Connah's Quay Low Carbon Power

Environmental Statement Volume II
Chapter 25: Summary of Likely Significant Effects

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Prepared for:
Uniper UK Limited

Prepared by:
AECOM Limited

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25. Summary of Likely Significant Environmental Effects

25.1 Introduction

25.1.1 **Chapters 8** to **24** (**EN010166/APP/6.2**) of this Environmental Statement (ES) have considered the potential environmental impacts and effects of the of the Connah's Quay Combined Cycle Gas Turbine (CCGT) fitted with Carbon Capture Plant (CCP) (hereafter referred to as the Proposed Development). This chapter provides a summary of those adverse and beneficial environmental effects that are considered to be significant (i.e. moderate and major effects) following the application of embedded mitigation and provides details of additional mitigation together with the resulting residual effect.

25.1.2 This chapter is supported by **Figure 3-3: Areas Described in the ES** (**EN010166/APP/6.3**) which defines the terms used to describe the different areas of the Order limits.

25.2 Summary of Significant Environmental Effects and Additional Mitigation Measures

25.2.1 **Table 25-1** summarises the **moderate** or **major** (**significant**) environmental effects of the Proposed Development that have been identified, following implementation of the embedded mitigation or impact avoidance measures included in the design of the Proposed Development (as detailed in **Chapters 8** to **24** (**EN010166/APP/6.2**), where relevant). **Table 25-1** also summarises any additional mitigation measures that have been identified in the technical assessments contained in **Chapters 8** to **24** (**EN010166/APP/6.2**) and identifies the residual environmental effects. Therefore, **Table 25-1** identifies residual effects that are either **minor** or **negligible** (**not significant**) where additional mitigation would mitigate the significant effect down to a not significant level. This is because the assessments within **Chapters 8** to **24** identify the decommissioning effects are are considered to be comparable to, or less than, those assessed associated with construction activities. Therefore, the scale and nature of the activities required for decommissioning and construction are considered to be very similar and consequently the likely magnitude and duration of emissions are very similar.

25.2.2 For each topic, the reasonable worst-case scenario is assessed, including the construction programme scenario and design parameters. Further details on the reasonable worst-case (or the Rochdale Envelope) are set out in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**), **Chapter 4: The Proposed Development** (**EN010166/APP/6.2.4**) and **Chapter 5: Construction Management and Programme** (**EN010166/APP/6.2.5**). The specific worst-case for each assessment is described in **Chapters 8 to 24** (**EN010166/APP/6.2**) as appropriate. Effects have been assessed for the construction, operation (including maintenance) and decommissioning scenarios. Construction and decommissioning effects are typically temporary

effects that only occur during these phases while operational effects are typically considered permanent.

25.2.3 As outlined in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**) significant residual effects are deemed adverse or beneficial.

Table 25-1: Summary of Likely Significant Environmental Effects

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Air Quality				
Construction (and decommissioning)	**No significant effects** are predicted to occur[1].			
Operation				
Noise and Vibration				
Construction (and decommissioning)	Construction noise during core hours at R23 (including the travellers' encampment)	**Moderate adverse (Significant)**	Additional noise-control equipment such as jackets on pneumatic drills, acoustic covers on compressors, shrouds on piling rigs and cranes and potentially further refinement of construction works program would be considered and implemented where practicable.	**Minor Adverse or less (Not Significant)**
	Vibration from construction (and decommissioning) of C&IEA at R33	**Moderate adverse (Significant)**	Use of vibratory rollers on low amplitude mode when within 50 m of residential receptors and no vibratory rollers to be used with 16 m of Noise Sensitive Receptors (NSRs).	**Minor Adverse or less (Not Significant)**
	Road traffic noise level at source on Kelsterton Road (access road to Main Development Area) at NSR 21	**Moderate adverse (Significant)**	Further detailed assessment as necessary once construction traffic management have been confirmed. If necessary and agreed with Flintshire	**Moderate adverse (Significant)**

[1] Air quality impacts on ecological receptors are considered within **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**)

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
	(including the travellers' encampment)		County Council (FCC), noise monitoring can be undertaken to assess the potential impacts of construction traffic along Kelsterton Road.	
	Road traffic noise level at source on Kelsterton Road (access road to Main Development Area) at NSR 22 (including the travellers' encampment)	**Moderate adverse (Significant)**	Further detailed assessment as necessary once construction traffic management have been confirmed. If necessary and agreed with FCC, noise monitoring can be undertaken to assess the potential impacts of construction traffic along Kelsterton Road.	**Moderate adverse (Significant)**
Operation	Up to medium/high magnitude of noise impact during daytime operation – NSR 21 (including the travellers' encampment)	**Moderate / Major Adverse (Significant)**	Limits on noise emissions from plant and equipment at source. Acoustic fencing / screens or earth bunds to reduce transmission of noise from the Site to ensure the operational sound limit of rating level no greater than +8 decibels (dB) above the defined representative background sound level at each NSR is met. Further assessment of mitigation as the design evolves, in conjunction with design engineers, to further reduce adverse effects. During detailed design, an operational noise control scheme (including noise	Up to **Minor adverse (Not Significant)**

