

The Lighthouse Green Fuels Order

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Abbreviations

Abbreviation	In full
ARP	Adaptation Reporting Power
CCRA	Climate Change Risk Assessment
CHP	Combined Heat and Power
DCO	Development Consent Order
DEMP	Decommissioning Environmental Management Plan
EA	Environment Agency
EN-1	Overarching National Policy Statement for Energy
EN-3	National Policy Statement for Renewable Energy Infrastructure
EN-4	National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines
EN-5	National Policy Statement for Electrical Networks Infrastructure
ES	Environmental Statement
FRA	Flood Risk Assessment
HSE	Health, Safety and Environment
ICCI	In-Combination Climate Change Impacts
ISEP	Institute of Sustainability & Environmental Professionals
MPS	Marine Policy Statement
NAP	National Adaptation Programme
NAP3	Third National Adaptation Programme
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PPE	Personal Protective Equipment
RAM	Reliability, Availability and Maintainability
RCBC	Redcar and Cleveland Borough Council
RCP(s)	Representative Concentration Pathway(s)
SAF	Sustainable Aviation Fuel
STBC	Stockton-on-Tees Borough Council
SuDS	Sustainable Urban Drainage Systems
UKCP18	UK Climate Projections 2018

15 Climate Change Resilience

15.1 Introduction

- 15.1.1 This chapter of the Environmental Statement (ES) presents the assessment of likely significant effects arising from future climate change on the resilience of the Proposed Development during operation and decommissioning. This chapter sets out the relevant legislation, policy, standards and guidance applied to the assessment process; consultation undertaken to inform the assessment; assessment methodology; the relevant baseline conditions upon which the assessment is based; embedded mitigation considered in place before the assessment is undertaken; the likely significant effects that may arise as a result of the Proposed Development considering embedded mitigation; further mitigation proposals to reduce or remove identified likely significant effects wherever possible; likely remaining residual effects following further mitigation; and any monitoring proposals.
- 15.1.2 This assessment considers operation and decommissioning only in line with the approach agreed in **Appendix 1B: Scoping Opinion (ES Volume III, Application Document Ref. 6.3)**.
- 15.1.3 Construction is expected to take three to four years, from 2028 to 2031 (earliest operational year). The operational life for the majority of the Proposed Development will be at least 25 years (that is, operational may extend beyond the 25-year design life). Given the largely qualitative nature of the Climate Change Resilience (CCR) assessment, the adoption of a longer period for assessment beyond 25 years allows for a more conservative assessment process. While not reflecting the actual expected operational life of the Proposed Development, the adoption of climate parameters for a maximum of 50 years beyond construction represents a greater degree of change in future climate. In doing so, the assessment considers a more extreme degree of potential climate change over the study period therefore allowing for a more cautious assessment process of potential future climate hazards. On this basis a reasonable worst-case study period of 50 years beyond completion of construction is assumed, extending the time period for considering future climate projections out to 2081.
- 15.1.3.1 The scope of this Climate Change Resilience Assessment (CCRA) is set out in Table 15.1.

Table 15.1 Climate change resilience assessment scope

Aspect	Phase	Scoped in/out	Summary comments (including justification and assumptions relied upon for scoping out aspects)
Climate change resilience assessment (CCRA)	Construction	Scoped out	Climate change is not expected to be significant within the construction stage timescales and will not require additional mitigation beyond current good industry practice. This is informed by the assumption that construction will not extend beyond 2035, as noted in the Scoping Opinion.
	Operation	Scoped in	N/A
	Decommissioning	Scoped in	N/A

15.2 Legislation, planning and guidance

Overview

Table 15.2 Relevant legislation, policy and guidance

Legislation/Policy/Guidance	Description
Legislation	
The Climate Change Act 2008, [Ref 1]	The principal legislation in the UK addressing climate change. The Act establishes legally binding greenhouse gas emissions targets and carbon budgets, and sets the requirement for a national adaptation programme and associated publication of a national climate change risk assessment every five years. The Act provides the statutory framework to promote climate change mitigation and adaptation action in the UK.
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [Ref 2]	These regulations were introduced to transpose the EU's Environmental Impact Assessment Directive (2011/92/EU as amended by 2014/52/EU) into UK law for nationally significant infrastructure projects. Their main purpose is to ensure that environmental considerations are fully accounted for in the planning process for nationally significant infrastructure projects.

Legislation/Policy/Guidance	Description
Policy	
Overarching National Policy Statement for Energy (EN-1) 2025 [Ref 3]	Section 4.10.13 of the Policy Statement highlights that <i>“the Secretary of State should be satisfied that applicants for new energy infrastructure have taken into account the potential impacts of climate change using the latest UK Climate Projections and associated research and expert guidance (such as the EA’s Climate Change Allowances for Flood Risk Assessments) available at the time the ES was prepared to ensure they have identified appropriate mitigation or adaptation measures. This should cover the estimated lifetime of the new infrastructure, including any decommissioning period.”</i>
National Policy Statement for Renewable Energy Infrastructure (EN-3) 2025 [Ref 4]	EN-3 requires that CCR be addressed as part of the Environmental Statement (ES) accompanying any application. Applicants must assess the resilience of the project to climate change over its lifetime, considering risks such as: • rising sea levels and storm surge; • increased flooding; • higher temperatures; and • increased drought risk affecting water resources.
National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) 2024 [Ref 5]	EN-4 sets out that the transmission of gas remains crucial to meeting our energy needs during the transition to a net zero economy, enabling secure, reliable and affordable supplies of energy as we develop the means to address the carbon dioxide and other greenhouse gases associated with their use, including the development of low carbon alternatives. Part 2 of EN-4 covers the general assessment and technology-specific information including factors influencing site selection and design and climate change adaptation.
National Policy Statement for Electrical Networks Infrastructure (EN-5) 2025 [Ref 6]	EN-5 recognises <i>“The security and reliability of the UK’s current and future energy supply is highly dependent on having an electricity network which will enable the new electricity generation, storage, and interconnection infrastructure that our country needs to meet the rapid increase in electricity demand required to transition to Clean Power by 2030 and net zero, while maintaining energy security.”</i>
UK Marine Policy Statement (MPS) 2011 [Ref 7]	The UK MPS provides a strategic framework for marine planning across the UK. Its primary aim is to support the sustainable development of the UK marine area by balancing environmental protection with economic and social needs. It guides the preparation of Marine Plans and informs decisions on marine activities such as energy production, shipping, and coastal development.

