



LIGHTHOUSE GREEN FUELS PROJECT

Preliminary Environmental Information Report

Chapter 20: Summary of Likely Significant Effects

The Inspectorate Reference: **EN010150**

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Volume 1



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20. SUMMARY OF LIKELY SIGNIFICANT EFFECTS

20.1. INTRODUCTION

- 20.1.1. The technical topic specific impact assessments are presented in **Chapter 5: Air Quality (Volume 1)** to **Chapter 19: Cumulative Effects (Volume 1)** and have considered the potential environmental impacts and likely Significant effects of the Proposed Scheme. This Chapter provides a summary of the likely effects reported in the Topic Chapters and this is provided **Table 20-1**, **Table 20-2** and **Table 20-3** below.
- 20.1.2. The preliminary assessment of Significant effects will be reviewed and updated assessments will be reported in the ES.

20.2. SIGNIFICANCE OF EFFECTS

- 20.2.1. As set out in **Section 3.12** of **Chapter 3: Approach to EIA (Volume 1)**, effects, whether adverse or beneficial, assessed as having “moderate” or “major” significance are deemed to be Significant. Effects determined to be “minor” or “negligible” are deemed to be Not Significant. Any deviation from this approach is detailed in the methodology for each assessment within **Chapter 5: Air Quality (Volume 1)** to **Chapter 19: Cumulative Effects (Volume 1)**.
- 20.2.2. **Table 20-1** includes the following information:
- a description of the effect;
 - the sensitive receptor;
 - a summary of the significance of likely effects prior to the implementation of additional mitigation;
 - a summary of the additional mitigation measures to be implemented to minimise the significance of the effects (further information is provided in each Technical Chapter); and
 - the residual significance of these effects assuming all proposed additional mitigation is implemented.
- 20.2.3. **Table 20-2** includes the following information about **Chapter 12: Climate Resilience (Volume 1)**:
- the receptor;
 - the climate variables;
 - a summary of the potential impacts;
 - a summary of the significance of likely effects prior to the implementation of additional mitigation;
 - a summary of the additional mitigation measures to be implemented to minimise the significance of the effects (further information is provided in each Technical Chapter); and

- the residual significance of these effects assuming all proposed additional mitigation is implemented.

20.2.4. **Table 20-3** includes the following information about **Chapter 17: Major Accidents and Disasters (Volume 1)**:

- the risk record entry number;
- the Major Accidents and Disasters category;
- a description of the potential risk;
- the risk event at the highest level; and
- the reasonable worst consequence if the event did occur.

Table 20-1: Summary of Likely Environment Effects

Description of Effect		Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Chapter 5: Air Quality					
Construction Phase					
Construction Phase Fugitive Dust	Dust soiling effects during earthworks, construction and trackout	Human receptors within 350m of the DCO Application Boundary	Minor Adverse (Not Significant)	Further site specific mitigation based on the IAQM dust risk assessment, as detailed in Section 5.9 of Chapter 5: Air Quality (Volume 1) .	Negligible (Not Significant)
	Human health effects during earthworks, construction and trackout	Human receptors within 350m of the DCO Application Boundary	Minor Adverse (Not Significant)		Negligible (Not Significant)
	Ecological effects during earthworks, construction and trackout	Ecological receptors within 50m of the DCO Application Boundary	Minor Adverse (Not Significant)		Negligible (Not Significant)
Non-Road Mobile Machinery (NRMM) Emissions		NRMM emissions are not expected to be significant but an assessment of NRMM and construction road traffic will be presented in the Air Quality Chapter of the ES.			
Construction Road Traffic Emissions	Human Receptors	Selected human receptors within 200m of the ARN	Negligible (Not Significant)	Not required	Negligible (Not Significant)

Description of Effect		Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Operation Phase					
Emissions of Pollutants arising from the SAF Plant	Human Receptors	Human Receptors within 2km and gridded receptors within 10km	<div>Negligible (Not Significant) for all pollutants except the following pollutants for which the impact is judged to be:<ul style="list-style-type: none">NO₂ annual: Minor Adverse (Not Significant)NO₂ 1-hour: Minor Adverse (Not Significant)SO₂ 15-minute: Minor Adverse (Not Significant)SO₂ 24-hour: Minor Adverse (Not Significant)</div> <div>UHC annual has been assessed against the Benzene standard. The significance of the UHC impact will be deferred to the ES.</div>		
Operational Phase Fugitive Dust		Fugitive Dust emissions are not expected to be significant but an assessment will be presented in the Air Quality Chapter of the ES.			
Operational Road Traffic Emissions	Human Receptors	Human Receptors within 200m	Negligible (Not Significant)	Not required	Negligible (Not Significant)
Rail Terminal and Rail Line Emissions	Screening and potential assessment of these aspects will be presented in the Air Quality Chapter of the ES.				

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Chapter 6: Noise and Vibration				
Construction Phase				
Construction Noise	Human receptors at Saltview Terrace, Samphire Street and Port Clarence Road	In the absence of assessment being undertaken, Moderate/Major Adverse (Significant)	This assessment will be undertaken and reported in the ES.	
Construction Vibration	Human receptors on Port Clarence Road	In the absence of assessment being undertaken, Moderate/Major Adverse (Significant)		
Construction Traffic Noise		Negligible (Not Significant)	None required	Negligible (Not Significant)
Operation Phase				
Development generated Rail Noise	Human receptors on Port Clarence Road	In the absence of assessment being undertaken, Moderate/Major Adverse (Significant)	This assessment will be undertaken and reported in the ES.	
Development generated Rail Vibration		In the absence of assessment being undertaken,		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
		Moderate/Major Adverse (Significant)		
Development generated Road Noise	Human receptors on Saltview Terrace and Samphire Street	Negligible (Not Significant)	None required	Negligible (Not Significant)
Noise Impacts from Fixed Plant and Equipment	Human receptors in Port Clarence	Negligible to Minor Adverse (Not Significant)	None required	Negligible to Minor Adverse (Not Significant)
Chapter 7: Terrestrial Ecology				
Construction Phase				
Habitat loss and fragmentation	Teesmouth and Cleveland Coast SSSI	Major Adverse (Significant)	Design Proposed Scheme to avoid habitat loss within designated sites	Negligible (Not Significant)
	Teesmouth and Cleveland Coast SPA	Major Adverse (Significant)	Design Proposed Scheme to avoid habitat loss within designated sites	Negligible (Not Significant)
	Teesmouth and Cleveland Coast Ramsar	Major Adverse (Significant)	Design Proposed Scheme to avoid habitat	Negligible (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			loss within designated sites	
	Non-statutory designated sites (presence unconfirmed)	Major Adverse to Moderate Adverse (Significant)	Design Proposed Scheme to avoid habitat loss within designated sites	Negligible (Not Significant)
	OMHPDL HPI; Brownfields TVBAP	Moderate Adverse (Significant)	Bespoke compensatory habitat creation, including to maintain existing habitat connectivity	Minor Adverse (Not Significant)
	CFGM HPI	Minor Adverse (Not Significant) to Moderate Adverse (Significant)	Compensatory habitat creation and/or enhancement of habitats to be retained	Negligible (Not Significant)
	Reedbeds HPI, TVBAP	Moderate Adverse (Significant)	Compensatory habitat creation and/or enhancement of habitats to be retained	Negligible (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Lowland Calcareous Grassland HPI	Major Adverse (Significant) to Moderate Adverse (Significant)	Bespoke compensatory habitat creation	Minor Adverse (Not Significant)
	Mudflats and Saltmarsh TVBAP	Moderate Adverse (Significant)	Bespoke compensatory habitat creation	Minor Adverse (Not Significant)
	Inland salt meadow Annex I habitat	Major Adverse (Significant) to Moderate Adverse (Significant)	Bespoke compensatory habitat creation	Minor Adverse (Not Significant)
	Badger	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Avoidance of any active setts as far as feasible, or closure under licence; compensatory habitat creation and/or enhancement of habitats to be retained	An assessment of Residual Effects will be completed as part of the ES assessment
	Bats	An assessment of Likely Significant Effects will be completed as part of the ES assessment	Compensatory habitat creation and/or enhancement of	An assessment of Residual Effects will be completed as part of the ES assessment

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			habitats to be retained	
	Breeding birds (general)	Minor Adverse (Not Significant) to Moderate Adverse (Significant)	Compensatory habitat creation and/or enhancement of habitats to be retained	Negligible (Not Significant)
	Wintering birds (general)	Moderate Adverse (Significant)	Compensatory habitat creation and/or enhancement of habitats to be retained	Minor Adverse (Not Significant)
	Reptiles	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Compensatory habitat creation and/or enhancement of habitats to be retained.	An assessment of Residual Effects will be completed as part of the ES assessment
	Great Crested Newts (GCN)		Compensatory habitat creation and/or enhancement of habitats to be retained.	
	Terrestrial invertebrates		Compensatory habitat creation and/or	

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			enhancement of habitats to be retained.	
	Conservation Areas	Moderate Adverse (Significant)	Further arboricultural work to be undertaken at ES stage to fully determine potential impacts and any mitigation required	An assessment of Residual Effects will be completed as part of the ES assessment
	Trees	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Further arboricultural work to be undertaken at ES stage to fully determine potential impacts and any mitigation required	An assessment of Residual Effects will be completed as part of the ES assessment
Noise and vibration	Badgers	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Mitigation to be determined in response to full terrestrial ecology	An assessment of Residual Effects will be completed as part of the ES assessment. However, given the embedded mitigation to be included within the Proposed Scheme,
	Bats			
	Breeding birds (SSSI/SPA/Ramsar)			

