatic invertebrates, using saltmarsh primarily for roosting (resting), for wading across and foraging in pools and creeks. Non-breeding great crested grebes are therefore not affected by the presence or absence (or abundance) of saltmarsh plant species, but rather by the structure of the habitat in very broad terms. Atlantic salt meadow is unlikely to become unsuitable for great crested grebes unless the habitat became so tall, dense and rank that it no longer provided suitable open habitat for foraging and roosting. Great crested grebes would therefore only be affected by major structural changes to their habitat, and these would not arise until the upper nitrogen critical load of 20 kgN/ha/yr is exceeded.

7.3.39 Therefore, the upper nitrogen critical load of 20 kg N/ha/yr is considered appropriate for this species. Table D-12 (Abated FEED 2) shows that for receptor OE6 'in combination' nitrogen deposition is forecast to be 0.~~03~~07 kg N/ha/yr (0.~~64~~% of the critical load) which is well below 1% of the critical load. Moreover, with a Predicted Environmental Concentration of ~~17.29~~15.67 kg N/ha/yr, the critical load of 20 kg N/ha/yr suitable for great crested grebe at the SPA/Ramsar would also not be exceeded.

7.3.40 Regarding NOx, under all scenarios total NOx concentrations will fall below the critical level even in combination (Tables ~~D-4, D-~~20 and 24 of the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales (EN010166/APP/9~~,~~.45)** report and Tables D-14 and D-19~~).~~ of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4)**). Regarding ~~acid and~~ ammonia, under all scenarios

(Tables ~~41, 47, 54 and 61 for acid)~~13 and ~~(Tables 38, 44,~~17 of the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales (EN010166/APP/9.45)** report and Tables 51 and 58 ~~for ammonia),~~of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4)**), the contribution of the Proposed Development is imperceptible, being below 0.01 kq/ha/yr and thus not visible in the model. Regarding acid deposition, the only critical load equivalent for acid reported on the APIS website for the qualifying features of this SPA is that for calcareous grassland which is not found within the Mersey Estuary. Therefore, the contribution of the Proposed Development can be dismissed alone or in combination. Therefore, no LSE would arise on Mersey Estuary SPA/Ramsar site during operation.

River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC (receptor OE10)

7.3.41 As discussed for construction air quality, the modelled part of River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (the River Dee) is not designated for features sensitive to air quality as these are confined to the area around Bala Lake and therefore approximately 50 km from the Proposed Development and well beyond the potential zone of air quality impact. It is therefore not discussed further in this HRA.

Deeside and Buckley Newt Sites SAC (receptor OE11 and OE13)

7.3.42 Tables 38 (Abated FEED 1) and 44 (Abated ~~FEED2~~FEED 2) of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4)**) show that there are no receptors where the contribution of the Proposed Development to ammonia would exceed the 1% of the critical level threshold. ~~No~~Two other new point sources of ammonia have been identified to be modelled in combination with the Proposed Development. Table ~~D-11~~26 (Abated FEED 2, the worst-case scenario for this SAC) of the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales (EN010166/APP/9.45)** report shows that 'in combination' nitrogen deposition would reach a maximum of 0.~~18~~30 kg N/ha/yr at receptor OE11. (0.14 kg N/ha/yr from the Proposed Development). This equates to ~~1.8~~3.0% of the critical load for oak woodland of 10 kg N/ha/yr. **Since the critical load for nitrogen deposition would also be exceeded by total nitrogen deposition rates (the Predicted Environmental Concentration) likely significant effects cannot be dismissed and AA is required**.

7.3.43 Regarding acid deposition, Tables 23 and 27 of the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales (EN010166/APP/9.45)** report and Tables D-~~8, D-13, D-~~18 and D-23 of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4)** show that ~~'in combination'~~total acid deposition (the Predicted Environmental Concentration) does not exceed ~~1% of~~ the critical load equivalent under any of the modelled scenarios.

Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC (receptor OE17)

7.3.44 ~~Tables~~Table 38 (Abated FEED 1) of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4)**) shows that the ammonia contribution of the Proposed Development would be imperceptible being 0.2% of the critical

level. ~~No~~Two other new point sources of ammonia have been ~~identified to be~~ modelled in combination with the Proposed Development~~.~~ but Table 21 of the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales (EN010166/APP/9.45)** report shows that the in combination effect remains imperceptible at 0.4% of the critical level. Tables ~~D-7~~22 (Abated FEED 1) and ~~D-12~~26 (Abated FEED 2) are the worst-case for nitrogen deposition to this SAC and both show that in combination nitrogen deposition is forecast to be 0.~~03~~05 kg N/ha/yr and 0.06 kg N/ha/yr for FEED 1 and FEED 2 respectively, which is well below 1% of the critical load. Regarding acid deposition, Tables 23 and 27 of the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales (EN010166/APP/9.45)** report and Tables D-~~8, D-13, D-~~18 and D-23 of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4)** show that 'in combination' acid deposition does not exceed 1% of the critical load equivalent under any of the modelled scenarios.

Halkyn Mountain/ Mynydd Helygain SAC (receptor OE18)

7.3.45 Table 38 (Abated FEED 1) of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4)** shows that the ammonia contribution of the Proposed Development would be imperceptible, being 0.2% of the critical level. Table ~~D-7~~26 (Abated FEED ~~1~~2) shows that in combination nitrogen deposition is forecast to be 0.~~02~~04 kg N/ha/yr which is ~~well~~ below 1% of the critical load. Regarding acid deposition, Tables 23 and 27 of the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales (EN010166/APP/9.45)** report and Tables D-~~8, D-13, D-~~18 and D-23 of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4)** show that 'in combination' acid deposition does not exceed 1% of the critical load equivalent under any of the modelled scenarios.

Conclusion

7.3.46 In summary, LSE can be ruled out, alone or in combination, for all Habitats sites except Dee Estuary SAC/SPA /Ramsar site regarding nitrogen deposition to saltmarsh, and Deeside and Buckley Newt Sites SAC regarding nitrogen deposition to oak woodland. AA is required to explore these effects further.

8. In-Combination Assessment

8.1 Introduction

8.1.1 Whilst there is no legal definition of what constitutes a 'plan' or 'project' for the purposes of the Habitats Regulations, PINS advises that the following (but not limited to) should be considered for the HRA in-combination assessment (Ref 9):

- projects that are under construction;
- permitted application(s) not yet developed;
- submitted application(s) not yet decided;
- all refusals subject to appeal procedures not yet decided;
- projects on the PINS' National Infrastructure Programme of Projects (Ref 66); and
- Projects identified in the relevant development plan (and emerging development plans – with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals would be limited and the degree of uncertainty which may be present.

8.1.2 An assessment of the potential in-combination effects associated with the implementation of the off-setting measures defined in the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)** to be delivered at Gronant Fields is provided separately in Appendix C of the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)**.

8.2 Potential for likely significant effects in combination

8.2.1 At HRA Stage 1, the following developments are considered to have potential for in-combination effects:

- all developments with hydrological continuity to the Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar or River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC – this would include all applications for works that could lead to changes in water flows or water quality in the Habitats sites;
- all developments that will result in a loss of at least 2 ha of open greenfield habitat within 2 km of the Dee Estuary/ Aber Dyfrdwy SPA / Ramsar site, on the basis that depending on the result of bird surveys for those planning applications those fields could support foraging and roosting SPA birds around high tide; and
- all developments with stack emissions within 15 km of all Habitats sites discussed in this HRA, particularly Dee Estuary/ Aber Dyfrdwy SPA / SAC / Ramsar site and Deeside and Buckley Newt Sites SAC. This is the distance in Natural Resources Wales and Environment Agency

guidance (Ref 15, mentioned earlier in the report) within which air quality impacts from stack emissions may affect sensitive Habitats sites.

8.2.2 Regarding hydrological, water quality, and loss of functionally-linked habitat impacts on the Dee Estuary/ Aber Dyfrdwy SPA/ Ramsar site, the Proposed Development has already been screened in for AA.

8.2.3 Regarding air quality impacts, the Proposed Development has already been screened in for AA. The in-combination effect has been considered in the modelling and is reported in the air quality sections in this HRA. Full modelling results are provided in **Appendix 8-C: Air Quality Construction Assessment** and **Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**) of the ES. The list of other projects considered in the air quality modelling is provided in Annex D, paragraph D.1.3 of **Appendix 8-D: Air Quality Operational Assessment (EN010166/APP/6.4)**. The **Additional Operational Air Quality Considerations (EN010166/APP/9.38)** report has been prepared to qualitatively consider applications that were submitted or brought to the Applicant's attention after the cumulative cut off date of the end of March 2026 as set out in paragraph 24.4.22 of **Chapter 24: Cumulative and Combine Effects (EN010166/APP/6.2.24)**.

9. Conclusion of HRA Stage 1

9.1.1 A preliminary test of LSE has been undertaken for the Proposed Development, which has considered the following impact pathways:

- construction and decommissioning:
  - direct loss of/damage to qualifying habitats;
  - noise and visual disturbance;
  - water quality;
  - water quantity, level and flow;
  - loss of functionally linked land;
  - atmospheric pollution (including dust deposition); and
  - introduction of INNS.
- operation:
  - direct loss of / damage to qualifying habitat;
  - noise and visual disturbance;
  - loss of functionally linked land;
  - water quality;
  - water quantity, level and flow; and
  - atmospheric pollution.

9.1.2 In summary, the following impact pathways have been screened in for HRA Stage 2 (AA):

- direct loss of / damage to qualifying habitats of Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar site during construction/demolition;
- noise and visual disturbance of interest features of Dee Estuary/ Aber Dyfrdwy SPA / Ramsar site during construction/demolition;
- water quality during both construction and operation on Dee Estuary/ Aber Dyfrdwy SAC/ SPA / Ramsar and River Dee & Bala Lake SAC, due to the need to consider mitigation measures;
- loss of functionally linked land for Dee Estuary/ Aber Dyfrdwy SPA / Ramsar birds during construction / demolition and operation;
- visual disturbance associated with operational lighting disturbance of Dee Estuary/ Aber Dyfrdwy SPA / Ramsar site; and
- atmospheric pollution of Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar during construction/demolition, and of Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar and Deeside and Buckley Newt Sites SAC during operation.

10. HRA Stage 2 - Appropriate Assessment

10.1 Introduction

10.1.1 Each of the impact pathways taken forward to AA are discussed in the following sections.

10.1.2 An assessment of the implementation of the off-setting measures defined in the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)** to be delivered at Gronant Fields is provided separately in Appendix C of the **Outline Curlew Implementation and Monitoring Plan (EN010166/APP/6.13)**.

10.2 Construction and demolition

Direct habitat loss within Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar site

10.2.1 These three designations are treated together because saltmarsh (the habitat to be directly lost) is a qualifying feature of the Dee Estuary SAC and Dee Estuary Ramsar site and is a supporting habitat for birds of the Dee Estuary SPA. Treating these three sites together reduces repetition as the assessment is effectively identical for all three sites. The HRA Stage 1 Assessment identified that some loss of saltmarsh within Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar site was likely to occur due to the construction of the Proposed Surface Water Outfall. The total saltmarsh loss including from the construction works area has been estimated at approximately ~~650~~585 m^2.

10.2.2 The potential for erosion losses from the additional discharge has been explored. The discharge rate of the Proposed Surface Water Outfall is modelled to be 420 l/s with a velocity of 0.9 m/s. The velocities provided relate to the flow in the pipe which discharges into the concrete outfall structure that is approximately 2.5 m wide. These velocities will therefore be further reduced in the short section of the outfall structure to less than 0.5 m/s at the exit point, even for the most extreme case provided. Moreover, this is based on a worst-case scenario in that surface water runoff from all of the Main Development Area is assumed to be captured by the new network. While flow rates are high, the velocities even under a free draining scenario with climate change included are therefore not high enough to cause scour erosion around the new outfall. Further justification to support this is provided in **Appendix H**, which summarises the findings of a geomorphological walkover survey undertaken by a suitably qualified Coastal Geomorphologist on 23 January 2026.

10.2.3 Permanent losses (discussed later in the section on operation) would be much smaller than ~~650~~585 m^2 as the works corridor can be restored and most of the outfall pipe can be buried. Nonetheless, there would inevitably

be a lag period between burial of the pipe and any natural regeneration of saltmarsh vegetation over the works footprint. Given the works area is surrounded by saltmarsh, it is considered that allowing natural regeneration and colonisation from the surrounding area is a more appropriate restoration method than planting. This includes consideration of factors such as the proximity of sources of regeneration (including from the substrate which can be re-laid following works) and the fact the location and distribution of saltmarsh communities within the SAC is not static but changes naturally as a result of environmental conditions.

10.2.4 Moreover, even the permanent loss of saltmarsh due to the Proposed Surface Water Outfall would not ultimately be a net loss. Rather it would be temporary (though not short-term, lasting approximately five to 10 years) until the existing Connah's Quay Power Station is decommissioned at which point the existing outfall would become redundant and could be removed. Notwithstanding the small area affected, permanent or medium-term net loss of saltmarsh would be considered an adverse effect on the integrity of Dee Estuary / Aber Dyfrdwy SAC, given that saltmarsh is a qualifying feature underpinning the designation, and that saltmarsh losses are also forecast to arise due to sea level rise and coastal squeeze around the Dee Estuary.

10.2.5 The most relevant conservation objectives of the Dee Estuary / Aber Dyfrdwy SAC as expressed in the European Marine Site Regulation 33 Report (Ref 73) are that:

- the aggregate total extent of all estuarine communities within the site is maintained;
- the spatial distribution[11] of estuarine communities within the site is maintained;
- the total extent of Atlantic salt meadow vegetation communities within the site is maintained;
- the proportions of individual Atlantic salt meadow vegetation communities within the site are maintained;
- the zonation of Atlantic salt meadow vegetation communities and their transitions to fresh water and terrestrial vegetation are maintained; and
- the morphology of saltmarsh creeks and pans and the process of their evolution are maintained.

10.2.6 Atlantic salt meadow (which also counts as an 'estuarine community') is the habitat affected by the Proposed Surface Water Outfall as identified in **Appendix 11-C: Botanical Technical Appendix** (**EN010166/APP/6.4**) of the ES~~. The 650~~ and supported by the **2026 NVC Survey Report (EN010166/APP/9.46)**. The approximately 585 m^2 of habitat to be lost consists of species-poor grass dominated saltmarsh (SM28 *Elytrigia repens* dominated grassland) as depicted on **Plate 3**. While this is a natural part of

[11] The Regulation 33 report includes the clarification that '*Spatial distribution of estuarine communities refers to the macro spatial pattern in which communities are distributed around the estuary. For example it concerns the zonation of clean sands being found towards the estuary mouth, muddy sands in the mid estuary and mud in the upper estuary with saltmarsh concentrated along sheltered shores in the mid-upper estuary. The statement does not require micro-distribution of communities e.g. the exact mapped positions of specific communities to be maintained'.*

the saltmarsh community it has lower diversity and ecological interest than other areas.

Plate 3: Saltmarsh within the location of the Proposed Surface Water Outfall. (Taken on 02/07/2024 using an Apple iPhone SE. Facing west towards the Existing Surface Water Outfall Structure)



10.2.7 To address this loss and ensure no overall net loss within the SAC/SPA/Ramsar site, natural coastal processes will be allowed to resume south of the existing Connah's Quay Power Station along a currently defended frontage and in an area not otherwise proposed for managed realignment as part of other strategies. Under current circumstances the saltmarsh within Conservation Area 3 (known as Station Saltings, south of the existing Connah's Quay Power Station) will reduce in extent due to sea level rise and presence of the landward defences, resulting in coastal squeeze. The intention would be to bring part of the defences inland and allow the saltmarsh to naturally retreat to such an extent that any losses due to the Proposed Surface Water Outfall (the vast majority of which would be temporary) would be more than offset by the reduction in coastal squeeze allowed by the realigned defences south of the existing Connah's Quay Power Station. This would not avoid coastal squeeze altogether as that would require the removal of such defences, but it would substantially delay the rate of squeeze and the period at which any reduction in saltmarsh extent due to sea level rise would occur.

10.2.8 Therefore, the coastal defences south-east of the existing Connah's Quay Power Station adjacent to Compartment 3 would be set back to create a 1,300 m^2 area into which the saltmarsh in Conservation Area 3 can expand. The Management Plan for the Conservation Areas (Ref 67) indicates that between 2010 and the date of the Management Plan (2015) some previously exposed mud around Compartment 3 had been colonised by common saltmarsh grass (*Puccinella maritima*) indicating natural saltmarsh

colonisation and extension can occur in this area if suitable conditions are created.

10.2.9 Setting back the embankment would reduce long-term losses of saltmarsh in the Dee Estuary due to coastal squeeze and thus ensure no net loss of grass dominated SM16 or SM28 saltmarsh in the Dee Estuary by enabling the saltmarsh in the existing area to expand landwards. Provided this is done before the existing area of saltmarsh is lost it would allow the saltmarsh (which would be a naturally shifting community without hard defences) to move naturally inland to a greater extent by managed realignment than the loss due to the new outfall and therefore avoid a net loss. It would therefore not conflict with the conservation objectives regarding extent or proportions.

10.2.10 This is considered to offset the impact on saltmarsh rather than represent 'compensation' in the context of the Habitats Regulations. This is because rather than creating an entirely new area of habitat where none currently exists (which would be considered compensation), it is restoring natural coastal processes (retreating existing defences) for an existing area of saltmarsh (The Saltings) to allow that area of existing saltmarsh to continue to persist without erosion in the face of sea level rise, thus ensuring no net loss in the long-term. The Dee Estuary is a dynamic system with saltmarsh being lost and gained through natural deposition and erosion and in the longer term through sea level rise. Ideally for good management of the SAC to achieve its conservation objectives flood defences around the SAC would be removed. It should be noted that there would likely be localised losses of saltmarsh within the SAC due to rising sea levels even without the Proposed Development, and the retreat area would reduce those losses. This would enable the achievement of key conservation objectives for the SAC which relate to maintaining the extent of saltmarsh types and the balance of saltmarsh communities.

10.2.11 With these measures in place, no adverse effect on the integrity of the SAC/SPA/Ramsar site will arise.

Noise and visual disturbance to Dee Estuary / Aber Dyfrdwy SPA/Ramsar site

10.2.12 These two designations are treated together because the same species and assemblage of birds are qualifying features of both the Dee Estuary Ramsar site and Dee Estuary SPA. Treating these two sites together reduces repetition as the assessment is effectively identical for both sites. This is because the boundary of the SPA and Ramsar site (which in this location coincide) is treated as the sensitive feature. If noise levels at the boundary can be kept to acceptable limits, then all SPA and Ramsar birds within the designations will be protected. The offloading of materials at Connah's Quay North would make use of an existing quay that is already periodically used for offloading by large vessels and may involve use of a crane. While an intensification of barge movements would arise, the generally industrial nature of the frontage and presence of tall structures, particularly on the north bank of the river indicates this would not be a meaningful difference in background conditions.

10.2.13 Appendix D of this report presents noise contour maps, assuming use of an acoustic fence, for phases of construction. It also presents an operational noise map. Using a 60 dB threshold for disturbance, without reference to baseline noise levels at this point in the assessment, noise contour maps were calculated for both L_{Aeq} and L_{Amax} for all phases of construction, assuming use of 3 m high acoustic fencing (location shown on **ES Figure 5-3 (EN010166/APP/6.3**)) or other standard noise control which typically reduces noise levels by approximately 10 dB. The results were as follows:

- the phases 'site enabling works', 'main civils works', and 'plant installation works' would result in L_{Aeq} noise levels reaching 65 dB in Dee Estuary SPA / Ramsar; L_{Amax} levels would exceed 65 dB. However, with acoustic fencing, at no point in any Habitats site would noise levels exceed 60 dB due to these phases of work. Acoustic fencing will therefore be required as mitigation. The fence that has been included in noise modelling would be 3 m in height.
- water connection works – L_{Aeq} noise levels within an approximately 10ha area of the SPA foreshore would exceed 60 dB, while L_{Amax} levels would exceed 60 dB over a 7 ha area of the SPA / Ramsar (with a maximum noise level of more than 85 dB), even with acoustic fencing. **Therefore, this phase of the Proposed Development would require construction outside the sensitive period for Dee Estuary SPA / Ramsar, i.e. outside the period of September[12] to March.**
- proposed Surface Water Outfall – this has not been specifically modelled at time of assessment due to uncertainties over construction methodology. However, the results of that modelling are not required to complete the HRA. Since these works would be undertaken within the Dee Estuary / Aber Dyfrdwy SPA / Ramsar site they would also **require construction outside the sensitive period for Dee Estuary SPA / Ramsar, i.e. outside the period of September to March.**

10.2.14 During Compound 1 site enabling works, the L_{Amax} noise levels would slightly exceed 60 dB (being up to 65dB L_{Amax}) over approximately 0.4ha of the Dee Estuary / Aber Dyfrdwy SPA/Ramsar immediately west of the site boundary, overlapping with Connah's Quay Conservation Area 2. However, this would only occur when the plant is operating closest to the barrier.

10.2.15 During Main Development Area Plant Installation and Main Development Area Enabling Works L_{Amax} noise levels would also exceed 60dB but only over around 200 m^2 of the Dee Estuary/ Aber Dyfrdwy SPA / Ramsar (in the River Dee) and also only when the plant is operating closest to the barrier.

10.2.16 During Compound 2 site enabling works, the L_{Amax} noise levels would exceed 60 dB (up to 80 dB) over approximately 1 ha of the Dee Estuary/ Aber Dyfrdwy SPA / Ramsar (in the River Dee), but again only when the plant is operating closest to the barrier. Moreover, it should be noted that the baseline L_{Amax} along the Dee Estuary / Aber Dyfrdwy SPA / Ramsar frontage is already high being 82 dB to 90 dB during the day, depending on monitoring location. At no point within the Dee Estuary / Aber Dyfrdwy SPA /

[12] It is noted that the 'typical' wintering period encompasses October to March. However, peak counts of black-tailed godwit within the Dee Estuary often occur in September. This has been taken into account in setting the no-works sensitive period for the Proposed Development.

Ramsar site are L_{Amax} noise levels during construction forecast to exceed these levels.

10.2.17 For the Main Development Area Shrouded Piling (i.e. the use of a shroud to mitigate piling noise at the Main Development Area), the 60 dB L_{Amax} contour extends well into the SPA/Ramsar site, over approximately 22 ha of the SPA / Ramsar site. For most of this area L_{Amax} noise levels would be below 70 dB but the highest noise level would be 80-85 dB (which would be experienced over approximately 0.1 ha of the SPA/Ramsar site). Note that this is for shrouded piling, with acoustic fencing, so does take into account mitigation. The noise modelling (**Chapter 9 Noise and Vibration (EN010166/APP/6.2.9**) has assumed this would be impact/driven piling which accounts for the high L_{Amax} levels. In practice, quieter piling techniques may well be possible. Moreover, these maximum levels would only occur when piling was being undertaken immediately adjacent to the SPA / Ramsar boundary. Additionally, the baseline L_{Amax} along the Dee Estuary / Aber Dyfrdwy SPA / Ramsar frontage is already high being 82 dB to 90 dB during the day, depending on monitoring location. At no point within the Dee Estuary / Aber Dyfrdwy SPA / Ramsar site are L_{Amax} noise levels during construction forecast anticipated to exceed these levels (even the forecast maximum of 85 dB L_{Amax} being below 90 dB L_{Amax}) even using impact piling, provided shrouded piling and acoustic fencing are used.

10.2.18 Therefore, it is reasonable to conclude that no significant noise disturbance would arise provided acoustic fencing and other relevant noise mitigation (notably shrouding for any impact piling) is used. The exception is when undertaking works in the Water Connection Corridor and at the Existing and Proposed Surface Water Outfall. **At these locations seasonal avoidance would also be required as an additional mitigation measure**.

10.2.19 With regard to visual disturbance during construction, the acoustic fencing that would be installed to control noise impacts would also screen human activity. There is also an existing 2 m high bund visually screening the fields which would be used as a laydown area and for the main location of the Proposed Development from the SPA / Ramsar to the west. With acoustic fencing and appropriate seasonal restrictions on construction within the SPA/Ramsar site in place, no adverse effect on integrity will arise.

Water quality

10.2.20 Water quality impacts on Habitats sites were screened in for appropriate assessment at the request of Natural Resources Wales in order to consider water quality protection measures as mitigation. The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 (Ref 14) and the Environmental Permitting (England and Wales) Regulations 2016 (Ref 15) make it an offence to pollute watercourses, irrespective of whether they are Habitats sites or connect to Habitats sites. The Dee Estuary straddles the boundary between England and Wales and therefore English water quality regulations are relevant alongside Welsh regulations.

10.2.21 Therefore, the developer during the construction period on every project must have a duty of care to the water environment and to produce and implement plans and procedures to prevent discharge from works entering surface,

groundwater, wetlands or coastal waters. For the Proposed Development this will take the form of a Construction Environmental Management Plan (CEMP). The **Framework CEMP** (**EN010166/APP/6.5**) includes measures to:

- control and minimise the risk of pollution to surface waters and groundwater by managing construction site runoff and the risk of chemical spillage;
- control the storage, handling and disposal of potentially polluting substances during construction;
- manage activities within floodplains including storing materials outside of the floodplain as far as reasonably practicable, production of a Flood Risk Management Plan (FRMP) with floodplain control measures and contingency actions, and measures to safeguard safety of staff during construction from increases in flood risk on-site due to climate change;
- manage water removed from excavations including the risk from groundwater flooding through appropriate working practices (during excavations) such as having adequate plans and equipment in place for de-watering to enable safe and dry working environments, but also any risk to the flow regime or quality of any relevant, nearby water feature; and
- appropriate methods and mitigation measures when undertaking works within, under and adjacent to water features including managing any risk of physical damage to water features.

10.2.22 Moreover, a protective buffer zone would be established for all watercourses. For small watercourses that are less than approximately 5 m wide (bank top to bank top) the buffer zone would be 10 m from the centre line of the watercourse. For larger water features, such as the Dee Estuary, the buffer zone will be applied from the Mean High Water Line (MHWL). These measures collectively will prevent pollution from occurring and therefore protect receiving waterbodies and Habitats sites.

10.2.23 To confirm the protection provided, the **Framework CEMP (EN010166/APP/6.5)**) commits to the following in Table 7: '*A Water Management Plan (WMP) would be annexed to the final CEMP(s) which would outline the mitigation measures necessary to avoid, prevent and reduce adverse effects where possible upon the local surface water (and groundwater) environment during construction. The WMP would also include an outline of responsibilities with regard to water management, required water quality monitoring, pollution prevention measures, training requirements for construction workers with regard to the water environment, an outline of likely relevant permissions and consents required, and a Pollution Incident and Response Plan.*'

10.2.24 This WMP allows for more detailed measures to be outlined post consent including water quality monitoring. In addition, as discussed in **Chapter 13 Water Environment and Flood Risk** (**EN010166/APP/6.2.13**):

- Paragraph 13.5.17:'*During construction of the Proposed Development, it is proposed to undertake a surface water quality monitoring programme to ensure that mitigation measures are operating as planned and*

preventing pollution. This is standard practice for construction works of this type, and full details would be outlined in the WMP (also refer to the ***Framework CEMP (EN010166/APP/6.5)*** *for further details). The purpose of the monitoring programme would also be to ensure pollution is identified as quickly as possible and appropriate action is taken in line with the Pollution Prevention Plan (to be outlined within the WMP)*'.

- Paragraph 13.5.18 '*The water quality monitoring programme would be developed by the Principal Contractor(s) and would also reflect any requirements of secondary environmental permits / licences for works affecting, or for temporary discharges to, watercourses within the Proposed Development Site'.*

10.2.25 **As such, it is considered that new infrastructure can be constructed in a way to prevent pollution to the water environment to ensure no adverse effects on the integrity of any Habitats site from water pollution.**

Loss of functionally linked land for Dee Estuary / Aber Dyfrdwy SPA / Ramsar site

10.2.26 Baseline ornithology surveys have been completed. These consisted of one low tide (diurnal) and three high tide (one diurnal and two nocturnal) visits each month between November 2023 and October 2024 inclusive. The ~~analysis~~results of these surveys and an analysis of existing data were submitted into the Examination at Deadline 5 through the **Further Information on Wetland Bird Count Data [REP5-065]**. The relevant table is reproduced below as **Plate 1**. SPA/Ramsar species not listed in the table were not recorded at all. Five species for which the SPA/Ramsar is designated were recorded: dunlin, oystercatcher, curlew, shelduck and redshank.

Plate 1: Dee Estuary SPA / Ramsar site qualifying species recorded within the Order limits between November 2023 and March 2024 (Peak count shown in bold)

Species	Survey																		SPA cited population
	November			December			January				February				March				(% of pop. recorded by surveys)
	Low Tide	High Tide	Noc (Spring)	Low Tide	High Tide	Noc (Spring)	Low Tide	High Tide	Noc (Spring)	Noc (Neap)	Low Tide	High Tide	Noc (Spring)	Noc (Neap)	Low Tide	High Tide	Noc (Spring)	Noc (Neap)	
Dunlin										**6**									27,769 (<0.1%)
Oystercatcher							**6**				2	2				5			22,677 (<0.1%)
Curlew	52	42		13	**92**	6	32		50	69	42								3,899 (2.4%)
Shelduck					**2**														7,725 (<0.1%)
Redshank										**1**									5,293 (<0.1%)

~~10.2.26~~10.2.27 The analysis above suggests that the fields to be used as a laydown area (in the intermediate term) and to a smaller extent would be lost to the permanent footprint are functionally linked to Dee Estuary / Aber

Dyfrdwy SPA / Ramsar as they support more than 1% of the curlew population of the SPA. No other SPA or Ramsar bird species recorded were found at populations above 1% of the SPA population. The curlews are widely-distributed across the fields in the non-breeding season. A peak count of 160 birds (across all three fields within the proposed laydown area) was recorded in January 2024. Bird surveys for the Proposed Development are reported in ES (**Appendix 11-D: Ornithology Baseline Survey and Information Report** (**EN010166/APP/6.4**)). Note that bird survey data and WeBS data for the Proposed Development and Gronant Field mitigation area are also reported in the Outline Curlew Implementation and Monitoring Plan. Therefore, using a metric agreed with Natural Resources Wales (namely whether the site supports more than 1% of the SPA population of a given qualifying species) only the use of land within the Order limits by curlew is considered significant. Therefore, only habitat loss for this species requires mitigation.

~~10.2.27~~10.2.28 Of the land to be lost to the Proposed Development, approximately 11 ha would be lost temporarily. This loss would not be short-term, lasting approximately nine years, but would be reversible. A further 15 ha would be lost in the long-term, until the Proposed Development is decommissioned and the 26 ha of functionally linked land within the Order limits is reinstated to its existing or a materially similar condition that is suitable[13] to function as functionally linked land for curlew, unless otherwise agreed with the relevant discharging authority in consultation with NRW. Combined total losses therefore equate to 26 ha of functionally linked land for SPA / Ramsar curlew, to be lost in the intermediate to long-term.

~~10.2.28~~10.2.29 The normal solution to offsetting the loss of functionally linked land outside SPA boundaries is to acquire control of other areas of land within a suitable distance of the SPA / Ramsar and render them suitable for the affected species. The provision of such alternative habitat should be provided within 2 km of the SPA / Ramsar, as this is the distance identified in available guidance (Ref 16) within which curlew travel from designated sites to forage and roost, although functional linkage is more important than distance. This offsetting of loss of functionally-linked land is deemed mitigation for adverse effects on the integrity of SPA/Ramsar sites (for example, in the DCO applications for Lower Thames Crossing, East Yorkshire Solar Farm, A303 Stonehenge, Pear Tree Hill Solar Farm and others). This is because the adverse effect on integrity being addressed would be a possible reduction in curlew populations within the SPA due to a reduction in foraging and roosting opportunities in the wider landscape. By enhancing other areas for curlews, the adverse effect on integrity (a reduction in curlew populations within the SPA) is mitigated by ensuring there is no net loss of foraging and roosting opportunities.

~~10.2.29~~10.2.30 The Applicant's intention is to deliver 26 ha of habitats creation and improvements at Gronant Fields at Prestatyn (hereafter referred to as the Off-site Delivery Area) which are approximately 21.2 km from the Main Development Area and within the SPA / Ramsar site. The land would be managed until the Proposed Development is decommissioned and the 26 ha of functionally linked land within the Order limits is reinstated to its existing or

[13] neutral type grassland with regular sheep grazing to maintain sward height.

a materially similar condition that is suitable[14] to function as functionally linked land for curlew, unless otherwise agreed with the relevant discharging authority in consultation with NRW. Full details of the habitat management measures and enhancements are provided in the **Outline Curlew Implementation and Monitoring Plan** (**EN010166/APP/6.13**).