Legislation/Policy/Guidance	Description
North East Inshore and North East Offshore Marine Plan 2021 [Ref 8]	This document sets out a strategic framework for managing the sustainable use, protection, and development of the marine environment in the North East Inshore and Offshore areas of England. It outlines environmental priorities and constraints that must be considered during project planning and assessment of coastal developments.
Climate Change Adaptation: Policy Information [Ref 9]	This policy paper states that: “ <i>Preparing for a changing climate, or climate adaptation, will help the UK to reduce negative consequences of climate change and take advantage of new opportunities</i> ” and provides an overview of how the UK is preparing for climate change. This includes commitments to understanding the risks through the UK Climate Change Risk Assessment, preparing for climate change through the National Adaptation Programme, adapting services and infrastructure under the Adaptation Reporting Power (ARP).
National Planning Policy Framework (NPPF) 2024 [Ref 10]	Presents the Government’s planning policies for England. Guidance relating to ways to minimise vulnerability and improve resilience to climate change impacts is mainly set out in Section 14: Meeting the Challenge of Climate Change, Flooding and Coastal Change.
The Third National Adaptation Programme (NAP3) and the Fourth Strategy for Climate Adaptation Reporting (2023 – 2028) [Ref 11]	The National Adaptation Programme (NAP) sets the actions that government and others will take to adapt to the challenges of climate change in the UK. It sets out key actions for the next five years, including protecting and adapting local businesses, infrastructure and the natural environment in the face of changing climate.
Stockton-on-Tees Borough Council (STBC) Environmental Sustainability and Carbon Reduction Strategy 2022-2032 [Ref 12]	The Strategy (2022-2032) sets out the Local Authority’s strategy for achieving net zero emissions by 2032 and adapting to climate change. The Strategy outlines four strategic aims, of which Aim 4 is <i>Adapt to the impacts of climate change</i> .
Stockton-on-Tees Borough Council Local Plan 2019 [Ref 13]	This Local Plan promotes development that is resilient to climate-related risks such as flooding and extreme weather events.
Redcar and Cleveland Borough Council (RCBC) Local Plan 2018 [Ref 14]	This Local Plan includes policies and strategic objectives that directly address environmental sustainability and adaptation. It promotes the use of low-carbon technologies, encourages efficient use of natural resources, and highlights the need to adapt to increased flood risk.
Guidance	
National Planning Practice Guidance (NPPG): Climate Change 2019 [Ref 15]	Explains the processes and tools that can be used through the planning system in England to address the impacts of climate change. The Guidance on Climate Change advises how to identify suitable mitigation and adaptation measures in the planning process.

Legislation/Policy/Guidance	Description
Institute of Sustainability & Environmental Professionals (ISEP) EIA Guide to: Climate Change Resilience and Adaptation 2020 [Ref 16]	ISEP, formerly the Institute of Environmental Management and Assessment (IEMA) and hereafter referred to as 'the ISEP Guidance'. This guide provides a framework for the effective consideration of CCR and adaptation in the EIA process. This guide has been used within the assessment approach.
ISO 14091:2021 Adaptation to climate change – Guidelines on vulnerability, impacts and risk assessment [Ref 17]	This international standard provides guidelines on approaches to assess climate change-related risks. It highlights the role of risk assessments in improving climate change adaptation planning and informing climate change adaptation activities from their implementation through to monitoring.

15.3 Assessment methodology and significance criteria

Consultation

15.3.1 Table 15.3 presents the CCR comments received from the Planning Inspectorate as part of the Scoping Opinion.

Table 15.3 Scoping Opinion and responses

ID	Description	Inspectorate's comments	Response
3.9.3	Development lifespan	The Scoping Report proposes an anticipated lifespan of a minimum of 30 years for the purposes of the CCR assessment. Given that the operational lifespan of installations is often extended beyond the intended lifespan at the time of construction, the applicant should consider whether a more realistic lifespan should be considered and assessed (to 50 or 75 years in the context of CCR).	It has been assumed that the Proposed Development will have a maximum 50-year operational life followed by a one- or two-year decommissioning period. Refer to Paragraph 15.3.7.
3.9.4	Sea level rise projections	It is unclear what climate change uplifts are being proposed to be assessed. The ES (and FRA) must state the proposed climate change allowance and epoch to be used to assess flood risk. Agreement should be reached with the EA and this should be evidenced in the ES.	The FRA states the climate change allowances and epochs considered (refer to Flood Risk Assessment (Application Document Ref. 5.7)).
3.9.5	Coastal squeeze, shoreline management and erosion	The assessment of sea level rise and storm surge effects should have regard for the potential for coastal erosion and coastal squeeze to impact the proposed development.	This is considered in Chapter 12: Water Environment (ES Volume I, Application Document Ref. 6.1) .
3.9.6	Nature-based solutions	The design of mitigation and enhancement measures should consider nature-based solutions to climate resilience (such as providing green infrastructure on-site).	Nature-based solutions to climate resilience are considered within the design.

15.3.2 Table 15.4 outlines the comments received from statutory consultees following submission of the PEIR.

Table 15.4 Responses from statutory consultees following PEIR submissions

Consultee	Comment	Response
Environment Agency (EA)	Chapter 15: Climate Resilience - with regards to extreme heat and Table 8-1 (CCRA summary), this table should include, under description of impacts, safety risks to human receptors and how this will be mitigated.	Noted. The risks associated with construction of the project are not considered potentially significant given the timescales over which construction will take place (aligning with the rationale that the construction phase is scoped out of the assessment). Heat risks to human health are not considered likely during the operational phase due to the nature of operations being carried out under a wider health and safety regime, as set out in Paragraph 15.6.4. Potential heat stress risks during the decommissioning phase are considered unlikely due to wider health and safety regimes, as set out in Paragraph 15.6.11.

