South East Strategic Reservoir Option

Preliminary Environmental Information Report

Appendix 18.2 - Climate change risk assessment

Date: October 2025

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1 Climate change risk assessment

1.1 Introduction

1.1.1 This appendix sets out the climate change risk assessment, for the construction and operation stages respectively. The appendix is split into tables that list effects that are initially anticipated to be significant and tables that list effects that are not initially anticipated to be significant. The judgement of significance has been made assuming that embedded design mitigation and standard good practice mitigation relevant to climate resilience is applied (these are summarised in this appendix with further detail provided in the Draft commitments register in Appendix 2.2). Nevertheless, the assessment assumes that additional mitigation is not yet applied, as the precise nature and extent of any additional mitigation measures is not confirmed at this stage in the EIA process. As a result, consideration of residual effects (those that remain after the implementation of all mitigation, including additional mitigation) has not been completed for the PEI report.

1.2 Approach used to assess likelihood, consequence and likely significance

1.2.1 The methodology used to assess likelihood and consequence, the likelihood and consequence categories, and the risk matrix used to determine the significance effect are presented in Chapter 18: Climate resilience, Section 18.4. All stages include engagement with technical specialists across the construction, engineering and design teams as well as the discipline specialists for the CCR aspect.

1.2.2 The consequence rating adopts a 'reasonable worst case' approach and uses the highest consequence of the three categories of disruption, and/or an adverse health and safety impact, and/or damage. The likelihood rating assumes that 'embedded mitigation' and 'standard good practice' will be in place. Where risks are rated as moderate or above, the effects are deemed to be significant. Effects may therefore be significant if they have a low likelihood of occurrence during the Project time scales, but a high consequence, or conversely if they have a low consequence rating, but are assessed as being likely to occur at least several times during the time scales in question. Because embedded mitigations and standard good practices are considered in this assessment, most climate change risks considered are assessed to be non-significant at this stage based on the existing mitigations acting to reduce the likelihood of occurrence or the vulnerability of the receptor.

1.3 Likely significant operation effects

Table 1.1 Climate change risks leading to likely significant effects during operation (with embedded and standard good practice mitigation, but prior to additional mitigation)

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
Pumping station, pumping station building, and control building [CCR-69]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increasingly extreme high temperatures could result in heat damage or stress to buildings or MEICA components (e.g. overheating of valves/pumping equipment) resulting in inability to control intake / outfall to or from reservoir and river.	Consequence = Moderate (Damage) Likelihood = Moderate	**Significant** Adverse	(AM-44) Enhanced design approach for buildings considering a pessimistic emissions scenario.
Site-wide [CCR-151]	Hotter summers and heatwaves combined with drought	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Hotter summers and heatwaves combined with drought could lead to an increased risk of spontaneous grassland and woodland fires.	Consequence = Moderate (Disruption + Damage) Likelihood = Moderate	**Significant** Adverse	(AM-47) Measures to address the risk of wildfire. Measures to address the risk of wildfire.

1.4 Likely non-significant construction effects

Table 1.2 Climate change risks leading to likely non-significant effects during construction (with embedded and standard good practice mitigation, but prior to additional mitigation)