~~10.2.30~~10.2.31 Delivery of land to offset losses of functionally linked habitat can be considered mitigation rather than compensation in the context of the Habitats Regulations. This is because the adverse effect on the integrity of the SPA / Ramsar would be a possible reduction in curlew populations within the SPA (not specifically near the Construction and Operation Area but regarding the overall curlew population distributed around the SPA as the conservation objectives of the SPA relate to the curlew population as a whole) due to a reduction in foraging and roosting opportunities in the wider landscape. By delivering the mitigation at the Off-site Delivery Area this adverse effect on integrity (a reduction in curlew populations within the SPA) would be avoided by ensuring no net reduction in off-site foraging and roosting habitat. The Applicant is therefore avoiding (or mitigating for) the adverse effect on integrity by ensuring there is no net loss of foraging and roosting opportunities by enhancing other areas to support greater curlew numbers. The fact the Off-site Delivery Area lies within the SPA does not affect the decision of mitigation/compensation as that decision is based entirely on whether an adverse effect on integrity is avoided or not; it is entirely possible to deliver mitigation within an SPA.

~~10.2.31~~10.2.32 There is considerable precedent for DCOs to regard addressing loss of functionally-linked land as mitigation such as Sea Link, East Yorkshire Solar Farm, Lower Thames Crossing, Sunnica Energy Farm, Peartree Hill Solar Farm and Helios Renewable Energy. It is not just common in DCOs; for example, the Solent Wader and Brent Goose Strategy (Ref 68) sets out the processes for addressing loss of functionally-linked land around the Solent European sites. This is used by all the Solent local authorities when granting consent. The mitigation guidance (Ref 68) describes it as 'offsetting' (rather than compensation) and derogations are not required for developers to deliver offsetting habitat to address loss of functionally linked land.

~~10.2.32~~10.2.33 . The enhancement within the Off-site Delivery Area is likely to be achieved by introducing a suitable grazing and management regime in the first instance, supported by the creation of shallow scrapes, and potentially footdrains, that would become seasonally inundated and by raising ground water level at appropriate times (to be detailed in a Curlew Implementation and Monitoring Plan) to provide better foraging opportunities primarily for curlew but also to attract increased number of other SPA / Ramsar species.

~~10.2.33~~10.2.34 **With the mitigation included within the DCO Application, no adverse effect on the integrity of the Dee Estuary SPA / Ramsar site would arise**. The **Commitments Register** (**EN010166/APP/6.10**) provides further information on the relevant securing mechanisms for all relevant mitigation measures.

[14] neutral type grassland with regular sheep grazing to maintain sward height.

Atmospheric pollution of Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar site

~~10.2.34~~10.2.35 These three designations are treated together because saltmarsh (the habitat for which LSEs cannot be dismissed) is a qualifying feature of the Dee Estuary SAC and Dee Estuary Ramsar site and is a supporting habitat for birds of the Dee Estuary SPA. Treating these three designations together reduces repetition as the assessment is effectively identical for all three sites.

~~10.2.35~~10.2.36 As discussed in the Likely Significant Effects section, the only place where traffic will use roads within 200m of this Habitats site is where A548 Weighbridge Road crosses the River Dee (Flintshire Bridge) in Wales. The Stage 1 assessment identified that 'in-combination' traffic-related nitrogen deposition on Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar site (transects TE8a to TE8c) required further assessment since the nitrogen deposition impact at the closest point of the SAC would exceed 1% of the critical load for saltmarsh (with the contribution of the Proposed Development being 0.9% to 6.8% of the critical load). The worst-case impact is on transect TE8b where the contribution of the Proposed Development remains elevated above 1% of the critical load up to 65 m into the SAC. This would affect approximately 1.3 ha of saltmarsh or 0.008% of saltmarsh in the SAC. However, the following factors and characteristics that counteract negative ecological impacts must be taken into account:

- The small (though not imperceptible) impact (Ref 69)[15];
- The fact that some saltmarsh in this area would be pioneer saltmarsh less susceptible to nitrogen deposition;
- The fact that less than 0.01% of saltmarsh in the SAC would be affected and this would be a qualitative effect rather than loss of saltmarsh and may not arise at all in practice due to other confounding factors such as management and tidal inundation regime;
- The fact that the effect would be temporary. Although not short-term, construction would last approximately five years, but the worst-case data reported above are for the worst-case construction year not the entire construction period; and
- The fact that long-term nitrogen deposition over decades is generally more of a concern than shorter-term changes in deposition[16].

~~10.2.36~~10.2.37 Therefore, it is considered that this would not constitute an adverse effect on the integrity of the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar site.

[15] For example, National Highways Design Manual for Roads and Bridges identifies that any impact below 0.4 kg N/ha/yr would not cause a significant effect (Ref 69).
[16] . Caporn et al (2016) specifically address this point in sections 2.2.1 and 5.1 stating that '*The current rate of N deposition is primarily a proxy for long-term cumulative N deposition. Thus we would not expect that a change in N deposition, either increasing or decreasing, would immediately change species richness or composition, but instead these would be gradually influenced by longer-term changes in N deposition'.*

10.3 Operation

Direct habitat loss within Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar site

10.3.1 These three designations are treated together because saltmarsh (the habitat to be directly lost) is a qualifying feature of the Dee Estuary SAC and Dee Estuary Ramsar site and is a supporting habitat for birds of the Dee Estuary SPA. Treating these three sites together reduces repetition as the assessment is effectively identical for all three sites. As discussed in Section 10.2 (Construction and Demolition), there will be a small (maximum 5 m^2) permanent loss of saltmarsh within Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar site due to the presence of the Proposed Surface Water Outfall. Without mitigation and coupled with the lag-time between burial of the pipe and any natural regeneration of saltmarsh vegetation over the works footprint, it is considered that an adverse effect on integrity would arise. However, with the aforementioned creation of a 1,300 m^2 area of managed retreat south of the existing Connah's Quay Power Station no adverse effect on integrity would arise.

Visual disturbance (Lighting disturbance) of Dee Estuary / Aber Dyfrdwy SPA / Ramsar site

10.3.2 These two designations are treated together because the same species and assemblage of birds are qualifying features of both the Dee Estuary Ramsar site and Dee Estuary SPA. Treating these two sites together reduces repetition as the assessment is effectively identical for both sites. This is because the boundary of the SPA and Ramsar site (which in this location coincide) is treated as the sensitive feature. Potential for lighting disturbance of SPA / Ramsar birds during operation was screened into AA. There would be no direct lighting of the Dee Estuary / Aber Dyfrdwy SPA / Ramsar site beyond that which already arises from the existing Connah's Quay power station. Operational infrastructure would be located closer to the SPA / Ramsar site than is currently the case at the western end of the Proposed Development. However, there would still be an approximate 250 m gap between the operational facility and the SPA boundary to the west, including an existing 2 m high bund on the SPA / Ramsar boundary. The way the Proposed Development layout has been designed, there would also be an approximately 30 m separation between the operational facility and the River Dee running parallel to the Main Development Area.

10.3.3 The **Lighting Strategy (EN010166/APP/7.22)** details the operational lighting requirements for the Proposed Development. It ensures that lighting would be sited or screened in such a way as to reduce illumination on adjoining sensitive habitats to minimise effects on receptors that are sensitive to light impacts where practicable. For example, it identifies that any operational light sources will be mounted as high as possible so that sufficient light coverage to task areas is provided, while the potential for light spill, sky glow and glare is minimized. Furthermore, the aiming angles of light sources will be kept below 70 degrees to minimse the amount of light reaching above the horizontal plane. It should also be noted that, even if there is a very limited amount of light spillage onto intertidal habitats, some qualifying species may

have improved foraging efficiency under these conditions. For example, a 2013 research paper showed that illumination from an industrial complex enabled redshank to switch from tactile foraging to sight-based foraging, likely increasing their prey intake (Ref 69).

10.3.4 Given the existing bund and the 250 m gap separating the Proposed Development and the SPA / Ramsar, as well as the sensitive design of operational lighting, there would be no adverse effect on the integrity of Dee Estuary/ Aber Dyfrdwy SPA / Ramsar.

Water quality

10.3.5 Water quality was taken forward to appropriate assessment at Natural Resources Wales and Natural England's request because of the need to invoke mitigation measures. The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 (Ref 14) and the Environmental Permitting (England and Wales) Regulations 2016 (Ref 15) make it an offence to pollute watercourses, irrespective of whether they are Habitats sites or connect to Habitats sites. The Dee Estuary straddles the boundary between England and Wales and therefore English water quality regulations are relevant alongside Welsh regulations.

10.3.6 Therefore, during operation and maintenance, the undertaker has a duty of care to protect the water environment and to produce and implement plans and procedures to prevent discharge from works entering surface, groundwater, wetlands or coastal waters. This will take the form of operational and maintenance environment management plan(s) which would include measures for the protection of ground and surface waters, pollution prevention measures and an emergency response plan for pollution events. The operational and maintenance environment management plan(s) must be prepared in general accordance with **Appendix 4-A: Operation and Maintenance Mitigation Register (EN010166/APP/6.4)**.

10.3.7 As detailed in **Appendix 13-D: Outline Surface Water Drainage Strategy** (**EN010166/APP/6.4**), the Proposed Development will be designed to provide a drainage system that protects the environment from accidental discharges including segregation of clean water / rainwater and firewater from potentially contaminated water.

10.3.8 A number of chemicals would be required to be transported to, stored and used on site. The Main Development Area would therefore contain chemical storage facilities including a road tanker unloading area(s). Where any substance could pose a risk to the environment through an uncontrolled release (e.g. surface water drains), the substance would be stored within appropriate containment facilities including impermeable concrete surfaces, isolated drainage areas and appropriately designed and sized bunds.

10.3.9 Chemical storage will be regulated by NRW through an Environmental Permit that will be required for the operation of the Proposed Development and the inventory of materials to be stored on the Proposed Development Site will be developed through the detailed design.

10.3.10 As identified in **Appendix 13-D: Outline Surface Water Drainage Strategy (EN010166/APP/6.4)**, for surface water runoff a provisional simple index

approach (SIA) analysis has been undertaken in line with good practice (the CIRIA C753 SuDS Manual), which is an approach used to ensure that runoff is adequately treated to prevent adverse impacts to receiving waters. This will be updated for the detailed design Surface Water Drainage Strategy to ensure that sufficient mitigation is provided. A firewater strategy for the Main Development Area will also be developed post consent. Water quality monitoring will be regularly undertaken during operation to confirm the quality of any water in bunded areas, sumps or tanks to ensure that it is suitable for discharge or otherwise is taken by tanker for off-site disposal at a suitably permitted wastewater facility. A Surface Water Maintenance and Management Plan will be prepared during the detailed design phase to describe the requirements for access and frequency for maintaining drainage infrastructure on the Proposed Development Site, thereby ensuring continued efficacy. The final details of the drainage strategy, to be prepared in accordance with **Appendix 13-D: Outline Surface Water Drainage Strategy (EN010166/APP/6.4)**, are secured by Requirement 6 of the **Draft DCO (EN010166/APP/3.1)**.

10.3.11 In addition to surface water pollution, the Applicant is proposing to add a variation for a new contaminant stream to the existing permit. owever, any variation would only be granted if the proposals are deemed acceptable to protect the quality of the receiving watercourse. Moreover, in addition to cooling water, the Proposed Development drainage system includes:

- open drain system for surface water runoff which would discharge to the surface water outfall via interceptors and monitoring;
- oily water drains which would run to a common interceptor tank;
- chemical drains which would discharge to drains tanks and neutralisation;
- amine closed drain system; and
- foul sewerage for sanitary wastewater.

10.3.12 Surface water would be appropriately segregated from potentially higher risk water sources and treated prior to discharge. **Appendix 13-D: Outline Surface Water Drainage Strategy** (**EN010166/APP/6.4**) of the ES details drainage arrangements for the Main Development Area.

10.3.13 As such, it is considered that the operation and maintenance of the new infrastructure (where required) can be designed in a way to prevent pollution to the water environment and to ensure no adverse effects from water pollution on any Habitats site. **Adverse effects on integrity can therefore be avoided for all Habitats sites.**

Loss of functionally linked land for Dee Estuary / Aber Dyfrdwy SPA/Ramsar site

10.3.14 In addition to the construction period loss of functionally-linked land for SPA / Ramsar curlew there would be a long-term loss of 15 ha of functionally-linked land due to the Proposed Development, until such time as it is decommissioned. The mitigation measures outlined above regarding construction period losses of functionally linked land (i.e. enhancement of

land at Prestatyn) would also address operational period losses. As a result, there would be no adverse effect on the integrity of Dee Estuary/ Aber Dyfrdwy SPA / Ramsar site.

Atmospheric pollution of Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar site and Deeside and Buckley Newt Sites SAC

Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar site

10.3.15 These three designations are treated together because saltmarsh (the habitat for which LSE cannot be dismissed) is a qualifying feature of the Dee Estuary SAC and Dee Estuary Ramsar site and is a supporting habitat for birds of the Dee Estuary SPA. Treating these three sites together reduces repetition as the assessment is effectively identical for all three sites. The Stage 1 assessment identified that in combination nitrogen deposition at the closest point of Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar site (in Wales) would be ~~2.3~~5.8% of the critical load for saltmarsh, for which the Proposed Development would be responsible for a maximum of 1.3% of the critical load. Isopleth mapping was produced to inform the AA (~~**Appendix E**~~). Figure 2 of the **Consideration of Additional Emerging Schemes Identified by Natural Resources Wales (EN010166/APP/9.45)** report). This shows that the area affected by 'in combination' nitrogen deposition exceeding 1% of the critical load overlaps with areas of saltmarsh. Most of the affected areas are in Wales but also extend to England. It has been agreed with Natural England that mitigation should apply to the Dee Estuary Habitats site as a whole, rather than having to be split into English and Welsh parts.

10.3.16 Approximately ~~445~~2,389 ha of saltmarsh would be subject to 'in-combination' nitrogen deposition above 1% of the critical load, while approximately ~~245~~53.8 ha of saltmarsh would be subject to nitrogen deposition above 1% of the critical load due to the Proposed Development alone. While this is a large area of saltmarsh ~~(approximately 10-17% of the 2,566.3ha of saltmarsh in the Dee Estuary / Aber Dyfrdwy SAC / SPA / Ramsar site)~~ the nitrogen impact is relatively small (a maximum 0.~~23~~58 kgN/ha/yr, with most saltmarsh being subjected to smaller quantities) particularly given that as a precaution the lower critical load for saltmarsh (that applicable to upper saltmarsh) has been applied to the entire affected area. Areas of lower (pioneer) saltmarsh would be affected to a smaller extent.

10.3.17 The botanical effect of additional nitrogen on saltmarsh would most likely take the form of a shift in species richness away from less nitrogen tolerant species and towards more common nitrogen tolerant species such as *Elytrigia repens*. However, the botanical effect of additional nitrogen is dependent on a range of factors including existing exposure. For example, Caporn, *et al.,* 2016 (Ref 71) examined the effect of different incremental additions of nitrogen deposition on parameters such as species richness. While saltmarsh was not included in the study, other habitats that are notably more sensitive to nitrogen deposition such as acid grassland and heathland were included.

10.3.18 The study noted that for some parameters such as species richness the botanical impact of further nitrogen reduced relative to the background nitrogen deposition rates, possibly because nitrogen was already present in excess at higher deposition rates. This is contextually relevant as the modelling for the Proposed Development identifies background nitrogen deposition at ~~16.3~~12.1 kg N/ha/yr, approximately ~~63~~21% above the lowest part of the critical load range for saltmarsh.

10.3.19 The study also indicated that the minimum nitrogen dose required to cause a change in species richness of 1 species (other than in nitrogen impoverished sand dunes) was 0.4 kg N/ha/yr. For this reason National Highways Design Manual for Roads and Bridges (DMRB) guidance on Air Quality Volume LA105 (Ref 69) directs those undertaking assessments for highways schemes that if the forecast impact is less than 0.4 kg N/ha/yr, no significant effect would arise. DMRB guidelines have no direct applicability to schemes with stack emissions, and Natural England and NRW do not necessarily subscribe to the DMRB approach. However, the published research and DMRB guidance (Ref 69) nonetheless point towards the relatively small likely ecological implications of the forecast 'in-combination' impact.

Mitigation for Effects on Dee Estuary SAC / SPA / Ramsar site

10.3.20 The botanical effects of the small forecast in-combination increase in nitrogen deposition on Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar site (a maximum of ~~2.3~~5.8 % of the critical load) are likely to be relatively subtle, with the contribution of the Proposed Development (the only aspect that the Applicant is required to mitigate) only being slightly above the threshold of being deemed imperceptible (1.3 % of the critical load compared to a threshold for imperceptibility of 1 % of the critical load). The additional nitrogen deposition from the Proposed Development is equivalent to a ~~1.4~~0.9% increase in current nitrogen deposition. The botanical 'tipping point' for saltmarsh is at the 10 kgN/ha/yr deposition rate. The Dee Estuary is already ~~63~~50% above this. Therefore, the 'tipping point' at which significant change would be most likely to occur has already been passed and it can be reasonably expected that small amounts of additional nitrogen will have a commensurately small effect. For example, species-rich saltmarsh routinely persists in conditions of high nitrogen deposition, as evidenced by the fact that most saltmarsh in the UK is subject to high nitrogen deposition mainly due to sources such as agriculture (livestock and fertilizer).

10.3.21 Nonetheless, while small, the effect of the Proposed Development requires mitigation. In discussion with Natural Resources Wales, it has been agreed that a suitable method for mitigating the impact on the Dee Estuary SAC/SPA/Ramsar site would be for the Applicant to provide additional resources to enable the management of saltmarsh (Atlantic salt meadow) within the designated site, commensurate with the modelled impact. This will be undertaken to improve the health and quality of saltmarsh beyond that which would otherwise be achieved by existing required management, thus rendering the saltmarsh within the Dee Estuary more resilient to other pressures such as atmospheric nitrogen deposition.

10.3.22 The calculation approach is based on the principle that a specific amount of further nitrogen deposition from the Proposed Development over a given

area broadly correlates to a similar likely increase in management burden over that area to counteract the impact of additional nitrogen and maintain good quality saltmarsh. ~~Countryside Stewardship currently pays landowners £724 per hectare for conservation management of saltmarsh. The total area affected by the Proposed Development in combination with other projects and plans is modelled to be 445 ha. Therefore, a reasonable annual management budget for this area would be £322,180. The modelled impact of the Proposed Development across this area is equivalent to a maximum 1.4% increase on existing baseline nitrogen deposition rates. It can reasonably be assumed that the additional management burden would be equivalent i.e. an approximate 1.4% increase in deposition is likely to broadly translate into an approximately 1.4% increase in management cost to counteract that additional nitrogen. The additional burden due to the Proposed Development would therefore equate to a total of £4,210.52 per annum. Over the 30 year operation of the Proposed Development, this would therefore equate to £135,315[17]. This is therefore the sum which will be provided to Flintshire County Council (as the owner of the relevant saltmarsh land) for habitat management. The **Draft Bilateral Deed[18] (EN01016/APP/9.25)** will require the funds to be spent on saltmarsh habitat management, to ensure that these funds would not simply be used to fund existing management which the landowner was already undertaking (or should be undertaking as part of existing management agreements) but to provide additionality.~~Therefore, it is appropriate to consider the contribution of the Proposed Development to the total area affected in combination with other plans and projects using the outputs of the modelling for the Proposed Development alone. The contribution of the Proposed Development is summarised in **Table 10-1** which identifies a series of contour ranges to which a weight (multiplier) is applied to determine an annual contribution. These multipliers are summarised in **Table 10-2**, which also details the contribution by contour range. The multipliers utilise a value of £724 per hectare which Countryside Stewardship currently pays landowners for conservation management of saltmarsh.

Table 10-1: Multiplier for Each Contour Range

Contour Range (kgN/ha/yr)	Approach	Multiplier per ha (£/ha/Yr)
> 0.01 – ≤ 0.025	0.00175 x 724	1.267
> 0.025 – ≤ 0.05	0.00375 x 724	2.715
> 0.05 – ≤ 0.075	0.00625 x 724	4.525
> 0.075 – ≤ 0.1	0.00875 x 724	6.335
> 0.1 – ≤ 0.13	0.0115 x 724	8.326

~~[17] This value is index linked.~~
~~[18] As the Draft Bilateral Deed remains in draft at the end of the examination, the Applicant has entered into the **Unilateral Undertaking (EN010166/APP/9.42)** to secure this commitment.~~

Table 10-2: Calculation for Each Contour Range

Contour Range (kgN/ha/yr)	Area	Annual Contribution	30 Year Contribution
> 0.01 – ≤ 0.025	195.4	£247.57	£7,427.15
> 0.025 – ≤ 0.05	1439.4	£3,907.97	£117,239.13
> 0.05 – ≤ 0.075	520.2	£2,353.91	£70,617.15
> 0.075 – ≤ 0.1	201.7	£1,277.77	£38,333.09
> 0.1 – ≤ 0.13	53.8	£447.94	£13,438.16
		£8,235.16	**£247,054.68**

10.3.23 £247,054.68 is therefore the sum which will be either provided to FCC (as the owner of the relevant saltmarsh land) for habitat management or will be spent by the undertaker to fund such management (if FCC grants the undertaker a suitable lease, licence or other appropriate land right or interest of the relevant land to carry out the measures directly). The **First Unilateral Undertaking (EN010166/APP/9.42)** secures the original Saltmarsh Management Contribution of £135,315 and the **Second Unilateral Undertaking (EN010166/APP/9.48)** secures the Supplementary Saltmarsh Management Contribution of £111,739.68, with the combined contribution totalling £247,054.68.

10.3.24 Article 52 of the **Draft Development Consent Order (EN010166/APP/3.1)** requires the funds to be spent (whether by FCC or the undertaker) on saltmarsh habitat management in accordance with the **First Unilateral Undertaking (EN010166/APP/9.42)** and the **Second Unilateral Undertaking (EN010166/APP/9.48)**, to ensure that these funds would not simply be used to fund existing management which the landowner was already undertaking (or should be undertaking as part of existing management agreements) but to provide additionality.

~~10.3.23~~10.3.25 It is not possible to precisely identify the type or quantity of management that would need to be delivered to respond to any increase in nitrogen deposition, in advance of the impact arising, as it must be 'adaptive management' reacting to how the additional nitrogen deposition affects aspects such as vegetation growth rate and abundance of less desirable plant species. These cannot be forecast for a specific parcel of land as they are influenced by a range of factors other than nitrogen deposition. However, in broad terms an approximately 1% increase in existing nitrogen deposition, can be expected to translate, at most, into a similar scale of increase in (for example) grazing intensity (e.g. stocking for longer or with more animals), mowing intensity/frequency (if the area is not grazed) or similar.

~~10.3.24~~10.3.26 Supplementary to this, and as discussed regarding the effect of the Proposed Surface Water Outfall, the Proposed Development would also include managed retreat of the existing embankment between the existing Connah's Quay Power Station and Dee Estuary/ Aber Dyfrdwy SAC / SPA / Ramsar site to create an approximately 1,300 m^2 area of retreat to allow natural migration inland of SAC saltmarsh that would otherwise be reduced in extent (and ultimately entirely lost) due to coastal squeeze. The area being

created is more than 200 times larger than the area to be permanently lost due to the new outfall and it will allow a 0.13 ha area to persist that would otherwise be lost to coastal squeeze. It is considered that allowing an entire area of saltmarsh to persist in the face of sea-level rise will not only address the direct loss of habitat due to the outfall but also offset any subtle qualitative botanical changes that may arise across the wider saltmarsh in the Dee Estuary as a result of nitrogen deposition (for example, minor shifts towards more competitive grass species) during operation of the Proposed Development. The managed retreat would effectively address one human pressure (coastal squeeze leading to direct habitat loss) to offset another (qualitative changes due to elevated nitrogen deposition). For air quality, this is also because the adverse effect on integrity from nitrogen deposition would be a subtle botanical change (e.g. to more grass dominance) that may never actually arise in practice due to other factors. This would enable the achievement of a key conservation objective for the SAC: to ensure that '*the zonation of Atlantic salt meadow vegetation communities and their transitions to fresh water and terrestrial vegetation are maintained*'.

~~10.3.25~~10.3.27 The financial payment to Flintshire County Council would ensure that no adverse effect on the integrity of the SAC/SPA/Ramsar would arise either alone or in combination with other projects and plans. The additional extent of managed retreat beyond that purely required to offset the direct loss of saltmarsh from the proposed new outfall would provide an additional benefit but is not specifically required to mitigate air quality impacts now that a financial contribution to management is to be provided. It will therefore only be progressed if the surface water discharge is constructed.

Deeside and Buckley Newt Sites SAC

~~10.3.26~~10.3.28 The HRA Stage 1 assessment identified that in-combination nitrogen deposition at the closest part of Deeside and Buckley Newt Sites SAC (receptor OE11) would be ~~1.8~~3.0 % of the critical load for oak woodland under the worst-case scenario of unabated emissions. ~~The majority of this impact is attributable to the Proposed Development.~~ These are relatively small forecast impacts (given the threshold for defining impacts as imperceptible is 1 % of the critical level/load), although it does affect a relatively large amount of the SAC (approximately ~~65~~39 ha ~~or 31~~ from the Proposed Development alone, amounting to 19% of the SAC). Any actual ecological effects would apply to the oak woodland (which is not a primary reason for SAC designation) rather than the great-crested newt population.

~~10.3.27~~10.3.29 There are no comparable studies to Caporn et al (2016) (Ref 71) for woodland, but impacts of a small amount of deposition above the critical load when this is already far exceeded (as it is at this SAC) are likely to be relatively subtle (e.g. a change in species richness, percentage grass cover, or shift to more competitive species in the affected area) rather than wholesale habitat damage. Moreover, effects on the ground may not arise at all in practice. Research shows the woodland canopy and woodland management have a major impact on vegetation characteristics, and factors such as rainfall and light penetration may make any impact undetectable on the ground.

Mitigation for Deeside and Buckley Newt Sites SAC

~~10.3.28~~10.3.30 Discussion with the project's air quality consultants at AECOM has confirmed that it is not feasible to introduce further process improvements, or further amend the stack height of the development, which is already substantial at 150 m, to further reduce nitrogen deposition to below 1 % of the critical load for oak woodland. Such improvements have already been included in the design of the operational Proposed Development in order to reduce nitrogen deposition rates ~~to 1.8% of the critical load.~~as far as possible.

~~10.3.29~~10.3.31 Consideration was given to limiting the operational hours of the Proposed Development in order to bring 'in combination' nitrogen deposition rates (most of which are due to the Proposed Development) to 1 % of the critical load and thus render them mathematically imperceptible. However, ~~this would require~~as the in combination impacts are already greater than 1% across large areas without the Proposed Development ~~to only operate 41% of the year (i.e. approx. 3500 hours per year), which~~ this is not ~~commerciallya~~ feasible solution.

~~10.3.30~~10.3.32 The only remaining mitigation solution is to introduce habitat management or enhancement habitat management on-site to either counteract the small increase in management burden that may (as a precaution) arise from an increase in nitrogen deposition of ~~up to~~approximately 0.~~18~~14 kgN/ha/yr~~,~~ (the worst-case contribution of the Proposed Development), or to address other management issues that would render the site more resilient to nitrogen deposition. A site visit was undertaken to Deeside and Buckley Newt Sites SAC on 17 June 2025 in order to identify any aspects of the site that could benefit from improved management. This confirmed the site is well-managed.

~~10.3.31~~10.3.33 However, it is possible (though not certain) that the management effort required to maintain the oak woodland within the site in good condition may increase slightly as a result of increased ground flora vegetation growth from the additional nitrogen. It should be noted this is a precautionary judgment for the following reasons:

- the small magnitude of impact (up to 0.~~18~~14 kgN/ha/yr from the Proposed Development) albeit over a relatively large proportion of the SAC (~~31~~19%). For example, National Highways (Ref 69) would draw a conclusion of no adverse effect on integrity for schemes contributing nitrogen deposition of less than 0.4 kgN/ha/yr. It is noted that National Highways guidance is not binding and is not directly applicable to the Proposed Development. Moreover, it is understood Natural Resources Wales do not necessarily subscribe to the National Highways method. This is why precautionary mitigation is proposed;
- the fact that the oak woodland in the affected part of the SAC is well managed and appears to be in good condition despite background nitrogen deposition rates being ~~30.6~~25.2 kgN/ha/yr (~~360~~252% above the critical load) suggests that a small further increase in deposition (equivalent to a 0.5% increase in background deposition rates) is unlikely to result in a material change on the ground; and

- the fact that, due to confounding factors such as canopy cover, no actual detectable change in the vegetation may arise in practice.

~~10.3.32~~10.3.34 The proposed mitigation must be proportionate to the impact and expected effect. It is considered that the most appropriate way to address this effect on the SAC and underline a conclusion of no adverse effect on integrity would be for the Applicant to make a financial provision (£64,543[19]) to the site managers of the affected part of Deeside and Buckley Newt Sites SAC to address any small increase in woodland management burden that may arise due to operation of the Proposed Development. The impact of a small increase in nitrogen deposition and ammonia concentrations may never be detected in practice but may result in a slight increase in growth of more competitive ground flora species, requiring slightly more frequent woodland management. The impact of the Proposed Development (maximum of 0.~~18~~14 kgN/ha/yr) equates to a maximum 0.5% increase on the ~~30.6~~25.2 kgN/ha/yr background nitrogen deposition. This can therefore be precautionarily argued to potentially increase the woodland management burden to the same extent.

~~10.3.33~~10.3.35 With this financial provision ~~to be~~ secured through the ~~**Draft Bilateral Deed**~~[20]**First Unilateral Undertaking (EN010166/APP/9.~~25~~42)**, a conclusion of no adverse effect on integrity could be drawn, alone and in combination with other projects and plans.

10.4 In Combination Assessment

10.4.1 The in-combination assessment relating to air quality has already been covered above where the air quality results are discussed. As referenced in Section 8.2, and shown in **Appendix I**, a 15 km ZoI from the Main Development Area was used for stack emissions that could operate 'in combination' with the Proposed Development. For traffic emissions the modelling used to inform the air quality assessment forecast traffic growth on the affected road network from all sources over the construction period and during operation. This was done using the National Trip End Model Presentation Programme (TEMPRO) which is a common way of capturing traffic growth across districts, counties and regions. This was then adjusted to account for several significant developments. The specific schemes considered in the 'in combination' air quality modelling are not specifically listed separately in this report as they are already identified in the air quality modelling reports. In addition, **Additional Operational Air Quality Considerations (EN010166/9.38)** has been prepared to qualitatively consider applications identified by NRW which have been submitted, or information has only been made available, after the end of March 2026 cut off date for the identification of relevant other developments.

10.4.2 With regard to other plans and projects that could operate in combination with the Proposed Development through pathways other than air quality, notably loss of functionally-linked land, a 2 km zone of search was used to identify those sites closest to the Main Development Area and most likely to result in 'in combination' effects through pathways other than air quality,

[19] This value is index linked
[20] ~~As the Draft Bilateral Deed remains in draft at the end of the examination, the Applicant has entered into the **Unilateral Undertaking (EN010166/APP/9.42)** to secure this commitment~~

notably loss of functionally-linked habitat for Curlew, which is the only species for which loss of functionally linked land is identified due to the Proposed Development. This explains why no English projects are listed. The English border is located over 2 km from the Main Development Area at its closest point and it is almost 5 km before the nearest settlement on the English side of the border. Therefore, no development sites were identified in England for 'in combination' assessment.

10.4.3 It is important to note that there is only one area of functionally-linked land being lost due to the Proposed Development and the Applicant has already concluded an adverse effect on integrity (prior to mitigation) alone. The Conservation of Habitats and Species Regulations 2017 require consideration of likely significant effects/adverse effects on integrity 'alone **or** in combination' with other plans and projects as the purpose is to pick up those projects that have dismissed impacts alone, to ensure they consider impacts cumulatively. Since an adverse effect on integrity due to loss of functionally-linked land has already been identified 'alone' for the Proposed Development (prior to consideration of mitigation i.e. the **Outline Curlew Implementation and Monitoring Plan** (**EN010166/APP/6.13**)) there is no legal requirement to consider losses due to 'other plans or projects'. Nonetheless, the HRA has done so for completeness and context.