15.3.3 There were no additional responses relevant to CCR following consultation.

Study area

15.3.4 In the context of CCRA, the receptor being assessed is the Proposed Development itself. The scope for the CCRA relates to the impact of climate change on the Proposed Development (rather than the impact of the Proposed Development on the climate). As such, the physical boundary for this assessment is defined as the Proposed Development, as per **Figure 1.1: Site Location Plan** and **Figure 1.2: Proposed Development Boundary (ES Volume II, Application Document Ref. 6.2)**, and covers all new or updated assets and infrastructure within this area.

15.3.5 In the context of a CCRA, all elements of the Proposed Development are located in relatively close proximity to each other. Therefore, the same baseline conditions and future baseline (projections) apply for all Proposed Development elements.

15.3.6 The scope of this assessment includes the operational and decommissioning phases of the Proposed Development. Construction is expected to take three

to four years, from 2028 to 2031. Climate change is not expected to be so significant within the construction programme timescales as to require additional mitigation beyond current good industry practice.

- 15.3.7 For the purpose of the CCRA, on a reasonable worst-case basis it has been assumed that the Proposed Development will have a maximum 50-year operational life followed by a one- to two-year decommissioning period. Therefore, this risk assessment provides an assessment up to the year 2081.

Sensitive receptors

- 15.3.8 Elements of the Proposed Development, as per **Figure 1.1: Site Location** and **Figure 1.2: Proposed Development Boundary (ES Volume II, Application Document Ref. 6.2)**, are identified as receptors for the CCRA. This includes proposed infrastructure, assets (equipment, materials) and human health receptors (including workers within the Proposed Development during operation and decommissioning).

- 15.3.9 For the purpose of this assessment, the individual receptors comprising the Proposed Development were grouped into the following categories:

- built assets – these include the Sustainable Aviation Fuel (SAF) Production Facility and its components, feedstock handling and storage and pre-processing area, bulk liquid storage, flares, back-up generators, and sustainably-sourced biomass feedstock and waste wood fuelled Combined Heat and Power (CHP) plant (in line with the requirements of the SAF Mandate);
- infrastructure – these include pipeline infrastructure and utility connections (both import and export), hard landscaping (including pavement, car parking, temporary and permanent laydown areas), conveyors, drainage, and marine transport infrastructure;
- SAF production process - this is treated as a distinct receptor from the SAF Production Facility and its physical components, as disruption to production can arise from impacts other than those on physical equipment; and
- human receptors – including operational, maintenance and decommissioning staff.

Data sources

- 15.3.10 The following desktop sources have been used to inform the existing and future baseline conditions of the study area:

- HadUK weather data: HadUK-Grid is a collection of gridded climate variables derived from the network of UK land surface observations [Ref 18];
- UKCP18 National Climate Change Projections: These projections set out a range of possible climate scenarios for the UK until 2100 based on the latest scientific findings [Ref 19]; and
- UKCP18 Sea level anomalies for marine projections around the UK coastline [Ref 20], 2007-2100.

15.3.11 Climate projections consider uncertainty due to natural variability and an incomplete understanding of the climate system and its imperfect representation in models. The projections do this by giving the probabilities of a range of possible outcomes.

15.3.12 Met Office UK Climate Projections 2018 (UKCP18) are the most recent and comprehensive climate change projections for the UK. In addition to projections for future climate they also contain a comprehensive set of observed historical climate observations.

Assumptions and limitations

15.3.13 It is assumed that the data, information, and sources obtained from all organisations, institutions, bodies, or individuals are accurate at the time of their acquisition and/or consultation. It is assumed that where information has been obtained from respected open-source repositories, these sources were accurate at the time of writing and all citations, copyright, and distribution requirements are correct and clearly communicated.

15.3.14 The limitations and assumptions for using the proposed methodology are:

- as noted within the ISEP (2020) guidance [Ref 16], the assessment method is largely qualitative, particularly the process of scoring risks;
- there is limited methodological guidance on the assessment of individual risks and their impact;
- there is inherent uncertainty in climate change projections. The quantitative data used in this study was obtained from UKCP18 [Ref 19], the latest set of probabilistic projections for the UK; and
- there is often uncertainty in the relationship between changes in climate hazards and the respective response in terms of asset performance and/or condition.

Significance criteria

- 15.3.15 The significance of the climate risks identified in the CCRA is determined as a combination of the likelihood of a hazard having an impact on the Proposed Development, and the consequence of the impact occurring.
- 15.3.16 Likelihood and consequence are assessed on a qualitative four-point scale based on professional judgement in line with the ISEP (2020) guidance [Ref 16]. Likelihood scores and definitions used in this assessment are provided in Table 15.5.

Table 15.5 Qualitative scale of likelihood of hazard impact

Score	Likelihood definition
High	Occurs many times during the lifetime of the Proposed Development (e.g. seasonally or lasts many years/indefinitely).
Medium	Occurs more than once during the lifetime of the Proposed Development or lasts several months/one year.
Low	Occurs once during the lifetime of the Proposed Development or lasts several weeks.
Negligible	Unlikely to occur during the design life or only lasts for a few days.

- 15.3.17 Table 15.6 sets out the scores and definitions for assessing consequences of hazard impact.

Table 15.6 Qualitative scale of consequence of hazard impact

Score	Consequence definition
High	Very large safety risk; and/or Very large financial loss; and/or Major breach in compliance and prosecution.
Medium	Large safety risks; and/or Large financial loss; and/or Expected to cause non-compliance.
Low	Moderate safety risks; and/or Small financial loss; and/or Might cause non-compliance.
Negligible	Very small or no safety risks; and/or Small financial loss.

15.3.18 ISEP guidance [Ref 16] states that professional judgement should be used to determine whether an effect is significant. Where a risk is identified as major or major/moderate, this has been deemed to be significant. The resulting significance matrix is set out in Table 15.7.