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
New habitats [CCR-8]	Increased extreme rainfall frequence/intensity	(SGP-11) Standard good practice measures to protect trees during construction. (SGP-12) Standard good practice measures for establishment of trees and other planting.	Increased extreme rainfall events could result in damage to planting or vegetation, particularly when young or juvenile and habitats are in their development stage.	Consequence = Low (Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Construction activities [CCR-9]	Increased rainfall and winter recharge to groundwater	(ED-03) Construction sequencing to mitigate flood risk. (ED-56) Measures to reduce vulnerability to flooding and rainfall during construction.	Increased rainfall and winter recharge to groundwater poses a risk to all subterranean and earth movement related construction activities, including watercourse diversions.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Construction activities (on or near watercourses) [CCR-10]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-01) Provide floodplain conveyance and compensation before construction of the reservoir and the intake/outfall structure. (ED-56) Measures to reduce vulnerability to flooding and rainfall during construction. (SGP-03) Standard good practice measures for works within or adjacent to waterbodies. (SGP-05) Managing construction works within flood zones.	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity poses a risk to for all construction activity, equipment and workforce working on or near watercourses, and river pollution.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Construction activities (tunnel boring) [CCR-11]	Increased rainfall and winter recharge to groundwater	(ED-56) Measures to reduce vulnerability to flooding and rainfall during construction.	Increased rainfall and winter recharge to groundwater poses a risk to river tunnel boring.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Construction equipment [CCR-12]	Increased high temperatures	(ED-53) Measures to reduce vulnerability to increased temperatures and drought during construction.	Increased high temperatures could cause overheating of construction machinery and equipment, leading to operational inefficiencies and potential equipment failure.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Construction equipment [CCR-13]	Increased extreme rainfall frequence/intensity	(ED-56) Measures to reduce vulnerability to flooding and rainfall during construction.	Increased rainfall could lead to flooding and equipment damage, leading to delays in works.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Construction excavations, earthworks and embankments [CCR-14]	Increased extreme rainfall frequence/intensity	(ED-56) Measures to reduce vulnerability to flooding and rainfall during construction.	Increased adverse weather could compromise the integrity of the embankment across the site.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
		(SGP-15) Manage all soil resources during construction in accordance with standard good practice. (SGP-32) Pause earthworks during the winter months if appropriate. (SGP-38) Response measures during and after extreme weather events including the effects of climate change.				
Construction site [CCR-15]	Increased high temperatures	No embedded design or standard good practice mitigation identified at this stage.	Increased high temperatures could damage utility assets, disrupt utility provision, as well as damage to access road surfaces, potentially leading to disruption of construction.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Construction site [CCR-16]	Increased extreme rainfall frequence/intensity	(ED-56) Measures to reduce vulnerability to flooding and rainfall during construction. (SGP-03) Standard good practice measures for works within or adjacent to waterbodies. (SGP-38) Response measures during and after extreme weather events including the effects of climate change.	Increased extreme rainfall could cause flooding and waterlogging across construction sites, potentially damaging structures and trenches, disrupting site access, and delaying works.	Consequence = Low (Disruption + Damage) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Construction site [CCR-17]	Increased extreme rainfall frequence/intensity	(ED-03) Construction sequencing to mitigate flood risk. (ED-56) Measures to reduce vulnerability to flooding and rainfall during construction. (SGP-03) Standard good practice measures for works within or adjacent to waterbodies.	Increased rainfall and flooding could cause water damage to plant, equipment, general materials, and stockpiles used in river diversion construction, potentially delaying the project.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Construction site [CCR-18]	Increased extreme rainfall frequence/intensity	(ED-56) Measures to reduce vulnerability to flooding and rainfall during construction. (SGP-03) Standard good practice measures for works within or adjacent to waterbodies. (SGP-38) Response measures during and after extreme weather events including the effects of climate change.	Increased rainfall and flooding across the construction site could disrupt construction activities, leading to delays in works.	Consequence = Low (Disruption + Damage) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
Construction site [CCR-19]	Increased extreme rainfall frequence/intensity	(ED-56) Measures to reduce vulnerability to flooding and rainfall during construction.	Increased rainfall could lead to pit flooding, slope failure, waterlogging of excavated materials, and erosion of edges in borrow pits, potentially compromising their structural integrity.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Construction site [CCR-20]	Increased drought conditions	(ED-53) Measures to reduce vulnerability to increased temperatures and drought during construction.	Increased drought conditions could reduce water availability on construction sites, leading to operational inefficiencies.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Construction temporary buildings [CCR-21]	Increased high temperatures	(ED-53) Measures to reduce vulnerability to increased temperatures and drought during construction.	Increased high temperatures and heatwaves could result in overheating in temporary buildings across the site, affecting the health and productivity of the construction workforce.	Consequence = Low (Disruption + Health & Safety) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Construction workforce [CCR-22]	More frequent occupational heat stress days	(ED-53) Measures to reduce vulnerability to increased temperatures and drought during construction.	More frequent occupational heat stress days could lead to reduced productivity among construction workforce, potentially delaying the construction programme.	Consequence = Low (Disruption + Health & Safety) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Construction workforce [CCR-23]	Increased extreme rainfall frequence/intensity	(SGP-03) Standard good practice measures for works within or adjacent to waterbodies.	Increased rainfall and flooding could expose the construction workforce to unsafe site conditions, potentially causing work disruptions and increasing health and safety risks.	Consequence = Low (Disruption + Health & Safety) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Railway electrical power assets [CCR-25]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought. (ED-53) Measures to reduce vulnerability to increased temperatures and drought during construction.	Increased high temperatures could lead to overheating of electrical components (new mainline Switches and Crossings (S&C), upgrades to the Overhead Line Electrification and Signalling), resulting in equipment malfunction or failure. Prolonged heat may also degrade insulation on cables and increase the risk of fire.	Consequence = Moderate (Disruption) Likelihood = Very Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Railway electrical power assets [CCR-26]	Increased drought conditions	(ED-53) Measures to reduce vulnerability to increased temperatures and drought during construction.	Increased drought conditions could dry soils causing them to shrink and shift, causing misalignment or damage to buried ducting and cable conduits, potentially leading to service interruption or safety risks.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Railway electrical power assets [CCR-27]	Increased pluvial flood frequency/ intensity	(ED-56) Measures to reduce vulnerability to flooding and rainfall during construction.	Increased rainfall and surface water flooding could infiltrate ducting or substations, causing short circuits, power outages, and corrosion of electrical systems.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Railway electrical power assets [CCR-28]	Increased extreme rainfall frequence/intensity	(ED-56) Measures to reduce vulnerability to flooding and rainfall during construction.	Increased precipitation and flooding could lead to water ingress into signal control boxes and trackside equipment, which may lead to short-circuiting, equipment malfunction, or full system failure.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Railway structures [CCR-29]	Increased high temperatures	(ED-53) Measures to reduce vulnerability to increased temperatures and drought during construction.	Increased extreme heat could lead to thermal expansion of tracks, leading to rail buckling and service disruption.	Consequence = Moderate (Damage) Likelihood = Very Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
Railway structures [CCR-30]	Increased pluvial flood frequency/ intensity	(ED-56) Measures to reduce vulnerability to flooding and rainfall during construction.	Increased precipitation and flooding could lead to track-bed saturation, structural scour at culverts, and flooding of low-lying sections, affecting rail operability and safety.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Planting, leading to All Project Components [CCR-32]	Hotter summers and heatwaves combined with drought	No embedded design or standard good practice mitigation identified at this stage.	Hotter summers and heatwaves combined with drought could lead to an increased risk of spontaneous grassland and woodland fires.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Road structures [CCR-33]	Increased drought conditions	No embedded design or standard good practice mitigation identified at this stage.	Increased drought conditions could increase the likelihood of shrink-swell or subsidence that could lead to damage to road surfaces.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.