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Breeding birds (other)		baseline data and development of noise and vibration mitigation at ES stage.	plus more detailed mitigation measures to be determined upon review of further baseline information, it is anticipated that significant effects can be largely or entirely avoided.
	Peregrine			
	Wintering birds (SSSI/SPA/Ramsar)			
	Otter			
	Water vole			
	Reptiles			
	GCN			
	Terrestrial invertebrates			
Visual disturbance	Bats	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Modifying working practices to minimise visual disturbance to species when active.	An assessment of Residual Effects will be completed as part of the ES assessment.
Water pollution (marine vessel movements)	Bats	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Appropriate checking and maintenance of marine vessels before, during and after shipping movements.	An assessment of Residual Effects will be completed as part of the ES assessment.
	Wintering birds (SSSI/SPA/Ramsar)			
	Wintering birds (general)			
	Otter			

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Artificial lighting	Bats	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Modifying lighting design and locations in response to further terrestrial ecology baseline data.	An assessment of Residual Effects will be completed as part of the ES assessment.
	Breeding birds (SSSI/SPA/Ramsar)	Moderate Adverse (Significant)		Moderate Adverse (Significant)
	Wintering birds (SSSI/SPA/Ramsar)	Moderate Adverse (Significant)		Moderate Adverse (Significant)
	Reptiles	An assessment of Likely Significant Effects will be completed as part of the ES assessment.		An assessment of Residual Effects will be completed as part of the ES assessment.
	GCN			
	Terrestrial invertebrates			
Air pollution	Teesmouth and Cleveland Coast SPA	Major Adverse (Significant) to Moderate Adverse (Significant)	Mitigation to be determined in response to full terrestrial ecology baseline data and development of air quality mitigation at ES stage.	An assessment of Residual Effects will be completed as part of the ES assessment. Further modelling is to be undertaken and the air quality assessment refined, with detailed mitigation measures provided. With the implementation of these mitigation measures, it is anticipated that significant effects can be largely or entirely avoided.
	Teesmouth and Cleveland Coast Ramsar	Major Adverse (Significant) to Moderate Adverse (Significant)		
	Teesmouth and Cleveland Coast SSSI	Major Adverse (Significant) to Moderate Adverse (Significant)		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	OMHPDL HPI; Brownfields TVBAP	Moderate Adverse (Significant)		
	CFGH HPI	Moderate Adverse (Significant)		
	Mudflats HPI; Mudflats and Saltmarsh TVBAP	Moderate Adverse (Significant)		
	Lowland Fens HPI	Moderate Adverse (Significant)		
	Saline Lagoons HPI	Moderate Adverse (Significant)		
	Reebeds HPI, TVBAP	Moderate Adverse (Significant)		
	Eutrophic Standing Water HPI; Ponds, Lakes and Reservoirs TVBAP	Moderate Adverse (Significant)		
	Rivers HPI; Rivers and Streams TVBAP	Moderate Adverse (Significant)		
	Wet Woodland HPI; Semi-natural Broadleaved Lowland Woodland TVBAP	Moderate Adverse (Significant)		
	Conservation Areas	Moderate Adverse		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
		(Significant)		
	Trees	An assessment of Likely Significant Effects will be completed as part of the ES assessment.		
Operation Phase				
Noise and vibration	Badger	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Mitigation to be determined when full ecology baseline, noise monitoring results, and further design information are available.	An assessment of Residual Effects will be completed as part of the ES assessment.
	Bats	An assessment of Likely Significant Effects will be completed as part of the ES assessment.		
	Breeding birds (SSSI/SPA/Ramsar)	Moderate Adverse (Significant)		
	Breeding birds (other)	Moderate Adverse (Significant)		
	Peregrine	Moderate Adverse (Significant)		
	Wintering birds (SSSI/SPA/Ramsar)	Moderate Adverse (Significant)		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Reptiles	An assessment of Likely Significant Effects will be completed as part of the ES assessment.		
	GCN	An assessment of Likely Significant Effects will be completed as part of the ES assessment.		
	Terrestrial invertebrates	An assessment of Likely Significant Effects will be completed as part of the ES assessment.		
Visual disturbance	Bats	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Mitigation to be determined when full ecology baseline and further design information are available	An assessment of Residual Effects will be completed as part of the ES assessment.
	Breeding birds (SSSI/SPA/Ramsar)			
	Breeding birds (other)			
	Peregrine			
	Wintering birds			
	Otter			
	Water vole			

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Dust deposition	Teemouth and Cleveland Coast SPA	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Mitigation to be determined following detailed assessment in relation to operational dust emissions at the ES stage.	An assessment of Residual Effects will be completed as part of the ES assessment.
	Teemouth and Cleveland Coast Ramsar			
	Teemouth and Cleveland Coast SSSI			
	OMHPDL HPI; Brownfields TVBAP			
	CFGH HPI			
	Mudflats HPI			
	Lowland Fens HPI			
	Saline Lagoons HPI			
	Reedbeds HPI, TVBAP			
	Eutrophic Standing Waters HPI; Ponds, Lakes and Reservoirs TVBAP			
	Rivers HPI; Rivers and Streams TVBAP			
	Wet Woodland HPI; Semi-natural			

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Broadleaved Woodland TVBAP			
	Bats			
	Breeding birds (SSS/SPA/Ramsar)			
	Breeding birds (general)			
	Peregrine			
	Wintering birds (SSSI/SPA/Ramsar)			
	Otter			
	Water vole			
	Reptiles			
	GCN			
	Terrestrial invertebrates			
Artificial lighting	Bats	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	Full terrestrial ecology baseline and detailed lighting design to be completed at the ES stage.	An assessment of Residual Effects will be completed as part of the ES assessment.
	Breeding birds (SSSI/SPA/Ramsar)			
	Breeding birds (other)			
	Peregrine			

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Wintering birds (SSSI/SPA/Ramsar)			
	Otter			
	Water vole			
	Reptiles			
	GCN			
	Terrestrial invertebrates			
Air pollution	Teesmouth and Cleveland Coast SPA	Major Adverse (Significant) to Moderate Adverse (Significant)	Mitigation to be determined in response to full terrestrial ecology baseline data and further air quality data	An assessment of Residual Effects will be completed as part of the ES assessment. Further modelling is to be undertaken and the air quality assessment refined, with detailed mitigation measures provided. With the implementation of these mitigation measures, it is anticipated that significant effects can be largely or entirely avoided.
	Teesmouth and Cleveland Coast Ramsar	Major Adverse (Significant) to Moderate Adverse (Significant)		
	Teesmouth and Cleveland Coast SSSI	Major Adverse (Significant) to Moderate Adverse (Significant)		
	OMHPDL HPI; Brownfields TVBAP	Moderate Adverse (Significant)		
	CFGM HPI	Moderate Adverse (Significant)		
	Mudflats HPI; Mudflats and Saltmarsh TVBAP	Moderate Adverse (Significant)		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Lowland Fens HPI	Moderate Adverse (Significant)		
	Saline Lagoons HPI	Moderate Adverse (Significant)		
	Reebeds HPI, TVBAP	Moderate Adverse (Significant)		
	Eutrophic Standing Water HPI; Ponds, Lakes and Reservoirs TVBAP	Moderate Adverse (Significant)		
	Rivers HPI; Rivers and Streams TVBAP	Moderate Adverse (Significant)		
	Wet Woodland HPI; Semi-natural Broadleaved Lowland Woodland TVBAP	Moderate Adverse (Significant)		
	Conservation Areas	Moderate Adverse (Significant)		
	Trees	An assessment of Likely Significant Effects will be completed as part of the ES assessment.		
Chapter 8: Marine and Freshwater Ecology				
Construction Phase				

