Connah's Quay Low Carbon Power

Environmental Statement Volume IV Appendix 20F: Cumulative In-combination Climate Change Assessment

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1. Cumulative In-combination Climate Change Assessment

1.1 Summary of Likely Significant Residual Effects

Cumulative In-Combination Climate Change Assessment

1.1.1 The study area for the cumulative ICCI assessment has been determined by the EIA topic assessments, as described in other technical sections of this ES. The relevant topic chapters in **ES Volume II** (**EN010166/APP/6.2**) with sensitive receptors including:

- **Chapter 8: Air Quality** (**EN010166/APP/6.2.8**);
- **Chapter 9: Noise and Vibration** (**EN010166/APP/6.2.9**);
- **Chapter 13: Water Environment and Flood Risk** (**EN010166/APP/6.2.13**); and
- Soils and Agricultural Land (as part of **Chapter 14: Geology and Ground Conditions** (**EN010166/APP/6.2.14**)).

1.1.2 **Table 1** details the cumulative in-combination climate change impacts (ICCI) risks identified for the Proposed Development. There were no ICCIs identified for Traffic and Transport, Terrestrial and Aquatic Ecology, Marine Ecology, Landscape and Visual Amenity, Geology and Ground Conditions, Physical Processes, Terrestrial Heritage, Marine Heritage, Socio-Economics and Recreation and Tourism, Human Health, Major Accidents and Disasters, and Materials and Waste.

Table 1: Cumulative In-Combination Climate Change Assessment

Discipline / Receptor	Climate Hazard	Likelihood of hazard occurring	Likely ICCIs identified	Description of ICCI and embedded mitigation	Likelihood of ICCI occurring	Consequence	Significance
Air Quality							
Air Quality	Change in mean annual air temperature	Likely	For direct and cumulative impacts, ambient weather conditions, including barometric pressure and temperature, can slightly affect the amount of natural gas fuel burned within the combustion process for a given output. The consequence of a change in fuel consumption would be a corresponding change in stack mass flow rate and emission rates of trace pollutants in the stack plume.	Any potential for an increase in mass emission rates is limited in practice to the value set within the environmental permit for emission limit values.	Low	Negligible	Not significant
Air Quality	Change in the frequency	Possible	For direct and cumulative impacts, conditions that	The dispersion modelling assessment has used five years of meteorological	Low	Negligible	Not significant

Discipline / Receptor	Climate Hazard	Likelihood of hazard occurring	Likely ICCIs identified	Description of ICCI and embedded mitigation	Likelihood of ICCI occurring	Consequence	Significance
	of adverse meteorological conditions		transport pollutants directly from the source to the receptor may occur more often. Extended periods of dry weather may occur more frequently.	data, which accounts for the full range of weather conditions experienced in the area around the site. A change in climate equates to a change in the frequency of the meteorological conditions that have already been assessed. Although an impact might occur more often, the magnitude of the impact cannot physically be any greater than what has already been assessed because the meteorological condition has not changed. The embedded mitigation measures would continue to be effective even if the need for their use became more frequent.			
Noise and Vibration							
Noise and Vibration	Increase in mean	High	Increased temperatures may require greater	The assessment will be based on the worst-case scenario so there will be	Negligible	Negligible	Not significant

Discipline / Receptor	Climate Hazard	Likelihood of hazard occurring	Likely ICCIs identified	Description of ICCI and embedded mitigation	Likelihood of ICCI occurring	Consequence	Significance
	summer air temperature		cooling which will increase the number of cooling fans in operation, which could then result in potential increase in noise effects to receptors in the surrounding environment.	no further impact on noise effects impacting the surrounding environment.			
Noise and Vibration	Increase in mean summer air temperature	Very likely	Potential to exacerbate noise effects on communities in terms of individual dwellings and on a wider community, due to windows being open more often due to an increase in high temperatures.	The noise assessment criteria assume windows are open and closing windows is a form of mitigation against noise. Consequently, there is no further impact on noise effects arising from the ICCI.	Negligible	Negligible	Not significant
Noise and Vibration	Increase in mean summer air temperature	Very likely	Increases in temperature and humidity of the air reducing the	Over distances of a few hundred metres, which covers the noise study area, the effects of increases in air	Negligible	Negligible	Not significant