1.5 Likely non-significant operation effects

Table 1.3 Summary of likely non-significant effects during operation (with embedded and standard good practice mitigation, but prior to mitigation)

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
Electrical sub-stations/kiosks, communications and instrumentation kiosks [CCR-34]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	Increased precipitation and flooding could inundate electrical sub-stations or communication kiosks, damaging electrical components, causing outages, or leading to short-circuits and equipment failures due to water ingress.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Electrical sub-stations/kiosks, communications and instrumentation kiosks [CCR-35]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increased temperatures and extreme heat could lead to overheating of electrical components in sub-stations and communication kiosks, reducing equipment lifespan and efficiency, potentially causing power outages or failures, and risking cooling system malfunctions.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Reservoir embankment structure [CCR-36]	Increased high temperatures	(ED-17) Measures for safe reservoir operation.	Increased temperatures and extreme heat, combined with increased precipitation and more intense flooding, could increase the risk of deep cracking in clay embankment, slope erosion and failure in areas of landscape fill.	Consequence = High (Disruption + Damage) Likelihood = Very Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Reservoir embankment structure [CCR-37]	Increased drought conditions	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-17) Measures for safe reservoir operation.	Increased drought conditions could cause desiccation or cracking at the top of the dam core, leading to the initiation of internal erosion and posing a seepage and internal erosion risk when reservoir water levels rise again.	Consequence = High (Damage) Likelihood = Very Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Reservoir embankment structure [CCR-39]	Increased high temperatures	(ED-17) Measures for safe reservoir operation.	Increased temperatures and extreme heat could cause the death of vegetation planted on the reservoir embankment, potentially compromising slope stability and increasing erosion risk from surface water or wave overtopping flows.	Consequence = Moderate (Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Reservoir embankment structure [CCR-40]	Increased high temperatures	(ED-17) Measures for safe reservoir operation. (SGP-12) Standard good practice measures for establishment of trees and other planting.	Increased temperatures and drought conditions could encourage disease or drought stress in trees, making those planted near the reservoir embankment crest more vulnerable to uprooting during subsequent storm events.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Reservoir embankment structure [CCR-41]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought. (ED-13) Measures to address the risks of increased precipitation,	Increased prolonged periods of hot weather and drought could cause the soil on the outer face of the reservoir embankment to erode more easily (in areas of landscape fill) during heavy rainfall events, leading to silting of the open channel toe drain at the outer toe of the dam and reducing its capacity.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
		intense periods of rainfall and frequency and intensity of flooding. (ED-18) Embankment protection systems.				
Floating islands [CCR-42]	Increased extreme rainfall frequence/intensity	(ED-43) Asset design manages water table variability.	Increased precipitation and increased frequency and intensity of flooding could overload buoyancy systems, cause nutrient leaching, and result in plant stress on floating islands.	Consequence = Low (Disruption + Damage) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Floating islands [CCR-43]	Increased high temperatures	No embedded design or standard good practice mitigation identified at this stage.	Increased temperatures and extreme heat could lead to desiccation of vegetation and overheating of root zones on floating islands, potentially harming plant health and ecosystem stability.	Consequence = Low (Disruption + Damage) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Lagoons [CCR-44]	Increased drought conditions	No embedded design or standard good practice mitigation identified at this stage.	Increased severe drought could reduce water availability for lagoons, leading to lower water levels, which could disrupt aquatic habitats and reduce biodiversity.	Consequence = Low (Damage) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Lagoons [CCR-46]	Increased high temperatures	No embedded design or standard good practice mitigation identified at this stage.	Increased temperatures and extreme heat could cause thermal stress for aquatic species and increase the occurrence of algal blooms, leading to decreased oxygen levels for fish in lagoons.	Consequence = Low (Disruption + Damage) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Recreational users [CCR-47]	Increase in convective storms and high rainfall intensity	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought. (ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-17) Measures for safe reservoir operation.	Increase in convective storms poses a health and safety risk to those undertaking water sports on the reservoir.	Consequence = Low (Disruption + Health & Safety) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Recreational facilities [CCR-48]	Increased drought conditions	(ED-17) Measures for safe reservoir operation.	Increased drought conditions could lead to low reservoir water levels, making the slipways inaccessible and potentially exposing previously submerged hazards such as rocks and debris, creating safety risks.	Consequence = Low (Disruption + Health & Safety) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Reservoir towers [CCR-49]	Increased drought conditions	(ED-17) Measures for safe reservoir operation. (ED-28) Maintain water quality in the reservoir.	Increased drought conditions could lead to reservoir water levels falling below intake elevation, leading to inoperability or higher contaminant concentration at draw off inlets.	Consequence = Low (Disruption + Damage) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
Reservoir towers [CCR-50]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-17) Measures for safe reservoir operation.	Increased precipitation and intense rainfall could lead to higher inflows that stir up sediment, potentially clogging screens or valves at draw-off inlets, causing structural pressure on reservoir towers and increasing the risk of blockages and overflow.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Reservoir towers [CCR-51]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increased temperatures and extreme heat could cause the thermal expansion of draw-off inlet pipes, which could lead to pipe cracking and degradation.	Consequence = Moderate (Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Reservoir towers [CCR-52]	Increased rainfall and winter recharge to groundwater	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	Increased precipitation and flooding could damage tower structures if not properly designed to handle surges, leading to water ingress.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Reservoir tunnel (between reservoir and pumping station) [CCR-53]	Increased drought conditions	No embedded design or standard good practice mitigation identified at this stage.	Increased drought conditions could lead to reduced groundwater support pressure, which could adversely affect the tunnel's structural stability.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Reservoir tunnel (between reservoir and pumping station) [CCR-54]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	Increased precipitation and flooding could lead to erosion and saturation that weakens the reservoir tunnel structure and could lead to floodwater ingress into tunnel shafts.