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Noise and Vibration, Artificial lighting, and Visual Disturbance to harbour seals and their breeding locations in the SSSI.	Teesmouth and Cleveland Coast SSSI	Major Adverse (Significant) to Moderate Adverse (Significant)	Mitigation to be determined when full ecology baseline and further design information are available. This will be provided in the ES.	Residual effects will be determined when full ecology baseline data and further design information become available. This will be provided in the ES.
Changes to water quality (including suspension of sediment bound contaminants) associated with increased navigation (resulting from wave wash disturbing sediment).	Teesmouth and Cleveland Coast	Major Adverse (Significant) to Moderate Adverse (Significant)		
Increased pollution risk from spillages and dust deposition.	Teesmouth and Cleveland Coast SSSI	Major Adverse (Significant) to Moderate Adverse (Significant)		
Indirect impacts on grey seals and harbour seals, which are an important mobile feature of the Teesmouth NNR.	Teesmouth NNR	Moderate Adverse (Significant)		
Due to its distance from the Site and lack of hydrological connectivity to the Site, impacts to Berwick Hills LNR are expected to be avoided. Air quality impacts will be discussed in Chapter 5: Air Quality (Volume 1).	Berwick Hills LNR	Negligible (Not Significant)		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Due to their distances from the Site, impacts to the LWSs are expected to be avoided.	Greatham Creek North Bank Saltmarsh LWS and Greenabella Marsh LWS	Negligible (Not Significant)		Negligible (Not Significant)
Direct loss or physical disturbance/degradation of habitat and species within Area 8.	Macrophytes Aquatic Macroinvertebrates Freshwater Fish	To be determined when more baseline data becomes available.		Residual effects will be determined when full ecology baseline data and further design information become available. This will be provided in the ES.
Increased pollution risk from sedimentation caused by surface run-off from areas of bare earth, construction materials such as aggregate, stockpiles of topsoil or discharge of groundwater dewatering.	Macrophytes Aquatic Macroinvertebrates Freshwater Fish	To be determined when more baseline data becomes available.		
Increased pollution risk from sedimentation caused by surface run-off from areas of bare earth, construction materials such as aggregate, stockpiles of topsoil or discharge of groundwater dewatering.	Benthic Habitats and Associated Communities Marine Plants and Macroalgae Marine Fish Marine Mammals	Major Adverse (Significant) to Moderate Adverse (Significant)		
Increased pollution risk from sedimentation caused by	Phytoplankton	Moderate Adverse (Significant)		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
surface run-off from areas of bare earth, construction materials such as aggregate, stockpiles of topsoil or discharge of groundwater dewatering.				
Increased pollution risk from spillage of fuels/harmful chemicals that may spill directly into or migrate to surface water, which could negatively impact on species and habitat through direct and indirect degradation	Macrophytes Aquatic Macroinvertebrates Freshwater Fish	To be determined when more baseline data becomes available.		
Increased pollution risk from spillage of fuels/harmful chemicals that may spill directly into or migrate to surface water, which could negatively impact on species and habitat through direct and indirect degradation	Benthic Habitats and Associated Communities Marine Plants and Macroalgae Marine Fish Marine Mammals	Major Adverse (Significant) to Moderate Adverse (Significant)		
Increased pollution risk from spillage of fuels/harmful chemicals that may spill directly into or migrate to surface water, which could negatively impact on species and habitat through direct and indirect degradation	Phytoplankton	Moderate Adverse (Significant)		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Alterations to visual stimuli (artificial light spill) and the underwater soundscape.	Freshwater Fish	To be determined when more baseline data becomes available.		
Direct loss or physical disturbance/degradation of habitats and species within the Tees Estuary associated with potential improvement works to existing wharfs and increased navigation.	Benthic Habitats and Associated Communities Marine Plants and Macroalgae Marine Fish	Major Adverse (Significant) to Moderate Adverse (Significant)		
Increased pollution risk and changes to water quality (through suspension of sediment bound contaminants) during improvement works to existing wharfs and increased navigation (resulting in wave wash disturbing sediment). sediment).	Benthic Habitats and Associated Communities Marine Plants and Macroalgae Marine Fish Marine Mammals	Major Adverse (Significant) to Moderate Adverse (Significant)		
Increased pollution risk and changes to water quality (through suspension of sediment bound contaminants) during improvement works to existing wharfs and increased navigation (resulting in wave wash disturbing sediment). sediment).	Phytoplankton	Moderate Adverse (Significant)		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Disturbance to protected fish species, including migratory species in the Tees Estuary due to changes in visual stimuli, (notably artificial light spill) and underwater noise during construction (through potential improvement works to existing wharfs and increased vessel movements).	Marine Fish	Major Adverse (Significant) to Moderate Adverse (Significant)		
Disturbance to notable marine mammal species including harbour seals, grey seals and harbour porpoise due to changes in visual stimuli, (notably artificial light spill) through potential improvement works to existing wharfs and increased navigation.	Marine Mammals	Major Adverse (Significant) to Moderate Adverse (Significant)		
Changes in the behaviour due to disturbance (e.g. avoidance) and/or physical damage to marine mammals due to changes in the underwater soundscape through potential improvement works to existing wharfs and increased navigation.	Marine Mammals	Major Adverse (Significant) to Moderate Adverse (Significant)		
Vessel strikes/collisions with marine mammals within the	Marine Mammals	Major Adverse (Significant) to		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
River Tees due to increased navigation.		Moderate Adverse (Significant)		
Potential spread of INNS during construction activities through vessel/vehicle movements.	INNS	N/A		
Operation Phase				
Increased pollution risk from spillage of fuels/harmful chemicals that may spill directly into or migrate to surface water, which could result in habitat degradation and long-term loss of suitable habitat for the qualifying features (saltmarsh and harbour seals).	Tees and Cleveland Coast SSSI	Major Adverse (Significant) to Moderate Adverse (Significant)	Mitigation to be determined when full ecology baseline and further design information are available. This will be provided in the ES.	Residual effects will be determined when full ecology baseline data and further design information become available. This will be provided in the ES.
Depending on the processes to be used within Area 8 during operation, permanent noise impacts may also be incurred to the SSSI and harbour seals which inhabit this area.	Tees and Cleveland Coast SSSI	Major Adverse (Significant) to Moderate Adverse (Significant)		
Increased risk of pollution (including suspension of sediment bound contaminants) associated with operational navigation (resulting from wave wash disturbing sediment).	Tees and Cleveland Coast SSSI	Major Adverse (Significant) to Moderate Adverse (Significant)		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Due to its distance from the Site, direct impacts, and the majority of indirect impacts to the Teesmouth NNR are expected to be avoided. However, there may be indirect impacts on grey seals and harbour seals, which are an important mobile feature of the Teesmouth NNR.	Teesmouth NNR	Moderate Adverse (Significant)		
Due to its distance from the Site and lack of hydrological connectivity to the Site, impacts are expected to be avoided. Air quality impacts will be discussed in Chapter 5: Air Quality (Volume 1).	Berwick Hills LNR	Negligible (Not Significant)		
Due to their distances from the Site, impacts are expected to be avoided.	Greatham Creek North Bank Saltmarsh LWS and Greenabella Marsh LWS	Negligible (Not Significant)		Negligible (Not Significant)
Increased pollution risk from spillage of fuels/harmful chemicals that may spill directly into or migrate to surface water, which could negatively impact on species	Aquatic Macroinvertebrates Macrophytes Freshwater Fish	Major Adverse (Significant) to Moderate Adverse (Significant)		Residual effects will be determined when full ecology baseline data and further design information becomes available. This will be provided in the ES.

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
and habitat through direct and indirect degradation.				
Increased pollution risk from spillage of fuels/harmful chemicals that may spill directly into or migrate to surface water, which could negatively impact on species and habitat through direct and indirect degradation.	Benthic Habitats and Associated Communities Marine Plants and Macroalgae Marine Fish Marine Mammals	Major Adverse (Significant) to Moderate Adverse (Significant)		
Increased pollution risk from spillage of fuels/harmful chemicals that may spill directly into or migrate to surface water, which could negatively impact on species and habitat through direct and indirect degradation.	Phytoplankton	Moderate Adverse (Significant)		
Loss or physical disturbance/degradation of habitats and species due to increased operational navigation.	Benthic Habitats and Associated Communities Marine Plants and Macroalgae Marine Fish	Major Adverse (Significant) to Moderate Adverse (Significant)		
Increased pollution risk and changes to water quality (through suspension of sediment bound contaminants) associated with operational	Benthic Habitats and Associated Communities Marine Plants and Macroalgae,	Major Adverse (Significant) to Moderate Adverse (Significant)		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
navigation (resulting from wave wash disturbing sediment).	Marine Fish Marine Mammals			
Increased pollution risk and changes to water quality (through suspension of sediment bound contaminants) associated with operational navigation (resulting from wave wash disturbing sediment).	Phytoplankton	Moderate Adverse (Significant)		
Increased pollution risk from spillage of fuels/harmful chemicals that may spill directly into or migrate to surface water, which could negatively impact through direct and indirect degradation.	Benthic Habitats and Associated Communities Marine Plants and Macroalgae Marine Fish Marine Mammals	Major Adverse (Significant) to Moderate Adverse (Significant)		
Increased pollution risk from spillage of fuels/harmful chemicals that may spill directly into or migrate to surface water, which could negatively impact through direct and indirect degradation.	Phytoplankton	Moderate Adverse (Significant)		
Disturbance and changes in behaviour and/or physical damage of notable marine mammal species including harbour seals, grey seals and harbour porpoise present	Marine Mammals	Major Adverse (Significant) to Moderate Adverse (Significant)		