10.4.4 The following projects, as shown in **Appendix I**, lie within 2 km of the Construction and Operation Area and are large enough to result in the loss of functionally linked land if they involve the loss of at least 2 ha of open greenfield habitat (e.g. grassland or farmland):

- ID3. Shotton Paper Mill, Weighbridge Road, Deeside Industrial Park, Flintshire, CH5 2UL FUL/000353/24 - full application for a new tissue machine facility and associated structures at Shotton Paper Mill;
- ID9. Land at Quarry Farm and Leadbrook Drive, Oakenholt, Flint FUL/001038/25 - Construction of 109 affordable homes. New vehicular and pedestrian accesses off Ffordd Pedrog, public open space including equipped play, landscaping, highways works, foul and surface water drainage infrastructure and associated ancillary works;
- ID38. Parc Adfer Ltd, Zone 4, Deeside Industrial Park, Weighbridge Road, Sealand, Deeside, CH5 2LL (FUL/000916/25) - Full planning application for the construction and operation of carbon capture technology and Associated Works;
- ID55. Shotton Paper Mill, Weighbridge Road, Deeside Industrial Park, Connah's Quay, Flintshire, CH5 2UL (DNS/3279559) - Combined Heat and Power Facility to supply Shotton Paper Mill;
- ID75. Land at Ffordd Dewi, Flint, Flintshire, CH6 5WB FUL/000776/22 - New, two storey 240 FTE Place Welsh Medium Primary School building and 30 Place PTE Nursery. New, partial two storey wrap around childcare, Welsh Immersion and Community building. Project associated external works, inclusive of boundary treatments, new pedestrian access points, new car parking arrangements and extended vehicular access off Ffordd Dewi;

- ID92. Residential Development at Land off Northop Road, Flint Mountain, Flint, Flintshire, CH6 5LH FUL/000414/22 - Residential development of 200 dwellings, means of access open space and all associated works;
- ID113. Residential Development at Field West of, Highmere Drive, Connahs Quay, CH5 4YH FUL/000034/22 - Construction of a residential development of 141 no. dwellings and associated works;
- ID311. Street Record, Northop Road, Flint, Flintshire 058314 - An outline permission for residential development of up to 145 dwellings (Use Class C3) and associated works including highways access. All other matters (relating to appearance, landscaping, unit mix, precise layout and Affordable Housing provision) reserved.

10.4.5 Given that the mitigation measures identified to address the loss of functionally-linked land associated with the Proposed Development will be delivered before the loss of such habitat occurs, the Proposed Development would have addressed its contribution to any in-combination effect on the Dee Estuary/ Aber Dyfrdwy SPA / Ramsar.

10.4.6 None of these projects are identified as having overlapping zones with the Proposed Development for other impact pathways such as noise disturbance. The following project overlaps the Order limits (within the Proposed CO_2 Connection Corridor) and in close proximity to the Dee Estuary/ Aber Dyfrdwy SPA / Ramsar site (at Sandycroft), with the potential to result in disturbance effects in-combination with the Proposed Development:

- ID47. HyNet Carbon Dioxide Pipeline (HyNet CO_2 Pipeline Project) EN070007; CML2350 - A CO_2 pipeline that will transport CO_2 produced and captured by future hydrogen producing facilities and existing industrial premises in North West England and North Wales for offshore storage. The CO_2 pipeline will comprise both newbuild and existing pipelines (and newbuild and existing above-ground installations (AGI) to allow operation and maintenance works in relation to the pipeline, including the newbuild Proposed Liverpool Bay CCS Ltd's Flint AGI) that will be covered under the DCO (of the HyNet CO_2 Pipeline Project). When complete it will run from the Ince AGI in Cheshire to Talacre Beach in North Wales. Includes a Marine License for a Pipeline crossing of the River Dee using trenchless crossing technique, either micro-tunnelling or Horizontal Directional Drilling (HDD).

10.4.7 Given the mitigation measures identified to control noise disturbance on Dee Estuary/ Aber Dyfrdwy SPA / Ramsar site as part of the Proposed Development, the contribution of the Proposed Development to any in-combination noise impact alongside the HyNet Carbon Dioxide Pipeline project would have been addressed.

10.5 Conclusion

10.5.1 Given that the mitigation measures identified in this HRA are secured within relevant accompanying documents submitted as part of the DCO Application, it is concluded that the Proposed Development would not result

in an adverse effect on the integrity of any Habitats sites. As a result, there is no requirement to move to Stage 3 of HRA (Derogations).

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Glossary

Term	Definition
Abiotic	Refers to all non-living, physical factors e.g. sunlight, humidity, temperature.
Anandromous	Refers to fish that are born in freshwater and migrate to the ocean to mature before returning to the freshwater to spawn.
Barotrauma	Injury caused by change in air pressure, affecting typically the ear or lung.
Benthic	The flora and fauna found on the bottom, or in the bottom sediments.
Biosecurity	Procedures or measures designed to protect the population against harmful biological or biochemical substances.
Biotope mosaic	An area of consistent environmental conditions for particular plants and animals comprised of multiple habitat types.
Botanical	In relation to plants.
Cessation foraging	Temporary or final ceasing of an action (foraging).
Chloroplasts	An organelle within plant cells that produces energy through photosynthesis.
Community	A diverse group of organisms that interact in a common location.
Deoxygenation	The process of removing oxygen from a substance.
Ecosystem	A complex network of living organisms interacting with each other in their environment.
Electrical Connection Corridor	The area surrounding the existing electrical export transmission cable(s) that interface with the Main Development Area and the existing National Grid 400kV Deeside Substation.
Endocrine	Relating to the organs of the body that make and release hormones, or to the hormones themselves.
Estuarine	A partially enclosed coastal body of water in which river water is mixed with seawater.

Term	Definition
Eutrophication	The process of excessively enriching a body of water in nutrients, primarily phosphorus and nitrogen. This elevated nutrient level leads to rapid growth and proliferation of algae and phytoplankton, often resulting in negative ecological impacts.
Fauna	Animal life.
Flora	Plant life.
Habitat	The natural environment where an organism lives, grows, and thrives.
Habitats Regulations Assessment (HRA)	Evaluates whether development plans could negatively impact protected Habitats sites. It is required to ensure that any plan or project does not adversely affect the integrity of these sites beyond reasonable scientific doubt.
Habitats sites	Refers to all Natura 2000 sites in line with current standard practice (comprising SAC and SPA) potentially affected by a proposed project.
Holt	The den of an otter.
Construction & Indicative Enhancement Area	An area of vacant land under Applicant ownership south-east of the Main Development Area which may be used for biodiversity mitigation and / or enhancement.
Interstitial flow	Or hyporheic flow, is the percolating flow of water through permeable soils under and beside the open stream/riverbed.
Intertidal	The area above water level at low tide and underwater at high tide.
Invasive species	Non-native species that cause or are likely to cause harm to the environment, economy, or human health.
Invertebrate	Animals that lack a backbone such as arthropods or molluscs.
Migration	Seasonal movement of animals from one region to another.
Mudflats	Areas of flat empty land at the coast which are covered by the sea only when the tide is in.
Ornithology	The study of birds.

Term	Definition
Piling	The process of driving or boring pile foundations into the ground beneath a building that is under construction.
Planning Inspectorate (PINS)	Deals with planning appeals, national infrastructure planning applications, examinations of local plans and other planning-related and specialist casework in England and Wales.
Proposed CO_2 Connection Corridor	The area surrounding the CO_2 export pipeline to be constructed, that interfaces with the Repurposed CO2 Connection Corridor at one end, and the Flint AGI at the other.
Proposed Development	The physical elements of the Connah's Quay Low Carbon Power project.
Ramsar Site	A wetland site designated to be of international importance under the Ramsar Convention, also known as "The Convention on Wetlands", an international environmental treaty signed on 2 February 1971 in Ramsar, Iran, under the auspices of UNESCO.
Refugia	An area in which a population of organisms can survive through a period of unfavourable conditions.
Repurposed CO2 Connection Corridor	Area surrounding the repurposed existing gas pipeline that interfaces with the Existing GTP AGI or Proposed CO2 AGI (Main Development Area) at one end, and the Proposed CO2 Corridor at the other.
Salt meadow	A meadow that is subject to flooding by salt water.
Saltmarsh	An area of coastal grassland that is regularly flooded by seawater.
Site	The land on which the Proposed Development will be built.
Spawning	The act of producing or depositing eggs.
Species richness	The total number of species present in a given area as a measure of biodiversity.
Stomata	Tiny openings or pores in leaves that control water loss and gas exchange.
Substratum	An underlying layer or substance, in particular a layer of rock or soil beneath the surface of the ground.

Term	Definition
Turbidity	The measure of transparency of water.
Water Connection Corridor	The area surrounding the existing abstraction and discharge infrastructure for the abstraction and discharge of cooling water sourced from the River Dee required to facilitate upgrade works.

Abbreviations

Abbreviation	Term
AA	Appropriate Assessment
AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
APIS	Air Pollution Information System
CCGT	Combined Cycle Gas Turbine
CCS	Carbon Capture and Storage
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CJEU	Court of Justice of the European Union
CL	Critical Load
CMP	Core Management Plan
CO_2	Carbon Dioxide
dB	Decibels
DCO	Development Consent Order
Defra	Department for Environment and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DMRB	Design Manual for Roads and Bridges
DO	Dissolved Oxygen
EA	Environment Agency
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
FCC	Flintshire County Council
FRMP	Flood Risk Management Plan
GW	Gigawatt
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Assessment
HRSG	Heat Recovery Steam Generator
IASO	Invasive Alien Species (Enforcement and Permitting) Order 2019
IAQM	Institute of Air Quality Management
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Overriding Public Interest
IRZ	Impact Risk Zone

Abbreviation	Term
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect
MAGIC	Multi-Agency Geographic Information for the Countryside
MHWL	Mean High Water Line
MW	Megawatt
NE	Natural England
NH_3	Ammonia
NOx	Nitrogen Oxides
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Project
NVC	National Vegetation Classification
OS	Ordnance Survey
P	Phosphorus
PINS	Planning Inspectorate
PEA	Preliminary Ecological Appraisal
PEIR	Preliminary Environmental Information Report
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SO_2	Sulphur Dioxide
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Urban Drainage System
WCA	Wildlife and Countryside Act 1981
WFD	Water Framework Directive
WHO	World Health Organization
ZoI	Zone of Influence

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Appendix A - Location of Relevant Habitats Sites in Relation to the Proposed Development

Appendix B - Table of Habitats Sites and Impact Pathways

Table B-1: Summary of impact pathways and qualifying features for each Habitats site and stage of the Proposed Development considered in this HRA

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
Screening	Construction/ Decommissioning	Direct loss of/ damage to qualifying habitat	Dee Estuary/ Aber Dyfrdwy SAC	Annex I habitats present that are a primary reason for selection of this site: • *1140* Mudflats and sandflats not covered by seawater at low tide • *1310 Salicornia* and other annuals colonizing mud and sand • *1330* Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • *1130* Estuaries • *1210* Annual vegetation of drift lines • *1230* Vegetated sea cliffs of the Atlantic and Baltic Coasts • *2110* Embryonic shifting dunes

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
				• *2120* "Shifting dunes along the shoreline with *Ammophila arenaria* (""white dunes"")" • *2130* "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")" *** Priority feature** • *2190* Humid dune slacks Annex II species present as a qualifying feature, but not a primary reason for site selection: • *1095* Sea lamprey *Petromyzon marinus* • *1099* River lamprey *Lampetra fluviatilis* • *1395* Petalwort *Petalophyllum ralfsii*
			Dee Estuary/ Aber Dyfrdwy Ramsar	Qualifies under the following Criterion: **Ramsar criterion 1** • extensive intertidal mud and sand flats (20 km by 9 km) with large expanses of

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
				saltmarsh towards the head of the estuary. **Ramsar criterion 2** • supports breeding colonies of the vulnerable natterjack toad, *Epidalea calamita* **Ramsar criterion 5** • assemblages of international importance **Ramsar criterion 6** • species/populations occurring at levels of international importance.
			Dee Estuary/ Aber Dyfrdwy SPA	During the breeding season the area regularly supports: • *A195* little tern *Sterna albifrons* • *A193* common tern *Sterna hirundo* Over winter the area regularly supports:

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
				• *A157* bar-tailed godwit *Limosa lapponica* • *A054* pintail *Anas acuta* • *A052* teal *Anas crecca* • *A672* dunlin *Calidris alpina alpina* • *A143* knot *Calidris canutus* • *A130* Oystercatcher *Haematopus ostralegus* • *A616* black-tailed godwit *Limosa limosa islandica* • *A160* curlew *Numenius arquata* • *A141* grey plover *Pluvialis squatarola* • *A048* shelduck *Tadorna tadorna* • *A162* redshank *Tringa totanus* On passage the area regularly supports: • *A191* sandwich tern *Sterna sandvicensis* • *A162* redshank *Tringa totanus*

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
				Non-breeding waterbird assemblage (WATR) The site qualifies for supporting an internationally important assemblage of birds.
		Noise and visual disturbance	Dee Estuary/ Aber Dyfrdwy SPA	During the breeding season the area regularly supports: • *A195* little tern *Sterna albifrons* • *A193* common tern *Sterna hirundo* Over winter the area regularly supports: • *A157* bar-tailed godwit *Limosa lapponica* • *A054* pintail *Anas acuta* • *A052* teal *Anas crecca* • *A672* dunlin *Calidris alpina alpina* • *A143* knot *Calidris canutus* • *A130* Oystercatcher *Haematopus ostralegus* • *A616* black-tailed godwit *Limosa limosa islandica*

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
				• *A160* curlew *Numenius arquata* • *A141* grey plover *Pluvialis squatarola* • *A048* shelduck *Tadorna tadorna* • *A162* redshank *Tringa totanus* On passage the area regularly supports: • *A191* sandwich tern *Sterna sandvicensis* • *A162* redshank *Tringa totanus* *Non-breeding waterbird assemblage (WATR)* The site qualifies for supporting an internationally important assemblage of birds.
			Dee Estuary/ Aber Dyfrdwy SAC	As above
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
		Loss of functionally linked land	Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
		Atmospheric pollution	Dee Estuary/ Aber Dyfrdwy SAC	As above
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
			Halkyn Mountain SAC	Designated as an SAC for calaminarian grasslands Dry heathland Calcareous grassland Molina meadows Great crested newt
			Alyn Valley Woods SAC	Designated as an SAC for its Tilio-Acerion forests of slopes, screes and ravines Calcareous grassland Alluvial alder woodland
			River Dee and Bala Lake SAC	As above
		Water quality	Dee Estuary/ Aber Dyfrdwy SAC	As above

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
			River Dee and Bala Lake SAC	As above
		Water quantity, level and flow	Dee Estuary/ Aber Dyfrdwy SAC	As above
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
			River Dee and Bala Lake SAC	As above
		Barriers to movement	Dee Estuary/ Aber Dyfrdwy SAC	As above
			River Dee and Bala Lake SAC	As above
		Introduction of INNS	Dee Estuary/ Aber Dyfrdwy SAC	As above
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
	Operational phase	Noise and visual disturbance (including lighting)	Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
		Water quality	Dee Estuary/ Aber Dyfrdwy SAC	As above
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
		Water quantity, level and flow	Dee Estuary/ Aber Dyfrdwy SAC	As above
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
			River Dee and Bala Lake	As above
		Loss of functionally linked land	Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
		Atmospheric pollution	Dee Estuary/ Aber Dyfrdwy SAC	As above

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
			Deeside and Buckley Newt Sites SAC	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • *91A0* Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles Annex II species that are a primary reason for selection of this site: *1166* great crested newt *Triturus cristatus*
			Mersey Estuary SPA	Qualifying Features: A048 Tadorna tadorna; Common shelduck (Non-breeding) A052 Anas crecca; Eurasian teal (Non-breeding) A054 Anas acuta; Northern pintail (Non-breeding) A140 Pluvialis apricaria; European golden plover (Non-breeding) A149 Calidris alpina alpina; Dunlin

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
				(Non-breeding) A156 Limosa limosa islandica; Black-tailed godwit (Non-breeding) A162 Tringa totanus; Common redshank (Non-breeding) Waterbird assemblage
			Mersey Estuary Ramsar	Designated for its waterfowl assemblage (Ramsar criterion 5) Species with peak counts in spring/autumn: shelduck, black-tailed godwit, redshank Species with peak counts in winter: teal, pintail, dunlin
			River Dee and Bala Lake SAC	As above
			Alyn Valley Woods SAC	As above
			Halkyn Mountain SAC	As above
Appropriate Assessment	Construction/ Decommissioning	Direct habitat loss	Dee Estuary/ Aber Dyfrdwy SAC	As above
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
		Noise and visual disturbance	Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
		Loss of functionally linked land	Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
		Atmospheric pollution	Dee Estuary/ Aber Dyfrdwy SAC	As above
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
	Operation	Lighting disturbance	Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
		Loss of functionally linked land	Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
		Atmospheric pollution	Dee Estuary/ Aber Dyfrdwy SAC	As above

HRA Stage	Stage of Proposed Development	Impact Pathway	Habitats Sites	Qualifying Features
			Dee Estuary/ Aber Dyfrdwy Ramsar	As above
			Dee Estuary/ Aber Dyfrdwy SPA	As above
			Deeside and Buckley Newt Sites SAC	As above

Appendix C - Site Details, Conservation Objectives and Threats / Pressures of Relevant Habitats Sites

References:

Ref C 1. Site Improvement Plan: Dee Estuary/Aber Dyfrdwy & Mersey Narrows (SIP056). V1.0 2015 Available at: https://publications.naturalengland.org.uk/publication/6579320399069184 (Accessed: 9 June 2025).

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Ref C 3. Natural Resources Wales. (2022). Core Management Plan including Conservation Objectives: River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC. Version 3 2022. Available at: https://naturalresources.wales/media/673374/river_dee___bala_lake_32_plan.pdf (Accessed: 11 June 2025).

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Ref C 7. Natural England's Site Improvement Plan Available at: https://publications.naturalengland.org.uk/publication/6273450410770432#:~:text=This%20SIP%20includes%20the%20priorities,Management%20Plan%20and%20its%20consultation (Accessed 11 July 2025).

Ref C 8. JNCC. Information Sheet on Ramsar Wetlands (RIS). Dee Estuary. V3.0 2011. Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11041.pdf. (Accessed 11 July 2025).

Table C-1: Habitats Sites Taken Forward to HRA Screening

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
Dee Estuary/ Aber Dyfrdwy SAC (UK0030131)	Overlaps with the Proposed Development Site, specifically the Water Connection Corridor.	The Dee Estuary is one of the largest estuaries in the UK, with an area of over 14,000 ha (140 km^2). The Dee Estuary is hyper-tidal with a mean spring tidal range of 7.7 m at the mouth. The estuary historically stretched as far inland as Chester and its form has been modified considerably over the past 300 years as a direct result of human intervention. The intertidal area is currently dominated by mudflats and sandflats with the remainder being largely saltmarsh. At low water spring tides, over 90% of the estuary dries out. The extensive intertidal flats of the Dee Estuary form the fifth largest such area within an estuary in the UK. The site is of major importance for waterbirds; during the winter the intertidal flats, saltmarshes and fringing habitats including coastal grazing marsh/fields,	Annex I habitats present that are a primary reason for selection of this site: • *1140* Mudflats and sandflats not covered by seawater at low tide • *1310 Salicornia* and other annuals colonizing mud and sand • *1330* Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • *1130* Estuaries • *1210* Annual vegetation of drift lines • *1230* Vegetated sea cliffs of the Atlantic and Baltic Coasts • *2110* Embryonic shifting dunes • *2120* "Shifting dunes along the shoreline with *Ammophila arenaria* (""white dunes"")" • *2130* "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")" *** Priority feature** • *2190* Humid dune slacks

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
		provide feeding and roosting sites for internationally important numbers of ducks and waders; in summer the site supports nationally important breeding colonies of two species of tern. The site is also important during migration periods, particularly for wader populations moving along the west coast of Britain and for sandwich terns post-breeding.	Annex II species present as a qualifying feature, but not a primary reason for site selection: • *1095* Sea lamprey *Petromyzon marinus* • *1099* River lamprey *Lampetra fluviatilis* • *1395* Petalwort *Petalophyllum ralfsii*
Dee Estuary/ Aber Dyfrdwy SPA (UK9013011)	Overlaps with the Proposed Development Site, specifically the Water Connection Corridor.	As above.	During the breeding season the area regularly supports: • *A195* little tern *Sterna albifrons* • *A193* common tern *Sterna hirundo* Over winter the area regularly supports: • *A157* bar-tailed godwit *Limosa lapponica* • *A054* pintail *Anas acuta* • *A052* teal *Anas crecca* • *A672* dunlin *Calidris alpina alpina* • *A143* knot *Calidris canutus*

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
			• *A130* Oystercatcher *Haematopus ostralegus* • *A616* black-tailed godwit *Limosa limosa islandica* • *A160* curlew *Numenius arquata* • *A141* grey plover *Pluvialis squatarola* • *A048* shelduck *Tadorna tadorna* • *A162* redshank *Tringa totanus* On passage the area regularly supports: • *A191* sandwich tern *Sterna sandvicensis* • *A162* redshank *Tringa totanus* *WATR* The site qualifies for supporting an internationally important assemblage of birds.
Dee Estuary/ Aber Dyfrdwy Ramsar (UK11082)	Overlaps with the Proposed Development Site, specifically the Water Connection Corridor.	As above.	Qualifies under the following Criterion: Ramsar criterion 1 • Extensive intertidal mud and sand flats (20 km by 9 km) with large expanses of saltmarsh towards the head of the estuary. Ramsar criterion 2

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
			• Supports breeding colonies of the vulnerable natterjack toad, *Epidalea calamita* Ramsar criterion 5 • Assemblages of international importance Ramsar criterion 6 • Species/populations occurring at levels of international importance.
River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC (UK0030252)	Located adjacent to the Proposed Development Site	The River Dee has its source in Snowdonia at the outflow of Llyn Tegid and it includes the Ceiriog, Meloch, Tryweryn and Mynach tributaries. Its catchment contains a wide spectrum of landscape from high mountains around Bala, rugged peaks near Llangollen, steep sided wooded valleys, and the plains of Cheshire, Flintshire, north Shropshire and Wrexham. There is a tidal influence as far upstream as Farndon and high tides regularly exceed the Chester weir crest level.	Annex I habitats that are a primary reason for selection of this site: • *3260* Water courses of plain to montane levels with the *Ranunculion fluitantis and Callitricho-Batrachion* vegetation Annex II species that are a primary reason for selection of this site: • *1106* Atlantic salmon *Salmo salar* • *1831* floating water-plantain *Luronium natans*

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
		The aquatic plant community includes Wirtgen's water-crowfoot *Ranunculus x bachii* and pond water-crowfoot *R. peltatus*, and also floating water-plantain *Luronium natans*. Watercrowfoot forms extensive beds along the whole length of the Dee where flow conditions are suitable. Other aquatic plants which occur within the site include intermediate water-starwort *Callitriche hamulata*, alternate-flowered water-milfoil *Myriophyllum alterniflorum* and bryophytes including *Rhynchostegium riparoides* and *Fontinalis antipyretica*. Marginal vegetation consists mainly of reed canary-grass Phalaris arundinacea with occasional branched bur-reed Sparganium erectum. There is good tree cover along the banks of the River Dee and the tributaries, with the Ceiriog	Annex II species present as a qualifying feature, but not a primary reason for site selection: • *1095* sea lamprey *Petromyzon marinus* • *1096* brook lamprey *Lampetra planeri* • *1099* river lamprey *Lampetra fluviatilis* • *1163* bullhead *Cottus gobio* • *1355* otter *Lutra lutra*

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
		being tree lined on both banks along much of its length. The River Dee is recognised as one of North Wales' premier rivers for Atlantic salmon *Salmo salar*. The Mynach, Meloch and Ceiriog tributaries are the most important salmon spawning tributaries in the Dee catchment. Other migratory fish utilising the river system include river lamprey *Lampetra fluviatilus* and sea lamprey *Petromyzon marinus*. The Dee also supports important populations of non-migratory fish including bullhead *Cottus gobio* and brook lamprey *Lampetra planeri*. The otter *Lutra lutra* is well established throughout the river system, especially where appropriate bank side cover exists.	
Deeside and Buckley Newt Sites SAC (UK0030132)	Located approximately 1.5 km south of the Proposed Development Site	This composite site in north-east Flintshire is situated on the coastal slopes overlooking the Dee Estuary. Water bodies throughout the site support one of the largest breeding	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • *91A0* Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
		populations of the great crested newt *Triturus cristatus* in Great Britain. The site also supports significant populations of other widespread amphibian species including smooth newt *Triturus vulgaris*, palmate newt *T. helveticus*, common frog *Rana temporaria* and common toad *Bufo bufo.* Surrounding terrestrial habitat is rich and varies from neutral and acid grasslands, through *Molinia* mires to scrub, lowland dry and wet heath and mature broad-leaved woodland. Lowland dry and wet heath are an uncommon habitat type in North East Wales. This mosaic of habitats forms an important foraging, sheltering and overwintering area for adult and juvenile newts.	Annex II species that are a primary reason for selection of this site: • *1166* great crested newt *Triturus cristatus*
Halkyn Mountain/ Mynydd Helygain SAC (UK0030163)	Located approximately 3.6 km west of the Proposed Development Site	The majority of the site is located 4 km to the north-west of Mold in Flintshire, and lies at between 100-300 m. The site comprises	Annex I habitats that are a primary reason for selection of this site: • *6130* Calaminarian grasslands of the *Violetalia calaminariae*

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
		predominantly common land situated on an elongated plateau of Lower Carboniferous Limestone which trends north-south, with the Dee Estuary to the east and the Clwydian Hills to the west. The site supports many former mineral workings including metalliferous mine spoil tips along with small chert and limestone quarries. Three large quarries currently operate on Halkyn Common, two of which are included within Halkyn Common and Holywell Grasslands SSSI for their mineral interest. The relict industrial landscape supports a mosaic of calcareous grasslands, bracken and dry heath with localised heavy metal tolerant vegetation developed on old metal mine spoil. In places where surface drainage is impeded small areas of rush pasture, wet heath, marshy grasslands and fen communities can be found. The disused	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • *4030* European dry heaths • *6210* Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) • *6410 Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) Annex II species that are a primary reason for selection of this site: • *1166* Great crested newt *Triturus cristatus*

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
		quarries and pits throughout the site contain numerous small pools, which support one of the largest known breeding populations of the great crested newt *Triturus cristatus* in Wales along with an assemblage of other more widespread amphibian species. At the northern end of the plateau, along the west facing slope, a series of base-rich springs feed a small base-rich flush and associated fen-meadow. Two outlying areas of Halkyn Mountain SAC supporting significant stands of calaminarian grassland over old lead workings are to be found near the town of Holywell. The first area known locally as the Gowdal lies just to the west of Holywell town centre and the other, Herward Smithy comprises a small enclosure lying 2 km to the south-east of Holywell.	

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC (UK0030078)	Located approximately 6.8 km to the south-west of the Proposed Development Site	The site predominantly occupies the steep Carboniferous Limestone escarpment alongside the river Alyn, together with adjoining areas. The site supports a large stand of semi-natural broadleaved woodland namely the SAC feature '*Tilio – Acerion* forests of slopes, screes and ravines', arising along the steep gorge of the river Alyn and the Alyn's tributaries Nant Gain and Aber Eilun. Narrow woodland strips along the valley bottom and on the wetter ground of the floodplain around Aber Eilun are dominated by wet woodland corresponding to the SAC feature 'Alluvial forest with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno – Padion, Alnion incanae, Salicion alvae*)'. Several small areas of species rich calcicolous grassland constitute the third SAC feature 'Semi-natural dry grasslands and scrubland facies: on calcareous	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • *6210* Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) • *91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) * **Priority feature**

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
		substrates (*Festuco – Brometalia*)'.	
Mersey Estuary SPA	Located approximately 15.2 km to the north of the Proposed Development Site	The Mersey Estuary is a large sheltered estuarine site that comprises an unusual configuration with a narrow mouth and wide shallow basin. It comprises extensive intertidal mud- and sandflats on the northern and southern shores of the estuary, areas of rocky shore and saltmarsh (the latter continuously eroding or accretin. The saltmarsh components either constitute firm sandy areas or those that encompass muddy creeks. The intertidal sand- and mudflats are submerged at high tide and exposed at low tide, when they provide important foraging habitats for wintering birds. Furthermore, the SPA also provides extensive high-tide roosting sites that support large aggregations of waterbirds. It is of major importance for wintering duck and wader species, as well as for supporting passage wader	Over winter the area regularly supports: • A048 common shelduck *Tadorna tadorna* • A052 Eurasian teal *Anas crecca* • A054 Northern pintail *Anas acuta* • A140 European golden plover *Pluvialis apricaria* • A149 Dunlin *Calidris alpina alpina* • A156 Black-tailed godwit *Limosa limosa islandica* • A162 Common redshank *Tringa totanus* • Waterbird assemblage

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
		populations that move along the west coast of Britain during spring and autumn migratory periods.	
Mersey Estuary Ramsar	Located approximately 15.2 km to the north of the Proposed Development Site	As above.	Qualifies under the following Criteria: Ramsar criterion 5 Assemblages of international importance: • Species with peak counts in winter: 89576 waterfowl (5 year peak mean 1998/99-2002/2003) Ramsar criterion 6 • Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): Species with peak counts in spring/autumn: • Common shelduck *Tadorna tadorna* • Black-tailed godwit *Limosa limosa islandica* • Common redshank *Tringa totanus*

Habitats Site (including site code)	Distance to Order limits	Habitats Site Description	Summary of Qualifying Features (including *feature code*)
			Species with peak counts in winter: • Eurasian teal *Anas crecca* • Northern pintail *Anas acuta* • Dunlin *Calidris alpina alpina*

Table C-2: Conservation Objectives and Threats/ Pressures to the Integrity of Relevant Habitats Sites

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
Dee Estuary/ Aber Dyfrdwy SAC (UK0030131)	**nterest Feature 1: The Conservation Objective for the Estuary** The conservation objective for the "estuaries" feature of the Dee Estuary SAC is to maintain the feature in favourable condition. The "estuaries" feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the aggregate total extent of all estuarine communities within the site is maintained; • the spatial distribution of estuarine communities within the site is maintained; • the extent of individual estuarine habitat features within the site is maintained; • the variety and relative proportions of sediment and rocky substrates within the estuary is maintained; • the variety and extent of any notable subtidal sediment communities is maintained; • the variety and extent of notable intertidal hard substrata communities is maintained; • the spatial and temporal patterns of salinity, suspended sediments and nutrient concentrations are maintained within limits	The following threats/pressures to the integrity of the Dee Estuary SAC/ SPA have been identified in Natural England's Site Improvement Plan (Ref C 1): • public access/ disturbance • changes in species distributions • invasive species • climate change • coastal squeeze • inappropriate scrub control • water pollution • fisheries: Commercial marine and estuarine • inappropriate coastal management • overgrazing • direct impact from third party • marine litter • predation • planning permission: general • marine consents and permits • wildfire/ arson • air Pollution: impact of atmospheric nitrogen deposition • transportation and service corridors

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	sufficient to satisfy the requirements of statements (i) to (vi) above. **Interest Feature 2: The Conservation Objective for Mudflats and Sandflats Not Covered by Seawater at Low Tide** The conservation objective for the "mudflats and sandflats" feature of the Dee Estuary SAC is to maintain the feature in favourable condition. The "mudflats and sandflats" feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the total extent of mudflat and sandflat communities within the site is maintained; • the proportions of individual mudflat and sandflat communities within the site are maintained; • the topography of the intertidal flats and the dynamic processes of channel migration and sinuosity across the flats are maintained; • the abundance of typical species of the mudflat and sandflat feature within the site is maintained. **Interest Feature 3: The Conservation Objective for *Salicornia* and Other Annuals Colonising Mud and Sand**	• physical modification