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Water in the reservoir [CCR-55]	Hotter summers and heatwaves combined with drought	(ED-17) Measures for safe reservoir operation.	Increased temperatures and extreme heat could lead to increased evaporation, reducing water levels and compromising the reservoir's storage capacity.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Water in the reservoir [CCR-56]	Increased average temperatures	(ED-32) Management of aquatic INNS.	Increased temperatures and the changing UK climate is contributing to greater presence of invasive, non-native species that could reduce water quality - these could be spread by recreational equipment like sailing boats.	Consequence = Low (Disruption + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Water in the reservoir [CCR-57]	Increased average temperatures	No embedded design or standard good practice mitigation identified at this stage.	Warmer, wetter winters and hotter, drier summers may result in a change in land use or practices in the River Thames catchment upstream of the abstraction at Culham. This could affect abstracted water quality and therefore reservoir water quality.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Water quality monitors [CCR-58]	Increased high temperatures	No embedded design or standard good practice mitigation identified at this stage.	Increased temperatures and extreme heat could lead to sensor overheating and temperature fluctuations, potentially resulting in data inaccuracies from water quality monitors.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
Intake/outfall & control building [CCR-59]	Increased drought conditions	(ED-02) Manage water quality at the SESRO intake.	The increase in drought conditions in the River Thames result could lower water levels below the height of the intake structure, preventing intake.	Consequence = Negligible (Disruption + Health & Safety + Damage) Likelihood = High	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Intake/outfall & control building [CCR-60]	Increased high temperatures	(ED-28) Maintain water quality in the reservoir.	The increase in high temperatures could cause greater vegetation growth/algal bloom presence in River Thames causing adverse impacts to the quality of water entering the reservoir.	Consequence = Negligible (Disruption + Health & Safety + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Intake/outfall & control building [CCR-61]	Increased pluvial flood frequency/ intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	The increase in pluvial flooding risk could compromise the structural integrity of the intake/outfall and control building and hindering access for valve operation.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Intake/outfall & control building [CCR-62]	Increased rainfall and winter recharge to groundwater	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-43) Asset design manages water table variability.	The increase in rainfall and winter groundwater recharge could create a risk of equipment malfunction (e.g. control valves).	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Intake/outfall & control building [CCR-63]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	No embedded design or standard good practice mitigation identified at this stage.	The increase in rainfall and river flow levels could raise water levels above the outfall weir height, resulting in an inability to discharge water effectively from the intake/outfall.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Intake/outfall & control building [CCR-64]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-28) Maintain water quality in the reservoir.	The increase in rainfall could increase river flow velocities, resulting in increase in vegetation and debris flow, which could cause intake screen blockages.	Consequence = Low (Disruption + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Intake/outfall & control building [CCR-65]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	The increase in rainfall and river flows, leading to increased fluvial flood frequency/intensity, could lead to the flooding and resulting failure of mechanical equipment at the intake/outfall location.	Consequence = High (Disruption) Likelihood = Very Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Intake/outfall & control building [CCR-66]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-30) Scour protection on the River Thames.	The increase in rainfall could increase river flow velocities, which could lead to bank erosion around intake/outfall structure and create a risk of collapse.	Consequence = High (Disruption + Damage) Likelihood = Very Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
Pumping station, pumping station building, and control building [CCR-67]	Increase in convective storms and high rainfall intensity	(ED-09) Design of pumping station and T2ST Water Treatment Works backup generators.	Increase in convective storms could result in utilities disruption resulting in a loss of power creating a risk of Mechanical, Electrical, Instrumentation, Control and Automation (MEICA) equipment downtime with consequential loss of pump control or monitoring ability.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Pumping station, pumping station building, and control building [CCR-68]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increasing extreme high temperatures and heatwaves could result in poor thermal comfort at the pumping station, resulting in adverse health and safety conditions for the operation workforce.	Consequence = Low (Health & Safety) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Pumping station, pumping station building, and control building [CCR-70]	Increased pluvial flood frequency/ intensity	(ED-09) Design of pumping station and T2ST Water Treatment Works backup generators. (ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	The increase in pluvial flood frequency and intensity could hinder access to the pumping station and buildings, with the potential to prevent valve operation and cause water supply disruption.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Pumping station, pumping station building, and control building [CCR-71]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-09) Design of pumping station and T2ST Water Treatment Works backup generators. (ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-43) Asset design manages water table variability.	The increase in fluvial flood intensity could result in flooding at the pumping station, with the potential to prevent valve operation and cause water supply disruption.	Consequence = Moderate (Disruption + Damage) Likelihood = Very Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
River tunnel [CCR-72]	Increased average temperatures	(ED-32) Management of aquatic INNS.	Increased average temperatures could alter the habitat suitability for zebra and quagga mussels, potentially increasing their presence in river tunnels and reducing the capacity of water conveyance.	Consequence = Negligible (Disruption + Damage) Likelihood = High	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
River tunnel [CCR-73]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increasingly extreme high temperatures could cause component heat expansion, leading to tunnel structural stress and potentially compromising their long-term integrity.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Shafts [CCR-74]	Increased pluvial flood frequency/ intensity	(ED-22) Drainage Strategy to align with national and local planning policy and guidance.	The increase in pluvial flood frequency and intensity could raise the risk of flooding at tunnel shaft access points, potentially disrupting operations.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Drainage sitewide landscape [CCR-75]	Increased drought conditions	(ED-22) Drainage Strategy to align with national and local planning policy and guidance.	Increased drought conditions could cause vegetation dieback, ground shrinkage and topsoil erosion. This could result in reduced structural integrity and potential damage to drainage	Consequence = Moderate (Disruption)	**Not Significant** Adverse	No additional mitigation required as the