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
within the Tees Estuary due to changes in the underwater soundscape through increased operational navigation.				
Disturbance/avoidance behaviours in pinnipeds due to changes in the airborne noise. Notably, avoidance/disturbance to haul out or breeding locations.	Marine Mammals	Major Adverse (Significant) to Moderate Adverse (Significant)		
Vessel strikes/collisions with marine mammals within the River Tees due to increased navigation.	Marine Mammals	Major Adverse (Significant) to Moderate Adverse (Significant)		
Potential spread of INNS during operational navigation.	INNS	N/A		
Chapter 9: Water Environment and Flood Risk				
Construction Phase				
Pollution risk from disturbance of bed materials and potentially contaminated sediment.	River Tees (reference SW76 in Figure 9-9 (Volume 2))	Option 1: Minor Adverse (Not Significant) Option 2: Moderate Adverse (Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as	Moderate Adverse (Significant) to Minor Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			the design develops.	
Increased pollution risks from spillage of fuels or other harmful substances	River Tees (reference SW76 in Figure 9-9 (Volume 2))	Minor or Major Adverse (Significant)	Further measures will be identified for inclusion in the OCoCP as the design develops.	Minor Adverse (Not Significant) to Major Adverse (Significant)
Increased pollution risks from spillage of fuels or other harmful substances	North Sea / Tees Coastal Waterbody (reference SW78 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Increased pollution risks from spillage of fuels or other harmful substances	Holme Fleet (reference SW05 in Figure 9-9 (Volume 2))	Moderate Adverse (Significant)		Moderate Adverse (Significant)
Increased pollution risks from spillage of fuels or other harmful substances.	Dabholm Gut (reference SW78 in Figure 9-9 (Volume 2))	Moderate Adverse (Significant)		Moderate Adverse (Significant)
Increased pollution risks from spillage of fuels or other harmful substances.	The Fleet (reference SW81 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Increased pollution risks from spillage of fuels or other harmful substances	Ordinary watercourses and ditches located within the DCO Application	Minor (Not Significant) to Moderate Adverse (Significant)		Minor Adverse (Not Significant) to Moderate Adverse (Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Boundary Figure 9-9 (Volume 2))			
Increased pollution risks from spillage of fuels or other harmful substances	Ordinary watercourses and ditches located outside of the DCO Application Boundary Figure 9-9 (Volume 2))	Neutral (Not Significant) to Minor Adverse (Not Significant)		Neutral (Not Significant) to Minor Adverse (Not Significant)
Increased pollution risks from spillage of fuels or other harmful substances	Dorman's Pool Figure 9-9 (Volume 2))	Major Adverse (Significant)		Minor Adverse (Not Significant)
Increased pollution risks from spillage of fuels or other harmful substances	Other ponds located in designated areas including Saltholme East Pool, Saltholme West Pool and Paddy's Pool Figure 9-9 (Volume 2))	Moderate to Major Adverse (Significant)		Minor Adverse (Not Significant)
Increased pollution risks from spillage of fuels or other harmful substances	Teesmouth National Nature Reserve (reference SW01 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Increased pollution risks from spillage of fuels or other harmful substances	Licensed and Private (unlicensed/licenced) surface water abstractions	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Increased risk of pollution from sedimentation.	River Tees (reference SW76 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Increased risk of pollution from sedimentation.	North Sea / Tees Coastal Waterbody (reference SW78 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Increased risk of pollution from sedimentation.	Holme Fleet (reference SW05 in Figure 9-9 (Volume 2))	Moderate Adverse (Significant)		Moderate Adverse (Significant)
Increased risk of pollution from sedimentation.	Dabholm Gut (reference SW78 in Figure 9-9 (Volume 2))	Moderate Adverse (Significant)		Moderate Adverse (Significant)
Increased risk of pollution from sedimentation.	The Fleet (reference SW81 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Increased risk of pollution from sedimentation.	Ordinary watercourses and ditches located within the DCO Application Boundary Figure 9-9 (Volume 2)	Minor Adverse (Not Significant) to Moderate Adverse (Significant)		Minor Adverse (Not Significant) to Moderate Adverse (Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Increased risk of pollution from sedimentation.	Ordinary watercourses and ditches located outside of the DCO Application Boundary (Figure 9-9 (Volume 2))	Neutral (Not Significant) to Minor Adverse (Not Significant)		Neutral (Not Significant) to Minor Adverse (Not Significant)
Increased risk of pollution from sedimentation.	Dorman's Pool (Figure 9-9 (Volume 2))	Major Adverse (Significant)		Minor Adverse (Not Significant)
Increased risk of pollution from sedimentation.	Other ponds located in designated areas including Saltholme East Pool, Saltholme West Pool and Paddy's Pool (Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Increased risk of pollution from sedimentation.	Teesmouth National Nature Reserve (reference SW01 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Impact to watercourse quality attributes from temporary diversion, culverting or other physical modifications	Ordinary watercourses and ditches located within the DCO Application	Minor to Moderate Adverse (Not Significant)		Minor Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Boundary Figure 9-9 (Volume 2))			
Potential for damage to existing culverted watercourses that could lead to water quality impact	Holme Fleet (reference SW05 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)	Further measures will be identified for inclusion in the OCoCP as the design develops. Remedial or protective works will be undertaken as required.	Minor Adverse (Not Significant)
Potential for damage to existing culverted watercourses that could lead to water quality impact	Ordinary watercourses and ditches located within the DCO Application Boundary (Figure 9-9 (Volume 2))	Neutral to Minor Adverse (Not Significant)		Neutral to Minor Adverse (Not Significant)
Potential for damage to existing culverted watercourses that could lead to flood risk impact	Flood risk receptors: People, property and the infrastructure in the Site and surrounding area	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Increased flood risk from temporary construction works within/adjacent to the floodplain.	Flood risk receptors: People, property and the infrastructure in the Site and surrounding area	Minor Adverse (Not Significant)	Further measures will be identified for inclusion in the OCoCP as the design develops.	Minor Adverse (Not Significant)
Potential damage, obstruction or modification of existing flood defence infrastructure	Flood risk receptors: Proposed Scheme and people, property and the	Minor Adverse (Not Significant)	Further measures will be identified for inclusion in the	Minor Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	infrastructure in the Site and surrounding area		OCoCP as the design develops. A FRAP will be required for works within 16m of Environment Agency flood defence.	
Impacts to groundwater quantity (level and flow) and quality from Proposed Scheme. Potential temporary loss of water from storage and reduction in water levels (locally) within superficial deposit aquifers from construction phase activities. Increased pollution risk from spillage of fuels and other harmful substances that may migrate to local groundwater receptors.	Superficial deposit aquifers designated Secondary Undifferentiated Aquifers (Tidal Flat Deposits)	Moderate Adverse (Significant)	Further measures will be identified for inclusion in the OCoCP as the design develops.	Minor Adverse (Not Significant)
Impacts to groundwater quantity (level and flow) and quality from Proposed Scheme. Potential temporary loss of water from storage and reduction in water levels	Principal Aquifer - Sherwood Sandstone Group	Moderate Adverse (Significant)		Minor Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
<p>(locally) within Principal Aquifers and at groundwater abstractions due to groundwater control measures.</p> <p>Increased pollution risk from spillage of fuels and other harmful substances that may migrate to local groundwater receptors.</p>				
<p>Impacts to groundwater quantity (level and flow) and quality from Proposed Scheme due to groundwater control measures.</p> <p>Potential temporary loss of water from storage and reduction in water levels (locally) within the permeable layers of the Mercia Mudstone Group</p>	Secondary B Aquifer – Mercia Mudstone Group	Moderate Adverse (Significant)		Minor Adverse (Not Significant)
<p>Potential reduction in water level (locally) within Principal and Secondary aquifers due to groundwater control measures.</p>	Private (unlicensed/licenced) Groundwater Abstractions	Moderate Adverse (Significant)		Minor Adverse (Not Significant)
<p>Potential indirect impact to groundwater quantity (level and flow) and quality from Proposed Scheme. Potential</p>	GWDTE – The Tees and Cleveland Coast Ramsar / SSSI Sites	Moderate Adverse (Significant)		Minor Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
reduction in water level (locally) within Principal and Secondary aquifers due to groundwater control measures.				
Operation Phase				
Polluted surface water runoff and spillage risks containing silts, hydrocarbons or other harmful chemicals.	River Tees (reference SW76 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)	Ongoing development of proposed drainage strategy and other design / operational procedures to be agreed with Environment Agency and LLFA. Strategy not yet developed and therefore cannot be considered in assessment of residual effects.	Minor Adverse (Not Significant)
Polluted surface water runoff and spillage risks containing silts, hydrocarbons or other harmful chemicals.	North Sea / Tees Coastal Water Body (reference SW78 in Figure 9-9 (Volume 2))	Neutral (Not Significant)		Neutral (Not Significant)
Polluted surface water runoff and spillage risks containing silts, hydrocarbons or other harmful chemicals.	Holme Fleet (reference SW05 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Polluted surface water runoff and spillage risks containing silts, hydrocarbons or other harmful chemicals.	Dabholm Gut (reference SW78 in Figure 9-9 (Volume 2))	Neutral (Not Significant)		Neutral (Not Significant)
Polluted surface water runoff and spillage risks containing silts, hydrocarbons or other harmful chemicals.	The Fleet (reference SW81 in Figure 9-9 (Volume 2))	Neutral (Not Significant)		Neutral (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Polluted surface water runoff and spillage risks containing silts, hydrocarbons or other harmful chemicals.	Ordinary watercourses and ditches located within the DCO Application Boundary (Figure 9-9 (Volume 2))	Neutral to Minor Adverse (Not Significant)		Neutral to Minor Adverse (Not Significant)
Polluted surface water runoff and spillage risks containing silts, hydrocarbons or other harmful chemicals.	Ordinary watercourses and ditches located outside of the DCO Application Boundary (Figure 9-9 (Volume 2))	Neutral to Minor Adverse (Not Significant)		Neutral to Minor Adverse (Not Significant)
Polluted surface water runoff and spillage risks containing silts, hydrocarbons or other harmful chemicals.	Ponds located in designated areas including Dorman's Pool, Saltholme East Pool, Saltholme West Pool and Paddy's Pool (Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Polluted surface water runoff and spillage risks containing silts, hydrocarbons or other harmful chemicals.	Teasmouth National Nature Reserve (reference SW01 in Figure 9-9 (Volume 2))	Neutral (Not Significant)		Neutral (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Polluted surface water runoff and spillage risks containing silts, hydrocarbons or other harmful chemicals.	Licensed and Private (unlicensed/licenced) surface water abstractions	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Discharge of foul and effluent water that could cause deterioration of the receiving waterbody.	River Tees (reference SW76 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)	Ongoing development of proposed drainage strategy.	Minor Adverse (Not Significant)
Discharge of foul and effluent water that could cause deterioration of the receiving waterbody.	North Sea / Tees Coastal Water Body (reference SW78 in Figure 9-9 (Volume 2))	Neutral (Not Significant)	Strategy not yet developed and therefore cannot be considered in assessment of residual effects.	Neutral (Not Significant)
Discharge of treated industrial process effluent to the River Tees (via Bran Sands WWTP), increasing the nitrogen load discharged to the Teesmouth and Cleveland Coast SPA and Ramsar site.	Teesmouth and Cleveland Coast SPA and Ramsar site (Figure 9-1 (Volume 2))	Major Adverse (Significant)	Offsite mitigation including the purchase of nitrogen mitigation credits,	Neutral (Not Significant)
Discharge of foul and effluent water that could cause deterioration of the receiving waterbody.	Dabholm Gut (reference SW78 in Figure 9-9 (Volume 2))	Minor Adverse (Not Significant)	construction of a treatment wetland or the conversion of agricultural land	Minor Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			to a low nutrient land use.	
Impact associated with watercourse crossings, diversions or other physical modifications.	Ordinary watercourses and ditches located within the DCO Application Boundary (Figure 9-9 (Volume 2))	Minor Adverse (Not Significant) to Major Adverse (Significant)	Channels designed to maintain hydraulic form and function. Design not yet developed and therefore cannot be considered in assessment of residual effects.	Minor Adverse (Not Significant) to Major Adverse (Significant)
Increased flood risk from changes to flood flow conveyance and storage	Flood risk receptors: People, property and infrastructure in the Site and surrounding area	Moderate Adverse (Significant) to Major Adverse (Significant)	Ongoing assessment and development of appropriate flood defence and mitigation works. Measures not yet developed and therefore cannot be considered in assessment of residual effects.	Moderate Adverse (Significant) to Major Adverse (Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Increased flood risk from increased rates and volumes of surface water runoff from an increase in impermeable area	Flood risk receptors: People, property and infrastructure in the Site and surrounding area	Minor Adverse (Not Significant)	Ongoing development of proposed drainage strategy. Strategy not yet developed and therefore cannot be considered in assessment of residual effects.	Minor Adverse (Not Significant)
Flood risk from construction of the Proposed Scheme in areas identified to be at risk of flooding	Flood risk receptors: Proposed Scheme	Moderate Adverse (Significant) to Major Adverse (Significant)	Ongoing assessment and development of appropriate flood defence and mitigation works. Measures not yet developed and therefore cannot be considered in assessment of residual effects.	Moderate Adverse (Significant) to Major Adverse (Significant)
Potential for damage to existing culverted watercourses that could lead to flood risk impact	Flood risk receptors: Proposed Scheme and people, property	Minor Adverse (Not Significant)	Remedial or protective works will be	Minor Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	and the infrastructure in the Site and surrounding area		undertaken as required. Measures not yet developed and therefore cannot be considered in assessment of residual effects.	
Potential damage, obstruction or modification of existing flood defence infrastructure	Flood risk receptors: Proposed Scheme and people, property and the infrastructure in the Site and surrounding area	Minor Adverse (Not Significant)	Ongoing consideration of flood defence assets throughout design and operations. Measures not yet developed and therefore cannot be considered in assessment of residual effects.	Minor Adverse (Not Significant)
Potential for increased flood risk due to presence of groundwater flow barriers from intrusive earthworks that extend below the groundwater table forming groundwater flow barriers.	Flood risk receptors: Proposed Scheme and people, property and the infrastructure in the Site and surrounding area	Moderate Adverse (Significant)	Additional mitigation measures will be identified as the design progresses. Measures not	Minor Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			yet developed and therefore cannot be considered in assessment of residual effects.	
Groundwater quality of the superficial aquifers	Superficial deposit aquifers designated Secondary Undifferentiated Aquifers (Tidal Flat Deposits)	Moderate Adverse (Significant)	Additional mitigation measures will be identified as the design progresses in relation to groundwater quality. Measures not yet developed and therefore cannot be considered in assessment of residual effects.	Minor Adverse (Not Significant)
Groundwater quality of the principal bedrock aquifer	Principal Aquifer - Sherwood Sandstone Group	Moderate Adverse (Significant)		Minor Adverse (Not Significant)
Groundwater quality of the bedrock aquifer	Secondary B Aquifer – Mercia Mudstone Group	Minor Adverse (Not Significant)		Minor Adverse (Not Significant)
Chapter 10: Landscape and Visual Impact Assessment				
Construction Phase - Landscape				