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity

	The conservation objective for the "Salicornia and other annuals colonising mud and sand" feature of the Dee Estuary SAC is to maintain the feature in favourable condition.
	The "Salicornia and other annuals colonising mud and sand" feature will be considered to be in favourable condition when both:
	• subject to natural processes, each of the following conditions (i) to (iv) are met:
	  ○ the total extent of pioneer saltmarsh vegetation communities within the site is maintained;
	  ○ the presence of pioneer saltmarsh vegetation communities as part of transitions from intertidal sediment communities to higher saltmarsh are maintained;
	  ○ the abundance of the typical species of the pioneer saltmarsh vegetation communities is maintained;
	  ○ the abundance of the notable species of the pioneer saltmarsh vegetation communities is maintained.
	• and, regardless of natural processes, condition (v) is also met:
	  ○ the overall extent and abundance of common cord grass *Spartina anglica* is not increasing within the pioneer saltmarsh zone.	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	Interest Feature 4: The Conservation Objective for Atlantic Salt Meadow The conservation objective for the "Atlantic salt meadow" feature of the Dee Estuary SAC is to maintain the feature in favourable condition. The "Atlantic salt meadow" feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the total extent of Atlantic salt meadow vegetation communities within the site is maintained; • the proportions of individual Atlantic salt meadow vegetation communities within the site are maintained; • the zonation of Atlantic salt meadow vegetation communities and their transitions to fresh water and terrestrial vegetation are maintained; • the morphology of saltmarsh creeks and pans and the process of their evolution are maintained; • the extent of ungrazed areas of salt meadow within the estuary is maintained and there is no increase in grazing intensity over the rest of the salt meadow; • the relative abundance of the typical species of the Atlantic salt meadow vegetation communities is maintained;	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the abundance of the notable species of the Atlantic salt meadow vegetation communities is maintained. **Interest Feature 5: The Conservation Objective for Annual Vegetation of Drift Lines** The conservation objective for the "annual vegetation of drift lines" feature of the Dee Estuary SAC is to maintain the feature in a favourable condition. The "annual vegetation of drift lines" feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the extent of coarse sediment/shingle formations capable of supporting drift line vegetation communities within the site is maintained; • the presence of annual drift line vegetation communities within the site is maintained; • the presence of the typical species of the annual drift line vegetation communities is maintained. **Interest Feature 6: The Conservation Objective for *Lampetra fluviatilis* (River Lamprey)** The conservation objective for the "Lampetra fluviatilis (river lamprey)" feature of the Dee Estuary SAC is to maintain the feature in a favourable condition.	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	The "river lamprey" feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the migratory passage of both adult and juvenile river lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality; • the five-year mean count of river lampreys recorded by the Chester Weir fish trap is no less than 55 under the monitoring regime in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997–2000); • the abundance of prey species forming the river lamprey's food resource within the estuary is maintained. **Interest Feature 7: The Conservation Objective for *Petromyzon marinus* (Sea Lamprey)** The conservation objective for the "Petromyzon marinus (sea lamprey)" feature of the Dee Estuary SAC is to maintain the feature in a favourable condition. The "sea lamprey" feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the migratory passage of both adult and juvenile sea lampreys through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality; • the five-year mean count of sea lampreys recorded by the Chester Weir fish trap is no less than 18 under the monitoring regime in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997–2000); • the abundance of prey species forming the sea lamprey's food resource within the estuary is maintained.	
Dee Estuary/ Aber Dyfrdwy SPA (UK9013011)	Interest feature 1: Conservation objective for the internationally important population of the regularly occurring Annex I species: wintering bar-tailed godwit The conservation objective for the "wintering bar-tailed godwit" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "wintering bar-tailed godwit" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering bar-tailed godwit population is no less	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	than 1,150 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained • the extent and spatial distribution of vegetation less than 10 cm in height across the saltmarsh is maintained; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas; • aggregations of bar-tailed godwit roosting or feeding or on the intertidal flats or saltmarsh are not subject to significant disturbance. Interest feature 2: Conservation objective for the internationally important population of the regularly occurring Annex I species: breeding common tern The conservation objective for the "breeding common tern" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "breeding common tern" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year mean population size for the breeding common tern population is no less than 392	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	breeding pairs [i.e. the 5 year mean between 1995-1999]; • the five year mean productivity of the breeding common tern population is no less than 1.34 chicks fledging per breeding pair per year [i.e. the 5 year mean between 1995-1999]; • the abundance of common tern prey species within the estuary is maintained; • common terns are able to pass freely between the Dee Estuary and their breeding site at Shotton Lagoons and Reedbeds without obstruction; • aggregations of common terns roosting on the upper shore over high tide are not subject to significant disturbance. Interest feature 3: Conservation objective for the internationally important population of the regularly occurring Annex I species: breeding little tern The conservation objective for the "breeding little tern" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "breeding little tern" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the 5 year mean population size for the breeding little tern population is no less than 69 breeding pairs [i.e. the 5 year mean between 1995-1999]; • the five year mean productivity of the breeding little tern population is no less than 0.80 chicks fledging per breeding pair per year [i.e. the 5 year mean between 19951999]; • the breeding site is not subject to significant disturbance; • the extent of shingle habitat at Gronant, which is suitable for nesting little terns is maintained; • aggregations of little terns roosting on the beach at Gronant or Point of Ayr over high tide are not subject to significant disturbance. Interest feature 4: Conservation objective for the internationally important population of the regularly occurring Annex I species: passage Sandwich tern The conservation objective for the "passage Sandwich tern" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "passage Sandwich tern" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year mean peak population size for the autumn passage sandwich tern population is no	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	less than 957 individuals [i.e. the 5 year mean peak between 19951999]; • aggregations of Sandwich terns roosting on the upper shore over high tide are not subject to significant disturbance. Interest feature 5: Conservation objective for the internationally important population of the regularly occurring migratory species: passage redshank The conservation objective for the "passage redshank" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "passage redshank" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the passage redshank population is no less than 8,795 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained; • the abundance and dispersion of redshank prey species are maintained at levels sufficient to support the population size in (i);	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the extent and spatial distribution of saltmarsh vegetation less than 10 cm in height is maintained; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas; • aggregations of roosting or feeding redshank are not subject to significant disturbance. Interest feature 6: Conservation objective for the internationally important population of the regularly occurring migratory species: wintering shelduck The conservation objective for the "wintering shelduck" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "wintering shelduck" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering shelduck population is no less than 7,725 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the abundance and dispersion of shelduck prey species are maintained at levels sufficient to support the population size in (i); • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas; • aggregations of loafing or feeding shelduck are not subject to significant disturbance. Interest feature 7: Conservation objective for the internationally important population of the regularly occurring migratory species: wintering teal The conservation objective for the "wintering teal" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "wintering teal" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering teal population is no less than 5,251 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained • the extent of saltmarsh and the spatial distribution of its constituent vegetation community types is maintained;	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• greater than 25% cover of seed bearing plants is maintained during winter across the saltmarsh; • the extent of standing water pools or 'flashes' in the saltmarsh is maintained; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas; • aggregations of loafing or feeding teal are not subject to significant disturbance. Interest feature 8: Conservation objective for the internationally important population of the regularly occurring migratory species: wintering pintail The conservation objective for the "wintering pintail" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "wintering pintail" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering pintail population is no less than 5,407 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained;	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the extent of saltmarsh and the spatial distribution of its constituent vegetation community types is maintained; • the abundance and dispersion of pintail prey species is maintained at levels required to support the population size in (i); • greater than 25% cover of soft leaved herbs and grasses is maintained during winter across the saltmarsh; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around loafing areas, and feeding areas; • aggregations of loafing or feeding pintail are not subject to significant disturbance. Interest feature 9: Conservation objective for the internationally important population of the regularly occurring migratory species: wintering oystercatcher The conservation objective for the "wintering oystercatcher" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "wintering oystercatcher" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering oystercatcher population is no less	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	than 22,677 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained • the abundance and dispersion of oystercatcher prey species are maintained at levels sufficient to support the population size in (i); • the extent and spatial distribution of saltmarsh vegetation less than 10 cm in height is maintained; • the extent of rocky shore at Hilbre Island, Middle Eye, Little Eye and Tanskey Rocks is maintained; • the extent and height of the shingle spit at Point of Ayr is maintained; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas; • aggregations of roosting or feeding oystercatcher are not subject to significant disturbance. Interest feature 10: Conservation objective for the internationally important population of the regularly occurring migratory species: wintering grey plover The conservation objective for the "wintering grey plover" feature of The Dee Estuary SPA is to	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	maintain the feature in a favourable condition, as defined below: The interest feature "wintering grey plover" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering grey plover population is no less than 1,643 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained; • the abundance and dispersion of grey plover prey species are maintained at levels sufficient to support the population size in (i); • the extent and spatial distribution of saltmarsh vegetation less than 10 cm in height is maintained; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas; • aggregations of roosting or feeding grey plover are not subject to significant disturbance. Interest feature 11: Conservation objective for the internationally important population of the regularly occurring migratory species: wintering knot	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	The conservation objective for the "wintering knot" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "wintering knot" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering knot population is no less than 12,394 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained • the abundance and dispersion of knot prey species are maintained at levels sufficient to support the population size in (i); • the extent and spatial distribution of saltmarsh vegetation less than 10 cm in height is maintained • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas; • aggregations of roosting or feeding knot are not subject to significant disturbance. Interest feature 12: Conservation objective for the internationally important population of the regularly occurring migratory species: wintering dunlin	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	The conservation objective for the "wintering dunlin" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "wintering dunlin" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering dunlin population is no less than 27,769 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained; • the abundance and dispersion of dunlin prey species are maintained at levels sufficient to support the population size in (i); • the extent and spatial distribution of saltmarsh vegetation less than 10 cm in height is maintained; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas; • aggregations of roosting or feeding dunlin are not subject to significant disturbance. Interest feature 13: Conservation objective for the internationally important population of the regularly	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	occurring migratory species: wintering black-tailed godwit The conservation objective for the "wintering black-tailed godwit" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "wintering black-tailed godwit" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering black-tailed godwit population is no less than 1,747 individuals [i.e. the 5 year mean peak between 1994/951998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained; • the abundance and dispersion of black-tailed godwit prey species are maintained at levels sufficient to support the population size in (i); • the extent and spatial distribution of saltmarsh vegetation less than 10 cm in height is maintained; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas; • aggregations of roosting and feeding black-tailed godwit are not subject to significant disturbance.	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	Interest feature 14: Conservation objective for the internationally important population of the regularly occurring migratory species: wintering curlew The conservation objective for the "wintering curlew" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "wintering curlew" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering curlew population is no less than 3,899 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained; • the abundance and dispersion of curlew prey species are maintained at levels sufficient to support the population size in (i); • the extent and spatial distribution of saltmarsh vegetation less than 10 cm in height is maintained; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas;	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• aggregations of roosting or feeding curlew are not subject to significant disturbance. Interest feature 15: Conservation objective for the internationally important population of the regularly occurring migratory species: wintering redshank The conservation objective for the "wintering redshank" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "wintering redshank" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • * the 5 year peak mean population size for the wintering redshank population is no less than 5,293 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained; • the abundance and dispersion of redshank prey species are maintained at levels sufficient to support the population size in (i); • the extent and spatial distribution of saltmarsh vegetation less than 10 cm is maintained; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around both roosting sites and feeding areas;	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• aggregations of roosting or feeding redshank are not subject to significant disturbance. Interest feature 16: Conservation objective for the internationally important assemblage of regularly occurring waterbirds The conservation objective for the "internationally important assemblage of regularly occurring waterbirds" feature of The Dee Estuary SPA is to maintain the feature in a favourable condition, as defined below: The interest feature "internationally important assemblage of regularly occurring waterbirds" will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the 5 year peak mean population size for the wintering waterbird assemblage is no less than 120,726 individuals [i.e. the 5 year mean peak between 1994/95-1998/99]; • the relative proportions of waders and wildfowl comprising the wintering waterbird assemblage is maintained; • the extent of intertidal flats and the spatial distribution of their constituent sediment community types is maintained; • the extent of saltmarsh and the spatial distribution of its constituent vegetation community types is maintained;	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the extent and spatial distribution of saltmarsh vegetation less than 10 cm in height is maintained; • the extent of rocky shore at Hilbre Island, Middle Eye, Little Eye and Tanskey Rocks is maintained; • the extent and height of the shingle spit at Point of Ayr is maintained; • the abundance of waterbird prey species are maintained at levels sufficient to support the population size in (i); • greater than 25% cover of both seed bearing plants and soft leaved herbs and grasses is maintained during winter across the saltmarsh; • existing unrestricted bird sightlines of at least 200 m are maintained in every direction around roosting sites, loafing and feeding areas; • aggregations of roosting, loafing or feeding waterbirds are not subject to significant disturbance.	
Dee Estuary/ Aber Dyfrdwy Ramsar (UK11082)	Not available for Ramsar sites.	The Information Sheet on Ramsar Wetlands (RIS) (Ref C 2) identifies the following factors (past, present or potential) adversely affecting the site's ecological character: • introduction/invasion of exotic animal species • introduction/invasion of non-native plant species

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
		• overfishing • pollution – industrial waste • general disturbance from human activities • transport infrastructure development • sand dune erosion and accretion along the North Wales open coast
River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC (UK0030252)	Conservation Objective for Feature 1: Watercourses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation (EU Habitat Code: 3260) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • the conservation objective for the watercourse as defined above must be met. • The extent of this feature within its potential range in this SAC should be stable or increasing • the extent of the sub-communities that are represented within this feature should be stable or increasing. • the conservation status of the feature's typical species should be favourable. • all known, controllable factors, affecting the achievement of these conditions are under control (many factors may be unknown or beyond human control).	The following factors affecting the features and integrity of the River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC have been identified in Natural Resources Wales's Core Management Plan (Ref C 3): **Main pressures and threats for watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation:** • bank and riparian vegetation • species indicative of eutrophication • alien/ introduced species • water quality • light levels **Main pressures and threats for Atlantic salmon *Salmo salar:*** • water quality • water flow • river morphology e.g., artificial barriers

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	Conservation Objective for Feature 2: Atlantic salmon Salmo salar (EU Species Code: 1106) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • the parameters defined in the vision for the watercourse as defined above must be met • the SAC feature populations will be stable or increasing over the long term. • the natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. • there will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis • all known, controllable factors, affecting the achievement of these conditions are under control (many factors may be unknown or beyond human control). Conservation Objective for Feature 3: Luronium natans / Floating water-plantain The conservation objective for the lake water body as defined in the conservation objective for features 9 and 10 must be met. The vision for this feature is for it be in favourable conservation status, where all of the following conditions are satisfied:	• compensation stocking of salmon populations by NRW – upper limit set at 200,000 **Main pressures and threats for Luronium natans / Floating water-plantain:** • dredging • disturbance by motorised craft • water quality **Main pressures and threats for Sea lamprey *Petromyzon marinus*, Brook lamprey *Lampetra planeri*, River lamprey *Lampetra fluviatilis*:** • water quality • hydromorphology – barriers to movement; spawning site availability; spawning habitat. • exploitation **Main pressures and threats for Bullhead *Cottus gobio*:** • water quality • water flow • hydromorphology – barriers to movement; woody debris removal; bankside tree cover • non-native crayfish • stocking of other fish

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• there will be no contraction of the current L. natans extent and distribution, and the populations will be viable throughout their current distribution & will be able to maintain themselves on a long-term basis. Each L. natans population must be able to complete sexual and/or vegetative reproduction successfully. • the lake will have sufficient habitat to support existing L. natans populations within their current distribution and for future expansion. • all factors affecting the achievement of these conditions are under control. Conservation Objective for Features 4, 5, and 6: Sea lamprey Petromyzon marinus (EU Species Code: 1095), Brook lamprey Lampetra planeri (EU Species Code: 1096), River lamprey Lampetra fluviatilis (EU Species Code: 1099) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • the parameters defined in the vision for the watercourse as defined above must be met. • the SAC feature populations will be stable or increasing over the long term. • the natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.	• socking / transfers of bullhead within the catchment **Main pressures and threats for European otter *Lutra lutra:*** • potential breeding sites • potential resting sites • food availability • dispersal and access routes • anthropogenic mortality • disturbance

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• there will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis. • all factors affecting the achievement of these conditions are under control. Conservation Objective for Feature 7: Bullhead Cottus gobio (EU Species Code: 1163) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • the parameters defined in the vision for the watercourse as defined above must be met. • the SAC feature populations will be stable or increasing over the long term. • the natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. • there will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis. • all factors affecting the achievement of these conditions are under control. Conservation Objective for Feature 8: European otter Lutra lutra (EU Species Code: 1355)	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • the parameters defined in the vision for the watercourse as defined above must be met. • the SAC otter population is stable or increasing over the long term, both within the SAC and within its catchment. • there will be no loss of otter breeding or resting sites other than by natural means (such as naturally occurring river processes) within the SAC or its catchment. • the number of potential resting sites within the SAC will not be a factor limiting that limits the otter population's size or extent. • there should be no reduction of fish biomass within the SAC or its tributaries except for that attributable to natural fluctuations. • there should be no loss of amphibian habitat likely to provide a source of prey for members of the SAC otter population. • the potential range of otters in the within the SAC or its catchment is neither being reduced nor is likely to be reduced for the foreseeable future. • all known or potential access or dispersal routes within the catchment for otters that might be considered part of the SAC population should be maintained such that their function is not	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	impaired including the incorporation of measures or features required to avoid disturbance. • off site habitats likely to function as 'stepping stones' within the catchment for members of the SAC otter population will be maintained for migration, dispersal, foraging and genetic exchange purposes. • all man-made structures within or likely to be used by otters from the SAC population must incorporate effective measures to facilitate the safe movement and dispersal of otters. • all known, controllable factors, affecting the achievement of these conditions are under control (many factors may be unknown or beyond human control). Conservation Objectives for lake and marginal wetland SAC & Ramsar features 9 and 10: The lake and aquatic /emergent vegetation, Lake fen/swamp inc. wet woodland. • the total extent of the lake area, including lake fen and swamp shall be maintained. This includes some 10 ha of swamp/fen in total; of which at least 6 ha is attributable to NVC S11 Carex vesicaria swamp community. • the abundance and distribution of rare aquatic and emergent species will be maintained or increased and continue to be self-sustaining.	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the abundance and distribution of typical species of aquatic /emergent species will be common and continue to be self-sustaining. • the fen and swamp layers comprises locally native species, see table below for the relevant species for each vegetation community. The abundance of typical species of each fen and swamp type will be common. • the abundance and distribution of uncommon / rare plants occurring within each fen and swamp vegetation community will be maintained or increased and continue to be self-sustaining. • invasive non-native species such as rhododendron, Japanese knotweed, Canadian pondweed and Himalayan balsam will not be present. This condition is considered under "factors". • water quality targets for the lake should be of a standard that will ensure it reaches Good Ecological Status or better as defined by the Water Framewok Directive. The river Dee should reach its water quality targets as set out in Appendix 2 of the Supplementary Advice on the Conservation Objectives. • eutrophication of the lake from diffuse and point source pollution will be under control and incidences of blue/green algal blooms will have stopped. The nutrient levels in the lake will be	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	similar to the levels inferred from the diatom assemblages for the lake prior to 1925. • all factors affecting the achievement of these conditions are under control. Conservation Objective for Feature 11. Gwyniad Coregonus lavaretus. There are fewer than 10 recorded populations of whitefish in the British Isles and the Llyn Tegid population is the only one in Wales. Dwelling mainly in the deeper and cooler offshore waters this carnivorous fish feeds on microscopic animals floating in the water. Each year, between January and February, it moves into the shallower waters of the lake to spawn in clean gravel beds. Between 2004 and 2007 an attempt was made to establish a 'refuge' population at Llyn Arenig Fawr, an upland oligotrophic lake in Migneint-Arenig-Dduallt SAC (Refer to Migneint-Arenig-Dduallt SAC plan). The conservation objective for the lake water body as defined in conservation objectives for features 9 &10 must be met. The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • the population of the feature in the SAC is stable or increasing over the long term. • the natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• suitable habitat is defined in terms of near-natural hydrological regime, depth of water and substrate type at spawning sites, and ecosystem structure and functions e.g. food supply. • all factors affecting the achievement of these conditions are under control. Conservation Objective for Feature 12. Glutinous snail. Myxas glutinosa. The conservation objective for the lake water body as defined in conservation objective for features 9 &10 must be met. The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • this population will continue to thrive and colonise all suitable areas of habitat in the marginal zone. The species will have been extensively studied and its ecology, especially its response to fluctuating water levels, will be better understood so that its niche requirements can continue to be met. In addition, we will fully understand whether the apparently different mean growth rates in snail populations at different locations around the lake is due to minor habitat variance or to isolated sub-population differences.maintenance of the quality and extent of suitable habitat. • all factors affecting the achievement of these conditions are under control.	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
Deeside and Buckley Newt Sites SAC (UK0030132)	Conservation Objective for Feature 1: Great crested newt Triturus cristatus (EU Species Code: 1166) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • no less than 600 great crested newts will be present on the site • at least 50 display/breeding ponds will be found throughout the entire site • great crested newt larvae will be found in 25 or more of the breeding ponds • half of the display/breeding ponds on the site will have a water depth of 10 cm of more during the summer months. • native macrophytes will cover at least half of the pond surface yet some of the water surface (40%) will still remain open. • aquatic marginal vegetation will be present around the ponds • breeding/display ponds will not be heavily shaded by surrounding vegetation • algal blooms and surface sheens will be absent from display/breeding ponds • fish will not be present in breeding/display ponds which support great crested newts • only small numbers of water and wildfowl will be seen on the ponds	The following factors affecting the features and integrity of the Deeside and Buckley Newt Sites SAC have been identified in Natural Resources Wales's Core Management Plan (Ref C 4): **Main pressures and threats for Great crested newt *Triturus cristatus:*** • extent of breeding/ display ponds • availability of macrophyte plant cover • water depth • pollution • extent of shading • extent and quality of terrestrial habitat • availability of dispersal routes • presence of water and wildfowl • presence of fish • non-native aquatic plant species, especially *Crassula helmsii* **Main pressures and threats for Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles:** • invasive species – *Rhododendron ponticum* / cherry laurel • no-native species – beech and larch • recreation

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the terrestrial habitat surrounding breeding ponds will comprise of refuge areas for newts, foraging areas, areas of hibernacula and corridors which will aid the dispersal of great crested newts • off-site habitats that function as stepping stone or corridors located between SAC compartments will be maintained for migration, dispersal, foraging and genetic exchange purposes • off-site features that impact on successful dispersal, such as roadside gully-pots, will not be subject to future construction • non-native aquatic species will not be present • amphibian chytridiomycosis will not be present • all factors affecting the achievement of the foregoing conditions are under control. Conservation Objective for Feature 2: Old sessile oak woods with Ilex and Blechnum in the British Isles (EU Habitat Code: 91AO) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • old sessile oak woodland will occupy at least 10% of the total site area • the woodland is maintained as far as possible by natural processes	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the trees and shrubs are mainly native broadleaved species dominated by oak with some, birch, alder and ash • the occasional sycamore may be present but will not become dominant anywhere in the canopy or the under-storey • beech and conifer species will be largely absent from the canopy, under-storey and the woodland as a whole • the abundance of individual native tree species will vary throughout the woodland. There may be dense stands of one species or mixture of several species occupying a given area at any one time • existing canopy gaps which occur over great crested newt ponds will be maintained, and supplemented by a changing patchwork of naturally occurring pattern of gaps and temporary glades which will give rise to structural diversity • the woodland will contain trees and shrubs of all ages and sizes, as a mixture or in single aged groups • plentiful native tree seedlings throughout the site will develop into saplings in the open glades • the field and ground layers will contain such species as ivy, bramble, honeysuckle, broad-buckler fern, male fern and greater wood-rush	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• exotic species such as rhododendron and cherry laurel will not be tolerated within the woodland • there will be abundant dead and dying trees with holes and hollows, rot columns, torn off limbs and rotten branches throughout the woodland • all factors affecting the achievement of these conditions are under control.	
Halkyn Mountain/ Mynydd Helygain SAC (UK0030163)	Conservation Objective for Feature 1: Calaminarian grassland of the Violetalia calaminariae type (European code 6130) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • there will be no overall decline in the extent of this feature and where possible, opportunities will be sought to increase its extent, subject to the provision of suitable substrate, delivered for example through quarry restoration schemes. • this habitat will support Minuartia verna and Festuca ovina along with common vascular plant such as Plantago lanceolata, Rumex acetosa, Thymus praecox and Euphrasia spp. • this habitat will support a prominent suite of bryophyte and lichen species: Lichen flora within this habitat will comprise a constant assemblage of generally common calcicole species. Ubiquitous elements will include the macro lichens Cladonia rangiformis, C. pocillum, Peltigera rufescens and the crustose lichen	The following factors affecting the features and integrity of Halkyn Mountain/ Mynydd Helygain SAC have been identified in Natural Resources Wales's Core Management Plan (Ref C 5): **Main pressures and threats for Calaminarian grassland of the *Violetalia calaminariae* type:** • under and over grazing • agricultural operations • changes in edaphic conditions • succession • development **Main pressures and threats for European dry heath:** • under and over grazing • nutrient enrichment • burning • cutting regime

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	Bacidia sabuletorum. The small acrocarps Bryum pallens, Dicranella varia and Weissia controversa will also be very common bryophytes within the calaminarian grassland community forming low crusts with species of lichen and algae. • the nationally scarce bryophyte Bryum pallescens will also be a common plant in this habitat. • this habitat will support small areas of bare ground • the sward height will be less than 5 cm high. • where possible, areas of this habitat will be fenced to allow the control of access and grazing levels otherwise uncontrolled on the urban common. • there will be an absence of taxa indicative of more mesotrophic, less toxic environmental conditions. • as far as is practically possible, factors affecting the achievement of the foregoing conditions are under control. Conservation Objective for Feature 2: European dry heath (European Code 4130) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:	• development **Main pressures and threats for Semi – natural dry grassland and scrubland facies on calcareous substrates:** • under And over grazing • nutrient enrichment • physical damage • development **Main pressures and threats for *Molinia* meadows on calcareous peaty or clayey-silt-laden soils (*Molinion caeruleae*):** • under and over grazing • nutrient enrichment • mowing or topping of rush • watercourse management • hydrology • succession • development **Main pressures and threats for Great crested newt *Triturus cristatus:*** • extent of breeding/ display ponds • macrophyte cover • water depth

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the heath communities are typified by a closed canopy dominated by a mixture of ericaceous shrubs such as bell heather and ling heather together with western gorse. Bilberry and Wavy hair grass will also prevail through the H12 and H18 communities. • european dry heath will cover c. 20% of the site and opportunities will be sought to increase its extent for example through quarry restoration schemes. • opportunities will be sought where appropriate to improve the species diversity of existing stands. • as far as is practically possible, factors affecting the achievement of the foregoing conditions are under control. Conservation Objective for Feature 3: Semi – natural dry grassland and scrubland facies on calcareous substrates (European Code 6210) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • there will be no overall decline in the extent of this feature and opportunities will be sought to increase its extent for example through quarry restoration schemes and bracken control programmes. • the calcareous grassland sward will support forbs such as Carex spp., Gallium verum,	• pollution • extent of shading • extent and quality of terrestrial habitat • presence of water and wildfowl • presence of fish • presence of non-native aquaticplant species, especially *Crassula helmsii*

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	Helianthemum nummularium, Lotus corniculatus, Pilosella officinarum, Polygala vulgaris, Sanguisorba minor, Thymus praecox along with characteristic grasses such as Briza media, Festuca ovina and Koeleria macrantha. • the CG1 community, owing to its open character, might also encompass frequent small areas of bare ground and exposed rock along with a moderate cover of terricolous lichens and acrocarpous mosses. • uncommon vascular plants, including the locally scarce Ophioglossum vulgatum, Botrychium lunaria, Gentianella marelle and Cirsium acaule, will continue to prevail at favoured locations within this habitat. • there will be an absence of taxa indicative of more mesotrophic, environmental conditions within this habitat. • agriculturally favoured species such as Holcus lanatus, Lolium perenne and Trifolium repens will be rare or absent within this habitat. • bracken and tree/scrub species will be rare or absent within this habitat. • the cover of rank grassland species such as Arrhenatherum and Dactylis glomerata within this habitat will be nominal. • there will be an absence of introduced species (e.g. non-native cotoneaster)	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• as far as is practically possible, factors affecting the achievement of the foregoing conditions are under control. Conservation Objective for Feature 4: Molinia meadows on calcareous peaty or clayey-silt-laden soils (Molinion caeruleae) (European code 6410) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • purple moor grass and short sedges such as tawny sedge, flea sedge, carnation sedge, common sedge and glaucous sedge will be frequent throughout the sward. Species such as devil's bit scabious, tormentil, marsh valerian and black knapweed will also prevail along with the bryophytes Calliergon cuspidatum and Campylium stellatum. • the habitat will continue to support marsh orchid and fragrant orchid. • adequate hydrological conditions are maintained to sustain this habitat in terms of water quantity and quality (much of this habitat is fed by springs issuing from base rich rock). • there will be no overall decline in the extent of this feature and opportunities will be sought to increase its extent where hydrological and edaphic factors permit.	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• uncommon vascular plants, including the locally scarce Valeriana diocia, Eriphorum latifolium, Carex diocica, Parnassia palustris, Eleocharis quinqueflora, Carex lepidocarpa, and Gymnadenia conopsea continue to prevail at favoured locations within this habitat. • as far as is practically possible, factors affecting the achievement of the foregoing conditions are under control. Conservation Objective for Feature 5: Great crested newt Triturus cristatus (EU Species Code: 1166) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • the site will continue to support at least 200 adult great crested newts as identified by torch surveys in the spring, in and around ponds within the pond clusters at Wern y Gaer, Pen yr Henblas, Rhes y Cae, Pant Quarry, Mount Villas, Mill Pond, Pant y Ffridd, Moel y gaer, Moel y crio, Plas Winta, Holywell Golf Course. • terrestrial and aquatic habitats will be managed to ensure high variability and thus the availability of suitable breeding ponds, and of foraging, sheltering, dispersal and over-wintering areas. • the existing 99 ponds will be retained and restored where necessary and opportunities will	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	be sought to deliver amphibian conservation schemes as they arise in suitable locations across the site. • at least 50% of the 46 known great crested newt breeding ponds will have a water depth of 10 cm of more during the summer months. • at least 50% of the 46 known great crested newt breeding ponds will support a good cover of native macrophytes, yet at least 25% of the water surface in these ponds will still remain open to encourage display areas. • surrounding vegetation, particularly on the southern margins, will not heavily shade breeding ponds. • fish will not be present in any T.cristatus breeding ponds. • water and wildfowl will not be encouraged on great crested newt breeding ponds • invasive aquatic species such as Crassula helmsii will not be present within any ponds. Where they are currently present they will be subject to management. • no barriers to newt dispersal will be permitted, which might further fragment the site. • refuge potential, particularly within 50 metres of breeding ponds is maintained or created. A shrub layer, tussocky grassland, rushes, sedges, scrub, heaped brash all provide examples of suitable refuge habitat.	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• any new roads and access tracks will not incorporate gully pots. • Amphibian chytridiomycosis will not be present within great crested newt populations on the site.	
Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC (UK0030078)	Conservation Objective for Feature 1: Tilio-Acerion forests of slopes, screes and ravines (EU Habitat Code: 9180) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • Tilio-Acerion woodland will occupy at least 80% (current extent) of the total site area • the woodland is maintained as far as possible by natural processes • the trees and shrubs are mainly native broadleaved species, such as ash, oak (sessile oak or hybrid), wych elm, lime, downy birch and hazel • sycamore may be present but will not become dominant anywhere in the canopy or the understorey • beech and conifer species will be largely absent from the canopy, under-storey and the woodland as a whole • the abundance of individual native tree species will vary throughout the woodland. There may be dense stands of one species or mixture of	The following factors affecting the features and integrity of Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC have been identified in Natural Resources Wales's Core Management Plan (Ref C 6): **Main pressures and threats for *Tilio-Acerion* forests of slopes, screes and ravines:** • invasive species - *Rhododendron ponticum*/ Cherry laurel; snowberry; *Cotoneaster* • non-native species • livestock grazing • recreation **Main pressures and threats for Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*):** • water quality • water quantity • livestock grazing

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	several species occupying a given area at any one time. • a changing patchwork of naturally occurring pattern of gaps and temporary glades will give rise to structural diversity • the woodland will contain trees and shrubs of all ages and sizes, as a mixture or in single aged groups • plentiful native tree seedlings throughout the site will develop into saplings in the open glades • the field and ground layers will contain such species as dog's mercury and false brome will be abundant across the majority of the woodland on drier base-rich soils, with ferns, particularly harts-tongue also being common. Other frequent and locally abundant species will include ivy, nettle and bramble • exotic species such as rhododendron, cherry laurel, snowberry and cotoneaster will not be tolerated within the woodland • there will be abundant dead and dying trees with holes and hollows, rot columns, torn off limbs and rotten branches throughout the woodland • all factors affecting the achievement of these conditions are under control Conservation Objective for Feature 2: Alluvial forests with Alnus glutinosa and Fraxinus excelsior	**Main pressures and threats for Dry grasslands and scrublands on chalk or limestone - Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)** • livestock grazing • scrub encroachment • recreation