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			infrastructure. When followed by a heavy rainfall event, the eroded soil could lead to silting up of drainage features, reducing their capacity to convey water and increase the risk of on-site flooding.	Likelihood = Low		effect is not significant.
Drainage sitewide landscape [CCR-76]	Increased rainfall and winter recharge to groundwater	(ED-22) Drainage Strategy to align with national and local planning policy and guidance.	Increased rainfall could lead to elevated groundwater levels resulting in groundwater levels exceeding design limits of drainage sitewide landscape and causing flooding.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Recreational lakes (East and West) [CCR-77]	Increased average temperatures	No embedded design or standard good practice mitigation identified at this stage.	The increase in average temperatures could enhance algal blooms, leading to a decline in water quality, which could affect the functionality of recreational lakes - both for fishing and for water sports.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Recreational lakes (East and West) [CCR-78]	Increased drought conditions	(ED-31) Lining of key watercourses and surface water features and provision of substrate.	The increase in drought conditions could decrease water levels in the recreational lakes, impacting recreational use and functionality.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Recreational lakes (East and West) [CCR-79]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	The increase in rainfall and resulting risk of fluvial flooding could cause the overflow and erosion of the recreational lakes.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Watercourses diversions [CCR-80]	Increased drought conditions	No embedded design or standard good practice mitigation identified at this stage.	Increased drought conditions could cause soil drying and shrinkage; subsequent 'first flush' heavy rainfall events could cause mobilised material to block culverts inlets or head walls and reduce flood compensation area effectiveness and increase risk of overtopping.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Watercourses diversions [CCR-81]	Increased drought conditions	No embedded design or standard good practice mitigation identified at this stage.	The increase in drought conditions could lead to the drying out and cracking of ditch diversions, potentially reducing their structural integrity and effectiveness in managing water flow.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Watercourses diversions [CCR-82]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-22) Drainage Strategy to align with national and local planning policy and guidance.	Increased rainfall could lead to higher flow volumes affecting river diversions, resulting in overflow, erosion, and an increased sediment load that could block water flow and reduce the efficiency of drain headwalls.	Consequence = Low (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Watercourses diversions [CCR-83]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	Increased rainfall and river flows could cause the capacity of flood compensation storage areas to be exceeded, leading to flooding.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
Wilts and Berks Canal [CCR-84]	Increased drought conditions	No embedded design or standard good practice mitigation identified at this stage.	Increased drought conditions could cause lower water levels in the Wilts & Berks Canal. This would increase exposure of the clay lining which could become degraded and cause leakages, which would reduce potential for future use.	Consequence = Low (Disruption + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Wilts and Berks Canal [CCR-85]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	Increased rainfall could lead to increased flow volumes in the Wilts & Berks Canal, with a risk of overtopping.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Parking facilities [CCR-86]	Increased extreme rainfall frequence/intensity	(ED-22) Drainage Strategy to align with national and local planning policy and guidance.	Increased rainfall and flooding lead to surface water accumulation, affecting parking facilities, causing disruption to access and vehicle damage.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Parking facilities [CCR-87]	Increased high temperatures	No embedded design or standard good practice mitigation identified at this stage.	Increased high temperatures cause degradation of paving materials and higher surface temperatures of parking facilities, resulting in damage to surfaces and potential discomfort for users.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Site-wide road access [CCR-88]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	The increase in rainfall and river flow volumes could increase the risk of fluvial flooding at on-site access points for workforce and visitors, potentially causing unsafe conditions and could result in disrupted operations.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Road bridges (e.g. those crossing the River Ock) [CCR-89]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	The increase in rainfall and river flow volumes could increase the risk of fluvial flooding could result in inundation of roads where they intersect with rivers and the floodplain.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Road drainage [CCR-90]	Increased extreme rainfall frequence/intensity	(ED-22) Drainage Strategy to align with national and local planning policy and guidance.	The increase in extreme rainfall and more intense pluvial flooding could lead to drainage systems becoming overwhelmed, resulting in localised flooding and delays to road operations.	Consequence = Low (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Road drainage [CCR-91]	Increased drought conditions	(ED-22) Drainage Strategy to align with national and local planning policy and guidance.	Increased drought conditions could reduce the inflow into swales which could result in vegetation loss and reductions in drainage effectiveness.	Consequence = Low (Disruption + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Road structures [CCR-92]	Increased extreme rainfall frequence/intensity	No embedded design or standard good practice mitigation identified at this stage.	Increased precipitation could increase the likelihood of potholing, rutting and cracking from moisture entering and remaining in road surfaces.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.