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
NCA 23 Tees Lowlands	At the scale of the NCA construction activity will become be perceived in relation to the extensive industrial context.	Negligible Adverse (Not Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as the design develops.	Negligible Adverse (not significant). Owing to the size of the NCA together with the location of the existing extensive industrial context, it is unlikely that this will change as the design develops at ES stage unless extensive increases to the Application Boundary are made.
East Billingham to Teesmouth LCA	Introduction of construction activity will have a strong characterising influence across some parts of the LCA.	Moderate Adverse (Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as the design develops.	The assessment of residual effects will be completed as part of the ES at present they remain as per the Significance of Effect with Embedded Mitigation. It is anticipated that some significant effects will remain.
Construction Phase - Visual				
Residents in Port Clarence (Viewpoint 4)	Large scale elements associated with construction activity will be visible from some parts of the residential area.	Moderate Adverse (Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as	The assessment of residual effects will be completed as part of the ES at present they remain as per the Significance of Effect with Embedded Mitigation. It is anticipated that some significant effects will remain.

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			the design develops.	
King Charles III England Coast Path (Viewpoint 1 and 2)	Construction activity will feature prominently in the visual experience from parts of the route.	Moderate Adverse (Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as the design develops.	
Teesdale Way (Near to Viewpoints 5 and 6)	Construction activity associated with the Proposed Scheme will only be visible for short sections of the route.	Moderate Adverse (Not Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as the design develops.	
RSPB Salthome Nature Reserve (Viewpoint 3 and 8)	Views across the open landscape towards construction activity will be available from the nature Reserve.	Moderate Adverse (Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as	

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			the design develops.	
Tees Transporter Bridge (Viewpoint 5)	Upper aspects of construction activity associated with the Proposed Scheme will be visible.	Moderate Adverse (Not Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as the design develops.	
Riverside Stadium (Viewpoint 6)	Upper aspects of construction activity associated with the Proposed Scheme will be visible.	Minor Adverse (Not Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as the design develops.	
River Tees Viewpoint (Viewpoint 7)	Upper aspects of construction activity associated with the Proposed Scheme may be visible	Negligible Adverse (Not Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as	

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	through gaps in mature tree cover.		the design develops.	
Teesmouth National Nature Reserve (Viewpoint 8)	Construction activity will be perceptible but will generally be seen in the context of other larger scale industrial development.	Negligible Adverse (Not Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as the design develops.	
The A178 Seaton Carew Road (Viewpoint 2)	Views towards construction activity will be possible across the landscape for passengers and users of public transport, but will generally be seen in the context of other larger scale industrial development. Drivers are anticipated to be focussed on the road	Minor Adverse (Not Significant)	Further measures will be identified for inclusion in the OCoCP and recommended construction methodology as the design develops.	

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	and for them, construction activity will only be perceived as peripheral glimpses.			
Operation Phase - Landscape				
NCA 23 Tees Lowlands	At the scale of the NCA the Proposed Scheme will become assimilated into the extensive industrial context.	Negligible Adverse (Not Significant)	Additional landscape mitigation measures will be developed as the Proposed Scheme design is progressed.	Negligible Adverse (Not significant). Owing to the size of the NCA together with the location of the existing extensive industrial context, it is unlikely that this will change as the design develops at ES stage unless extensive increases to the Application Boundary are made.
East Billingham to Teesmouth LCA	The Proposed Scheme will have a strong characterising influence across the less developed north westerly part of the LCA.	Moderate Adverse (Not Significant)	Additional landscape mitigation measures will be developed as the Proposed Scheme design is progressed. At this stage this is anticipated to include additional	The assessment of residual effects will be completed as part of the ES at present they remain as per the Significance of Effect with Embedded Mitigation.

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			planting to the western areas of the Site.	
Operation Phase - Visual				
Residents in Port Clarence (Viewpoint 4)	The upper aspects of the Proposed Scheme including the Flare Stack will be visible from some parts of the residential area.	Moderate Adverse (Significant)	Additional landscape mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES at present they remain as per the Significance of Effect with Embedded Mitigation. It is anticipated that some significant effects will remain
King Charles III England Coast Path (Viewpoint 1 and 2)	There will be close range views of large scale industrial structures from parts of the route.	Moderate Adverse (Significant)	Additional landscape mitigation measures will be developed as the Proposed Scheme design is progressed. At this stage this is anticipated to include additional planting to the western areas of the Site.	

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Teesdale Way (Viewpoint 5 and 6)	Construction activity associated with the Proposed Scheme will only be visible for short sections of the route.	Moderate Adverse (Not Significant)	Additional landscape mitigation measures will be developed as the Proposed Scheme design is progressed.	
RSPB Salthome Nature Reserve (Viewpoint 3 and 8)	Views across the open landscape towards large scale industrial structures will be available from the nature Reserve.	Moderate Adverse (Significant)	Additional landscape mitigation measures will be developed as the Proposed Scheme design is progressed. At this stage this is anticipated to include additional planting to the western areas of the Site.	
Tees Transporter Bridge (Viewpoint 5)	Upper aspects of the Proposed Scheme including the Main	Moderate Adverse (Significant)	Additional landscape mitigation measures will	

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Flare Stack will be visible.		be developed as the Proposed Scheme design is progressed.	
Riverside Stadium (Viewpoint 6)	Upper aspects of the Proposed Scheme will be visible through gaps in intervening built development.	Minor Adverse (Not Significant)	Additional landscape mitigation measures will be developed as the Proposed Scheme design is progressed.	
River Tees Viewpoint (Viewpoint 7)	Upper aspects of the Proposed Scheme may be visible through gaps in intervening mature tree cover.	Negligible Adverse (Not Significant)	Additional landscape mitigation measures will be developed as the Proposed Scheme design is progressed.	
Teesmouth National Nature Reserve (Viewpoint 8)	The Proposed Scheme will be perceptible but will generally be perceived in relation to other industrial	Negligible Adverse (Not Significant)	Additional landscape mitigation measures will be developed as the Proposed	