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	(Alno-Padion, Alnion incanae, Salicion albae) (EU Habitat Code: 91E0) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • alder wet woodland will occupy at least 3% (current extent) of the site • the woodland is maintained as far as possible by natural processes • the trees and shrubs will be locally native broadleaved species with alder dominating the canopy • willow, ash, and birch may be a component of the canopy and the understorey but they will not become dominant anywhere • the presence of sycamore and poplar will be discouraged • the sparse shrub layer will comprise of a scattering of hazel, willow and rowan • the woodland will contain trees and shrubs of all ages and sizes, as mixtures or in single aged groups • a changing patchwork of naturally occurring pattern of gaps and temporary glades will give rise to structural diversity • seedlings will be relatively sparse throughout the site with only a few native seedlings from	

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	nonself coppicing trees develop into saplings in the open glades • the majority of regeneration will be from the base of the alders by means of self-coppicing • the field and ground layers will be a patchwork of alluvial species, with no one species dominating. It will contain such species such as remote sedge, meadowsweet, and nettle on dries areas • there will be abundant dead and dying trees with holes and hollows, rot columns, torn off limbs and rotten branches throughout the woodland • all factors affecting the achievement of these conditions are under control Conservation Objective for Feature 3: Dry grasslands and scrublands on chalk or limestone - Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) (EU Habitat Code: 6210) The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • calcareous grassland will occupy at least 1.1% (current extent) of the site, and opportunities will be sought to increase the extent into areas which have become scrub • the grassland will be a rich mix of herbs and grasses reflecting the calcareous grassland	

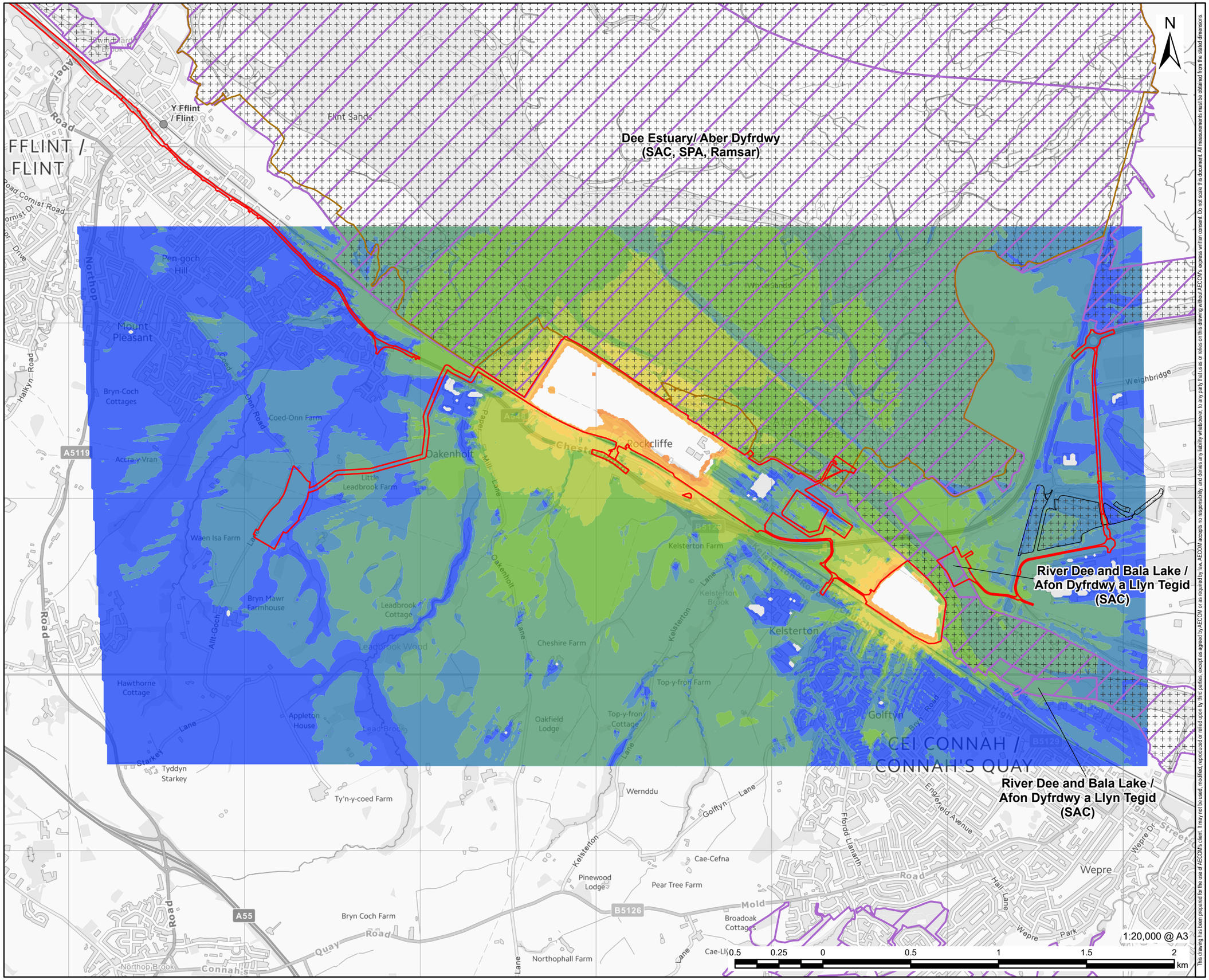
Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	community present, with a high broadleaved herb component • there will be at least 4 positive indicators present within each of the calcareous grassland communities present as defined in the performance indicators • terricolous lichens and acrocarpous bryophytes are present in any CG1 community • species indicative of agricultural improvements will be rare or absent • species indicative of rank vegetation will be rare or absent • scrub species and bracken will be rare or absent • Introduced species such as cotoneaster will be absent • all factors affecting the achievement of these conditions are under control	
Mersey Estuary SPA	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; • the extent and distribution of the habitats of the qualifying features	The following factors affecting the features and integrity of Mersey Estuary SPA have been identified in Natural England's Site Improvement Plan (Ref C 7): • changes in species distributions • invasive species • public access / disturbance

Habitats Site (including site code)	Conservation Objectives	Threats/ Pressures to Site Integrity
	• the structure and function of the habitats of the qualifying features • the supporting processes on which the habitats of the qualifying features rely • the population of each of the qualifying features, and, • the distribution of the qualifying features within the site.	
Mersey Estuary Ramsar	Not available for Ramsar sites.	The Information Sheet on Ramsar Wetlands (RIS) (Ref C 8) identifies the following factors (past, present or potential) adversely affecting the site's ecological character: • no factors reported

Appendix D - Noise Modelling Contour Maps

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www.aecom.com

LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Site Enabling- With Barrier Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75

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FIGURE TITLE

Average Construction Noise Levels for Site Enabling - With Barrier

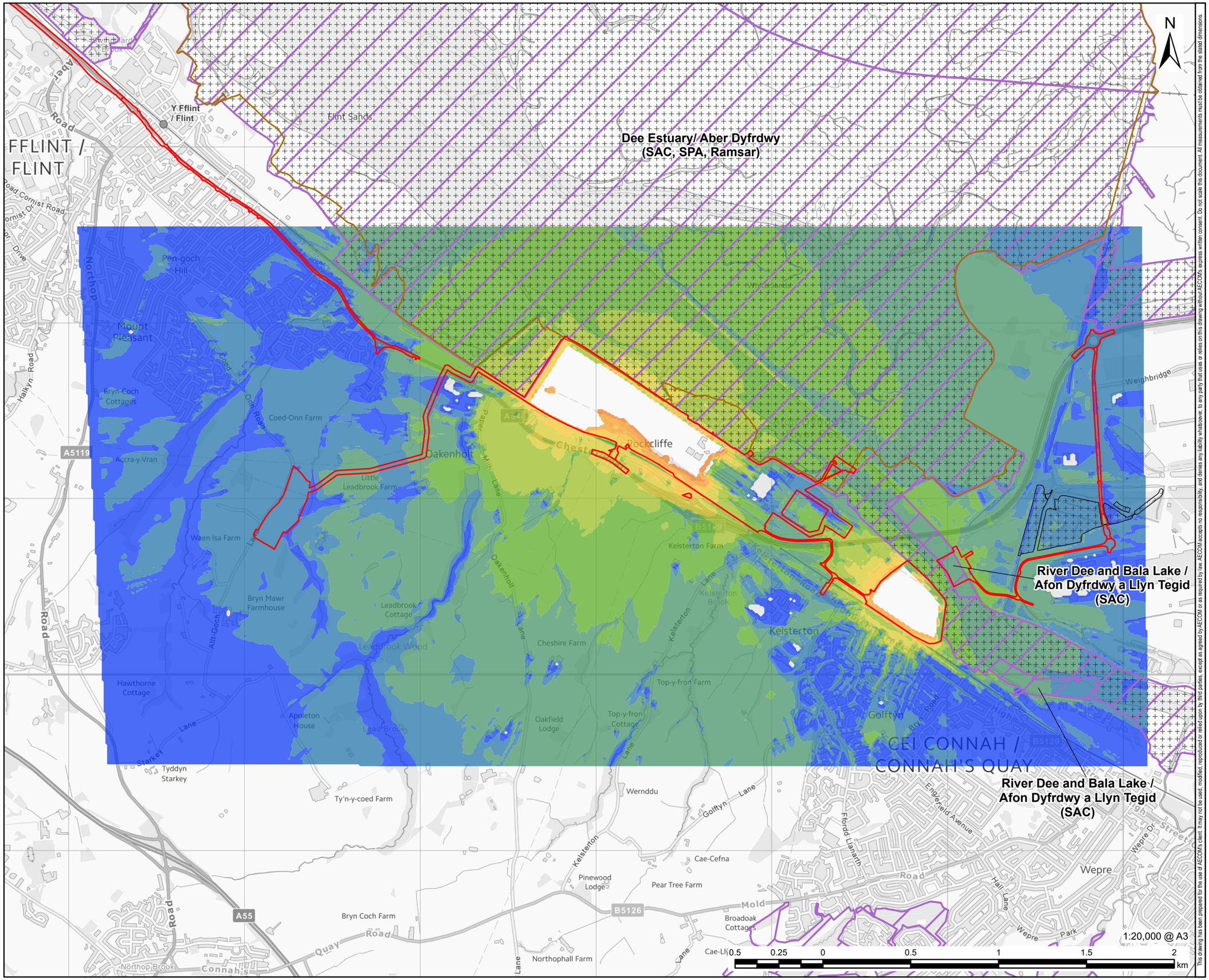
FIGURE NUMBER

Figure D1

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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Main Civils - With Barrier Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75

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PROJECT NUMBER

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FIGURE TITLE

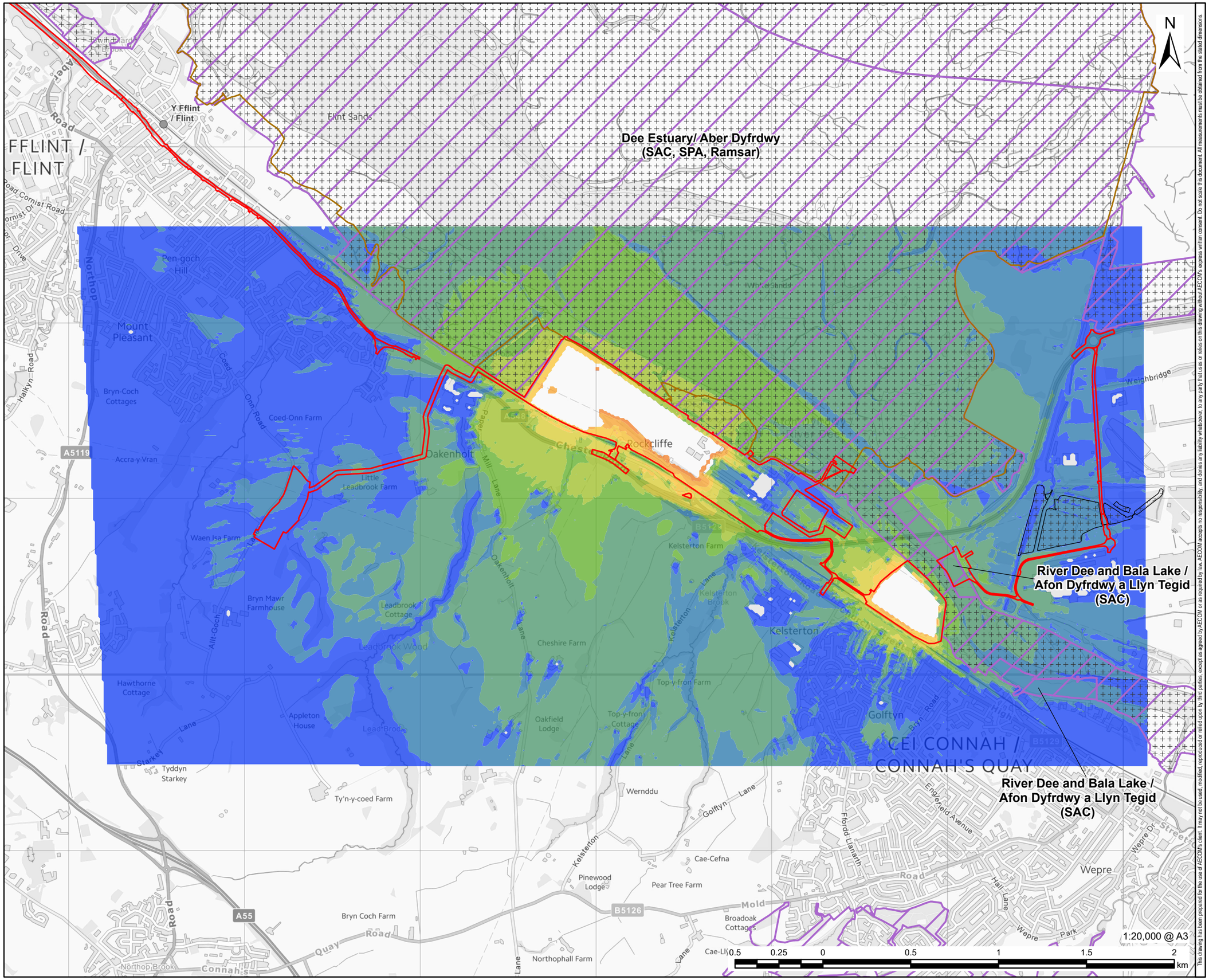
Average Construction Noise Levels for Main Civils - With Barrier

FIGURE NUMBER

Figure D2

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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Plant Installation - With Barrier Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75

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DATE

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PROJECT NUMBER

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FIGURE TITLE

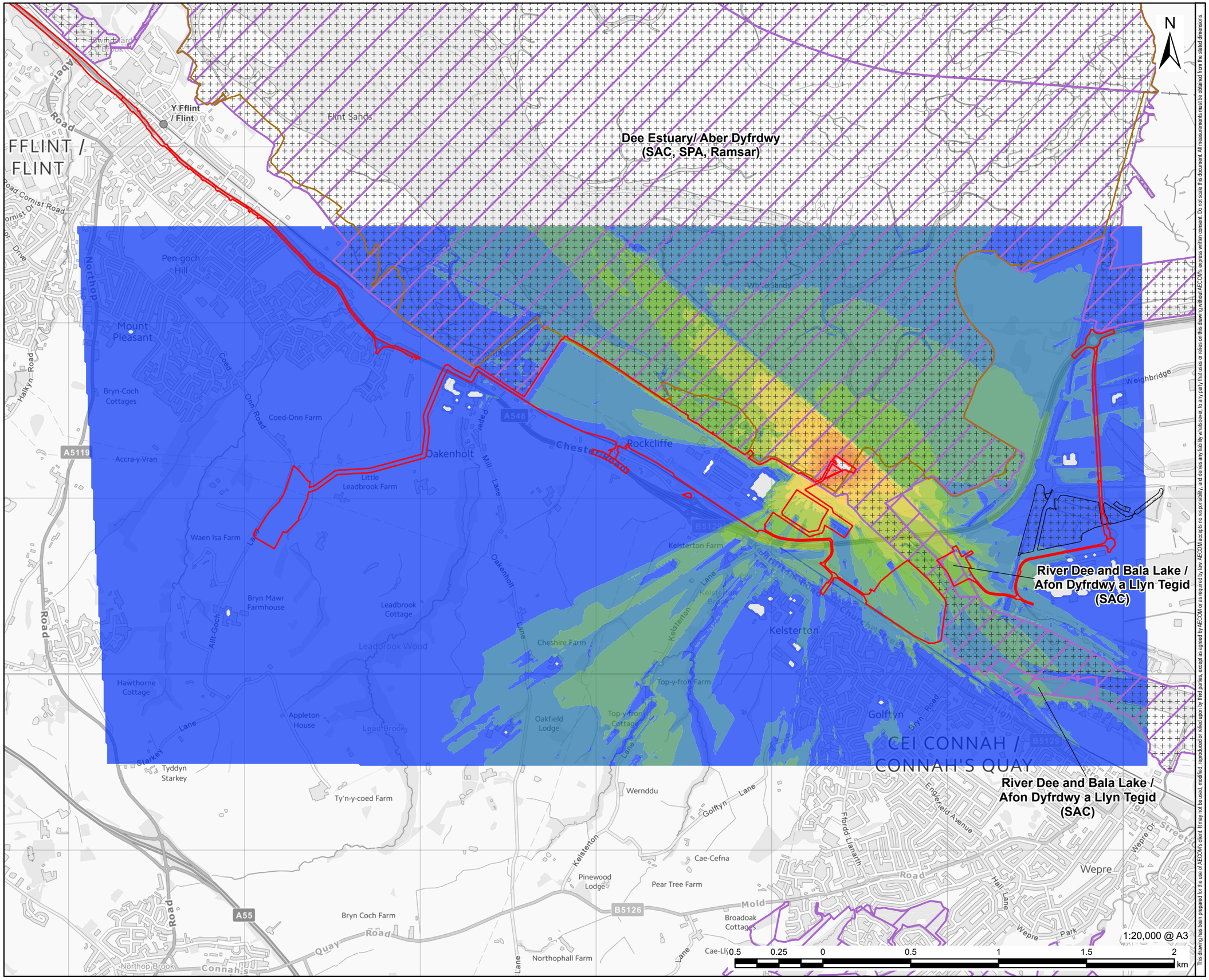
Average Construction Noise Levels for Plant Installation - With Barrier

FIGURE NUMBER

Figure D3

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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Water Connection - With Barrier Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85
- ≥ 85

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DATE

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PROJECT NUMBER

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FIGURE TITLE

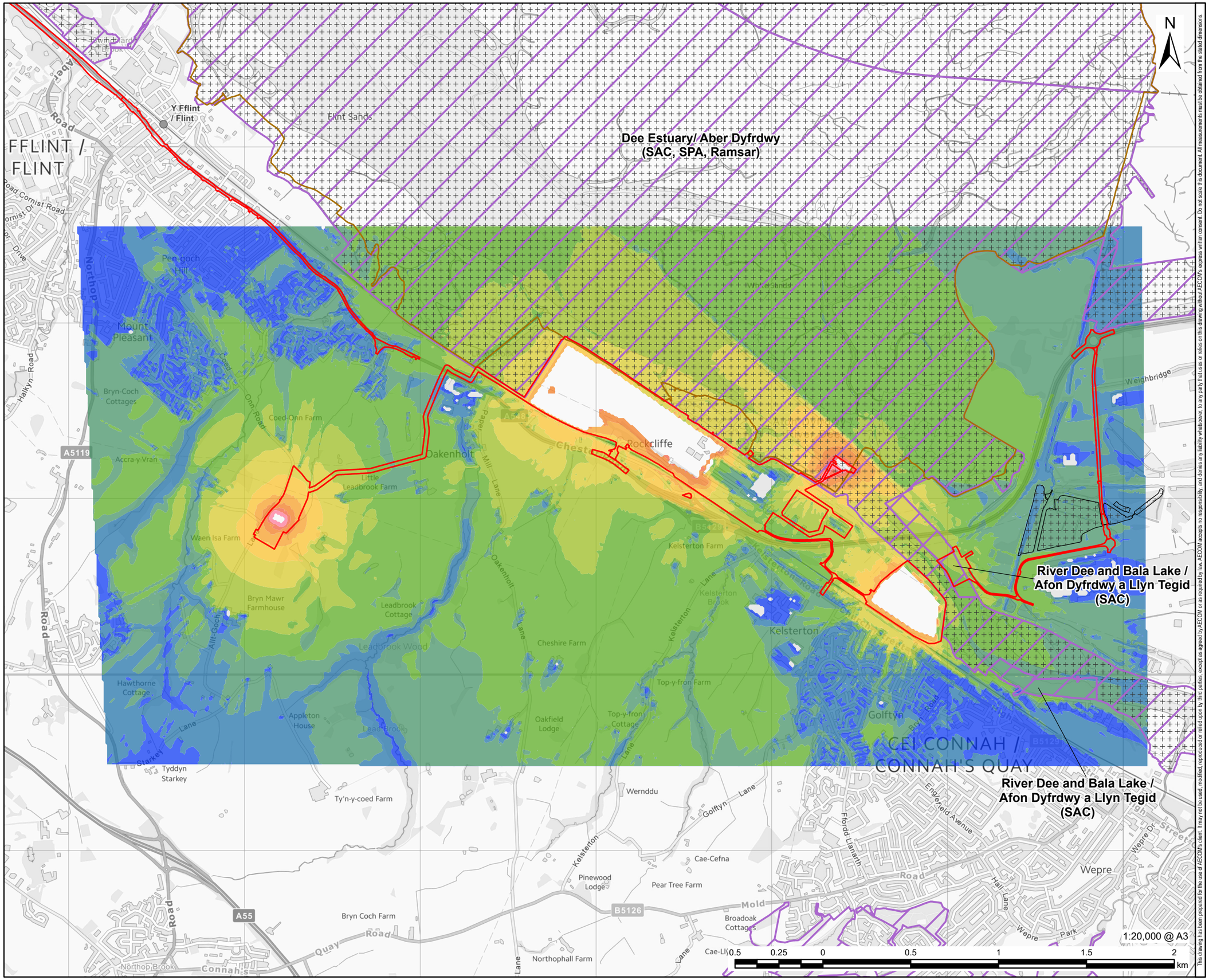
Average Construction Noise Levels for Water Connection - With Barrier

FIGURE NUMBER

Figure D4

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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Worst Case (CO_2 compound, Main Civils, Plant Installation, Water Connection) - With Barrier Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85
- ≥ 85

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FIGURE TITLE

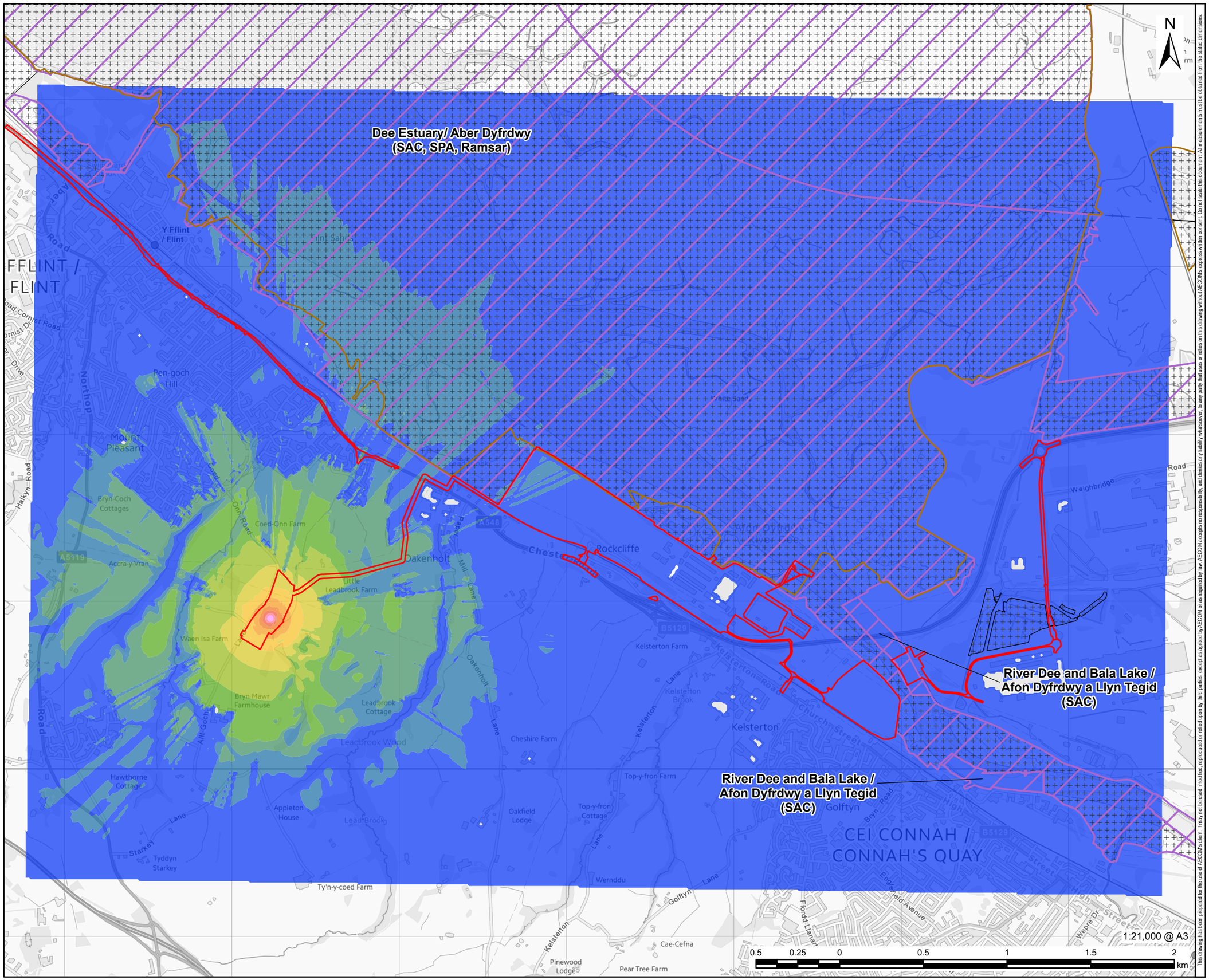
Average Construction Noise Levels for Worst Case Construction Scenario - With Barrier

FIGURE NUMBER

Figure D5

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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

CO2 Compound - With Barrier Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85
- ≥ 85

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FIGURE TITLE

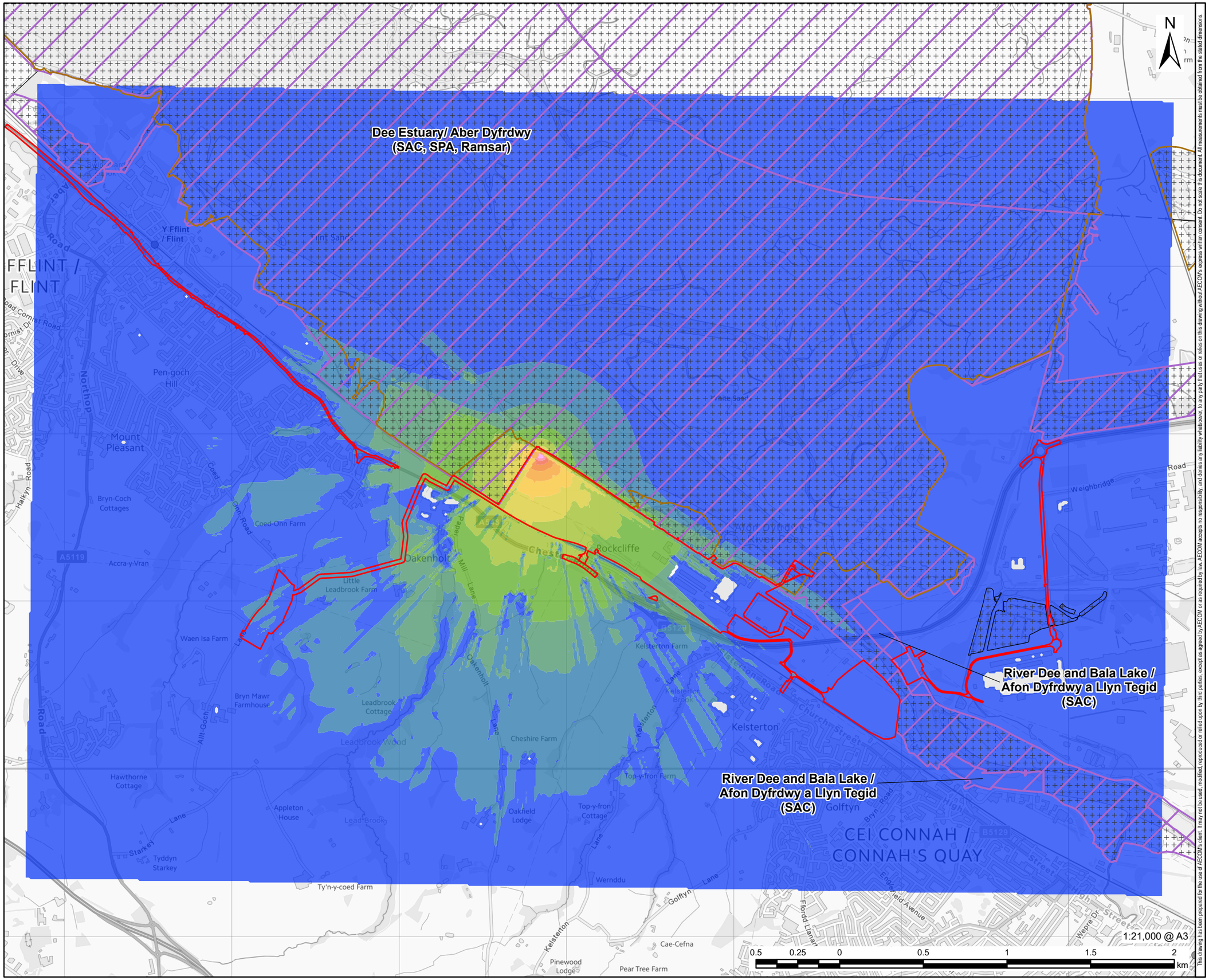
Maximum Construction Noise Levels for CO2 Compound - With Barrier

FIGURE NUMBER

Figure D6

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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Compound 1 Site Enabling - With Barrier-Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85
- ≥ 85

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FIGURE TITLE

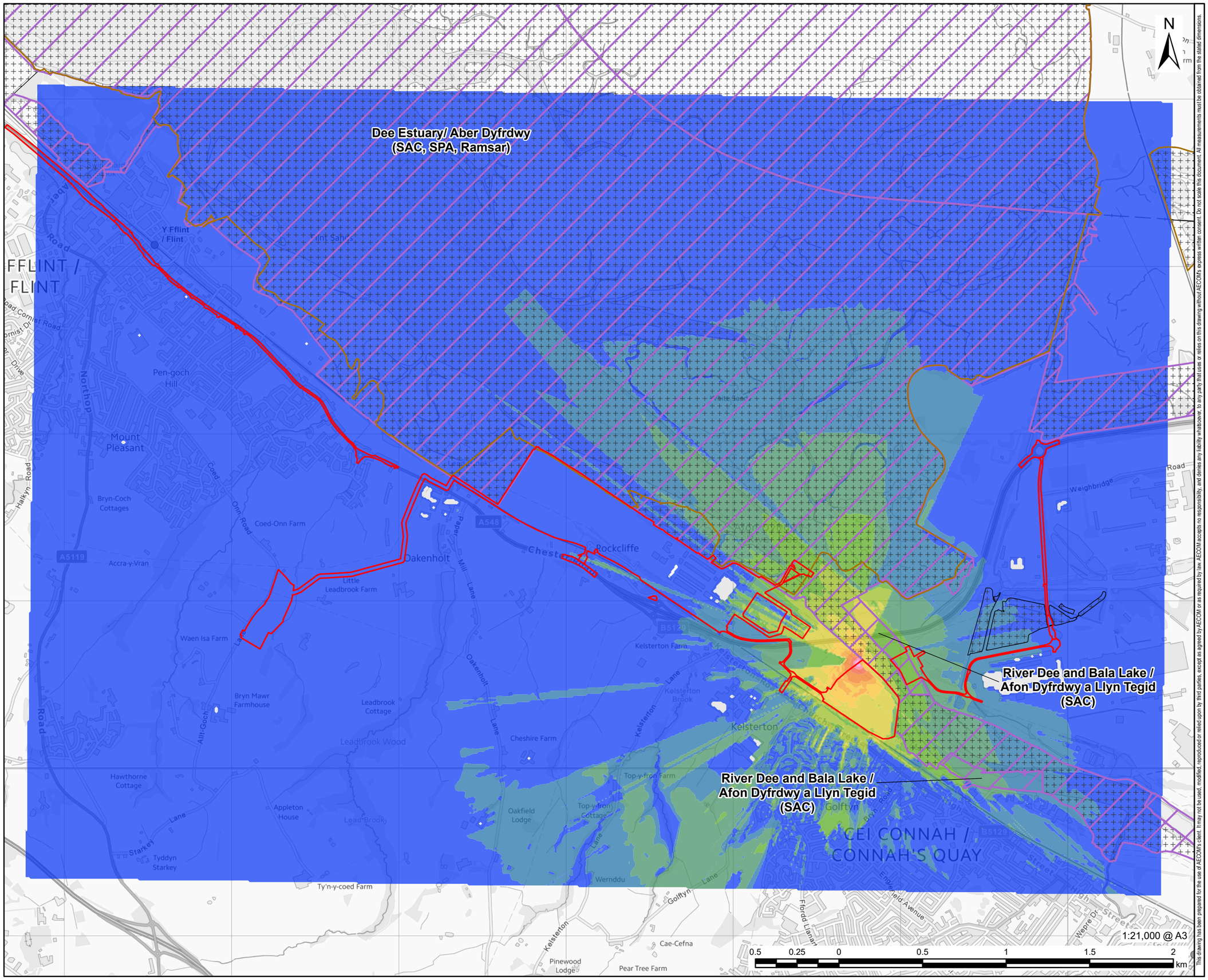
Maximum Construction Noise Levels for Compound 1 Site Enabling - With Barrier