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Road structures [CCR-93]	Increased high temperatures	No embedded design or standard good practice mitigation identified at this stage.	Increased high temperatures could cause permanent deformation of asphalt surfaced pavement that could hinder access.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
New habitats [CCR-94]	Hotter summers and heatwaves combined with drought	(ED-58) Landscape-led design that responds to landscape character, provides a sense of place and identity, ecological resilience and integrates into the wider landscape setting.	Increased drought conditions could lead to increased soil moisture deficits that could negatively affect vegetation and planting, as well as result in soil erosion.	Consequence = Low (Disruption + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
New habitats [CCR-95]	Increased high temperatures	(ED-58) Landscape-led design that responds to landscape character, provides a sense of place and identity, ecological resilience and integrates into the wider landscape setting.	Increased high temperatures could result in habitat heat stress.	Consequence = Low (Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Topsoil [CCR-96]	Hotter summers and heatwaves combined with drought	(SGP-42) Management and maintenance of plants and habitats to ensure soil health and functions are sustained.	Hotter summers and heatwaves combined with drought could cause soil degradation, which could be compounded by the increase in extreme rainfall events and accelerate soil erosion.	Consequence = Low (Disruption + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Active travel routes, additional footpaths and non-motorised vehicles (NMU) provision [CCR-97]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increased high temperatures could increase the wear of and damage to route surfacing.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Active travel routes, additional footpaths and non-motorised vehicles (NMU) provision [CCR-98]	Increased pluvial flood frequency/ intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	Increased extreme rainfall and pluvial flooding could increase the wear of and damage to route surfacing, or make routes unnavigable.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Recreational users [CCR-99]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increased high temperatures and risk of heatwaves could pose a health and safety risk to visitors.	Consequence = Low (Health & Safety) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Recreational users [CCR-100]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	Increased on-site fluvial flooding could result in people becoming stranded, posting a health and safety risk.	Consequence = Low (Health & Safety) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Recreational facility buildings / Facilities [CCR-101]	Increased extreme rainfall frequence/intensity	(ED-22) Drainage Strategy to align with national and local planning policy and guidance.	Increased extreme rainfall and flooding could lead to water ingress of recreational buildings at the façade or roofs, that could result in asset damage or cause a health and safety risk to visitors and operation workforce.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the

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		(ED-42) Operation stage surface water management.				effect is not significant.
Recreational facility buildings / Facilities [CCR-102]	Increased high temperatures	(ED-54) Compliance with Design standards.	Increased high temperatures could lead to failure of Mechanical, Electrical, and Plumbing (MEP) systems and poor thermal comfort in recreational buildings.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Recreational facility buildings / Facilities [CCR-103]	Increased rainfall and winter recharge to groundwater	(ED-54) Compliance with Design standards.	Increased rainfall and winter recharge to groundwater could cause ingress or increased hydraulic loading resulting in structural weakening, potentially compromising the integrity of building foundations.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Recreational facility buildings / Facilities [CCR-104]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	Increased fluvial flooding could lead to water ingress at ground level and result in asset damage or cause a health and safety risk to visitors and operation workforce.	Consequence = Low (Disruption + Health & Safety + Damage) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Battery energy storage system (BESS) [CCR-105]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-43) Asset design manages water table variability.	Increased rainfall and river flows could result in flooding that could damage substations, inverters, and underground cables of BESS, causing energy transmission failures and extended outages in renewable-powered grids.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Battery energy storage system (BESS) [CCR-106]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Higher ambient temperatures could reduce the efficiency of battery energy storage systems (BESS) and increase cooling demands, shortening battery lifespan and increasing operational costs.	Consequence = Low (Disruption) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Battery energy storage system (BESS) [CCR-107]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-46) Emergency fire management system for Battery Energy Storage System (BESS).	Increased fluvial flooding poses a risk to the storage of water required for emergency fire management, increasing the risk of water contamination.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Existing 132kV overhead line diversion [CCR-108]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-54) Compliance with Design standards.	Increased rainfall and fluvial flooding could result in pylon bases becoming submerged with water.	Consequence = Low (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Existing 132kV overhead line diversion [CCR-109]	Increased drought conditions	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increased drought conditions could increase shrink swell or erosion, causing stability risk to pylon foundations due to soil movement, potentially leading to tilt or collapse.	Consequence = Low (Disruption + Damage)	Not Significant Adverse	No additional mitigation required as the