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	development and will become assimilated into this context.		Scheme design is progressed.	
The A178 Seaton Carew Road (Viewpoint 2)	Views towards the Proposed Scheme will be possible across the landscape for passengers and users of public transport but will generally be seen in the context of other large scale industrial development. Drivers are anticipated to be focussed on the road and for them, the Proposed Scheme will only be perceived as perceived glimpses.	Minor Adverse (Not Significant)	Additional landscape mitigation measures will be developed as the Proposed Scheme design is progressed.	
Decommissioning Phase – Landscape				
NCA 23 Tees Lowlands	At the scale of the NCA,	Minor Beneficial (Not Significant)	Further measures will be identified for	The assessment of residual effects will be completed as part of the ES at present they

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Medium sensitivity	decommissioning activities will become be perceived in relation to the extensive industrial context.		inclusion in the ODP and recommended methodology as the design develops.	remain as per the Significance of Effect with Embedded Mitigation.
East Billingham to Teesmouth LCA Medium sensitivity	Introduction of decommissioning activity will have a strong characterising influence across some parts of the LCA.	Minor Beneficial (Not Significant)	Further measures will be identified for inclusion in the ODP and recommended methodology as the design develops.	The assessment of residual effects will be completed as part of the ES it is anticipated that some significant effect are likely to remain.
<i>Decommissioning Phase - Visual</i>				
Residents in Port Clarence (Viewpoint 4)	Large scale elements associated with decommissioning activity will be visible from some parts of the residential area.	Minor Beneficial (Not Significant)	Further measures will be identified for inclusion in the Outline Decommission Plan and recommended methodology as the design develops.	The assessment of residual effects will be completed as part of the ES at present they remain as per the Significance of Effect with Embedded Mitigation.

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
King Charles III England Coast Path (Viewpoint 1 and 2)	Decommissioning activity and increased traffic, wharf and marine movement will feature prominently in the visual experience from parts of the route.	Minor Beneficial (Not Significant)	Further measures will be identified for inclusion in the Outline Decommission Plan and recommended methodology as the design develops.	
Teesdale Way (Near Viewpoint 5 and 6)	Decommissioning activity and increased traffic, wharf and marine movement associated with the Proposed Scheme will only be visible for short sections of the route.	Minor Beneficial (Not Significant)	Further measures will be identified for inclusion in the Outline Decommission Plan and recommended methodology as the design develops.	
RSPB Salthome Nature Reserve (Viewpoint 3 and 8)	Views across the open landscape towards decommissioning activity will be	Minor Beneficial (Not Significant)	Further measures will be identified for inclusion in the Decommission Plan and recommended methodology as	

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	available from the nature Reserve.		the design develops.	
Tees Transporter Bridge (Viewpoint 5)	Upper aspects of decommissioning activity and increased traffic, wharf and marine movement associated with the Proposed Scheme will be visible.	Minor Beneficial (Not Significant)	Further measures will be identified for inclusion in the Outline Decommission Plan and recommended methodology as the design develops.	
Riverside Stadium (Viewpoint 6)	Upper aspects of decommissioning activity associated with the Proposed Scheme will be visible.	Minor Beneficial (Not Significant)	Further measures will be identified for inclusion in the Outline Decommission Plan and recommended methodology as the design develops.	
River Tees Viewpoint (Viewpoint 7)	Upper aspects of decommissioning activity and increased traffic, wharf and marine	Minor Beneficial (Not Significant)	Further measures will be identified for inclusion in the Outline Decommission	

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	movement associated with the Proposed Scheme may be visible through gaps in mature tree cover.		Plan and recommended methodology as the design develops.	
Teesmouth National Nature Reserve (Viewpoint 8)	Decommissioning activity will be perceptible but will generally be seen in the context of other larger scale industrial development.	Negligible Beneficial (Not Significant)	Further measures will be identified for inclusion in the Outline Decommission Plan and recommended methodology as the design develops.	
The A178 Seaton Carew Road (Viewpoint 2)	Views towards the decommissioning works across the landscape for passengers and users of public transport, but will generally be seen in the context of other large scale industrial development.	Minor Beneficial (Not Significant)	Further measures will be identified for inclusion in the Outline Decommission Plan and recommended methodology as the design develops.	

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Drivers are anticipated to be focussed on the road and for them, the decommissioning works will be perceived as peripheral glimpses and an increase in traffic.			
Chapter 11: Greenhouse Gases				
Construction Phase				
This assessment will be presented in the Greenhouse Gases chapter of the ES.				
Operation Phase				
This assessment will be presented in the Greenhouse Gases chapter of the ES.				
Chapter 13: Materials and Waste				
Construction Phase				
Depletion of material resources during construction.	Material resources	Slight Adverse (Not Significant)	None required	Slight Adverse (Not Significant)
Reduction in regional or national landfill void capacity during construction.	Landfill void capacity	Moderate Adverse (Significant)	The Principal Contractor to achieve not less than 90% inert and non-hazardous	Slight Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			material recovery.	
Operation Phase				
Reduction in regional or national landfill void capacity during operation.	Landfill void capacity	Moderate Adverse (Significant)	Adherence to Environmental Permit requirements for managing and handling operational waste.	Slight Adverse (Not Significant)
Reduction in regional or national landfill void capacity during decommissioning.	Landfill void capacity	Slight Adverse (Not Significant)	None required	Slight Adverse (Not Significant)
Chapter 14: Socioeconomics				
Construction Phase				
Construction employment generation	Economic receptors – the regional economy and employees	Moderate beneficial (Significant)	N/A	Moderate beneficial (Significant)
Increased demand for accommodation for temporary construction workers	Economic receptors – accommodation providers	Minor Adverse (Not Significant)	N/A	Minor Adverse (Not Significant)
Chapter 15: Population and Human Health				
Construction Phase				

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Effects on Cyclists and Horse-riders	England Coast Path (and North Tees Trail) Teesdale Way NCN Route 1 NCN Route 65	Moderate Adverse (Not Significant)	Engagement with users (via contacts at Stockton-on-Tees Borough Council and Redcar and Cleveland Borough Council) in order to understand levels and patterns of usage. Implementing clear signage informing users of the timing and duration of the planned works. Topic specific mitigation related to amenity effects on users of PRow and NCN routes.	Slight Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Effects on Terrestrial Recreation	RSPB Saltholme Nature Reserve and Dorman's Pool Nature Reserve	Moderate Adverse (Significant)	Engagement with users and the RSPB and Teesmouth Bird V (via contacts at Stockton-on Tees Borough Council) in order to understand levels and patterns of usage. Implementing clear signage informing users of the timing and duration of the planned works. Topic specific mitigation measures related to amenity effects on users of terrestrial recreation facilities as set out in relevant	Slight Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			chapters of this PEIR.	
Effects on Human Health	Local Population	Minor Adverse (Not Significant)	Ongoing engagement with the local community should be sought via an Engagement Plan.	Negligible (Not Significant)
Operation Phase				
Effects on businesses that rely on the River Tees	N+P Subcoal Production Teeside Industrial Chemicals Limited Navigator Terminals Seal Sands Limited Port of Middlesbrough ABLE Ports Heidelberg Materials Ready-mixed Concrete A&P Tees BOC Teeside Hydrogen Greenergy Biofuels Teeside	An assessment of Likely Significant Effects will be completed as part of the ES assessment.	None identified	TBC – to be assessed as part of the ES. There is the potential for Significant residual adverse effects on some of the business receptors

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
	Svitzer Marine Tarmac Cochrane's Wharf Marine Aggregates and Breedon Aggregates MP Storage and Blending Wilton Group North Tees Limited			
Effects on Terrestrial Recreation	RSPB Saltholme Nature Reserve and Dorman's Pool Nature Reserve	Slight Adverse (Not Significant)	Engagement with users and the RSPB (via contacts at Stockton-on-Tees Borough Council) in order to understand levels and patterns of usage. Implementing clear signage informing users of the timing and duration of the planned works. Topic specific mitigation	Slight Adverse (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
			measures related to amenity effects on users of terrestrial recreation facilities as set out Chapter 5: Air Quality (Volume 1); Chapter 6: Noise and Vibration (Volume 1); and Chapter 10: Landscape and Visual (Volume 1); of this PEIR.	
Effects on Human Health	Local Population	Minor Adverse (Not Significant)	Ongoing engagement with the local community should be sought via an Engagement Plan.	Negligible (Not Significant)

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Chapter 16: Traffic and Transport				
Construction/Decommissioning Phase				
Severance and Pedestrian Delay (incorporating delay to all non-motorised users)	Highway Links/PRoW (non-motorised user)	Neutral or Slight Adverse (Not Significant)	N/A	Neutral or Slight Adverse (Not Significant)
Pedestrian Amenity	Highway Links/PRoW (non-motorised user)	Neutral or Slight Adverse (Not Significant)	N/A	Neutral or Slight Adverse (Not Significant)
Fear and Intimidation	Highway Links/PRoW (non-motorised user)	Neutral or Slight Adverse (Not Significant)	N/A	Neutral or Slight Adverse (Not Significant)
Public Transport Network	Public Transport Users	The assessment will be identified and presented as part of the ES and TA		
Driver Delay	Highway Links/Junctions (motorised users)	The assessment will be identified and presented as part of the ES and TA		
Highway Safety	Highway Links/Junctions (motorised users)	The assessment will be identified and presented as part of the ES and TA		
Hazardous Loads	Highway Links/Junctions (motorised users)	The assessment will be identified and presented as part of the ES and TA		
Operation Phase				