Table 15.7 Significance scoring matrix

		Consequence			
		High	Medium	Low	Negligible
Likelihood	High	Major (S)	Major/Moderate (S)	Moderate/Minor (NS)	Minor/Negligible (NS)
	Medium	Major/Moderate (S)	Moderate (S)	Minor (NS)	Negligible (NS)
	Low	Moderate (S)	Minor (NS)	Minor (NS)	Negligible (NS)
	Negligible	Minor/Negligible (NS)	Negligible (NS)	Negligible (NS)	Negligible (NS)
S = Significant NS = Not Significant					

15.4 Baseline conditions

Current and future baseline

15.4.1 Information regarding historical climate conditions for the Proposed Development was obtained from HadUK observation data. HadUK data includes various climate metrics which mirror projection data to provide context for the future baseline. Historical climate conditions are provided within the 'Baseline Observation (1980-2010)' column of Table 15.8.

- 15.4.2 The future climate is presented for the 30-year periods (following the World Meteorological Organisation definition of climate [Ref 21]) covering the years from 2010 to 2080 to identify the anticipated climate conditions. These projections are provided against the average of the baseline period of 1981-2010 (based on model data), and 1991 to 2020 (current climate) as an indication of change from the baseline period.
- 15.4.3 The probabilistic projections in the UKCP18 dataset provide local low, central and high changes, corresponding to various percentile levels (e.g. 10th, 50th and 90th percentile). There are several Representative Concentration Pathways (RCPs) available for UKCP18 with each pathway representing a different climate scenario resulting in a different range of global mean temperature increases over the 21st century.
- 15.4.4 UKCP18 Probabilistic Climate Projections data for Representative Concentration Pathway (RCP) 8.5 was used to describe the future baseline [Ref 19]. The use of RCP 8.5 as a future baseline, which represents a high emissions and high impact future scenario, is in line with ISEP (2020) guidance recommendations to adopt a conservative approach establishing realistic changes to future climatic conditions.
- 15.4.5 Table 15.8 contains both the historical baseline information and the future climate change projections for multiple climate metrics.

Table 15.8 Baseline and projection data for climate metrics. All projections data was taken for RCP 8.5 for pre-defined 30-year periods, using the 50th percentile value.¹

Metric	Unit	Baseline observation (1980 to 2010)	Future climate (RCP8.5)				
			2010 to 2040	2020 to 2050	2030 to 2060	2040 to 2070	2050 to 2080
Average summer temperature	°C	15.62	+1.51	+1.98	+2.53	+3.18	+4.03
Average winter temperature	°C	4.57	+0.81	+1.25	+1.61	+2.24	+2.66
Average daily maximum temperature in Summer	°C	19.96	+1.64	+2.21	+2.85	+3.57	+4.55
Average daily minimum	°C	1.57	+0.98	+1.46	+1.78	+2.34	+2.79

¹ This data has been updated following PEIR. Changes to values following PEIR are due to the use of 30-year periods, as per WMO, and updates to data.

Metric	Unit	Baseline observation (1980 to 2010)	Future climate (RCP8.5)				
			2010 to 2040	2020 to 2050	2030 to 2060	2040 to 2070	2050 to 2080
temperature in winter							
Number of frost days (night temperature <0°C)	Number per year	38.13	-15.15	-21.58	-26.15	-30.67	-34.67
Number of hot days (daily maximum temperature >25°C)	Number per year	7.13	+4.82	+7.27	+12.02	+18.42	+26.92
Average summer precipitation	mm/day (% difference)	1.91	-1%	-5%	-8%	-12%	-24%
Average winter precipitation	mm/day (% difference)	1.50	-5%	-2%	1%	3%	8%

15.4.6 Table 15.9 presents the projections for 'weather extremes' in the future climate, under RCP8.5 at the 50th percentile.

Table 15.9 Baseline and projection data for weather extreme metrics. All projections data was taken for RCP 8.5 for pre-defined 30-year periods, using the 50th percentile value.

Metric	Unit	Baseline observation (1980 to 2010)	Future climate (RCP8.5)				
			2010 to 2040	2020 to 2050	2030 to 2060	2040 to 2070	2050 to 2080
Dry spells (10 days or more with no precipitation)	Number per year	2.7	0.0	+0.1	+0.2	+0.3	+0.5
Heavy rainfall - annual number of days with >20mm rainfall	Number per year	2.3	-0.3	-0.3	-0.1	-0.1	-0.2
Average annual wettest day (RX1DAY)	mm	29.3	+0.5	+1.2	+0.5	+0.8	+2.2
Average number of heatwaves per year (three days above 25°C)	Number per year	0.8	+0.5	+0.9	+1.5	+2.5	+3.5

15.4.7 The Proposed Development is located alongside the tidal River Tees, which flows into the nearby North Sea. Therefore, it is potentially exposed to future

sea level rise. Sea level projections at the closest marine projections data point, immediately east of the Proposed Development, range from 0.12m in the 2030s to 0.74m in the 2080s. Table 15.10 presents the projected sea level rise for 20-year periods from 2020 to 2080 using UKCP18 marine projections data for RCP8.5 [Ref 20].

Table 15.10 Sea level rise projections in metres presented as 50th percentile (10th percentile to 90th percentile in brackets) for RCP8.5

Metric	2020 to 2040	2030 to 2050	2040 to 2060	2050 to 2070	2060 to 2080
Sea level anomaly (m) from 1981 to 2000 baseline	+0.14 (+0.10 to +0.18)	+0.20 (+0.15 to +0.25)	+0.26 (+0.19 to +0.34)	+0.33 (+0.25 to +0.44)	+0.42 (+0.30 to +0.55)

15.4.8 Overall, the results suggest that the following future weather hazards are likely to be applicable to the Proposed Development:

- warmer winters: during both operation and decommissioning, as Table 15.8 shows, both the Winter average and average daily minimum temperatures are increasing;
- wetter winters and drier summers: the data suggests that mean summer precipitation is projected to decrease by up to 24% by the 2050-2080 period while mean Winter precipitation is projected to increase by up to 8%; and
- hotter summers and increases in extreme heat: the average summer temperatures are projected to increase from 15.6°C to 19.7°C, as is the number of heatwaves per year – from 0.8 heatwaves per year in the baseline period to 3.48 heatwaves per year in the period 2050-2080.