FIGURE NUMBER

Figure D7

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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Compound 2 Site Enabling - With Barrier - Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85
- ≥ 85

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FIGURE TITLE

Maximum Construction Noise Levels for Compound 2 Site Enabling - With Barrier

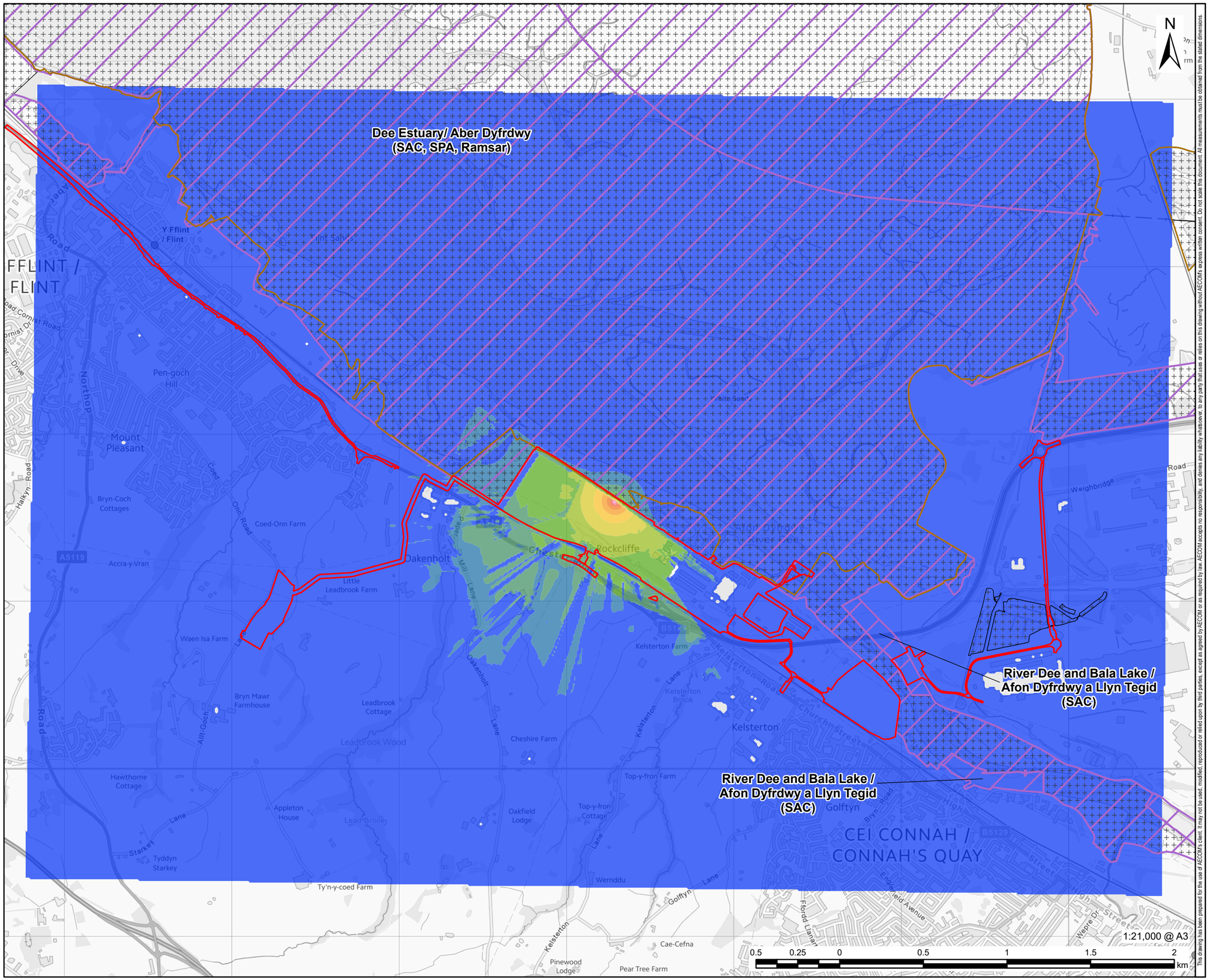
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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Main Site Plant Installation - With Barrier - Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85
- ≥ 85

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PROJECT NUMBER

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FIGURE TITLE

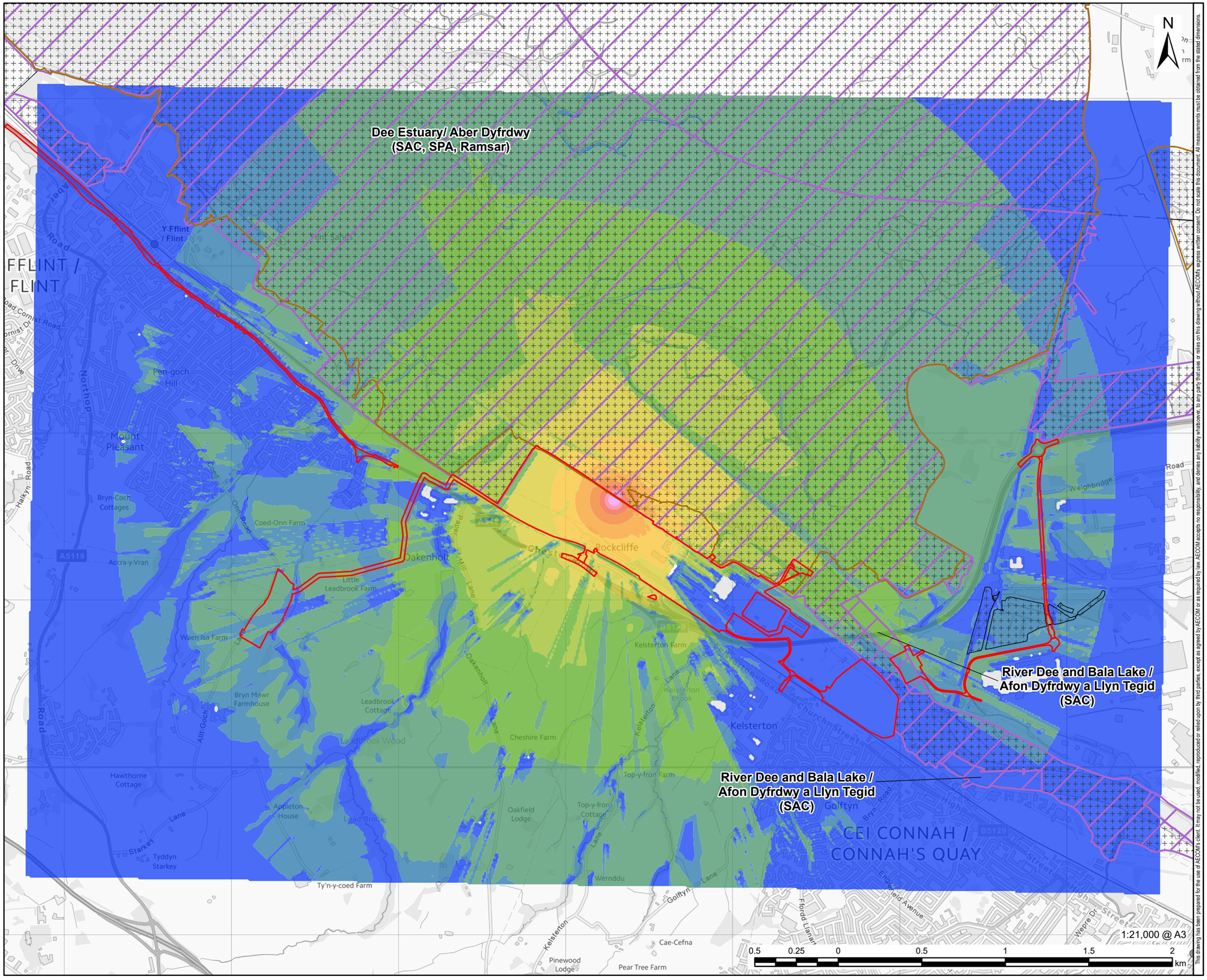
Maximum Construction Noise Levels for Main Site Plant Installation - With Barrier

FIGURE NUMBER

Figure D9

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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Main Site Shrouded Piling - With Barrier - Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85
- ≥ 85

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PROJECT NUMBER

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FIGURE TITLE

Maximum Construction Noise Levels for Main Site Shrouded Piling - With Barrier

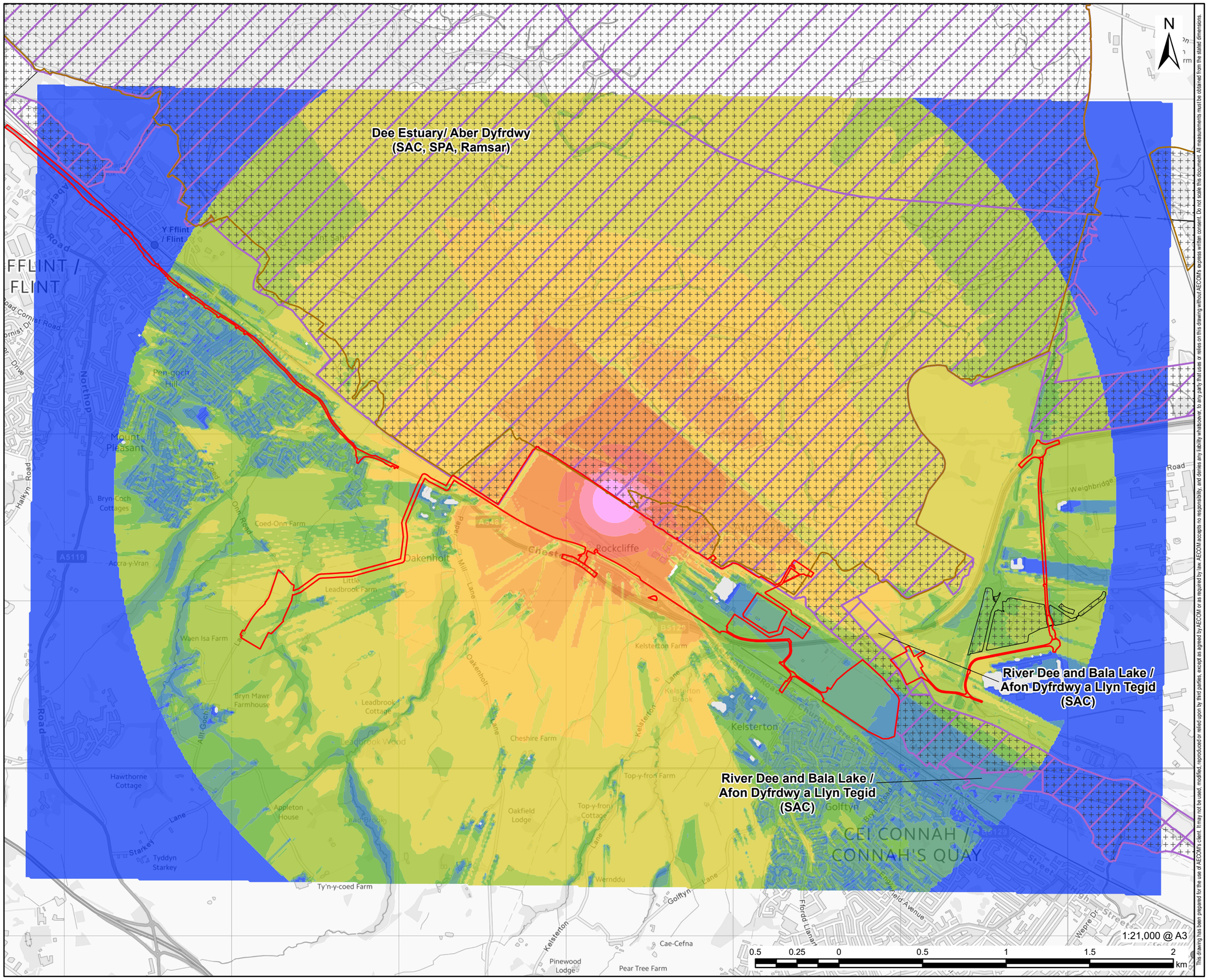
FIGURE NUMBER

Figure D10

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PROJECT

Connah's Quay Low Carbon Power

CONSULTANT

AECOM Limited
The Colmore Building
Colmore Circus, Queensway
Birmingham, B4 6AT
www.aecom.com

LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Main Site Unshrouded Piling - With Barrier Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85
- ≥ 85

NOTES

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ISSUE PURPOSE

Report to Inform Habitats Regulations Assessment

DATE

March 2026

PROJECT NUMBER

60768754

FIGURE TITLE

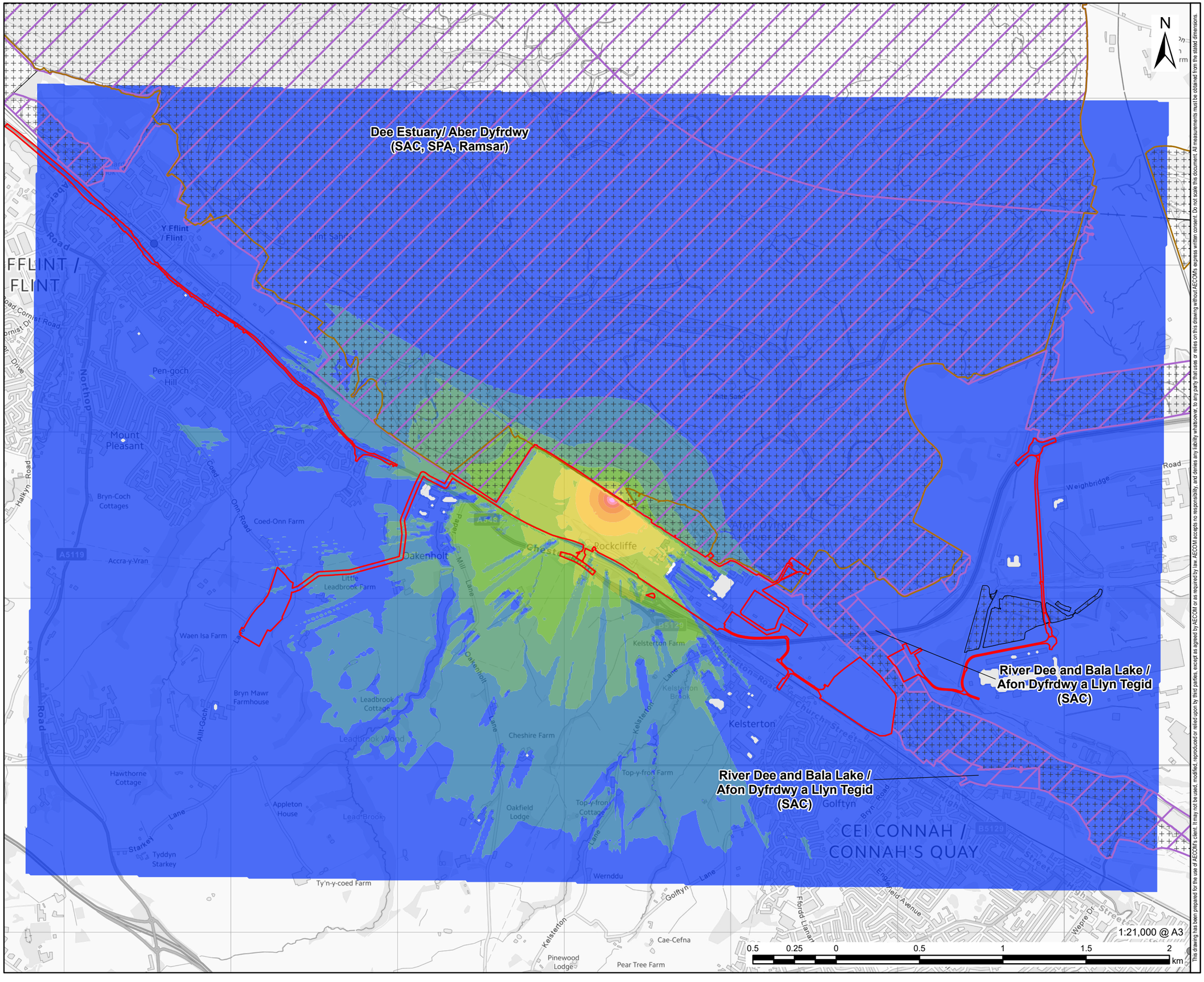
Maximum Construction Noise Levels for Main Site Unshrouded Piling - With Barrier

FIGURE NUMBER

Figure D11

Revision: 1 Drawn: LP Checked: JG Approved: KK Date: 2026-03-01

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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Main Site Enabling- With Barrier Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85
- ≥ 85

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ISSUE PURPOSE

Report to Inform Habitats Regulations Assessment

DATE

March 2026

PROJECT NUMBER

60768754

FIGURE TITLE

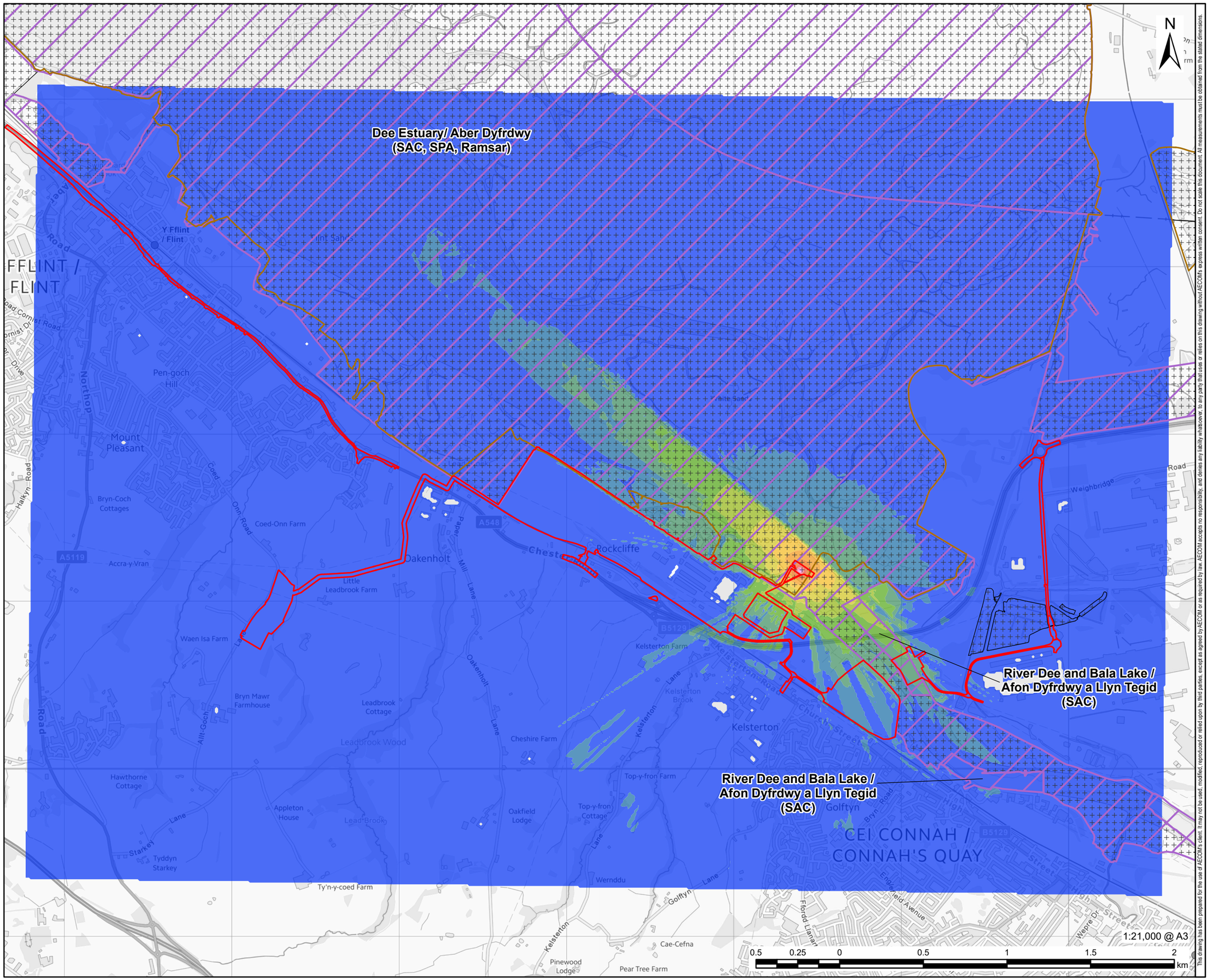
Maximum Construction Noise Levels for Main Site Enabling- With Barrier

FIGURE NUMBER

Figure D12

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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Water Connection Corridor - With Barrier Noise Contour (dB):

- < 35
- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85
- ≥ 85

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DATE

March 2026

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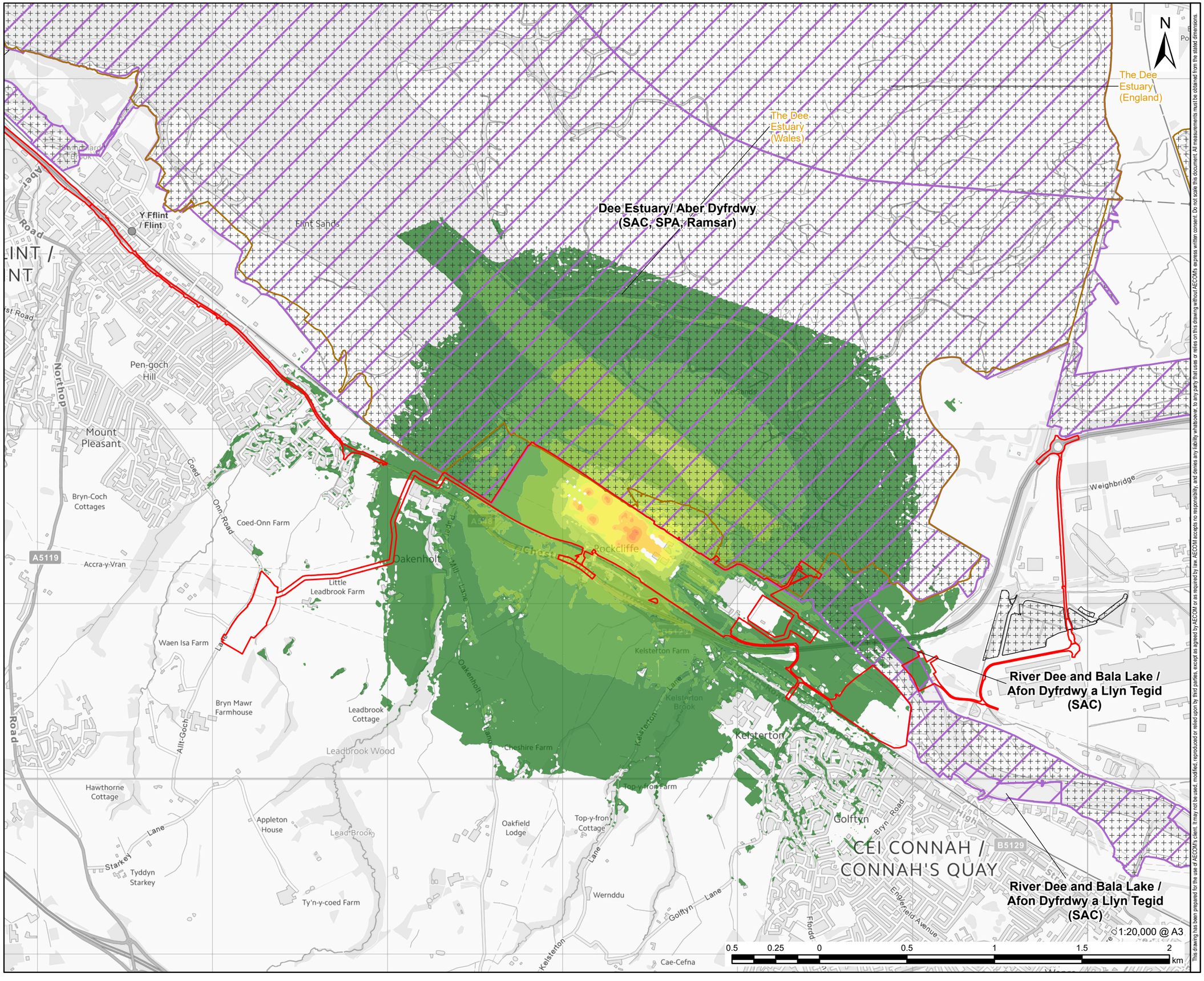
FIGURE TITLE

Maximum Construction Noise Levels for Water Connection Corridor - With Barrier

FIGURE NUMBER

Figure D13

Revision: 0 Drawn: LP Checked: JG Approved: KK Date: 2026-03-01



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LEGEND

- Order limits
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Operational Noise Level Contour (dB):

- ≥ 35 - < 40
- ≥ 40 - < 45
- ≥ 45 - < 50
- ≥ 50 - < 55
- ≥ 55 - < 60
- ≥ 60 - < 65
- ≥ 65 - < 70
- ≥ 70 - < 75
- ≥ 75 - < 80
- ≥ 80 - < 85

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FIGURE TITLE

Operational Noise Level Contours for Ecology

FIGURE NUMBER

Figure D14

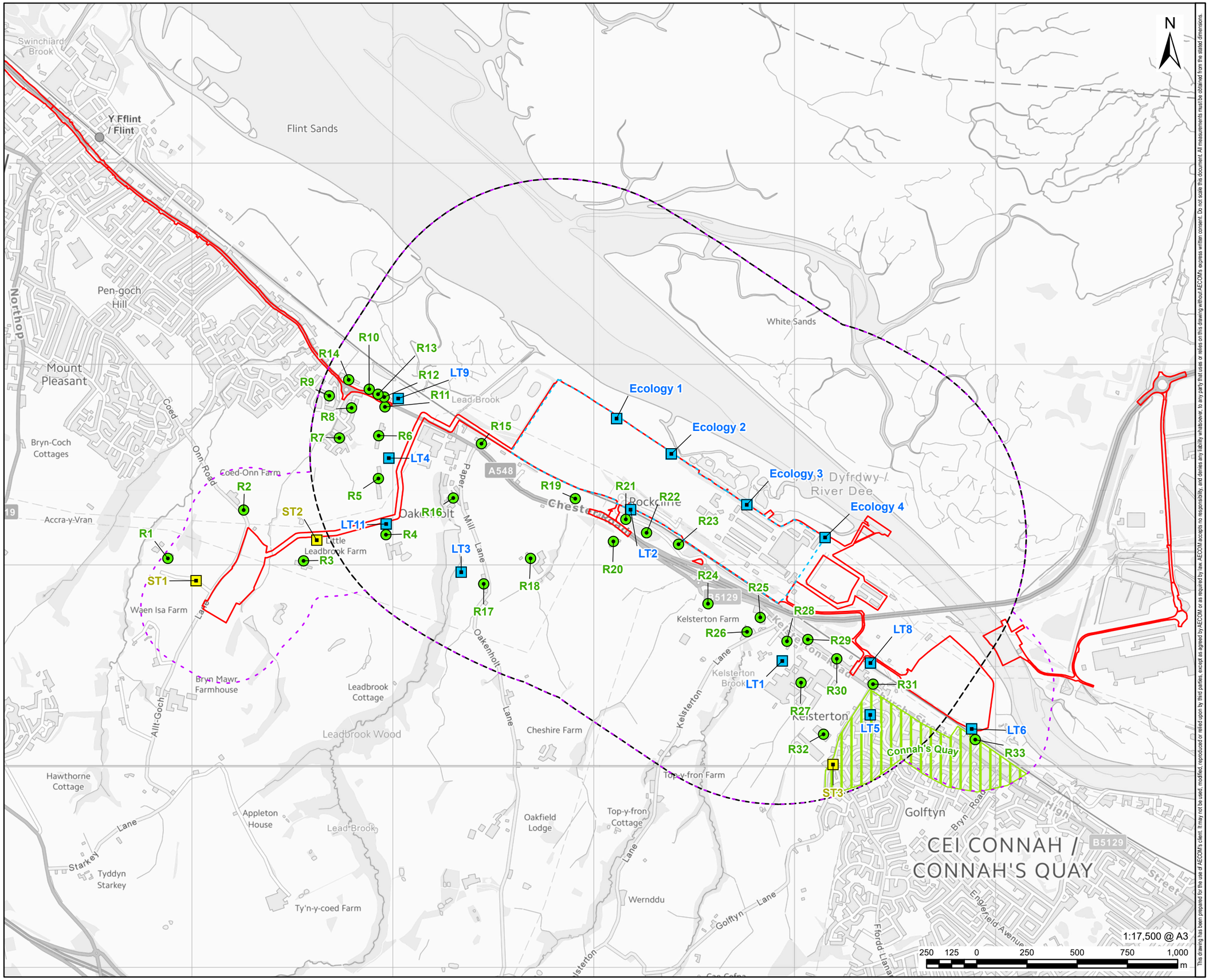
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LEGEND

- Order limits
- Main Development Area
- Operational Noise Study Area (1km Buffer of the Main Development Area)
- Construction Noise Study Area (1km Buffer of the Main Development Area and 300m Buffer of the Construction and Operation Area)

Monitoring Location

- Long
- Short

Receptor Location

- Point
- Extent

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ISSUE PURPOSE

Report to Inform Habitats Regulations Assessment

DATE

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PROJECT NUMBER

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FIGURE TITLE

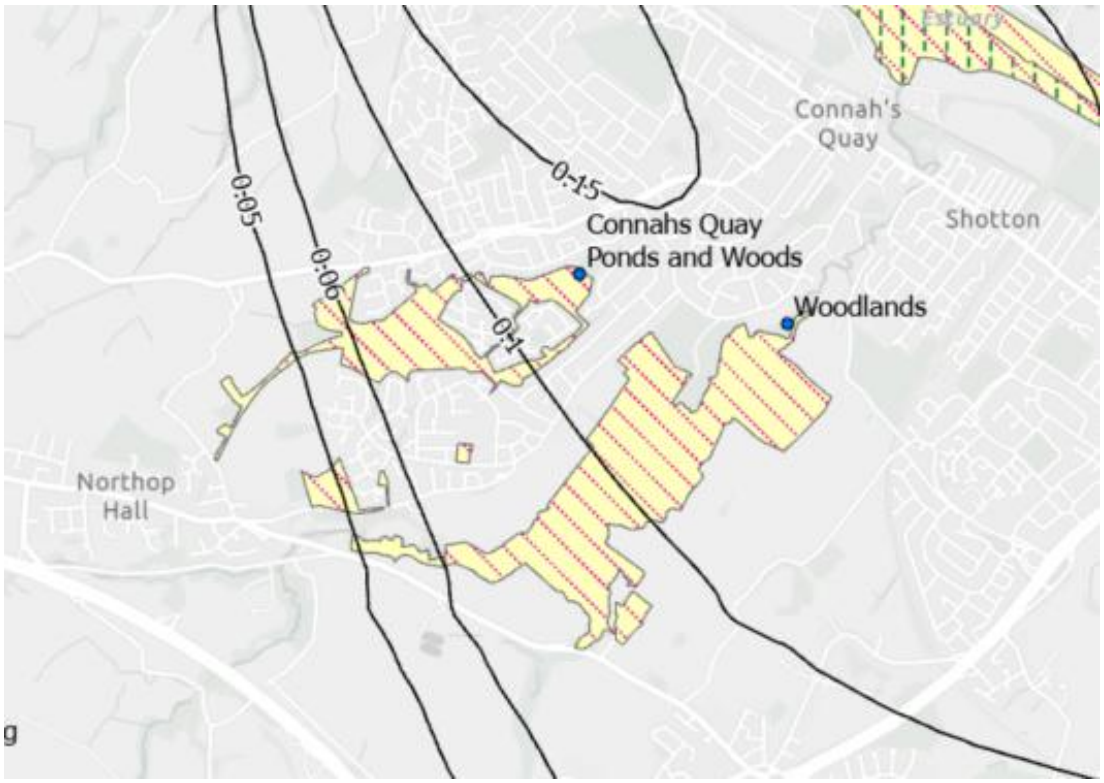
Noise Sensitive Receptors and Sound Monitoring Locations

FIGURE NUMBER

Figure D15

Appendix E – Isopleth Maps

Isopleth maps showing Deeside and Buckley Newt Sites SAC and the nitrogen deposition contours (in kgN/ha/yr) for in combination nitrogen deposition. 0.1 kgN/na/yr is 1% of the oak woodland critical load of 10 kgN/ha/yr



Appendix F – Correspondence Log with Natural Resources Wales

Date	Form of Correspondence	Key topics discussed and key outcomes
01/07/2024	Meeting (Microsoft Teams with Marine Ecology Advisors)	A meeting to discuss the marine ecology surveys that will be taking place.
15/02/2024	Letter (to NRW)	A letter requesting data to inform the geology and ground conditions assessment.
22/03/2024	Email (to Development Planning Advisor)	An email to advise that a Discretionary Advice Planning Application is being prepared and that advice would be sought from NRW in relation to the following topics: Geology and Soils; Flood Consequence Assessment; Water Resources and Water Framework Directive; Terrestrial Ecology; Marine Ecology; Marine Licence; Net Benefits for Biodiversity (NBB); Habitats Regulations Assessment (HRA); Noise; and Air Quality.
12/04/2024	Email (to Development and Flood Risk Advisor)	An email requesting various information such as information on landfills, ground investigation reports, potential or known contaminated land.