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
			limits agreed with the local authority) would be prepared, secured by a Requirement of the **Draft DCO** (**EN010166/APP/3.1**), demonstrating the use of Best Available Techniques (BAT) for the control of noise for the Environmental Permit.	
	Up to medium/high magnitude of noise impact during nighttime operation – NSR 21 (including the travellers' encampment)	**Major Adverse** (**Significant**)	Limits on noise emissions from plant and equipment at source. Acoustic fencing / screens or earth bunds to reduce transmission of sound from the Site to NSRs to ensure the operational sound limit of rating level no greater than +8 dB above the defined representative background sound level at each NSR is met. Further assessment of mitigation as the design evolves, in conjunction with design engineers, to further reduce adverse effects. During detailed design, an operational sound control scheme would be prepared to ensure the operational sound limit of a Rating level of no greater than +8 dB above the background level is met, which is , secured by a Requirement of the **Draft DCO** (**EN010166/APP/3.1**),	Up to **Minor adverse** (**Not Significant**)

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
			demonstrating the use of BAT for the control of noise for the Environmental Permit.	
	Up to high magnitude of noise impact during night-time operation - NSR 22 (including the travellers' encampment)	**Major adverse** (**Significant**)	Limits on noise emissions from plant and equipment at source. Acoustic fencing / screens or earth bunds to reduce transmission of sound from the Site to NSRs to ensure the operational sound limit of rating level no greater than +8 dB above the defined representative background sound level at each NSR is met. Further assessment of mitigation as the design evolves, in conjunction with design engineers, to further reduce adverse effects. During detailed design, an operational sound control scheme would be prepared to ensure the operational sound limit of a Rating level of no greater than +8 dB above the background level is met, which is , secured by a Requirement of the **Draft DCO** (**EN010166/APP/3.1**), demonstrating the use of BAT for the control of noise for the Environmental Permit.	Up to **Minor adverse** (**Not Significant**)

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Traffic and Transport				
Construction (and decommissioning)	**No significant effects** are predicted to occur.			
Operation				
Terrestrial and Aquatic Ecology				
Construction (and Decommissioning)	Loss of Open Mosaic Habitat	**Moderate adverse** (**significant**) in the short term; reducing to **Neutral** (**not significant**) in the medium to long term	N/A	**Moderate adverse** (**significant**) in the short term (construction only)[2]; reducing to **Neutral** (**not significant**) in the medium to long term
	Terrestrial Invertebrates – habitat loss	**Moderate adverse** (**significant**) in the short term; reducing to **Neutral** (**not significant**) in the medium to long term	N/A	**Moderate adverse** (**significant**) in the short term (construction only)[3]; reducing to **Neutral** (**not significant**) in the medium to long term

[2] This effect would not arise during the decommissioning phase
[3] This effect would not arise during the decommissioning phase

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
	Freshwater Fish – disturbance through light	**Moderate adverse (significant)**	Timing of works to avoid migration periods. Construction carried out in daylight hours to minimise lighting.	**Neutral (not significant)**
	Loss of roosting and foraging habitat - Dee Estuary Special Protection Area (SPA)/Ramsar site qualifying species: • Bar-tailed godwit (non-breeding) • Pintail (non-breeding) • Black-tailed godwit (non-breeding) • Curlew (non-breeding) • Redshank (non-breeding)	**Moderate** or **Major adverse (significant)**	Provision of enhanced habitats on-site and off-site.	**Negligible** or **Minor adverse (not significant)**
	Noise and visual disturbance - Dee Estuary SPA/Ramsar site qualifying species: • Bar-tailed godwit (non-breeding) • Pintail (non-breeding)	**Moderate** or **Major adverse (significant)**	Additional noise mitigation. Timing of works within the Surface Waer Outfall Area and Water Connection Corridor to avoid the over-wintering period.	**Negligible** or **Minor adverse (not significant)**

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
	• Black-tailed godwit (non-breeding) • Curlew (non-breeding) • Redshank (non-breeding)			
	Loss of roosting and foraging habitat - Dee Estuary Site of Special Scientific Interest (SSSI) species Dee Estuary SSSI species (Regularly occurring species and assemblages) • Non-breeding wetland bird assemblage	**Moderate adverse** (**significant**)	Provision of enhanced habitats on-site and off-site.	**Minor adverse** (**not significant**)
	Noise and visual disturbance - Dee Estuary SSSI species (Regularly occurring species and assemblages) • Non-breeding wetland bird assemblage • Avocet (breeding) • Spotted redshank (non-breeding) • Greenshank (non-breeding)	**Moderate** or **Major adverse** (**significant**)	Additional noise mitigation. Timing of works within the Surface Water Outfall Area and Water Connection Corridor to avoid the over-wintering period.	**Minor adverse** (**not significant**)