15.4.9 The latest Met Office information about future changes to other variables suggests the following trends:

- storms – there are no compelling trends in changes to storminess, as determined by maximum gust speeds, from the UK wind network over the last four decades. However, from 2050 onwards, increases in the frequency of winter storms are expected over the UK with deeper and more intense storms [Ref 22];
- wind – from 2050 onwards, there is an increase in near surface wind speeds over the UK winter season. Surface wind speeds increase more over western parts of the UK and over the ocean in winter and decrease across the UK in summer [Ref 23]; and

- lightning – there is likely to be an increase in lightning frequency over the UK in summer and spring, with a decrease in autumn. In winter, future decreases in lightning are seen over the sea to the north and west of the UK, where high flash rates are currently seen [Ref 22].

15.5 Mitigation and enhancement measures

Embedded mitigation

Operation

- 15.5.1 Embedded measures are modifications to the design of a scheme, made during the pre-application phase, that are an inherent part of the design and do not require additional action to be taken. Measures for the Proposed Development relevant to CCRA are presented in Table 15.11.

Table 15.11 Embedded mitigation measures relevant to CCRA

Climate hazard	Embedded mitigation measure
All hazards	The design will be in accordance with the UK Building Regulations and BS EN codes. Where no BS EN code exists, the Eurocodes and ISO standards will be adopted (temperature, wind/storms, snow load). Structures have been designed to accommodate an increase in extreme wind and storm events, including ensuring emergency access routes to critical parts of the infrastructure, even in the event of flooding. The plant will be subject to a global conformity assessment by a third party to demonstrate the components meet the requirements of applicable design, manufacture and conformity Directives and Regulations. The Proposed Development design has considered Reliability, Availability and Maintainability (RAM) studies to ensure critical equipment has a back-up system in the event of maintenance or equipment failure, including during extreme weather events. A site-wide maintenance system will be in operation at the Proposed Development which will incorporate regulatory and equipment manufacturers' inspection and maintenance requirements. The Proposed Development will be subject to a defined maintenance regime in accordance with equipment manufacturers requirements. This will contribute to resilience of physical assets to extreme weather events. The design will account for potential risks associated with ground movement after prolonged periods of dry weather. Critical inventory (through adequate silo capacity) and contingency logistics plans will be maintained in case of supply chain disruption.
Heavy precipitation and flooding	The finished floor level of the development and drainage design has been informed by the Flood Risk Assessment (FRA). The FRA assesses flood risk from all sources of flooding and identifies appropriate mitigation measures. Consultation was undertaken with the EA during the assessment. This includes seeking agreement of the appropriate climate change allowances most applicable to the Proposed Development.

Climate hazard	Embedded mitigation measure
	Drainage across the Proposed Development will be designed to minimise water retained within the Proposed Development, thereby reducing surface-water flood risk. Sensitive electrical equipment will be housed in areas appropriately shielded from precipitation and flooding, for example, by elevating critical infrastructure above flood level. An appropriate surface water drainage system, taking into account future climate projections, will be implemented that will incorporate appropriate pollution control and maintenance measures to mitigate the risk of pollution during operation. Hydraulic modelling has been undertaken as part of the FRA to inform the design of appropriate mitigation and ensure no unacceptable flood risk to the Proposed Development. Nature-based solutions and Sustainable Drainage Systems (SuDS) will be incorporated within the design where practicable. The storage facilities will be covered for inclement weather protection, or alternatively, constructed within a dedicated building. Alternatively, storage will be provided by enclosed silos. Exposed machinery will be Ingress Protection Rated (IP-rated) and installed on plinths or raised foundations. Conveying equipment will be elevated and enclosed, reducing impacts of potential flooding.
Storms and high winds	The Proposed Development will have its own CHP plant installed to provide power which will reduce national or district electricity grid reliance. The flare design will mitigate the potential for flame blowout due to wind or rain and will include facilities for automatic re-ignition. Lightning protection systems and surge protection for electrical systems will be installed to mitigate the risk of lightning strikes damaging the Proposed Development. Emergency systems, including flare, will be designed for a total loss of electrical power.
Extreme heat	Design upper temperature thresholds will account for projected ambient temperature increases, recognising that the structures will also be designed to withstand the greater heat of the SAF production operation and electricity and steam production. Major electrical substations or cabins will be ventilated to manage overheating. The conveying equipment will include belt tensioners to accommodate thermal variation and support steelwork will be designed to allow for thermal expansion. Pneumatic and piping systems will incorporate expansion bellows or stress loops to accommodate thermal stress.
Sea level rise	The design will account for projected sea level rise, including where necessary material selection and corrosion control and allowance (for example, installation of saltwater barriers).

Decommissioning

- 15.5.2 The **draft DCO (Application Document Ref. 3.1)** includes a requirement that provides for the submission and approval of a Decommissioning Environmental Management Plan (DEMP) prior to the decommissioning of the relevant part of the Proposed Development. The DEMP will consider measures to reduce the risk of weather and climate change impacts during the decommissioning phase. Measures will be developed for inclusion in the DEMP to support preparedness for, and responses to, weather and climate change impacts during the decommissioning phase.
- 15.5.3 It is also assumed that good industry practice in health and safety and decommissioning techniques will have evolved with regard to climate risks as these risks have emerged and become more generally recognised.

15.6 Likely impact and effects of the Proposed Development**Overview**

- 15.6.1 This section presents the results of the assessment of likely significant effects with the embedded and good industry practice mitigation measures, described in the previous section. Table 15.12 presents the full assessment.