Date	Form of Correspondence	Key topics discussed and key outcomes
07/05/2024	Meeting (Microsoft Teams with Flood Risk Advisors)	A meeting to introduce the project and discuss the approach to hydraulic modelling.
08/05/2024	Email (to Flood Risk Advisors)	An email chain clarifying points raised during the hydraulic modelling meeting. NRW also provided feedback on the Modelling Method Statement.
15/07/2024	Meeting (Microsoft Teams with terrestrial and marine ecological advisors)	A meeting to discuss and agree ecology survey scope and engage on ecological matters related to the Proposed Development. This related to both terrestrial and aquatic ecology, and marine ecology.
20/11/2024	Email (to Development and Flood Risk Advisor)	Email to discuss the Drainage Strategy and discharge of surface water into the Dee Estuary.
12/12/2024	Meeting (Microsoft Teams with Marine Ecology, Coastal Processes and Fisheries Advisors)	A meeting to provide an update to project program, changes to the works taking place in the Water Connection Corridor and the anticipated environmental impact pathways.
26/01/2025	Meeting (Microsoft Teams with Flood Risk Advisors)	A meeting to discuss the outcomes and hydraulic modeling and issue the modeling to NRW for formal review.
29/01/2025	Meeting (Microsoft Teams with Marine Ecology Advisors)	A meeting covering: a Water Connection Corridor design update; an update on surveys and hydraulic modeling; the anticipated environmental impact pathways; and

Date	Form of Correspondence	Key topics discussed and key outcomes
		the requirement for marine licensing.
26/02/2025	Meeting (Microsoft Teams)	Hydraulic modelling update.
28/03/2025	Email from Development Planning Advisor)	An email responding to a query on freeboard requirements.
05/03/2025	Meeting (Microsoft Teams with Ecology and Conservation Advisors)	A meeting covering: a review of Statutory Consultation comments; the progress of ecology surveys; and the approach to Abnormal Indivisible Loads (AIL)
08/05/2025	Meeting (Microsoft Teams with Ecology and Conservation Advisors)	A meeting was held to present the ornithology results in detail and further discuss the options for mitigation for the functionally linked land. The methodology for the assessment of noise impacts on birds was agreed. It should be done according to *Waterbird Disturbance Mitigation Toolkit* pdf Update was provided on impacts to saltmarsh.
08/05/2025	Email (from Development Planning Advisor)	Hydraulic modelling feedback.
16/05/2025	Email (from Development Planning Advisor)	An email responding to the Applicant's request for a Discretionary Advice Service (DAS), providing a quote and terms and conditions. Advice was also given on where to obtain the data required for various surveys and assessments.

Date	Form of Correspondence	Key topics discussed and key outcomes
02/06/2025	Meeting (Microsoft Teams with Ecology and Conservation Advisors)	A meeting was held to present the findings of the Air Quality assessment. An update was provided on impacts to saltmarsh as a result of the works at the surface water outfall area. High level discussion of statement of common ground.
07/07/2025	Meeting (Microsoft Teams)	Discussion of mitigation proposals for air quality impacts and design of mitigation land for loss of functionally linked land for curlew.

Appendix G – Screening Matrices

To aid the Examining Authority in confirming that all designated features of all SACs, SPAs and Ramsar sites have been considered in this HRA, the following matrices have been prepared setting out the Likely Significant Effects assessment for each feature of each Habitats site and referencing the relevant assessment text.

Table G-1-1: Identifying the impact pathways considered in this HRA, which are referred to in the detailed screening matrices below

Designation	Impact pathways identified	Presented in screening matrices as:
Dee Estuary/ Aber Dyfrdwy SAC	Direct loss of/ damage to qualifying habitat during construction and decommissioning.	Direct habitat loss
	Noise and visual disturbance during construction and decommissioning.	Noise and visual disturbance
	Atmospheric pollution during operation, construction and decommissioning.	Atmospheric pollution
	Changes in water quality during operation, construction and decommissioning.	Water quality
	Water quantity, level and flow during operation, construction and decommissioning.	Hydrological changes
	Barriers to movement during construction and decommissioning.	Barriers to movement
	Introduction of invasive non-native species during construction and decommissioning.	Introduction of INNS
Dee Estuary/ Aber Dyfrdwy SPA/ Ramsar	Direct loss of/ damage to qualifying habitat during construction and decommissioning.	Direct habitat loss
	Noise and visual disturbance during operation, construction and decommissioning.	Noise and visual disturbance
	Loss of functionally linked land during operation, construction and decommissioning.	Loss of FLL

Designation	Impact pathways identified	Presented in screening matrices as:
	Atmospheric pollution during operation, construction and decommissioning.	Atmospheric pollution
	Changes in water quality during operation, construction and decommissioning.	Water quality
	Water quantity, level and flow during operation, construction and decommissioning.	Hydrological changes
	Introduction of invasive non-native species during construction and decommissioning.	Introduction of INNS
Halkyn Mountain SAC	Atmospheric pollution during operation, construction and decommissioning.	Atmospheric pollution
Alyn Valley Woods SAC	Atmospheric pollution during operation, construction and decommissioning.	Atmospheric pollution
River Dee and Bala Lake SAC	Atmospheric pollution during operation, construction and decommissioning.	Atmospheric pollution
	Changes in water quality during operation, construction and decommissioning.	Water quality
	Water quantity, level and flow during operation, construction and decommissioning.	Hydrological changes
	Barriers to movement during construction and decommissioning.	Barriers to movement
Deeside and Buckley Newt Sites SAC	Atmospheric pollution during operation.	Atmospheric pollution

Designation	Impact pathways identified	Presented in screening matrices as:
Mersey Estuary SPA/ Ramsar	Atmospheric pollution during operation.	Atmospheric pollution

General matrix key:

✓ = Likely significant effect **cannot** be excluded and appropriate assessment is needed
x = Likely significant effect **can** be excluded and no appropriate assessment is needed
- = not applicable to this qualifying feature

Stage of proposed Development:

C = Construction
O = Operation
D = Decommissioning

Table G-2: Detailed screening matrix assessing the qualifying features of the Dee Estuary/ Aber Dyfrdwy SAC against the identified impact pathways during construction (C columns), operation (O columns) and decommissioning (D columns)Name of Habitats site and Designation: Dee Estuary/ Aber Dyfrdwy SAC

EU Code: UK0030131

Distance to NSIP: Within

Effect	Direct habitat loss			Noise and visual disturbance			Atmospheric pollution			Water quality			Hydrological changes			Barriers to movement		Introduction of INNS		In combination effects		
Stage of Proposed Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**D**	**C**	**D**	**C**	**O**	**D**
Mudflats and sandflats not covered by seawater at low tide	x_a	x_l	x_a	-	-	-	x_n	x_o	x_n	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
Salicornia and other annuals colonizing mud and sand	x_a	x_l	x_a	-	-	-	x_n	x_o	x_n	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	✓$_b$	✓$_m$	✓$_b$	-	-	-	✓$_d$	✓$_f$	✓$_d$	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
Estuaries	x_a	x_l	x_a	-	-	-	x_n	x_o	x_n	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
Annual vegetation of drift lines	x_a	x_l	x_a	-	-	-	x_n	x_o	x_n	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
Vegetated sea cliffs of the Atlantic and Baltic Coasts	x_a	x_l	x_a	-	-	-	x_n	x_o	x_n	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
Embryonic shifting dunes	x_a	x_l	x_a	-	-	-	x_n	x_o	x_n	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
"Shifting dunes along the shoreline with *Ammophila arenaria* (""white dunes"")"	x_a	x_l	x_a	-	-	-	x_n	x_o	x_n	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
"Fixed coastal dunes with herbaceous vegetation (""grey dunes"")" * Priority feature	x_a	x_l	x_a	-	-	-	x_n	x_o	x_n	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
Humid dune slacks	x_a	x_l	x_a	-	-	-	x_n	x_o	x_n	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
Sea lamprey *Petromyzon marinus*	-	-	-	x_c	x_q	x_c	x_e	x_e	x_e	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	x_i	x_i	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
River lamprey *Lampetra fluviatilis*	-	-	-	x_c	x_q	x_c	x_e	x_e	x_e	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	x_i	x_i	x_j	x_j	✓$_k$	✓$_k$	✓$_k$
Petalwort *Petalophyllum ralfsii*	-	-	-	-	-	-	x_p	x_p	x_p	✓$_g$	✓$_g$	✓$_g$	x_h	x_h	x_h	-	-	x_j	x_j	✓$_k$	✓$_k$	✓$_k$

a. The working areas for the Proposed Surface Water Outfall and Water Connection Corridor lie directly within the Dee Estuary/ Aber Dyfrdwy SAC. Paragraph 7.2.11 states that these areas are saltmarsh (*1330* Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)) and intertidal mudflat (*1140* Mudflats and sandflats not covered by seawater at low tide), both of which are qualifying habitat features. No other qualifying habitats are present in these areas and therefore cannot be affected by habitat loss. Paragraph 7.2.12 states that materials for works to the Water Connection Corridor would be supplied by boat as there is a concrete plinth, and workers would access by foot across the saltmarsh, which is current practice for inspections. Therefore, no loss of intertidal mudflat habitat would arise from works in the Water Connection Corridor. In addition, no intertidal mudflat will be lost due to the Proposed Surface Water Outfall.

b. The Existing Surface Water Outfall and Proposed Surface Water Outfall are both located within areas confirmed during the NVC survey by AECOM in 2024 to be saltmarsh (*1330* Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)) (Paragraph 7.2.14). Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SAC regarding loss of / damage to qualifying habitat in the construction and / or decommissioning phases cannot be excluded specifically regarding the Proposed Surface Water Outfall, and this impact pathway is screened in for Appropriate Assessment.

c. Paragraph 7.2.21 describes how works within the Water Connection Corridor and around the Proposed Surface Water Outfall would take place at low tide when the infrastructure is exposed. No evidence of lamprey from eDNA sampling was found within Kelsterton Brook where works to the Proposed Surface Water Outfall will take place. As such, no LSE would arise and this pathway is screened out from Appropriate Assessment.

d. Paragraph 7.2.62 highlights that the only qualifying SAC habitat that is sensitive to nitrogen deposition within the 200 m zone of influence is saltmarsh. On the basis of the air quality modelling using a critical load of 10 kgN/ha/yr, nitrogen deposition arising from construction/ decommissioning traffic on Dee Estuary/ Aber Dyfrdwy SAC would be between 0.5% and 6.8% (paragraph 7.2.67). Therefore, LSE cannot be dismissed and this pathway is screened in for Appropriate Assessment for the saltmarsh habitat.

e. No likely significant effect as fish species are not vulnerable to atmospheric pollution.

f. The qualifying SAC habitat most sensitive to nitrogen deposition within the zone of influence is saltmarsh. Paragraphs 7.3.32 to 7.3.35 describe the results of the air quality monitoring for the operational phase of the Proposed Development. The contribution of the Proposed Development would be relatively small, being a maximum of 0.13 kg N/ha/yr (1.3% of the critical load). Since the critical load for nitrogen deposition would also be exceeded by total nitrogen deposition rates (the Predicted Environmental Concentration) LSE cannot be dismissed, and this pathway is screened in for Appropriate Assessment.

g. Due to the geographic overlap and overall proximity of the Proposed Development to the Dee Estuary / Aber Dyfrdwy SAC and the short flow-path distances there is no potential for attenuation and/or dilution processes that would provide a natural buffer against aquatic contaminants. Therefore, likely significant effects cannot be dismissed and impacts are taken forward to Appropriate Assessment.

h. Being a tidal ecosystem the SIP for the Dee Estuary / Aber Dyfrdwy SAC does not identify change in water quantity, level and flow as a threat to site integrity. During the operational phase, the Applicant proposes to maintain the permitted abstraction and discharge parameters as far as reasonably practicable, i.e. abstraction would continue to be limited to periods around high water in line with the current abstraction licence (paragraph 7.3.17). Paragraphs 7.3.20 and 7.3.21 highlight the implementation of a surface water drainage strategy **(Appendix 13-D: Outline Surface Water Drainage Strategy (EN010166/APP/6.4))** which will include measures to regulate surface water discharge. Working within the current abstraction licence and with the implementation of **Appendix 13-D: Outline Surface Water Drainage Strategy (EN010166/APP/6.4**) there is no potential for the Proposed Development to result in LSEs during construction and decommissioning or operation, and this pathway is screened out from Appropriate Assessment.

i. The Proposed Development will encompass refurbishment and upgrading works to the existing water-cooling infrastructure serving the existing Connah's Quay Power Station. These works will generally be undertaken around low tide in order to most easily access the screens. Paragraph 7.2.69 acknowledges that divers and support boats may be required however, the localised scale and intermittent nature of these upgrading works are highly unlikely to act as barriers to movement of anadromous fish, with the majority of the water column being free from any disruptions therefore no LSE would arise, and this pathway is screened out from Appropriate Assessment.

j. Paragraphs 7.2.69 – 7.2.72 describe the legislative requirements to prevent the spread of INNS, irrespective of whether there are Habitats sites in the vicinity therefore no LSE would arise and this pathway is screened out from Appropriate Assessment.

k. Since likely significant effects will arise from construction and decommissioning and operation due to loss of/damage to qualifying habitat and air quality impacts regarding saltmarsh habitat this will also operate in combination with other plans and projects. No 'in combination' effects will arise from air quality impacts regarding other qualifying habitats and species as they are either located beyond the zone of influence, or not sensitive to nitrogen deposition. No noise or visual disturbance effect will arise 'in combination' as works are to take place at low tide and no evidence of lamprey from eDNA sampling was found within Kelsterton Brook. There will be no 'in combination' effects arising from changes in water quality or hydrology as current legislation places a duty of care on the Applicant to safeguard watercourses and the Applicant will be operating within existing abstraction/ discharge permits. No 'in combination' effects will arise as a result of creating barriers to movement, as works will be carried out at low tide and will be localised and intermittent, leaving the majority of the water column free from any disruptions. There will be no 'in combination' effects arising due to the spread of INNS as the Applicant will comply with the relevant legislation.

l. The Existing Surface Water Outfall and Proposed Surface Water Outfall are both located within areas confirmed during the NVC survey by AECOM in 2024 to be saltmarsh (1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)) (Paragraph 7.2.14). Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SAC regarding loss of / damage to these qualifying habitats in the construction and / or decommissioning phases can be excluded, and this impact pathway is screened out for Appropriate Assessment.

m. Paragraph 7.3.1 states that while most habitat loss is in the construction phase and would be reinstated, there would be a small permanent loss of saltmarsh (1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)). Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SAC regarding loss of / damage to qualifying habitat in the operational phase cannot be excluded specifically regarding the Proposed Surface Water Outfall. This impact pathway is screened in for Appropriate Assessment.

n. The SAC is designated for a range of coastal habitats. The most sensitive habitat for which the SAC is designated is its sand dunes. Others such as intertidal mudflats, are not sensitive to nitrogen deposition. As described in paragraph 7.2.62, the only sensitive habitat within 200 m of the modelled road network is saltmarsh. As such, LSE on other qualifying habitats can be screened out from Appropriate Assessment.

o. The SAC is designated for a range of coastal habitats. The most sensitive habitat for which the SAC is designated is its sand dunes. Others such as intertidal mudflats are not sensitive to nitrogen deposition. The only qualifying SAC habitat present within the zone of influence is saltmarsh. As such, LSE on other qualifying habitats can be screened out from Appropriate Assessment.

p. Petalwort is associated with dune slacks. As this habitat is beyond the zone of influence for air quality impacts, this pathway can be screened out from Appropriate Assessment.

q. There will also be no noise and vibration impacts on sea or river lamprey during operation as there will be no 'in river' activities taking place. As such, LSE on qualifying species of fish can be screened out from Appropriate Assessment.

Table G-3: Detailed screening matrix assessing the qualifying features of the Dee Estuary/ Aber Dyfrdwy SPA/ Ramsar site against the identified impact pathways during construction (C columns), operation (O columns) and decommissioning (D columns)

Name of Habitats site and Designation: Dee Estuary/ Aber Dyfrdwy SPA/ Ramsar site

EU Code: UK9013011/ UK11082

Distance to NSIP: Within

Effect	Direct habitat loss			Noise and visual disturbance			Loss of FLL			Atmospheric pollution			Water quality			Hydrological changes			Introduction of INNS		In combination effects		
Stage of Proposed Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**D**	**C**	**O**	**D**
Bar-tailed godwit *Limosa lapponica*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Common tern *Sterna hirundo*	✓q	-	-	✓c	✓e	✓c	Xq	Xq	Xq	Xq	Xq	Xq	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Little tern *Sterna albifrons*	✓q	-	-	✓c	✓e	✓c	Xq	Xq	Xq	Xq	Xq	Xq	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Sandwich tern *Sterna sandvicensis*	✓q	-	-	✓c	✓e	✓c	Xq	Xq	Xq	Xq	Xq	Xq	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Redshank *Tringa totanus*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Shelduck *Tadorna tadorna*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Teal *Anas crecca*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Pintail *Anas acuta*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Oystercatcher *Haematopus ostralegus*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Grey plover *Pluvialis squatarola*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Knot *Calidris canutus islandica*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Dunlin *Calidris alpina*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Black-tailed godwit *Limosa limosa islandica*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Curlew *Numenius arquata*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Redshank *Tringa totanus*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Waterbird assemblage qualification.	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p

Name of Habitats site and Designation: Dee Estuary/ Aber Dyfrdwy SPA/ Ramsar site

EU Code: UK9013011/ UK11082

Distance to NSIP: Within

Effect	Direct habitat loss			Noise and visual disturbance			Loss of FLL			Atmospheric pollution			Water quality			Hydrological changes			Introduction of INNS		In combination effects		
Stage of Proposed Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**D**	**C**	**O**	**D**
Ramsar criterion 1 - Extensive intertidal mud and sand flats (20 km by 9 km) with large expanses of saltmarsh towards the head of the estuary. Habitats Directive Annex I features present on the SAC include:																							
Estuaries	x_a	x_n	x_a	-	-	-	-	-	-	✓$_i$	✓$_j$	✓$_i$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$
Mudflats and sandflats not covered by seawater at low tide	x_a	x_n	x_a	-	-	-	-	-	-	✓$_i$	✓$_j$	✓$_i$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$
Annual vegetation of drift lines	x_a	x_n	x_a	-	-	-	-	-	-	✓$_i$	✓$_j$	✓$_i$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$
Vegetated sea cliffs of the Atlantic and Baltic coasts	x_a	x_n	x_a	-	-	-	-	-	-	✓$_i$	✓$_j$	✓$_i$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$
Salicornia and other annuals colonising mud and sand	x_a	x_n	x_a	-	-	-	-	-	-	✓$_i$	✓$_j$	✓$_i$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	✓$_b$	✓$_o$	✓$_b$	-	-	-	-	-	-	✓$_i$	✓$_j$	✓$_i$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$
Embryonic shifting dunes	x_a	x_n	x_a	-	-	-	-	-	-	✓$_i$	✓$_j$	✓$_i$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$
Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")	x_a	x_n	x_a	-	-	-	-	-	-	✓$_i$	✓$_j$	✓$_i$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$
Fixed dunes with herbaceous vegetation ("grey dunes")	x_a	x_n	x_a	-	-	-	-	-	-	✓$_i$	✓$_j$	✓$_i$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$
Humid dune slacks	x_a	x_n	x_a	-	-	-	-	-	-	✓$_i$	✓$_j$	✓$_i$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$
Ramsar criterion 2 - it supports breeding colonies of the vulnerable:																							
Natterjack toad *Epidalea calamita*	-	-	-	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d	x_d
Ramsar criterion 5 - Assemblages of international importance:																							
Species with peak counts in winter	✓$_r$	-	-	✓$_c$	✓$_e$	✓$_c$	✓$_f$	✓$_g$	✓$_f$	✓$_h$	✓$_h$	✓$_h$	✓$_k$	✓$_k$	✓$_k$	x_l	x_l	x_l	x_m	x_m	✓$_p$	✓$_p$	✓$_p$

Name of Habitats site and Designation: Dee Estuary/ Aber Dyfrdwy SPA/ Ramsar site

EU Code: UK9013011/ UK11082

Distance to NSIP: Within

Effect	Direct habitat loss			Noise and visual disturbance			Loss of FLL			Atmospheric pollution			Water quality			Hydrological changes			Introduction of INNS		In combination effects		
Stage of Proposed Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**D**	**C**	**O**	**D**
Ramsar criterion 6 - species/populations occurring at levels of international importance:																							
Species with peak counts in spring/autumn:																							
Redshank *Tringa totanus*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Species with peak counts in winter:																							
Teal *Anas crecca*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Shelduck *Tadorna tadorna*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Oystercatcher *Haematopus ostralegus*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Curlew *Numenius arquata*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Pintail *Anas acuta*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Grey plover *Pluvialis squatarola*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Knot *Calidris canutus islandica*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Dunlin *Calidris alpina alpina*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Black-tailed godwit *Limosa limosa islandica*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Bar-tailed godwit *Limosa lapponica*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p
Redshank *Tringa totanus*	✓r	-	-	✓c	✓e	✓c	✓f	✓g	✓f	✓h	✓h	✓h	✓k	✓k	✓k	Xl	Xl	Xl	Xm	Xm	✓p	✓p	✓p

a. The working areas for the Proposed Surface Water Outfall and Water Connection Corridor lie directly within the Dee Estuary/ Aber Dyfrdwy Ramsar. Paragraph 7.2.11 states that these areas are saltmarsh (*1330* Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)) and intertidal mudflat (*1140* Mudflats and sandflats not covered by seawater at low tide), both of which are qualifying habitat features. No other qualifying habitats are present in these areas and therefore cannot be affected by habitat loss. Paragraph 7.2.12 states that materials for works to the Water Connection Corridor would be supplied by boat as there is a concrete plinth, and workers would access by foot across the saltmarsh, which is current practice for inspections. Therefore, no loss of intertidal mudflat habitat would arise from works in the Water Connection Corridor. In addition, no intertidal mudflat will be lost due to the Proposed Surface Water Outfall.

b. The Existing Surface Water Outfall and Proposed Surface Water Outfall are both located within areas confirmed during the NVC survey by AECOM in 2024 to be saltmarsh (*1330* Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)) (Paragraph 7.2.14). Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy Ramsar regarding loss of / damage to qualifying habitat in the construction and / or decommissioning phases cannot be excluded specifically regarding the Proposed Surface Water Outfall and this impact pathway is screened in for Appropriate Assessment.

c. Paragraph 7.2.20 states that the Site Improvement Plan (SIP) for the Dee Estuary / Aber Dyfrdwy SPA / Ramsar specifies disturbance as a threat to the integrity of the site, mainly due to public access recreation activities affecting SPA/Ramsar birds. Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SPA / Ramsar regarding disturbance in the construction and / or decommissioning phases cannot be excluded, and this impact pathway is screened in for Appropriate Assessment.

d. Natterjack toads are not widespread across the Dee Estuary / Aber Dyfrdwy Ramsar. They are restricted to a small number of coastal dune systems and slack habitats, mainly at the mouth of the estuary, where suitable early-successional sand dune conditions occur. The primary Dee Estuary population is located on the north-east Welsh coast at Gronant Dunes between Prestatyn and Point of Ayr[21], over 20 km from the Proposed Development. As such, all impact pathways are screened out, both alone and in-combination, from Appropriate Assessment.

e. Paragraph 7.3.5 states that noise modelling for the Proposed Development shows that at no point within any Habitats site are noise levels forecast to exceed 60dB LAeq, even in the absence of acoustic fencing or any other form of mitigation. With regard to visual disturbance, there is already human activity along the boundary of the SPA/Ramsar site for the existing Connah's Quay Power Station. The new development would slightly increase the frontage over which this activity occurs, but not to a significant degree. Moreover, in the long term the existing facility will cease to operate thus reducing human activity to close to current levels. It is therefore possible to conclude that no likely significant noise or human activity disturbance effect would arise either alone or in combination with other plans or projects. This pathway is screened out from Appropriate Assessment. However, there would be a net increase in operational lighting. While this can be easily managed, controls on lighting have been deemed mitigation for the purposes of this HRA and are therefore discussed further in the Appropriate Assessment.

f. Paragraph 7.2.48 describes the area of grassland that has been identified as the construction laydown area. At 24.76 ha it is large enough to act as functionally linked land and, being adjacent to the SPA, is within the 500 m IRZ for wintering waders (Ref 62) and could be regularly used by significant proportions of the relevant qualifying wintering and passage populations / species. Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SPA / Ramsar regarding the potential loss of functionally linked land in the construction and / or decommissioning phase cannot be excluded, and this impact pathway is screened in for Appropriate Assessment.

g. The current design would result in the permanent loss of approximately 15 ha of the rough grassland, improved grassland and pasture area to the west. This is the same location that would be used as a construction laydown area. Such habitat offers foraging opportunities for several qualifying Dee Estuary/ Aber Dyfrdwy SPA / Ramsar bird species, most notably curlew *Numenius arquata* and is of sufficient area to serve as functionally-linked land for qualifying features of the SPA (Paragraph 7.3.8). As such, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SPA / Ramsar regarding the potential loss of functionally linked land in the operational phase cannot be excluded. This impact pathway is screened in for Appropriate Assessment.

h. Included due to potential negative impact on the species due to impacts on the species' broad habitat.

i. Paragraph 7.2.62 highlights that the only qualifying Ramsar habitat that is sensitive to nitrogen deposition within the 200 m zone of influence is saltmarsh. On the basis of the air quality modelling using a critical load of 10 kgN/ha/yr, nitrogen deposition arising from construction/ decommissioning traffic on Dee Estuary/ Aber Dyfrdwy Ramsar would be between 0.5% and 6.8% (paragraph 7.2.67). Therefore, LSE cannot be dismissed and this pathway is screened in for Appropriate Assessment for the saltmarsh habitat.

j. The qualifying Ramsar habitat most sensitive to nitrogen deposition within the zone of influence is saltmarsh. Paragraphs 7.3.32 and 7.3.34 describe the results of the air quality monitoring for the operational phase of the Proposed Development. The contribution of the Proposed Development would be relatively small, being a maximum of 0.13 kg N/ha/yr (1.3% of the critical load). Since the critical load for nitrogen deposition would also be exceeded by total nitrogen deposition rates (the Predicted Environmental Concentration) LSE cannot be dismissed, and this pathway is screened in for Appropriate Assessment.

k. Due to the geographic overlap and overall proximity of the Proposed Development to the Dee Estuary / Aber Dyfrdwy SPA / Ramsar and the short flow-path distances there is virtually no potential for attenuation and/or dilution processes that would provide a natural buffer against aquatic contaminants. Therefore, likely significant effects on these Habitats sites cannot be dismissed and impacts are taken forward to Appropriate Assessment.

l. Being a tidal ecosystem the SIP for the Dee Estuary / Aber Dyfrdwy SPA / Ramsar does not identify change in water quantity, level and flow as a threat to site integrity. During the operational phase, the Applicant proposes to maintain the permitted abstraction and discharge parameters as far as reasonably practicable, i.e. abstraction would continue to be limited to periods around

[21] Natural Resources Wales (2024) *Rejuvenating the dunes at Gronant and Talacre*. Available at: https://naturalresourceswales.gov.uk/about-us/news-and-blogs/blogs/rejuvenating-the-dunes-at-gronant-and-talacre/?lang=en (Accessed: 25 March 2026).

high water in line with the current abstraction licence (paragraph 7.3.17). Paragraphs 7.3.20 and 7.3.21 highlight the implementation of a surface water drainage strategy **(Appendix 13-D: Outline Surface Water Drainage Strategy (EN010166/APP/6.4))** which will include measures to regulate surface water discharge. Working within the current abstraction licence and with the implementation of **Appendix 13-D: Outline Surface Water Drainage Strategy (EN010166/APP/6.4)** there is no potential for the Proposed Development to result in LSEs during construction and decommissioning or operation, and this pathway is screened out from Appropriate Assessment.

m. Paragraphs 7.2.69 to 7.2.72 describe the legislative requirements to prevent the spread of INNS, irrespective of whether there are Habitats sites in the vicinity therefore no LSE would arise and this pathway is screened out from Appropriate Assessment.

n. The Existing Surface Water Outfall and Proposed Surface Water Outfall are both located within areas confirmed during the NVC survey by AECOM in 2024 to be saltmarsh (1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)) (Paragraph 7.2.14). Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy Ramsar regarding loss of / damage to the other qualifying habitats in the operational phase can be excluded as they are not present, and this impact pathway is screened out for Appropriate Assessment.

o. Paragraph 7.3.1 states that while most habitat loss is in the construction phase and would be reinstated, there would be a small permanent loss of saltmarsh (1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)). Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy Ramsar regarding loss of / damage to qualifying habitat in the operational phase cannot be excluded specifically regarding the Proposed Surface Water Outfall. This impact pathway is screened in for Appropriate Assessment.

p. Since likely significant effects will arise from construction and decommissioning and operation due to loss of/damage to qualifying habitat (specifically saltmarsh) and air quality impacts (to saltmarsh) this will also operate in combination with other plans and projects and is therefore covered by the same appropriate assessment for impacts on saltmarsh. No noise or visual disturbance effect will arise on fish or otter 'in combination' as works are to take place at low tide and no evidence of lamprey from eDNA sampling was found within Kelsterton Brook. Disturbance impacts on SPA and Ramsar birds (other than breeding terns which are remote from the Proposed Development) are screened in alone and will therefore be screened in 'in combination'. There will be no 'in combination' effects arising from changes in water quality or hydrology as current legislation places a duty of care on the Applicant to safeguard watercourses and the Applicant will be operating within existing abstraction/ discharge permits. No 'in combination' effects will arise as a result of creating barriers to movement, as works will be carried out at low tide and will be localised and intermittent, leaving the majority of the water column free from any disruptions. There will be no 'in combination' effects arising due to the spread of INNS as the Applicant will comply with the relevant legislation.

q. The key breeding areas for terns are remote from the Proposed Development, being over 20 km away around Gronant, Denbighshire, at the mouth of the Dee Estuary. This impact pathway is therefore screened out from Appropriate Assessment.

r. Paragraph 7.2.3 acknowledges that any construction activities associated with temporary and/or permanent habitat loss from an SPA can affect the birds for which the SPA is designated. The Existing Surface Water Outfall and Proposed Surface Water Outfall are both located within areas confirmed during the NVC survey by AECOM in 2024 to be saltmarsh (1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)). Therefore, LSEs of the Proposed Development on the Dee Estuary / Aber Dyfrdwy SPA / Ramsar regarding loss of / damage to qualifying habitat in the construction and / or decommissioning phases cannot be excluded specifically regarding the Proposed Surface Water Outfall. This impact pathway is screened in for further consideration as part of the Appropriate Assessment.