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				Likelihood = Moderate		effect is not significant.
Existing 132kV overhead line diversion [CCR-111]	Increased high temperatures	(ED-54) Compliance with Design standards.	Increased air temperatures could lead to thermal expansion of overhead line conductors which could reduce transmission efficiency, damage insulation or cause line sag in overhead cables.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
High voltage connections including underground cabling [CCR-112]	Increased drought conditions	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increased drought conditions could lead to soil shrinkage, exposing or stressing cables, reducing protective cover and increasing risk of mechanical damage.	Consequence = Low (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
High voltage connections including underground cabling [CCR-113]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	Increased extreme rainfall and pluvial flooding could lead to water ingress which could cause short circuits or accelerate cable degradation, particularly at vulnerable joints or ducts.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
On-site utilities networks for facilities (foul drainage, electrical, water, fire water) [CCR-114]	Increased drought conditions	No embedded design or standard good practice mitigation identified at this stage.	Extended dry periods could reduce raw water availability, placing strain on water abstraction systems and treatment facilities, leading to water supply restrictions and operational inefficiencies.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
On-site utilities networks for facilities (foul drainage, electrical, water, fire water) [CCR-116]	Increased high temperatures	No embedded design or standard good practice mitigation identified at this stage.	Increased high temperatures could reduce the efficiency of transformers and overhead lines, increasing the risk of overheating, load shedding, and component failure.	Consequence = Low (Disruption) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Power supply [CCR-117]	Increase in convective storms and high rainfall intensity	(ED-09) Design of pumping station and T2ST Water Treatment Works backup generators. (SGP-39) Lightning strike risk assessment.	An increase in storm events could cause power fluctuations in the electricity grid, resulting in power outages that could disrupt the power supply to critical infrastructure.	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Renewable energy assets [CCR-118]	Increased drought conditions	No embedded design or standard good practice mitigation identified at this stage.	Increased drought conditions resulting in dry, dusty conditions could increase soiling on solar panels, reducing energy yield and requiring more frequent cleaning, which may be challenging to achieve in remote or water-scarce areas.	Consequence = Low (Disruption) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Renewable energy assets [CCR-119]	Increased drought conditions	(ED-43) Asset design manages water table variability.	Increased drought conditions leading to very low water levels in reservoir could cause asset damage.	Consequence = Low (Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Renewable energy assets [CCR-120]	Increased high temperatures	No embedded design or standard good practice mitigation identified at this stage.	Prolonged solar PV exposure to high temperatures could contribute to reduced energy output and the degradation of solar PV over time, potentially shortening their lifespan.	Consequence = Low (Disruption + Damage) Likelihood = Low	**Not Significant**	No additional mitigation required as the

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						effect is not significant.
Telecommunications lines [CCR-121]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-54) Compliance with Design standards.	Heavy rainfall and storm events could lead to water ingress into junction boxes and underground ducts, causing short circuits, corrosion, and service outages.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Telecommunications lines [CCR-122]	Increased high temperatures	(ED-54) Compliance with Design standards.	Prolonged high temperatures could cause thermal expansion and overheating of cable insulation and electronic components, increasing the risk of signal loss, service disruption, or infrastructure failure.	Consequence = Low (Disruption + Damage) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Transformers / substations [CCR-123]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-54) Compliance with Design standards.	Increased rainfall and higher water levels could result in flooding to transformers/substations.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Transformers / substations [CCR-124]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Higher ambient temperatures could lead to transformers / substations shutting down due to overheating.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Pipelines [CCR-125]	Hotter summers and heatwaves combined with drought	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	The rise in temperatures and extreme heat could cause thermal expansion, subsidence and material stress in pipelines, resulting in material degradation and increased risk of cracking and joint failure.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Water treatment processes [CCR-126]	Increase in convective storms and high rainfall intensity	No embedded design or standard good practice mitigation identified at this stage.	Increase in convective storms and high rainfall intensity could result in flooding that disrupts the delivery of chemicals to the Thames to Southern Water Water Treatment Works (T2ST WTW)	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Water treatment processes [CCR-127]	Increased average temperatures	(ED-28) Maintain water quality in the reservoir.	The increase in average temperatures could raise water temperatures, leading to accelerated microbial growth or algal blooms in the reservoir, which could reduce the efficiency of the water treatment processes and therefore a risk of a potential decrease in potable water quality.	Consequence = Low (Disruption + Health & Safety) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Water treatment processes [CCR-128]	Increased average temperatures	(ED-28) Maintain water quality in the reservoir.	The increase in average temperatures could raise water temperatures, reducing the efficiency of the dissolved air flotation treatment process, or require more power or larger pump sizes to create the air required for the treatment, with a resulting adverse impact to potable water quality.	Consequence = Low (Disruption) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.