Risk assessment results

Table 15.12 Climate change resilience assessment results

Risk ID	Receptor	Climate hazard	Risk narrative	Likelihood score	Consequence score	Significance conclusion	Residual effects (post-mitigation reassessment)
1	All receptors	Extreme heat	Deterioration of material structure and fabric. Potential melting and deformation of materials. Security infrastructure and lighting may fail in heatwave conditions.	Negligible	Low	Negligible adverse (NS)	Not applicable
2		Storms and high winds	Increased operational disruption. Potential power loss unlikely due to on-site powerplant. Potential disruption to marine infrastructure supporting feedstock deliveries and product export. Short-term disruption mitigated by storage of one to two months' supply of feedstock and export storage designed to mitigate potential impacts of shipping disruption.	Medium	Low	Minor adverse (NS)	Not applicable
3		Storms and high winds	Potential material damage/degradation from flying debris, increased weathering, exposure to sea spray, expected to be mitigated through design.	Low	Low	Minor adverse (NS)	Not applicable
4		Heavy precipitation and flooding	Deterioration of material structure and fabric expected to be mitigated through design.	Low	Medium	Minor adverse (NS)	Not applicable
5			Reduction in ground stability and hastening the deterioration of materials.	Low	Low	Minor adverse (NS)	Not applicable
6		Heavy precipitation and flooding	Flooding of any assets resulting in loss or disruption of function and associated risks.	Low	Medium	Minor adverse (NS)	Not applicable
7		Drought	Reduction in ground stability and hastening the deterioration of materials.	Negligible	Low	Negligible (NS)	Not applicable
8			Low availability of process water and cooling water during drought potentially leading to temporary plant shutdown.	Medium	Low	Minor adverse (NS)	Not applicable
9		Sea level rise	Flooding of all assets resulting in loss or disruption of function and associated risks. Reduction in ground stability. Disruption to business continuity. Deterioration of material structure and fabric expected to be mitigated through design. Safety risk to operational staff.	Low	Medium	Minor adverse (NS)	Not applicable
10	Built assets	Extreme heat	No risk to built assets related to extreme heat identified.	Not applicable	Not applicable	Not applicable	Not applicable
11		Storms and high winds	Damage from wind-driven rain infiltration into building materials and surfaces.	Low	Low	Minor adverse (NS)	Not applicable
12			Potential impact to stability of above-ground infrastructure.	Low	Medium	Minor adverse (NS)	Not applicable
13		Heavy precipitation and flooding	Mobilisation of pollutants during extreme precipitation events.	Low	Medium	Minor adverse (NS)	Not applicable
14			Flooding could damage buildings and building materials. This could also lead to reduced structural integrity.	Low	Medium	Minor adverse (NS)	Not applicable
15		Drought	Drying out and cracking of materials which has the potential to affect structural and foundation stability.	Low	Medium	Minor adverse (NS)	Not applicable
16	Infrastructure	Extreme heat	Overheating of infrastructure, leading to greater demand for cooling. Deterioration of material structure and fabric expected to be mitigated through design. Potential deformation or deterioration of materials expected to be mitigated through design and material selection. Security infrastructure and lighting may fail in heatwave conditions. This is mitigated by selecting equipment suitable for future environmental conditions.	Medium	Low	Minor adverse (NS)	Not applicable

Risk ID	Receptor	Climate hazard	Risk narrative	Likelihood score	Consequence score	Significance conclusion	Residual effects (post-mitigation reassessment)
17			It is anticipated that over time faults in machinery and equipment (pipelines and cable connections, conveying corridors) may occur (due to design life of equipment). Extreme temperature events have the potential to exacerbate the occurrence of these faults. This will be monitored through regular inspection of equipment and planned preventative maintenance.	Medium	Low	Minor adverse (NS)	Not applicable
18		Storms and high winds	Material degradation expected to be mitigated through design. Increased operational disruption. Damage from wind-driven rain infiltration and sea spray into conveying equipment structures. Windborne dust and debris clogging drainage systems and requiring clearing.	Medium	Low	Minor adverse (NS)	Not applicable
19			Potential impact to stability of above-ground infrastructure.	Low	Medium	Minor adverse (NS)	Not applicable
20		Heavy precipitation and flooding	Mobilisation of pollutants during extreme precipitation events.	Low	Medium	Minor adverse (NS)	Not applicable
21			Flooding could damage infrastructure materials. This could also lead to reduced structural integrity.	Low	Medium	Minor adverse (NS)	Not applicable
22			Drainage infrastructure overwhelmed leading to surface water flooding.	Low	Medium	Minor adverse (NS)	Not applicable
23		Drought	Drying out and cracking of materials which has the potential to affect structural and foundation stability.	Negligible	Medium	Negligible adverse (NS)	Not applicable
24	SAF production process and equipment	Extreme heat	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 increase the occurrence of these faults.	Medium	Low	Minor adverse (NS)	Not applicable
25			Overheating of electronic equipment resulting in potential fire risks. Key control equipment will be housed in buildings with HVAC, and equipment will be specified for the conditions.	Low	Low	Minor adverse (NS)	Not applicable
26			Overheating of equipment, leading to greater demand for cooling. Increased temperature of cooling water thereby reducing efficiency of this process.	Medium	Negligible	Negligible adverse (NS)	Not applicable
27		Storms and high winds	Deterioration of material structure and fabric expected to be mitigated through design.	Medium	Low	Minor adverse (NS)	Not applicable
28			Lightning strike can cause fire as well as power surges and shock waves which can destabilise energy systems, as well as cause damage to electronic equipment. This is mitigated by the application of lightning protection to key systems and tall structures.	Negligible	Medium	Negligible adverse (NS)	Not applicable
29			Potential impact to stability of above ground infrastructure.	Low	Medium	Minor adverse (NS)	Not applicable
30		Heavy precipitation and flooding	Flooding of all assets resulting in loss or disruption of function and associated risks. Deterioration of material structure and fabric expected to be mitigated through design. Disruption of site access due to flooding of roads.	Medium	Low	Minor adverse (NS)	Not applicable
31			Power outages and disruption of functioning of plant and pre-processing machinery during extreme precipitation events.	Low	Medium	Minor adverse (NS)	Not applicable
32		Drought	Low availability of process water and cooling water during drought potentially leading to temporary plant shutdown.	Negligible	Medium	Negligible adverse (NS)	Not applicable
33			Drying out and cracking of materials which has the potential to affect structural and foundation stability.	Low	Medium	Minor adverse (NS)	Not applicable
34	Human health receptors	Extreme heat	Increased risk of fire; heat-associated safety risks (for staff in workspaces without air conditioning).	Low	Medium	Minor adverse (NS)	Not applicable

Risk ID	Receptor	Climate hazard	Risk narrative	Likelihood score	Consequence score	Significance conclusion	Residual effects (post-mitigation reassessment)
35		Storms and high winds	Potential safety risk to staff exposed to storm or high-wind conditions; or should structures become weakened.	Low	Medium	Minor adverse (NS)	Not applicable
36		Heavy precipitation and flooding	Safety risks to operational staff.	Medium	Low	Minor adverse (NS)	Not applicable
37		Drought	No risk to human health receptors related to drought identified.	Not applicable	Not applicable	Not applicable	Not applicable