Table G-4: Detailed screening matrix assessing the qualifying features of the Halkyn Mountain SAC against the identified impact pathways during construction (C columns), operation (O columns) and decommissioning (D columns)

Name of Habitats site and Designation: Halkyn Mountain SAC

EU code: UK0030163

Distance to NSIP: approximately 3.6 km west of the Proposed Development Site

Effect	Atmospheric pollution			In combination effects		
Stage of Proposed Development	C	O	D	C	O	D
European dry heaths	x[a]	x[b]	x[a]	x[a]	x[b]	x[a]
Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)	x[a]	x[b]	x[a]	x[a]	x[b]	x[a]
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)	x[a]	x[b]	x[a]	x[a]	x[b]	x[a]
Great crested newt *Triturus cristatus*	x[a]	x[b]	x[a]	x[a]	x[b]	x[a]

a. Given that the Proposed Development will not result in a temporary traffic increase within 200 m of these Habitats sites, LSE can be dismissed (paragraph 7.2.53) and this pathway is screened out from Appropriate Assessment.

b. Paragraph 7.3.44 describes the results of the air quality modelling. The ammonia contribution of the Proposed Development would be imperceptible being 0.2% of the critical level. In combination nitrogen deposition is forecast to be 0.02 kg N/ha/yr which is well below

1% of the critical load. Regarding acid deposition, 'in combination' acid deposition does not exceed 1% of the critical load equivalent under any of the modelled scenarios. In summary, LSE can be ruled out for this Habitats site, alone or in combination, and this pathway is screened out from Appropriate Assessment.

Table G-5: Detailed screening matrix assessing the qualifying features of the Alyn Valley Woods SAC against the identified impact pathways during construction (C columns), operation (O columns) and decommissioning (D columns)

Name of Habitats site and Designation: Alyn Valley Woods SAC

EU code: UK0030078

Distance to NSIP: approximately 6.8 km to the south-west of the Proposed Development Site

Effect	Atmospheric pollution			In combination effects		
Stage of Proposed Development	C	O	D	C	O	D
Tilio-Acerion forests of slopes, screes and ravines * Priority feature	x[a]	x[b]	x[a]	x[a]	x[b]	x[a]
Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)	x[a]	x[b]	x[a]	x[a]	x[b]	x[a]
Alluvial forests with *Alnus glutinosa and Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) * Priority feature	x[a]	x[b]	x[a]	x[a]	x[b]	x[a]

a. Given that the Proposed Development will not result in a temporary traffic increase within 200 m of these Habitats sites, LSE can be dismissed (paragraph 7.2.53) and this pathway is screened out from Appropriate Assessment.

b. Paragraph 7.3.44 describes the results of the air quality modelling. The ammonia contribution of the Proposed Development would be imperceptible being 0.2% of the critical level. In combination nitrogen deposition is forecast to be 0.03 kg N/ha/yr which is well below 1% of the critical load. Regarding acid deposition, 'in combination' acid deposition does not exceed 1% of the critical load

equivalent under any of the modelled scenarios. In summary, LSE can be ruled out for this Habitats site, alone or in combination, and this pathway is screened out from Appropriate Assessment.

Table G-6: Detailed screening matrix assessing the qualifying features of the River Dee and Bala Lake SAC against the identified impact pathways during construction (C columns), operation (O columns) and decommissioning (D columns)

Name of Habitats site and Designation: River Dee and Bala Lake SAC

EU code: UK0030252

Distance to NSIP: adjacent

Effect	Noise and visual disturbance			Atmospheric pollution			Water quality			Hydrological changes			Barriers to movement		In combination effects		
Stage of Proposed Development	C	O	D	C	O	D	C	O	D	C	O	D	C	D	C	O	D
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	-	-	-	x_a	x_b	x_a	✓$_c$	✓$_c$	✓$_c$	x_d	x_e	x_d	-	-	✓$_h$	✓$_h$	✓$_h$
Atlantic salmon *Salmo salar*	x_i		x_i	x_a	x_b	x_a	✓$_c$	✓$_c$	✓$_c$	x_d	x_e	x_d	x_f	x_f	✓$_h$	✓$_h$	✓$_h$
Floating water-plantain *Luronium natans*	-	-	-	x_a	x_b	x_a	✓$_c$	✓$_c$	✓$_c$	x_d	x_e	x_d	-	-	✓$_h$	✓$_h$	✓$_h$
Sea lamprey *Petromyzon marinus*	x_i	x_k	x_i	x_a	x_b	x_a	✓$_c$	✓$_c$	✓$_c$	x_d	x_e	x_d	x_f	x_f	✓$_h$	✓$_h$	✓$_h$

Name of Habitats site and Designation: River Dee and Bala Lake SAC

EU code: UK0030252

Distance to NSIP: adjacent

Effect	Noise and visual disturbance			Atmospheric pollution			Water quality			Hydrological changes			Barriers to movement		In combination effects		
Stage of Proposed Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**D**	**C**	**O**	**D**
Brook lamprey *Lampetra planeri*	x_i	x_k	x_i	x_a	x_b	x_a	✓$_c$	✓$_c$	✓$_c$	x_d	x_e	x_d	x_f	x_f	✓$_h$	✓$_h$	✓$_h$
River lamprey *Lampetra fluviatilis*	x_i	x_k	x_i	x_a	x_b	x_a	✓$_c$	✓$_c$	✓$_c$	x_d	x_e	x_d	x_f	x_f	✓$_h$	✓$_h$	✓$_h$
Bullhead *Cottus gobio*	x_i	x_k	x_i	x_a	x_b	x_a	✓$_c$	✓$_c$	✓$_c$	x_d	x_e	x_d	-	-	✓$_h$	✓$_h$	✓$_h$
Otter *Lutra lutra*	x_j	x_k	x_j	x_a	x_b	x_a	✓$_c$	✓$_c$	✓$_c$	x_d	x_e	x_d	x_g	x_g	✓$_h$	✓$_h$	✓$_h$

a. Paragraph 7.2.50 describes the conclusion of an assessment of the impacts of dust deposition. The assessment showed that the frequency and duration of dust impacts would not give rise to significant effects on any sensitive features within designated ecological sites. In terms of exhaust emissions, APIS only identifies one qualifying feature, floating water-plantain, as being sensitive to air quality impacts. However, this plant is found only in Bala Lake, rather than in the River Dee, and is therefore beyond the ZoI for the Proposed Development. While the interest feature 'Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation' is identified as having an ammonia and NO_x sensitivity, modelling for the Proposed Development shows that the relevant critical levels (3 μgm^{-3} for ammonia and 30 μgm^{-3} for NO_x) would not be exceeded even in combination with other projects and plans (paragraph 7.2.54 . As such, LSE can be ruled out for this Habitats site, alone or in combination, and this pathway is screened out from Appropriate Assessment.

b. Paragraph 7.3.41 clarifies that the modelled part of River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (the River Dee) is not designated for features sensitive to air quality and is therefore not discussed further in the HRA.

c. Due to the geographic overlap and overall proximity of the Proposed Development to the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC and the short flow-path distances there is virtually no potential for attenuation and/or dilution processes that would provide a natural buffer against aquatic contaminants. Therefore likely significant effects on these Habitats sites cannot be dismissed and impacts are taken forward to Appropriate Assessment.

d. Paragraphs 7.2.38 and 7.2.39 relate to the Dee General Directions which mean that no additional water supplies beyond existing consents and licensed volumes would be required for the Proposed Development. As such, no LSE would arise and this pathway is screened out from Appropriate Assessment.

e. The Applicant proposes to maintain the permitted abstraction and discharge parameters as far as reasonably practicable, i.e. abstraction would continue to be limited to periods around high water in line with the current abstraction licence. Furthermore, the anticipated abstraction regime (including any deviation thereof) must be agreed with NRW as part of their licensing regime, which will ensure that no material negative impacts on the qualifying habitats and species of the SAC will occur (paragraph 7.3.25). As such, no LSE would arise and this pathway is screened out from Appropriate Assessment.

f. The Proposed Development will encompass refurbishment and upgrading works to the existing water cooling infrastructure serving the existing Connah's Quay Power Station. These works will generally be undertaken around low tide in order to most easily access the screens and this will involve foot access across the saltmarsh, in line with existing monitoring and management activities. In addition to direct foot-only access via the saltmarsh, these works (e.g. eel screen upgrades) may be undertaken by divers (and accompanying support boats) over a period of three to five months. However, the localised scale and intermittent nature of these upgrading works are highly unlikely to act as barriers to movement of anadromous fish, with the majority of the water column being free from any disruptions (paragraph 7.2.67). As such, no LSE would arise and this pathway is screened out from Appropriate Assessment.

g. Paragraph 7.2.66 states that the upgrading of the Water Connection Corridor would take place in the Dee Estuary during the day when otters are less likely to be active and they will not block movement along the banks of the Dee. As such, no LSE would arise and this pathway is screened out from Appropriate Assessment.

h. All developments with hydrological continuity to the River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC – this would include all applications for works that could lead to changes in water flows or water quality in the Habitats sites – are considered to have the potential to result in in-combination effects. (paragraph 8.2.1).

i. Paragraph 7.2.27 describes how the works within the Water Connection Corridor and around the Proposed Surface Water Outfall would generally take place at low tide when the infrastructure is exposed therefore, little noise would be carried through the water column since most works would be undertaken around low tide. Lamprey are a species of low sensitivity to underwater noise, and there is no evidence of SAC fish being present beyond the River Dee itself. With regard to Atlantic salmon, the localised scale and intermittent nature of these upgrading works are highly unlikely to act as barriers to movement of anadromous fish such as salmon, with the majority of the water column being free from any disruptions. It is concluded that there is no potential for the Proposed Development to result in LSEs on the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC regarding noise disturbance to lamprey or Atlantic salmon in the construction or decommissioning phases and this pathway is screened out from Appropriate Assessment.

j. Paragraph 7.2.25 describes how the habitat use of otter is largely limited to river water channels and adjoining banks and that construction activities would be carried out during daylight hours when otters are less likely to be active. Moreover, surveys for the Proposed Development indicate no holts or couches within 300 m of the Proposed Development Site. Therefore, it is concluded that there is no potential for the Proposed Development to result in LSEs on the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC regarding noise disturbance to otter in the construction or decommissioning phases and this pathway is screened out from Appropriate Assessment.

k. There will also be no noise and vibration impacts on otter or fish qualifying interest features of River Dee & Bala Lake SAC or Dee Estuary SAC during operation because there are no 'in river' activities during operation and no evidence of otter holts or resting places within the vicinity of the Proposed Development. Therefore, likely significant effects on River Dee & Bala Lake SAC can be dismissed and this pathway is screened out from Appropriate Assessment.

Table G-7: Detailed screening matrix assessing the qualifying features of the Deeside and Buckley Newt Sites SAC against the identified impact pathways during construction (C columns), operation (O columns) and decommissioning (D columns)

Name of Habitats site and Designation: Deeside and Buckley Newt Sites SAC

EU code: UK0030132

Distance to NSIP: approximately 1.5 km south of the Proposed Development Site

Effect	Atmospheric pollution			In combination effects		
Stage of Proposed Development	C	O	D	C	O	D
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	x[a]	✓[b]	x[a]	x[a]	✓[b]	x[a]
Great crested newt *Triturus cristatus*	x[a]	✓[c]	x[a]	x[a]	✓[c]	x[a]

a Paragraph 7.2.63 describes the results of the air quality monitoring. The maximum contribution at the roadside is 0.01 kgN/ha/yr which means the contribution of the Proposed Development becomes too small to be identified in the model beyond the immediate roadside. It is therefore considered that the effect on the SAC is effectively zero and no LSE would arise on Deeside and Buckley Newt Sites SAC from nitrogen deposition due to the Proposed Development. This pathway is screened out from Appropriate Assessment.

b. Paragraph 7.3.42 states that shows that 'in combination' nitrogen deposition would reach a maximum of 0.18 kg N/ha/yr at receptor OE11. This equates to 1.8% of the critical load for oak woodland of 10 kg N/ha/yr. Since the critical load for nitrogen deposition would also be exceeded by total nitrogen deposition rates (the Predicted Environmental Concentration) likely significant effects cannot be dismissed and Appropriate Assessment is required.

c. Included as potential negative impact on species due to impacts on the species' broad habitat.

Table G-8: Detailed screening matrix assessing the qualifying features of the Mersey Estuary SPA/ Ramsar site against the identified impact pathways during construction (C columns), operation (O columns) and decommissioning (D columns)

Name of Habitats site and Designation: Mersey Estuary SPA/ Ramsar site

EU code: UK9005131/ UK11041

Distance to NSIP: approximately 15.2 km to the north of the Proposed Development Site

Effect	Atmospheric pollution			In combination effects		
Stage of Proposed Development	C	O	D	C	O	D
Golden plover *Pluvialis apricaria*	-	x_a	-	-	x_a	-
Redshank *Tringa totanus*	-	x_a	-	-	x_a	-
Shelduck *Tadorna tadorna*	-	x_a	-	-	x_a	-
Teal *Anas crecca*	-	x_a	-	-	x_a	-
Pintail *Anas acuta*	-	x_a	-	-	x_a	-
Dunlin *Calidris alpina alpina*	-	x_a	-	-	x_a	-
Black-tailed godwit *Limosa limosa islandica*	-	x_a	-	-	x_a	-
Redshank *Tringa totanus*	-	x_a	-	-	x_a	-
Waterbird assemblage qualification	-	x_a	-	-	x_a	-

Name of Habitats site and Designation: Mersey Estuary SPA/ Ramsar site

EU code: UK9005131/ UK11041

Distance to NSIP: approximately 15.2 km to the north of the Proposed Development Site

Effect	Atmospheric pollution			In combination effects		
Stage of Proposed Development	**C**	**O**	**D**	**C**	**O**	**D**
Ramsar criterion 5 - Assemblages of international importance:						
Species with peak counts in winter	-	x_a	-	-	x_a	-
Ramsar criterion 6 – species/populations occurring at levels of international importance:						
Shelduck *Tadorna tadorna*	-	x_a	-	-	x_a	-
Black-tailed godwit *Limosa limosa islandica*	-	x_a	-	-	x_a	-
Redshank *Tringa totanus totanus*	-	x_a	-	-	x_a	-
Teal *Anas crecca*	-	x_a	-	-	x_a	-
Pintail *Anas acuta*	-	x_a	-	-	x_a	-
Dunlin *Calidris alpina alpina*	-	x_a	-	-	x_a	-

a. For all SPA birds APIS indicates that they are either not sensitive to air quality impacts on their habitats, or air quality impacts are as likely to be positive (e.g. through increasing prey abundance) as negative. Paragraph 7.3.36 describes how two species are sensitive to nitrogen deposition in hay meadow habitat but this is not present within the Mersey Estuary SPA/Ramsar site. Great crested grebe, which is part of the assemblage qualification, is identified as being potentially negatively affected by nitrogen deposition on saltmarsh habitat. Paragraph 7.3.37 describes great crested grebes would only be affected by major structural changes to their habitat. Therefore, the upper nitrogen critical load of 20 kg N/ha/yr is considered appropriate for this species. 'In combination' nitrogen deposition is forecast to be 0.03 kg N/ha/yr which is well below 1% of the critical load. Moreover, with a Predicted Environmental Concentration of 17.29 kg N/ha/yr, the critical load of 20 kg N/ha/yr suitable for great crested grebe at the SPA/Ramsar would also not be exceeded. As such, no LSE would arise, either alone or in-combination, and this pathway is screened out from Appropriate Assessment.

Appendix H – Geomorphological Walkover Report



Connah's Quay Low Carbon Power

Geomorphological Walkover Survey Report

Planning Inspectorate Reference: EN010166
Document Reference: EN010166/9.12
Planning Act 2008 (as amended)
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation (2)(q)
Revision 00

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Prepared for:
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1. Introduction

1.1.1 Within the relevant representations, Natural England **[RR-026]** commented on the assumptions made within the **Report to Inform Habitats Regulations Assessment (RIHRA) [APP-253]** on scour erosion of saltmarsh associated with the proposed surface water outfall. In response to NE29 within the **Applicant's Response to Relevant Representations [REP1-062]** it is confirmed that the assessment does not include scour losses because as detailed in paragraph 10.2.2 of the **RIHRA [APP-253]**, no scour losses are expected. The response to NE29 further states that the applicant undertook a walkover survey on 23 January 2026 to validate this position. The details and findings of this walkover survey are presented in this submission.

2. Survey Details

2.1.1 A geomorphological walkover survey was undertaken by a suitably qualified Coastal Geomorphologist on 23 January 2026.

2.1.2 The walkover survey was focused on the location of the proposed surface water outfall and the adjacent areas of saltmarsh habitat within the Connah's Quay Nature Reserve. This area is hereafter referred to as the 'saltmarsh drainage basin'.

2.1.3 The survey was undertaken between the hours of 0900 and 1600.

3. Survey Findings

3.1.1 During the geomorphological walkover survey it was evident that the majority of erosion active within the saltmarsh drainage basin is as a result of tidal ingress and subsequent drainage back into Old Rockcliffe Brook (hereafter referred to as the creek) (see **Plate 1**) and River Dee.

3.1.2 The tidal influence has been observed to extend up to the existing surface water outfall associated with the existing Connah's Quay Power Station. Evidence was present to determine that water levels regularly reach the level of the creek top at the location of the existing outfall headwall. Additionally, there is evidence of tidal ingress during higher astronomical tides that extend to within 0.4 m of the top of existing berm tops within the saltmarsh drainage basin as shown in **Plate 1** and **Plate 2**.

Plate 1 Photograph showing the saltmarsh creek (the Existing Surface Water Outfall is 5 m behind), the top of the corridor berm, high water terrace and drainage flattened grasses above the narrow creek

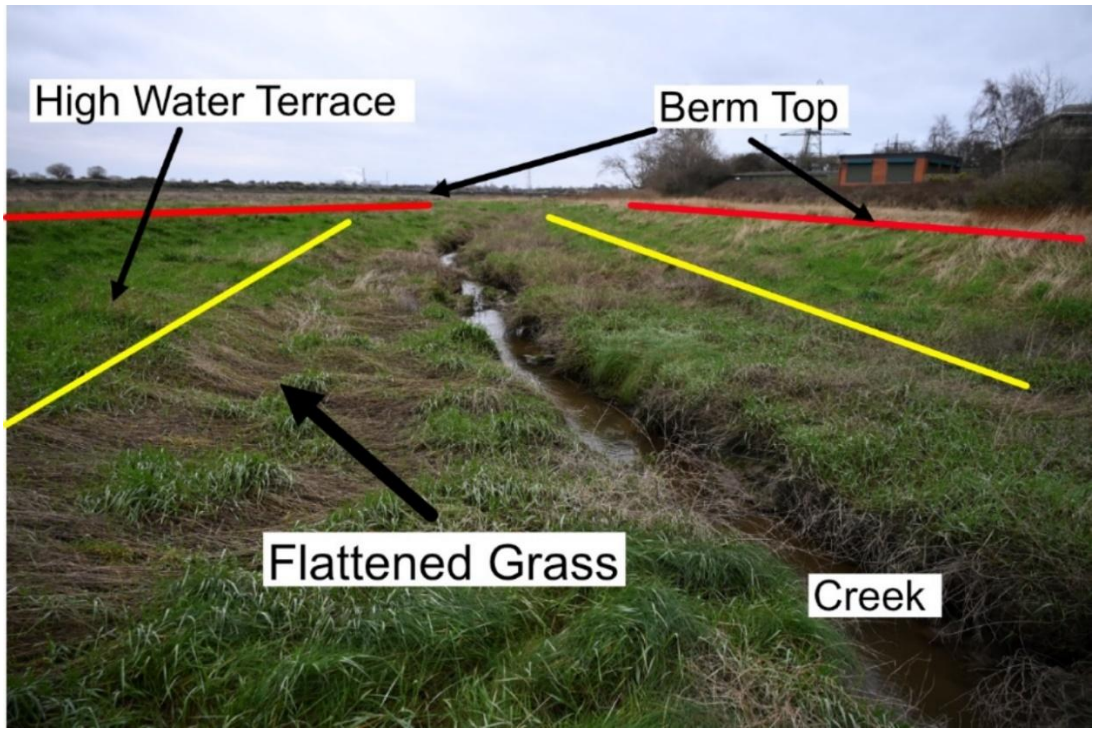
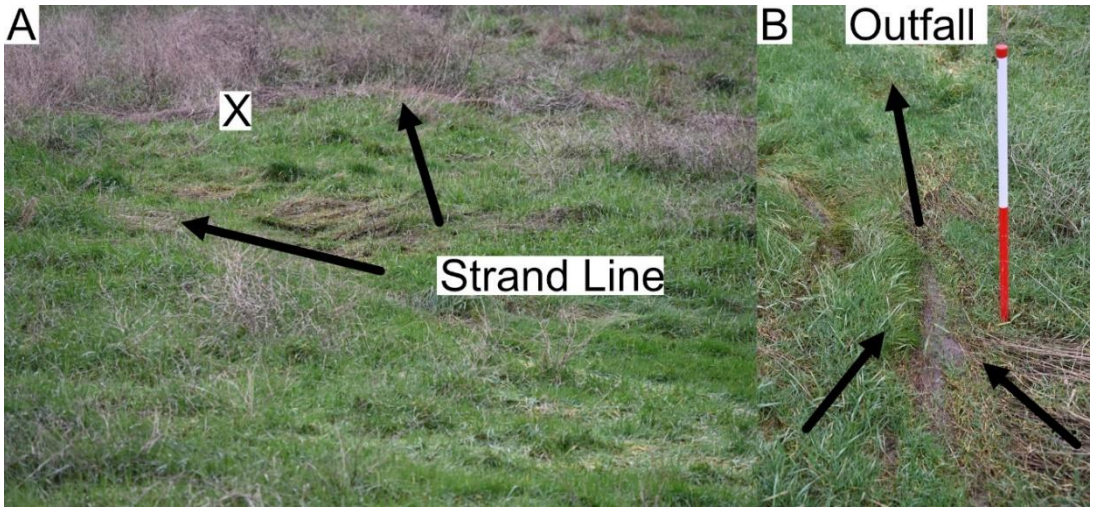


Plate 2 Photos of the high water strand line (X) and flattened and orientated vegetation towards the outfall in Basin 1



3.1.3 Immediately adjacent to the Existing Surface Water Outfall there is evidence of saltmarsh development in the mouth of the outfall, indicating that the existing discharge rates are not high enough to prevent the accumulation of sedimentary material and vegetation. Additionally, there is a region of scour adjacent to the outfall structure (to the north of the outfall apron) that has a likely origin in the combination of outfall discharge and tidal ingress creating a vortex with enough energy to bowl out the area over significant time.

Plate 3 Photographs showing the culvert emplacement at the source of the saltmarsh creek, including flap valve and erosion bowl to one side



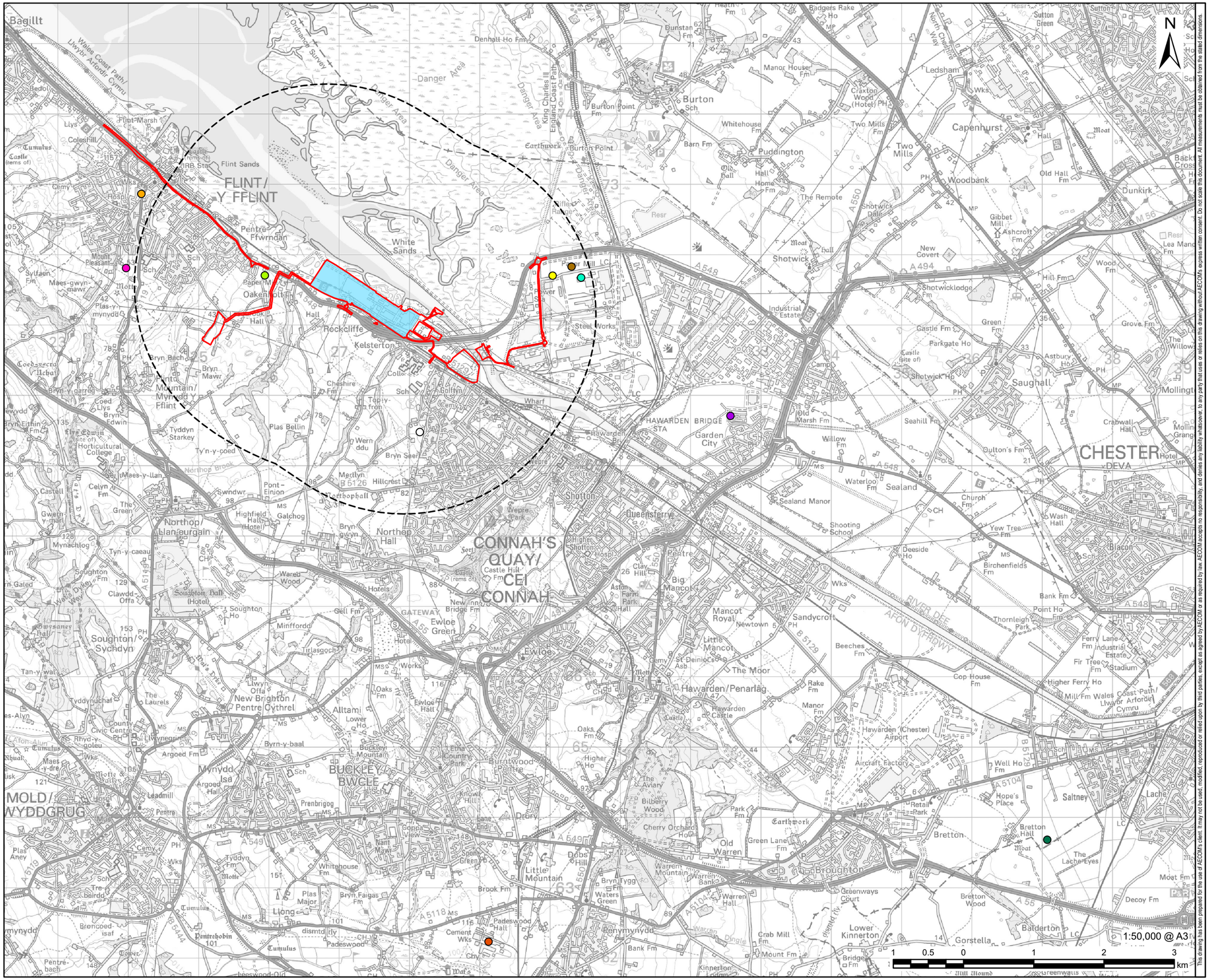
3.1.4 In summary, the addition of higher discharge flows from the outfall location may, to a limited extent, modify the existing creek channel width and depth, discharge volume and velocity. However, this effect is likely to be minimal compared to the effect of the far greater volume and frequency of tidal ingress within the existing creek channel which does and would form the dominant source of saltmarsh erosion.

4. Conclusion

4.1.1 The findings of this walkover survey support the previous conclusions by confirming that detailed modelling is not required to demonstrate that scour erosion associated with the proposed surface water outfall would not occur. The assumption made within the **RIHRA [APP-253]** of a loss of saltmarsh loss at 5m^2 is, therefore, considered appropriate.

Appendix I – Location of Projects considered within the Incombination Assessment

Revision: 0 Drawn: LP Checked: JG Approved: NS Date: 2026-05-27


Bagillt
Wales Coast Path/ Llwybr Arfordir Cymru
Flint Marsh
Coleshill
Flint Sands
FLINT / Y FFLINT
Pentre Ffwrndan
White Sands
Danger Area
Oakenholt
Rockcliffe
Kelsterton
Steel Works
Industrial Estate
Burton
Burton Point
Puddington
Whitehouse Fm
Two Mills
Capenhurst
Woodbank
Shotwick
New Covert
Shotwicklodge
Parkgate Ho
Saughall
Old Marsh Fm
Seahill Fm
Garden City
HAWARDEN BRIDGE STA
Hawarden Pk
Wharf
Queensferry
Shotton
CONNAH'S QUAY / CEI CONNAH
Ewloe
Ewloe Green
New Inn Bridge Fm
Northop / Llanfeurgain
Northop Hall
Soughton / Sychdyn
New Brighton / Pentre Cythrel
Alltami
BUCKLEY / BWCLE
MOLD / WYDDGRUG
Mynydd Isa
Leadmill
Pontblyddyn
Penyffordd
Hawarden / Penarlâg
Hawarden Castle
Hawarden (Chester) Airport
Aircraft Factory
The Moor
Mancot Royal
Big Mancot
Little Mancot
Sandycroft
Queensferry
Sealand
Sealand Manor
Waterloo Fm
Broughton
Bretton
Retail Park
Saltney
Lache
CHESTER / DEVA
Crabwall
Mollington
Blacon
Dunkirk
Ledsham
Capenhurst
Two Mills
Craxton Wood (Hotel) PH
Manor House Fm
Badgers Rake Ho
Sutton Green
North Cheshire Way
Denhall Ho Fm
Dunstan Fm
Heath Fm
Earthwork
Burton Point
Barn Fm
Home Fm
The Remote
Shotwick Dale
Gibbet Hill
Ashcroft Fm
Old Hall Fm
Backford Cross
Lea Mane Fm
Wood Fm
Hill Fm
Grove Fm
The Willows
Green Fm
Castle Fm
Astbury Ho
Shotwick Ho
Camp
Old Warren
Green Lane Fm
Earthwork
Cherry Orchard Ho
Park Fm
Bitterny Wood
The Aviary
Burntwood / Pentre
Drury
Lane End
Coppa View
Nant Mawr
Dobs Hill
Little Mountain
Warren Mountain
Warren Bank
Warren Hall
Greenways Court
Bretton Wood
Bretton Hall
Hope's Place
The Lache Eyes
Moat Fm
Decoy Fm
Balderton
Gorstella
Lower Kinnerton
Crab Mill Fm
Penymynydd
Padeswood
Cement Wks
Brook Fm
Bryn Faigas Fm
Plas Major
Whitehouse Fm
Tyddyn Fm
Nant Mawr
Spon Green
Waters Green
Bryn Tygg Fm
Tyddyn Starkey
Plas Bellin
Wern ddu
Bryn Seer
Ty'n-y-coed
Northop Brook
Cheshire Fm
Topiy-fron
Golftyn
Bryn Bach
Bryn Mawr
Pant Mountain / Mynydd Y Fflint
Coed Llys
Bryn Edwin
Bryn Eithin Fm
Ysgol Glan Aber
Horticultural College
Maes-y-llan
Castell
Celyn Fm
The Green
Gwern-y-mari
Mynachlog
Tyn-y-caeau
Soughton Fm
Soughton Hall (Hotel)
Soughton Ho
Clawdd Offa
Wared Wood
Gell Fm
Minffordd
Tirlasgoch
Hotels
Gwysaney Hall
Tan-y-wal
Tyddynuchaf
The Laurels
Llwyn Offa
Oaks Fm
Ewloe Hall
Byrn-y-baal
Argoed Fm
Argoed Hall
Rhyd-y-goleu
County Civic Centre
Maes-y-dre
Prenbrigog
Tyddyn Fm
Plas Aney
Tre-lobaird
Broncoed-isaf
Pentrobobin
Pentre-bach
Llong
Padeswood
Hillcrest
Merllyn
Pont-Einion
Swndwr
Highfield Hall (Hotel)
Galchog
Earthophall
Vepre Park
Civic Centre
Higher Shotton
Clay Hill
Castle Hill Fm
Aston Farm Park Hall
Pentre
Wks
Deeside Ho
Birchenfields Fm
Yew Tree Fm
Wash Hall
Church Fm
Shooting School
Sealand Manor
Thornleigh Park
Point Ho Fm
Bank Fm
Ferry Lane Industrial Estate
Fir Tree Fm
Stadium
Higher Ferry Ho
Mill Fm
Wales Coast Path / Llwybr Arfordir Cymru
Cop House Fm
Beeches Fm
Rake Fm
Manor Fm
Well Ho Fm
Hope's Place
Retail Park
Bridge Fm
Mount Fm
Kinnerton Lodge
Greenwalls
Mill Mound
Hawarden Bridge Fm
Oaks Fm
Higher Ho
Lower Ho
Alltami
Buckley Mountain
Elfed Country Park
Knowl Hill
Argoed Fm
Argoed Hall
Leadmill
Pentre
Mus
Ysgol
Cemy
Wks
Hosp
Sch
Mote
Castle (rems of)
Tumulus
Danger Area
King Charles II England Coast Path
Offa's Dyke Path
Rifle Range
Resr
Flint Sands
Paper Mill LC
Tower
Colliery
Golftyn
Cemy
Hall
Moat
Ashton Hall
Ewloe Castle
Hawarden Castle
Castle (site of)
Old Ball
Hall
Home Fm
Moat
Ashton Hall
Ewloe Castle
Castle (site of)
Hawarden Castle
Castle (rems of)
Castle Hill Fm
Castle (rems of)
Castle (site of)
Castle (rems of)
Castle (site of)
Castle (rems of)
Castle (site of)