Receptor name [Effect ID]	Climate change hazard	Embedded design / standard good practice mitigation applied	Climate risk description	Consequence and likelihood of risk	Initial significance / Direction of effect	Additional mitigation identified (including monitoring)
Water treatment processes [CCR-129]	Increased drought conditions	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	The rise in drought conditions could reduce water levels in the reservoir and therefore water volumes entering the water treatment works, affecting water treatment processes and causing disruptions due to hindered treatment operations.	Consequence = Low (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Water treatment processes [CCR-130]	Increased high temperatures	No embedded design or standard good practice mitigation identified at this stage.	Increasing high temperatures could exceed those suitable for storing sodium hypochlorite, which could result in the formation of chlorate in the potable water supply, resulting in adverse water quality and disruption to water supply during tank cleaning.	Consequence = Moderate (Health & Safety) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Water Treatment Works buildings [CCR-131]	Increased high temperatures	(ED-61) Design of Water Treatment Works to consider climate change.	Increased temperatures could raise internal temperatures in operational buildings, leading to health risks, thermal discomfort, and disruption due to higher energy demand.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Water Treatment Works buildings [CCR-132]	Increased pluvial flood frequency/ intensity	(ED-61) Design of Water Treatment Works to consider climate change.	Increased rainfall and pluvial flooding could result in water ingress and damage to ground-floor infrastructure at the Water Treatment Works buildings.	Consequence = Moderate (Disruption + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Water Treatment Works buildings [CCR-133]	Increased rainfall, increased river flows and increased fluvial flood frequency/intensity	(ED-61) Design of Water Treatment Works to consider climate change.	The increase in rainfall and river flows, leading to increased fluvial flood frequency/intensity, could lead to building flooding and resulting failure of mechanical equipment and treatment processes at the Water Treatment Works.	Consequence = Moderate (Disruption + Health & Safety + Damage) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Site-wide [CCR-134]	Increased rainfall and winter recharge to groundwater	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding.	The increase in winter groundwater recharge could affect groundwater levels could affect the areas surrounding the reservoir embankment	Consequence = Moderate (Disruption) Likelihood = Low	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Operation workforce [CCR-135]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-42) Operation stage surface water management. (ED-43) Asset design manages water table variability.	Increased rainfall and flooding could expose the operation workforce to hazardous site conditions and access issues, potentially disrupting work activities and compromising health and safety.	Consequence = Low (Disruption + Health & Safety) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.
Operation workforce [CCR-136]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increased exposure to extreme heat could expose the operation workforce to thermal stress, potentially affecting health, safety, and productivity.	Consequence = Low (Disruption + Health & Safety) Likelihood = Moderate	**Not Significant** Adverse	No additional mitigation required as the effect is not significant.

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Operation workforce [CCR-137]	More frequent occupational heat stress days	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increased high temperatures and risk of heatwaves could pose a health and safety risk to the operation workforce.	Consequence = Low (Disruption + Health & Safety) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Wilts and Berks Canal [CCR-138]	Increased average temperatures	No embedded design or standard good practice mitigation identified at this stage.	Increased average temperatures could cause material degradation and higher surface temperatures, leading to user discomfort and the need for shaded areas on the tow path.	Consequence = Low (Disruption + Health & Safety) Likelihood = Moderate	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Wilts and Berks Canal [CCR-139]	Increased high temperatures	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	Increased high temperatures could cause expansion and softening of tow paths and crossing structures, resulting in rutting and deformation of the Wilts & Berks Canal.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Site access [CCR-140]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-42) Operation stage surface water management.	Increased precipitation and frequent flooding, could lead to erosion and surface rutting of site access paths, resulting in damage that disrupts site accessibility.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Pipelines, tunnels, tunnel shafts and pumping station [CCR-141]	Increased rainfall and winter recharge to groundwater	(ED-43) Asset design manages water table variability.	Increased rainfall and winter recharge to groundwater and impacts to groundwater levels could increase the hydraulic loading, potentially weakening pipeline and tunnel structures and causing water ingress at the pumping station and tunnel shafts.	Consequence = Moderate (Disruption) Likelihood = Very Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
River tunnel and tunnel shafts, pumping station, intake-outfall structure and pipelines [CCR-142]	Increased drought conditions	(ED-12) Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought.	The increase in drought conditions could exacerbate shrink-swell soils, leading to subsidence and heave, which could affect assets' structural stability.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Road structures [CCR-149]	Increased extreme rainfall frequence/intensity	(ED-13) Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding. (ED-22) Drainage Strategy to align with national and local planning policy and guidance.	The increasing variability between wet and dry periods and events, along with soil moisture levels, could increase the risk of earthworks failure and landslides.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.
Road structures [CCR-150]	Increased drought conditions	No embedded design or standard good practice mitigation identified at this stage.	Increased drought conditions could increase the likelihood of shrink-swell or subsidence that could lead to damage to road surfaces.	Consequence = Moderate (Disruption) Likelihood = Low	Not Significant Adverse	No additional mitigation required as the effect is not significant.

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