Operational impacts

- 15.6.2 As discussed in Section 15.3, for the purpose of the CCRA, as a worst-case it has been assumed that the Proposed Development will have a maximum 50-year operational life followed by a one- to two-year decommissioning period. Therefore, this risk assessment provides an assessment up to the year 2081.
- 15.6.3 As shown in Table 15.12, the likelihood and consequence scores of climate change hazards and risks range from **negligible** to **medium**. The significance conclusions of the CCR risks identified in this assessment do not exceed **minor adverse (NS) (not significant)** once embedded mitigation has been considered.
- 15.6.4 During the operational phase, there is the potential for adverse weather conditions to impact the Proposed Development, if risks are not appropriately mitigated. Extreme heat is projected to become more frequent which has the potential to exacerbate deterioration of material structures and fabric. However, comparable industrial plant has been developed and operated in the Middle East for many years and the plant has been designed to withstand much greater heat stresses during the SAF production operation, and electricity and steam production, than seen in these geographies. Beyond the impact on the Proposed Development itself, there is a risk of heat-related illness to staff and workers within the Proposed Development. This risk can be mitigated via health and safety procedures and the provision of suitable shading and, where necessary, air-conditioned spaces.
- 15.6.5 Risks from heavy precipitation and flooding are also projected to increase, including risk of operational disruption during floods and extreme precipitation events, physical damage to assets as a result of flooding, and safety risks to operational staff.
- 15.6.6 Storms and high winds are projected to increase in frequency and intensity, potentially leading to more operational disruption, increased risk of physical damage to the Proposed Development and safety risks for operational staff.
- 15.6.7 It is considered that embedded mitigation measures, as outlined in Section 15.5, will provide sufficient levels of resilience to the projected changes in climate for all receptors considered in this assessment. The risk to staff from extreme weather will be mitigated through the implementation of appropriate safety measures and by following government guidelines.

Decommissioning impacts

- 15.6.8 For the purpose of this assessment, decommissioning of the Proposed Development is expected to last in the range of one to two-years and occur

a maximum of 50-years from the first year of operation. Therefore, decommissioning could potentially occur as late as 2082.

- 15.6.9 As shown in Table 15.12, the likelihood and consequence scores of climate change hazards and risks range from **negligible** to **medium**. The significance conclusion of the CCR risks identified in this assessment do not exceed **minor adverse (NS)** once embedded mitigation has been considered.
- 15.6.10 During the decommissioning stage of the Proposed Development, there is a potential for extreme weather conditions to pose risks to decommissioning plant and equipment and workers. Workers may be at risk of heat-related illness during periods of extreme heat. Storms, high winds and heavy precipitation may physically damage plant, vehicles and equipment, and pose health and safety risks to workers.
- 15.6.11 Risks to human health will be mitigated through adherence to relevant health and safety measures, provision of Personal Protective Equipment (PPE) where necessary and by rescheduling visits to the Proposed Development and maintenance activities during extreme weather conditions. Appropriate cooling and shading will be installed at workstations to protect workers from heat stress.
- 15.6.12 As the decommissioning phase is likely to be in the latter half of this century (post 2080), it is also anticipated that some climate hazards will have intensified, become more frequent, or both, as outlined in Section 15.4. However, it is also assumed that good industry practice in health and safety and decommissioning techniques will have evolved with regards to climate risks as these risks have emerged and become more generally recognised.

Additional mitigation

- 15.6.13 Additional mitigation measures are actions that require site- and project-specific activity in addition to embedded mitigation in order to reduce an effect or achieve a specified outcome.
- 15.6.14 It is assumed that the embedded mitigation measures will provide sufficient levels of mitigation against projected climate changes and that no additional mitigation is proposed.

Monitoring measures

- 15.6.15 To monitor the effects of climate change on the Proposed Development the following measures shall be applied:
- regular monitoring of weather-related impacts throughout the operational phase of the Proposed Development, acknowledging the uncertainties in climate projections. This monitoring will help evaluate

the effectiveness of mitigation measures and should be updated when new climate data becomes available;

- development and monitoring of a record of extreme weather incidents impacting the Proposed Development (for example, road surface damage, flooding, snow and ice) to help identify thresholds that trigger maintenance. Post-event inspections should follow intense rainfall or other extreme conditions to assess damage and apply necessary mitigation;
- regular conduct of inspections of drainage systems, materials, and structures to identify signs of deterioration. Additional checks should be carried out after extreme weather events (for example, flooding, heatwaves, droughts and storms), with repairs or replacements scheduled as needed; and
- reassessment of the replacement frequencies, with activities brought forward where necessary, for example following an extreme weather event.

15.7 Residual effects and conclusions

- 15.7.1 Based on the assumption that all mitigation measures presented in Section 15.5 and Section 15.6.4 are fully and successfully implemented into the design and operation of the Proposed Development, the CCRA concludes that there are no residual significant effects.

15.8 Summary of significant effects

15.8.1 Table 15.13 presents a summary of the CCRA, detailing mitigation measures and residual effects.

15.8.2 The CCRA concludes that there are no likely significant effects, assuming mitigation is successfully implemented into the design and operation of the Proposed Development.

Table 15.13 CCRA summary of risk assessment presented in Table 15.12

Climate hazard	Risk narrative	Significance of effect	Embedded mitigation measures	Residual effects
Extreme heat	Risk of equipment overheating and/or reduced equipment efficiency. Hastened degradation of materials and machinery due to extreme temperature events. Greater cooling demand. Risk to human health receptors during extreme heat events	Not significant.	Standard plant design and specification.	No significant residual effects.
Storms and high winds	Risk of physical damage to assets and safety risks to human receptors.	Not significant.	None required beyond standard design and systems.	No significant residual effects.
	Increased operational disruption and potential power loss. Supply chain disruption.	Not significant.	The Proposed Development includes power-generation and emergency back-up systems for safe shutdown as required. Operator will maintain critical inventory and develop contingency logistics plans. Emergency systems, including flare, will be designed for a total loss of electrical power.	No significant residual effects.