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
Severance and Pedestrian Delay (incorporating delay to all non-motorised users)	Highway Links/PRoW (non-motorised user)	Neutral or Slight Adverse (Not Significant)	N/A	Neutral or Slight Adverse (Not Significant)
Pedestrian Amenity	Highway Links/PRoW (non-motorised user)	Neutral or Slight Adverse (Not Significant)	N/A	Neutral or Slight Adverse (Not Significant)
Fear and Intimidation	Highway Links/PRoW (non-motorised user)	Neutral or Slight Adverse (Not Significant)	N/A	Neutral or Slight Adverse (Not Significant)
Public Transport Network	Public Transport Users	The assessment will be identified and presented as part of the ES and TA.		
Driver Delay	Highway Links/Junctions (motorised users)	The assessment will be identified and presented as part of the ES and TA.		
Highway Safety	Highway Links/Junctions (motorised users)	The assessment will be identified and presented as part of the ES and TA.		
Hazardous Loads	Highway Links/Junctions (motorised users)	The assessment will be identified and presented as part of the ES and TA.		
Chapter 18: Marine Navigation				
Construction Phase				
This will be identified as part of the Navigation Risk Assessment (NRA) and presented as part of the ES.				
Operation Phase				

Description of Effect	Sensitive Receptor	Significance of Effect with Embedded Mitigation	Additional Design, Mitigation, Enhancement Measure	Residual Effect
This will be identified as part of the Navigation Risk Assessment (NRA) and presented as part of the ES.				
Chapter 19: Cumulative Effects				
<i>Construction Phase</i>				
This will be identified and presented as part of the ES.				
<i>Operation Phase</i>				
This will be identified and presented as part of the ES.				

Table 20-2: Summary of Effects for the Assessment of Climate Change Resilience

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
Chapter 12: Climate Resilience					
<i>Operation Phase</i>					
SAF Plant and components	Precipitation: Extreme precipitation events Sea level rise	Flooding of all assets resulting in loss or disruption of function and associated risks	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Deterioration of material structure and fabric	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Power outages and disruption of functioning of plant	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Precipitation: Snow/ice	Damage to above ground infrastructure due to snow and ice	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Drought	Drying out and cracking of materials which has the potential to affect structural and foundation stability.	Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Drought	Low river flows, affecting the water that is available for cooling.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Drought	Low river flows potentially leading to subsidence	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
				Proposed Scheme design is progressed.	
	Temperature: Extreme temperature events	It is anticipated that over time faults in machinery and equipment may occur (due to design life of equipment), extreme temperature events have the potential to exacerbate the occurrence of these faults.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Overheating of infrastructure, leading to greater demand for cooling.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature:	Overheating of electronic equipment	Not Significant	Additional climate risk mitigation measures will be	The assessment of residual effects will

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Extreme temperature events	resulting in potential fire risks.		developed as the Proposed Scheme design is progressed.	be completed as part of the ES.
	Temperature: Extreme temperature events	Increased temperature of cooling water and of river flows that are used for cooling, thereby reducing efficiency of this process.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Faster deterioration of materials from UV radiation (e.g., fading and brittleness.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
				design is progressed.	
	Temperature: Extreme temperature events	Potential melting and deformation of materials.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Security infrastructure and lighting may fail in heatwave conditions.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Increased pressure on thermal oxidiser.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Wind: Gales and high winds	Potential impact to stability of above-ground infrastructure.	Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Storms and lightning	Damage from wind-driven rain infiltration into building materials and surfaces.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Material degradation.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds;	Increased operational disruption.	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Storms and lightning			Proposed Scheme design is progressed.	
	Wind: Gales and high winds; Storms and lightning	Power loss.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Storms and lightning	Lightning strike can cause fire as well as power surges and shock waves which can destabilise energy systems, as well as cause damage to electronical equipment.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Relative humidity: Changes in annual average	Humidity affects both the performance of the plant and storage areas as well as the comfort of staff.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
				design is progressed.	
	Relative humidity: Changes in annual average	Increase condensation, mould growth, mildew, staining and the corrosion and decay of metal surfaces.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Relative humidity: Changes in annual average	Poor insulation performance.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
Feedstock Storage & Pre-Processing Area	Precipitation: Extreme precipitation events	Mobilisation of pollutants potentially affecting building materials and consequently the structural integrity.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Precipitation: Extreme precipitation events Sea level rise	Flooding of all assets resulting in loss or disruption of function and associated risks.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events	Power outages and disruption to functioning of machinery.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Snow/ice	Damage to above ground infrastructure due to snow and ice.	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
				Proposed Scheme design is progressed.	
	Temperature: Extreme temperature events	It is anticipated that over time faults in machinery and equipment may occur (due to design life of equipment), extreme temperature events have the potential to exacerbate the occurrence of these faults.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Faster deterioration of materials from UV radiation (e.g., fading and brittleness).	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind:	Potential impact to stability of above-	Significant	Additional climate risk mitigation measures will be	The assessment of residual effects will

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Gales and high winds	ground infrastructure.		developed as the Proposed Scheme design is progressed.	be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Material degradation.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Storms and lightning	Damage from wind-driven rain infiltration into building materials and surfaces.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Increased operational disruption.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Wind: Gales and high winds; Storms and lightning	Power loss.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Storms and lightning	Lightning strike can cause fire as well as power surges and shock waves which can destabilise energy systems, as well as cause damage to electronical equipment.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Relative humidity: Changes in annual average	Humidity affects both the performance of the plant and storage areas as well as the comfort of staff.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Relative humidity: Changes in annual average	Increase condensation, mould growth, mildew, staining and the corrosion and decay of metal surfaces.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Relative humidity: Changes in annual average	Poor insulation performance.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
Bulk Liquid Storage	Precipitation: Drought; Extreme precipitation events Sea level rise	Reduction in ground stability and hastening the deterioration of materials.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events	Mobilisation of pollutants potentially affecting building materials and	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Sea level rise	consequently the structural integrity.		Proposed Scheme design is progressed.	
	Precipitation: Extreme precipitation events Sea level rise	Flooding of all assets resulting in loss or disruption of function and associated risks.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Power outages and disruption to business continuity.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Precipitation: Snow/ice	Damage to above ground infrastructure due to snow and ice.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Drought	Drying out and cracking of materials which has the potential to affect structural and foundation stability.	Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Drought	Cracking of surfaces (during dry spells).	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Change in annual average;	It is anticipated that over time faults in machinery and equipment may	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Extreme temperature events	occur (due to design life of equipment), extreme temperature events have the potential to exacerbate the occurrence of these faults.		Proposed Scheme design is progressed.	
	Temperature: Change in annual average; Extreme temperature events	Overheating of infrastructure.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Change in annual average; Extreme temperature events	Faster deterioration of materials from UV radiation (e.g., fading and brittleness).	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature:	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be	The assessment of residual effects will

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Change in annual average; Extreme temperature events			developed as the Proposed Scheme design is progressed.	be completed as part of the ES.
	Wind: Gales and high winds	Potential impact to stability of above-ground infrastructure.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Material degradation.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Storms and lightning	Damage from wind-driven rain infiltration into building materials and surfaces.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
				design is progressed.	
	Wind: Gales and high winds; Storms and lightning	Increased operational disruption.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Relative humidity: Changes in annual average	Humidity affects both the performance of the plant and storage areas.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Relative humidity: Changes in annual average	Increase condensation, mould growth, mildew, staining and the corrosion and decay of metal surfaces.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Relative humidity: Changes in annual average	Poor insulation performance.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
Pipeline and cable connections (import and export)	Precipitation: Extreme precipitation events Sea level rise	Reduction in ground stability and hastening the deterioration of materials.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Flooding of all assets resulting in loss or disruption of function and associated risks.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Sea level rise			Proposed Scheme design is progressed.	
	Precipitation: Extreme precipitation events Sea level rise	Power outages and disruption to business continuity.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	It is anticipated that over time faults in machinery and equipment may occur (due to design life of equipment), extreme temperature events have the potential to exacerbate the occurrence of these faults.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature:	Overheating of electronic equipment	Not Significant	Additional climate risk mitigation measures will be	The assessment of residual effects will

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Extreme temperature events	resulting in potential fire risks.		developed as the Proposed Scheme design is progressed.	be completed as part of the ES.
	Temperature: Extreme temperature events	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Potential melting and deformation of materials.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds	Potential impact to stability of above-ground infrastructure.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
				design is progressed.	
	Wind: Gales and high winds; Storms and lightning	Material degradation.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Increased operational disruption.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Relative humidity: Changes in annual average	Corrosion and decay of metal surfaces.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Relative humidity: Changes in annual average	Poor insulation performance.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
Flares	Precipitation: Extreme precipitation events Sea level rise	Flooding of all assets resulting in loss or disruption of function and associated risks.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Snow/ice	Damage to above ground infrastructure due to snow and ice.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Sea level rise			Proposed Scheme design is progressed.	
	Temperature: Extreme temperature events	Faster deterioration of materials from UV radiation (e.g., fading and brittleness).	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds	Potential impact to stability of above-ground infrastructure.	Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Wind: Gales and high winds; Storms and lightning	Material degradation.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Storms and lightning	Damage from wind-driven rain infiltration into building materials and surfaces.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Increased operational disruption.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Relative humidity: Changes in annual average	Increase condensation, mould growth, mildew, staining and the	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
		corrosion and decay of metal surfaces.		Proposed Scheme design is progressed.	
	Relative humidity: Changes in annual average	Poor insulation performance.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
Hard landscaping (including pavement, parking, temporary and permanent laydown areas)	Precipitation: Extreme precipitation events Sea level rise	Flooding of all assets resulting in loss or disruption of function and associated risks.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
				design is progressed.	
	Precipitation: Drought	Cracking of surfaces (during dry spells).	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Change in annual average; Extreme temperature events	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Damage from wind-driven rain infiltration into building materials and surfaces.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
Conveying Corridors	Precipitation: Extreme precipitation events Sea level rise	Flooding of all assets resulting in loss or disruption of function and associated risks.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Power outages and disruption to business continuity.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events	Damage to above ground infrastructure due to snow and ice.	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Sea level rise			Proposed Scheme design is progressed.	
	Temperature: Extreme temperature events	It is anticipated that over time faults in machinery and equipment may occur (due to design life of equipment), extreme temperature events have the potential to exacerbate the occurrence of these faults.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Faster deterioration of materials from UV radiation (e.g., fading and brittleness).	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature:	Expansion and contraction of tracks	Not Significant	Additional climate risk mitigation measures will be	The assessment of residual effects will