Discipline / Receptor	Climate Hazard	Likelihood of hazard occurring	Likely ICCIs identified	Description of ICCI and embedded mitigation	Likelihood of ICCI occurring	Consequence	Significance
			atmospheric attenuation of noise.	temperature and humidity on sound attenuation with distance from the sound sources on-site are minimal temperature, and 70% relative humidity provide a worst-case assessment. Consequently, increases in temperature and humidity are unlikely to further affect noise levels at receptors during either the construction or operational phases.			
Water Environment							
Water quality	Increase in winter rainfall	Very likely	Operation: Increased precipitation can impact peak discharge rates for surface water runoff, which can impact receiving waterbodies (receptors) if the capacity of the drainage	The impact of climate change on expected flows has been accommodated in the design of drainage infrastructure to ensure appropriate treatment and attenuation of anticipated flows, as outlined above.	Low	Negligible	Not significant

Discipline / Receptor	Climate Hazard	Likelihood of hazard occurring	Likely ICCIs identified	Description of ICCI and embedded mitigation	Likelihood of ICCI occurring	Consequence	Significance
			infrastructure is exceeded in extreme events. If this results in the storage capacity of attenuation features being exceeded, then there is potential for the River Dee to receive untreated water. This could lead to a deterioration in water quality.				
Water quality	Increased sea temperature	Likely	Discharge of cooling water with increased sea temperature due to climate change could result in impacts to marine environments.	Any increases in discharge temperature, in addition to CC increases could result in increased temperatures locally and regionally across the River Dee SSSI, potentially impacting on habitats. However, the operational discharge temperature of cooling water discharges will comply with the existing Environmental Permit with no changes	Low	Negligible	Not significant

Discipline / Receptor	Climate Hazard	Likelihood of hazard occurring	Likely ICCIs identified	Description of ICCI and embedded mitigation	Likelihood of ICCI occurring	Consequence	Significance
				proposed to the permitted levels.			
Water resources	Increased droughts	Likely	Reduction in water availability for abstraction and impact on nearby existing abstractions	Increases in abstraction from surface water and groundwater sources could reduce the availability of water for other users. However, there is no change proposed to the existing abstraction volume from the River Dee for cooling water, and no new additional abstractions from other sources required. As such, no additional pressures on abstraction will result from the Proposed Development. The existing levels will have been factored into forecasting with Dwr Cymru Welsh Water's Water Resources Management Plan 2024.	Low	Negligible	Not significant

Discipline / Receptor	Climate Hazard	Likelihood of hazard occurring	Likely ICCIs identified	Description of ICCI and embedded mitigation	Likelihood of ICCI occurring	Consequence	Significance
Groundwater aquifers	Decrease in summer precipitation rate	Possible	Reduction in precipitation could reduce aquifer storage and groundwater levels. Construction: construction activities such as dewatering can reduce groundwater levels. This potential impact will be localised and unlikely to impact the surrounding environment.	Reduction in groundwater levels could reduce water availability for water dependent receptors and water users (i.e. groundwater abstractions). Dewatering during construction will be kept to a minimum and only undertaken where required to limit any reduction in groundwater recharge.	Low	Low	Not significant
Geology and Ground Conditions							
Soil Resource	Increase to winter rainfall	Very likely	Increased soil erosion of unvegetated soils	Vegetation stripping of soils during construction may temporarily increase erosion vulnerability of soils. However, permanent vegetation cover of soil following reinstatement and during operation will help protect the soil surface and increase	Low	Low	Not significant

Discipline / Receptor	Climate Hazard	Likelihood of hazard occurring	Likely ICCIs identified	Description of ICCI and embedded mitigation	Likelihood of ICCI occurring	Consequence	Significance
				permeability and soil pore water storage to mitigate effects of increased precipitation			