Climate hazard	Risk narrative	Significance of effect	Embedded mitigation measures	Residual effects
Heavy precipitation and flooding	Risks of physical damage due to flooding, particularly to electrical equipment. Safety risks to human receptors. Mobilisation of pollutants during extreme precipitation events. Potential power outages and operational disruption.	Not significant.	Appropriate site levels and drainage systems. Power generation will be installed within the Proposed Development.	No significant residual effects.
Drought	Potential damage and safety risks caused by ground movement arising from long periods of dry weather. Drying out and cracking of materials. Low availability of process water and cooling water during drought potentially leading to temporary plant shutdown.	Not significant.	None required.	No significant residual effects.
Sea level rise	Risks of physical damage due to flooding, including deterioration of material structure and fabric. Reduction in ground stability from sea level rise or inundation. Power outages and disruption to business continuity. Safety risk to operational staff.	Not significant.	Design accounts for projected sea level rise in line with Flood Risk Assessment. Design considers appropriate material selection and corrosion control and allowance (for example, installation of saltwater barriers).	No significant residual effects.

References

- Ref 1 UK Government (2008) Climate Change Act 2008. Available online: <https://www.legislation.gov.uk/ukpga/2008/27/contents> [Accessed March 2026]
- Ref 2 UK Government (2017) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available online: <https://www.legislation.gov.uk/uksi/2017/572/contents> [Accessed March 2026]
- Ref 3 Department for Energy Security and Net Zero (2025) Overarching National Policy Statement for Energy (EN-1). Available online: <https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1-2025> [Accessed May 2026]
- Ref 4 Department for Energy Security and Net Zero (2025) National Policy Statement for Renewable Energy Infrastructure (EN-3). Available online: <https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3-2025> [Accessed May 2026]
- Ref 5 Department for Energy Security and Net Zero (2024) Overarching National Policy Statement (NPS) for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4). Available online: <https://www.gov.uk/government/publications/national-policy-statement-for-natural-gas-supply-infrastructure-and-gas-and-oil-pipelines-en-4> [Accessed May 2026]
- Ref 6 Department for Energy Security and Net Zero (2025) Overarching National Policy Statement (NPS) for Electricity Networks Infrastructure (EN-5). Available online: <https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5-2025> [Accessed May 2026]
- Ref 7 HM Government (2011) UK Marine Policy Statement. Available online: <https://assets.publishing.service.gov.uk/media/5a795700ed915d042206795b/pb3654-marine-policy-statement-110316.pdf> [Accessed March 2026]
- Ref 8 HM Government (2021) North East Inshore and North East Offshore Marine Plan. Available online: https://assets.publishing.service.gov.uk/media/60f6f3df8fa8f50c7450ebf1/FINAL_North_East_Marine_Plan_1.pdf [Accessed March 2026]
- Ref 9 DEFRA (2022) Climate Change Adaptation: Policy Information. Available online: <https://www.gov.uk/government/publications/climate-change->

[adaptation-policy-information/climate-change-adaptation-policy-information](#)
[Accessed March 2026]

- Ref 10 UK Government (2024) National Planning Policy Framework. Available online: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> [Accessed March 2026]
- Ref 11 UK Government (2023) Third National Adaptation Programme. Available online: <https://www.gov.uk/government/publications/third-national-adaptation-programme-nap3> [Accessed March 2026]
- Ref 12 Stockton-on-Tees Borough Council (n.d.) Environmental Sustainability and Carbon Reduction Strategy 2022-2032. Available online: https://www.stockton.gov.uk/media/3265/Environmental-Sustainability-and-Carbon-Reduction-Strategy-2022-%202032/pdf/Environmental_Sustainability_Carbon_Reduction_Strategy_2022-2032_Accessible.pdf [Accessed March 2026]
- Ref 13 Stockton-on-Tees Borough Council (2019) Local Plan Adopted 30 January 2019. Available online: https://www.stockton.gov.uk/media/2518/Local-Plan-2019/pdf/Local_Plan_2019.pdf?m=1645450086087 [Accessed March 2026]
- Ref 14 Redcar and Cleveland Borough Council (2018) Redcar & Cleveland Local Plan Adopted May 2018. Available online: <https://www.redcar-cleveland.gov.uk/sites/default/files/2022-04/Local%20Plan%20Adopted%20May%202018.pdf> [Accessed March 2026]
- Ref 15 C. a. L. G. Ministry of Housing (2019) National Planning Practice Guidance: Climate Change. Available online: <https://www.gov.uk/guidance/climate-change> [Accessed June 2026]
- Ref 16 Institute of Sustainability and Environmental Professionals (2020) Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation. Available online: <https://www.isepglobal.org/content/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020/> [Accessed March 2026]
- Ref 17 ISO 14091:2021 (2021) Adaptation to climate change — Guidelines on vulnerability, impacts and risk assessment. Available online: <https://www.iso.org/standard/68508.html> [Accessed March 2026]
- Ref 18 Met Office Hadley Centre (2018) HadUK-Grid gridded and regional average climate observations for the UK. Available online: <https://catalogue.ceda.ac.uk/uuid/4dc8450d889a491ebb20e724debe2dfb/> [Accessed March 2026]

- Ref 19 Met Office Hadley Centre (2018) UKCP18 Probabilistic Climate Projections. Available online: <https://catalogue.ceda.ac.uk/uuid/9842e395f2d04f48a177c3550756bf98/> [Accessed March 2026]
- Ref 20 Met Office (n.d.) Sea level anomalies for marine projections around UK coastline, 2007-2100. Available online: https://ukclimateprojections-ui.metoffice.gov.uk/products/form/MS4_Anomalies_Subset_01 [Accessed March 2026]
- Ref 21 WMO (2026) Climate. Available online: <https://wmo.int/topics/climate> [Accessed March 2026]
- Ref 22 Met Office (2022) UK Climate Projections: Headline Findings. Available online: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18_headline_findings_v4_aug22.pdf [Accessed March 2026]
- Ref 23 Met Office (2021) UK Climate Projections 2018 Wind Fact Sheet. Available online: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-wind_march21.pdf [Accessed March 2026]