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Operation	Effects through changed in air quality: • Deeside and Buckley Newt sites SAC • Connah's Quay Ponds and Woodland SSSI	**Moderate adverse (significant)**	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.	**No significant effects (Not significant)**
Marine Ecology				
Construction	Effects on migratory fish from changes in existing lighting conditions during construction	**Moderate adverse (significant)**	Timing of works to avoid key migration periods. Works carried out during daylight hours to minimise lighting.	**Negligible (Not significant)**
Operation	**No significant effects** are predicted to occur.			
Water Environment and Flood Risk				
Construction (and decommissioning)	**No significant effects** are predicted to occur.			
Operation				
Geology and Ground Conditions				
Construction (and decommissioning)	**No significant effects** are predicted to occur.			

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Operation				
Landscape and Visual Amenity				
Construction (and decommissioning)	Visual effects - Viewpoints 8, 9 and 11	**Moderate adverse (significant)**	None	**Moderate adverse (significant)**
	Visual effects - Viewpoint 10	**Major adverse (significant)**	None	**Major adverse (significant)**
	Visual effects - Dynamic views in close proximity to the Main Development Area including Dee Estuary, NCR 5, and Public Right of Way (PRoW) on the north bank of the River Dee	**Moderate adverse (significant)**	None	**Moderate adverse (significant)**
Operation	Visual effects - Viewpoints 8, 9 and 11	**Moderate adverse (significant)**	None	**Moderate adverse (significant)**
	Visual effects - Viewpoint 10	**Major adverse (significant)**	None	**Major adverse (significant)**
	Visual effects - Dynamic views in close proximity to the Main Development Area including Dee Estuary, NCR 5, and PRoW on the north bank of the River Dee	**Moderate adverse (significant)**	None	**Moderate adverse (significant)**

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Physical Processes				
Construction	**No significant effects** are predicted to occur.			
Operation				
Terrestrial Heritage				
Construction	Impacts to below ground archaeological remains dating to the Roman period as a result of below ground works within the Proposed CO_2 Connection Corridor.	**Moderate adverse** (**significant**)	Programme of archaeological monitoring and recording.	**Minor adverse** (**not significant**)
Operation	**No significant effects** are predicted to occur.			
Marine Heritage				
Construction	Impacts to previously unrecorded marine heritage assets at the Surface Water Outfall Area – Direct effects	**Major adverse** (**significant**)	Written Scheme of Investigation and (WSI) and protocol for unexpected archaeological discoveries (PAD).	**Minor adverse** (**not significant**)
	Impacts to previously unrecorded marine heritage assets at the Surface Water Outfall Area –Indirect effects	**Major adverse** (**significant**)	WSI and PAD.	**Minor adverse** (**not significant**)
Operation	Impacts to previously unrecorded marine heritage	**Major adverse** (**significant**)	WSI and PAD.	**Minor adverse** (**not significant**)

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
	assets at the Surface Water Outfall Area – Direct effects			
	Impacts to previously unrecorded marine heritage assets at the Surface Water Outfall Area – Indirect effects	**Major adverse (significant)**	WSI and PAD.	**Minor adverse (not significant)**
Socio-Economics, Recreation and Tourism				
Construction (and decommissioning)	**No significant effects** are predicted to occur.			
Operation				
Climate Change				
Construction (and decommissioning)	**No significant GHG effects** are predicted to occur.			
	Risk of climate change to the Proposed Development	**Significant**	The full list of mitigation is listed in **Appendix 20-C: Climate Change Resilience Assessment (EN010166/APP/6.4)**.	**Not significant**
Operation	Impact of greenhouse gas (GHG) emissions arising during the operation of the Proposed Development in relation to the overall and ever decreasing UK and Welsh	**Moderate adverse (significant)**	No additional measures identified.	**Moderate adverse (significant)**

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
	carbon Budgets (as a proxy for the global climate).			
	Risk of climate change to the Proposed Development	**Significant**	The full list of mitigation is listed in **Appendix 20-C: Climate Change Resilience Assessment** (**EN010166/APP/6.4**).	**Not significant**
Human Health				
Construction (and decommissioning)	**No significant effects** are predicted to occur.			
Operation				
Major Accidents and Disasters				
Construction	**No significant effects** are predicted to occur.			
Operation				
Materials and Waste				
Construction	Changes in available hazardous landfill void capacity – excavated material	**Moderate** or **Large adverse (significant**)	No additional mitigation measures are proposed at this time, however, the hazardous excavated material volume estimates would be further refined with a Ground Investigation be undertaken prior to commencing construction. Waste management routes would be confirmed by the construction contractor.	**Moderate or Large adverse** (**significant**).