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Extreme temperature events	and conveying equipment corridor.		developed as the Proposed Scheme design is progressed.	be completed as part of the ES.
	Temperature: Extreme temperature events	Potential melting and deformation of materials.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Potential impact to stability of above-ground infrastructure.	Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Damage from wind-driven rain infiltration into conveyor structure.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Wind: Gales and high winds; Storms and lightning	Increased operational disruption.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
Rail Terminal	Precipitation: Extreme precipitation events Sea level rise	Reduction in earthwork stability and hastening the deterioration of materials.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events	Mobilisation of pollutants potentially affecting building materials and consequently the structural integrity.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Sea level rise			Proposed Scheme design is progressed.	
	Precipitation: Extreme precipitation events Sea level rise	Power outages and disruption to business continuity.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Snow/ice	Damage to above ground infrastructure due to snow and ice.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Drought	Drying out and cracking of materials which has the potential to affect structural and foundation stability.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Precipitation: Drought	Cracking of surfaces (during dry spells).	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Flooding of all assets resulting in loss or disruption of function and associated risks.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Change in annual average; Extreme temperature events	It is anticipated that over time faults in machinery and equipment may occur (due to design life of equipment), extreme temperature events have the potential to exacerbate the occurrence of these faults.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Temperature: Change in annual average; Extreme temperature events	Faster deterioration of materials from UV radiation (e.g., fading and brittleness).	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Change in annual average; Extreme temperature events	Expansion and contraction of tracks. Resulting in alternative transport forms being required.	Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Change in annual average; Extreme temperature events	Potential melting and deformation of materials.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds;	Damage from wind-driven rain infiltration into building	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Storms and lightning	materials and surfaces.		Proposed Scheme design is progressed.	
	Wind: Gales and high winds; Storms and lightning	Increased operational disruption.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
Drainage	Precipitation: Extreme precipitation events Sea level rise	Drainage infrastructure overwhelmed leading to surface water flooding.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Windborne dust and debris clogging drainage systems and requiring clearing	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
Marine transport infrastructure	Precipitation: Extreme precipitation events Sea level rise	Flooding of all assets resulting in loss or disruption of function and associated risks.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events	Mobilisation of pollutants potentially affecting building materials and consequently the structural integrity.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Extreme precipitation events Sea level rise	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Precipitation: Drought	Drying out and cracking of materials which has the potential to affect	Not Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
		structural and foundation stability.		Proposed Scheme design is progressed.	
	Precipitation: Drought	Low river flows, affecting marine infrastructure and has the potential to lead to subsidence.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Deterioration of material structure and fabric.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Faster deterioration of materials from UV radiation (e.g., fading and brittleness).	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
	Temperature: Extreme temperature events	Potential melting and deformation of materials.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Wind: Gales and high winds; Storms and lightning	Marine infrastructure may be unsafe to operate in high wind speeds.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
Operational staff and maintenance staff	Precipitation: Extreme precipitation events Sea level rise	Safety risks to operational staff.	Not Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.
	Temperature: Extreme temperature events	Increase risk of fire and associated safety risks (for staff working in non-air	Significant	Additional climate risk mitigation measures will be developed as the	The assessment of residual effects will be completed as part of the ES.

Receptor	Climate variables	Potential impacts	Significance (with embedded mitigation)	Additional mitigation and enhancement measures	Residual effect
		conditioning workspaces).		Proposed Scheme design is progressed.	
	Wind: Gales and high winds; Storms and lightning	Potential safety risk should structure become weakened.	Significant	Additional climate risk mitigation measures will be developed as the Proposed Scheme design is progressed.	The assessment of residual effects will be completed as part of the ES.

Table 20-3: Summary of Effects for the Assessment of Major Accidents and Disasters

Risk Record Entry Number	MA&D Category	Risk Description	Risk Event (High Level)	Reasonable Worst Consequence if Event Did Occur
Chapter 17: Major Accidents and Disasters				
<i>Construction and Decommissioning Phase</i>				
23	Technological or Manmade Hazards: Industrial and Urban Accidents.	Striking of third party major accident hazard pipelines leading to a large scale loss of containment event.	Fire and/or explosion or release of harmful gas.	Fire and/or explosion affects neighbouring property and/or members of the public.
24	Technological or Manmade Hazards: Pollution accidents.	Striking of pipelines leading to a large scale loss of containment event.	Physical damage or contamination of aquifer or borehole.	Localised contamination of the soil.
25	Technological or Manmade Hazards: Pollution accidents.	Striking of pipelines leading to a large scale loss of containment event.	Spillage or longer term seepage of pollutants into watercourse.	Localised contamination of surface water features.
<i>Operation Phase</i>				
8	Technological or Manmade Hazards: Industrial and Urban Accidents.	Large scale release of toxic gases (carbon monoxide (CO)).	Fire and/or explosion or release of harmful gas.	CO toxicity hazard affects neighbouring properties and/or those people in the immediate area.
9	Technological or Manmade Hazards: Industrial and Urban Accidents.	Major fire initiating a major event on the adjacent COMAH installations.	Fire and/or explosion or release of harmful gas.	Fire contained within the Site with drift of airborne combustion products offsite.

Risk Record Entry Number	MA&D Category	Risk Description	Risk Event (High Level)	Reasonable Worst Consequence if Event Did Occur
10	Technological or Manmade Hazards: Pollution accidents.	Large scale release of Green Naphtha resulting from a loss of containment event involving a pipeline and/or storage tank.	Physical damage or contamination of aquifer or borehole.	Localised contamination of the soil.
11	Technological or Manmade Hazards: Pollution accidents.	Large scale release of Green Naphtha resulting from a loss of containment event involving a pipeline and/or storage tank.	Spillage or longer term seepage of pollutants into watercourse.	Localised contamination of surface water features.
12	Technological or Manmade Hazards: Pollution accidents.	Large scale release of SAF resulting from a loss of containment event involving a pipeline and/or storage tank.	Physical damage or contamination of aquifer or borehole.	Localised contamination of the soil.
13	Technological or Manmade Hazards: Pollution accidents.	Large scale release of SAF resulting from a loss of containment event involving a pipeline and/or storage tank.	Spillage or longer term seepage of pollutants into watercourse.	Localised contamination of surface water features.
14	Technological or Manmade Hazards: Pollution accidents.	Large scale release of Green Naphtha/SAF resulting from a loss of containment event involving a pipeline and/or marine vessel/rail tanker wagon.	Physical damage or contamination of aquifer or borehole.	Contamination of soil/groundwater.

Risk Record Entry Number	MA&D Category	Risk Description	Risk Event (High Level)	Reasonable Worst Consequence if Event Did Occur
15	Technological or Manmade Hazards: Pollution accidents.	Large scale release of Green Naphtha/SAF resulting from a loss of containment event involving a pipeline and/or marine vessel/rail tanker wagon.	Spillage or longer term seepage of pollutants into watercourse.	Contamination of surface water.
16	Technological or Manmade Hazards: Industrial and Urban Accidents.	Large scale release of CO ₂ resulting from a loss of containment event involving a pipeline and/or the Carbon Capture Unit.	Fire and/or explosion or release of harmful gas.	CO ₂ toxicity and fogging hazard affects neighbouring properties and/or those people in the immediate area.
18	Technological or Manmade Hazards: Industrial and Urban Accidents.	Fire at adjacent COMAH facility spreads to Proposed Scheme initiating a major event.	Fire and/or explosion or release of harmful gas.	Fire contained within the Site with drift of airborne combustion products offsite.
19	Technological or Manmade Hazards: Transport accidents.	Large scale release of Green Naphtha resulting from a loss of containment event involving the marine vessel.	Spillage or longer term seepage of pollutants into watercourse.	Contamination of surface water.
20	Technological or Manmade Hazards: Transport accidents.	Large scale release of SAF resulting from a loss of containment event involving the marine vessel.	Spillage or longer term seepage of pollutants into watercourse.	Contamination of surface water.

Risk Record Entry Number	MA&D Category	Risk Description	Risk Event (High Level)	Reasonable Worst Consequence if Event Did Occur
21	Technological or Manmade Hazards: Pollution accidents.	Large scale release of caustic soda/wastewater treatment plant (WWTP) chemicals resulting from a loss of containment event involving a storage tank/pipeline.	Physical damage or contamination of aquifer or borehole.	Localised contamination of the soil.
22	Technological or Manmade Hazards: Pollution accidents.	Large scale release of caustic soda/WWTP chemicals resulting from a loss of containment event involving a storage tank/pipeline.	Spillage or longer term seepage of pollutants into watercourse.	Localised contamination of surface water features.
28	Technological or Manmade Hazards: Industrial and Urban Accidents.	Combustion of syngas/Green Naphtha/SAF following large scale leakage/loss of containment due to damage to process equipment/storage vessel.	Fire and/or explosion or release of harmful gas.	Fire and/or explosion affects neighbouring property and/or members of the public.

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