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Operation	**No significant effects** are predicted to occur.			
Cumulative and Combined Effects (Inter-project effects)				
Construction (and decommissioning)	Landscape (for developments in close proximity to the Proposed Development)	**Moderate adverse (significant)**	None available.	**Moderate adverse (significant)**
	Visual Amenity (for developments in close proximity to the Proposed Development)	**Moderate adverse (significant)**	None available.	**Moderate adverse (significant)**
	Change to the setting of the Croes Atti Roman Site (FL213) scheduled monument [4]	**Moderate adverse (significant)**	None available.	**Moderate adverse (significant)**
	Net Construction Employment	**Moderate beneficial (significant)**	N/A	**Moderate beneficial (significant)**
	Employment and Income' human health determinant	**Moderate beneficial (significant)**	N/A	**Moderate beneficial (significant)**
Operation	'Climate change mitigation and adaption' human health determinant (sub-population only)	**Moderate beneficial (significant)**	N/A	**Moderate beneficial (significant)**

[4] Potential impacts related to the operational phase of the other proposed schemes are not considered to result in any change to the assessed levels of impact identified during the construction phase.

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to additional mitigation	Additional Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Cumulative and Combined Effects (Intra-project effects)				
Construction	High potential for potential for a new or different significant environmental effect to occur at Residential Properties West end of Kelsterton Road (including the travellers' encampment)	**Significant**	None available.	**Significant**
	Moderate potential for potential for a new or different significant environmental effect to occur at Kelsterton Farm and Residential Properties at Kelsterton Lane / Kelsterton Road intersection	**Significant**	None available.	**Significant**
Operation	No potential intra-project effects identified.			

25.3 Summary of Significant Residual Effects

25.3.1 Following the application of additional mitigation, the Proposed Development is likely to result in the following significant residual effects:

- Noise and Vibration (Construction (and decommissioning)):
  - Road traffic noise level at source on Kelsterton Road (access road to Main Development Area) at NSR 21 and 22 (including the travellers' encampment) (**moderate adverse**).
- Terrestrial and Aquatic Ecology (Construction):
  - Loss of Open Mosaic Habitat (**moderate adverse** in the short term).
  - Terrestrial Invertebrate habitat loss (**moderate adverse** in the short term).
- Landscape and Visual (Construction (and decommissioning)):
  - Visual effects - Viewpoints 8, 9 and 11 (**moderate adverse**).
  - Visual effects - Viewpoint 10 (**major adverse**).
  - Dynamic views in close proximity to the Main Development Area including Dee Estuary, NCR 5, and PRoW on the north bank of the River Dee (**moderate adverse**).
- Landscape and Visual (Operation):
  - Visual effects - Viewpoints 8, 9 and 11 (**moderate adverse**).
  - Visual effects - Viewpoint 10 (**major adverse**).
  - Dynamic views in close proximity to the Main Development Area including Dee Estuary, NCR 5, and PRoW on the north bank of the River Dee (**moderate adverse**).
- Climate Change (Operation):
  - Impact of GHG emissions arising during the operation of the Proposed Development in relation to the overall and ever decreasing UK and Welsh carbon Budgets (as a proxy for the global climate) (**moderate adverse**).
- Materials and Waste (Construction):
  - Changes in available hazardous landfill void capacity – excavated material (**moderate or large adverse**).
- Cumulative and Combined Effects (Inter-project effects – Construction):
  - Landscape, for developments in close proximity to the Proposed Development (**moderate adverse**).
  - Visual Amenity, for developments in close proximity to the Proposed Development (**moderate adverse**).
  - Change to the setting of the Croes Atti Roman Site (FL213) scheduled monument (**moderate adverse**).
  - Net Construction Employment (**moderate beneficial**).

  - Employment and Income human health determinant (**moderate beneficial**).

- Cumulative and Combined Effects (Inter-project effects – Operation):
  - Climate Change Mitigation and Adaption human health determinant (sub-population only) (**moderate beneficial**).
- Cumulative and Combined Effects (Intra-project effects – Construction (and decommissioning)):
  - Potential for potential for a new or different significant environmental effect to occur at Residential Properties West end of Kelsterton Road (including the travellers' encampment) (**high**).
  - Potential for potential for a new or different significant environmental effect to occur at Kelsterton Farm (**moderate**).
  - Potential for potential for a new or different significant environmental effect to occur at Residential Properties at Kelsterton Lane / Kelsterton Road intersection (**moderate**).