

APPENDIX 7.4

IN-COMBINATION CLIMATE CHANGE IMPACT ASSESSMENT RESULTS

Assessment results

- 1.1 This appendix outlines the in-combination climate change impacts (ICCI) assessment of the Proposed Development. Here, the combined effects of the Proposed Development and potential climate change impacts on the receiving environment and other environmental topics are addressed. The results of the assessment are provided in **Table 7.1** and are grouped by environmental topic as follows:
- Air quality
 - Carbon
 - Contaminated land
 - Cultural heritage
 - Ecology
 - Human health
 - Landscape and visual
 - Noise and vibration
 - Socioeconomics
 - Traffic and transport
 - Ecology
 - Water resources, flood risk and drainage
- 1.2 Both the construction and operation phases of the Proposed Development have been considered.
- 1.3 No in-combination climate change effects have been identified for the daylight and sunlight and environmental wind topics.

Table 7.1: In-combination climate change assessment

Resources /receptors potentially impacted by the Proposed scheme identified by environmental topic	Effects of Proposed Scheme on receptors / resources identified by environmental topic	Existing or embedded mitigation measures	Potential climate change impacts on resources / receptors	Likelihood and consequence of in-combination impacts and effects given existing mitigation measures	Impact on significance of effect	Additional mitigation measures to address adverse effects on the ability of resources / receptors to adapt to climate change
Air Quality						
Atmosphere, humans and ecology	<p>Increase dust and air pollutants from construction works including demolition, track out, construction and earthworks. Increased dust and air pollutants from construction works will have temporary local effects.</p>	<p>Construction dust mitigation for high-risk developments will be put in place. This can be seen in the Air Quality chapter. With the application of high risk mitigation measures the risk of dust impacts will be reduced to negligible.</p>	<p>Hotter and drier/drought conditions exacerbate dust generation and concentrations of certain air pollutants.</p>	<p>It is unlikely that hotter and drier/drought conditions will exacerbate dust generations and concentrations of air pollutants because there are sufficient mitigation measures in the air quality chapter to limit the generation and dispersion of construction dust.</p>	<p>No change to significance.</p>	<p>No additional measures required.</p>
	<p>Increase in NO₂, NO_x and particulate matter (PM) from construction vehicles and changes in the volume, composition, and location of traffic on the highway network during construction works.</p>		<p>Increase in frequency and intensity of heavy rainfall events/ flooding suppresses</p>	<p>It is likely that heavy rainfall events/flooding will become more frequent in the future therefore suppressing dust movement and</p>	<p>No change to significance.</p>	

			dust movement.	reducing the amount of dust in the atmosphere during construction works.		
			Increased wind speed could influence dispersion of pollutants.*	Construction dust mitigation outlined in the air quality chapter will mitigate any further impacts due to climate change impacts.	No change to significance.	
	Impacts from the operation of the Proposed Scheme could arise from vehicle emissions due to changes in the volume, composition and distribution of traffic in the area (operation).	None required.	Hotter and drier/drought conditions could lead to increased sunshine which could increase the concentration of air pollutants such as ozone and NOx.	Hotter and drier conditions are likely in the future however vehicle emissions are predicted to reduce significantly as a result of improved engine technology and uptake of electric vehicles and therefore the consequence of this impact is low.	No change to significance.	
				Increase in frequency and intensity of heavy rainfall events/ flooding could lead to decreased concentration of air pollutants such as	Increased rainfall and flooding is likely in the future. This will have a small beneficial impact on air quality so the consequence of this impact is low.	No change to significance.

			ozone, NOx and PM _{10/2.5} .			
			Increased wind speed could influence dispersion of air pollutants.*	The consequence of this impact is low due to the uncertainty in projecting wind changes.	No change to significance.	
Contaminated Land						
People	Potential impact on human health on-site and off-site (direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and groundwater), during construction	Mitigation will be included in the CEMP.	Increased temperatures and occurrence of heat waves	May cause increased volatility of organic compounds (VOC) causing unpleasant odours locally. Limited climate changes are expected during the construction period and therefore the measures outlined in the CEMP will be sufficient to ensure the impact is not significant.	No change in significance.	No additional measures required.
			Increased temperatures and occurrence of heat waves	May cause increased volatility of organic compounds (VOC) causing unpleasant odours locally. Limited climate changes are expected during the construction period and therefore the measures outlined in the CEMP will be sufficient to ensure	No change in significance.	No additional measures required.

				the impact is not significant.		
Ground and surface water	Potential impact on groundwater quality (leaching, vertical and lateral migration from soils and water), and on surface water quality (lateral migration through groundwater, direct run-off from site).	Mitigation will be included in the CEMP	Increase in frequency and intensity of heavy rainfall events/ flooding	May cause an increased risk of sediment-laden run-off.	No change in significance.	No additional measures required.
Cultural Heritage						
Historic buildings	Temporary/permanent disruption to historic landscape setting during construction.	Hoarding during construction to hide the site, protecting the viewpoints.	Increased wind speed*	There could be an impact on the designed landscape due to trees lost from variation in wind patterns.	Wind may result in loss of trees, so this mitigation relies on existing vegetation outside of the site in order to hide the development and enclose conservation areas surrounding. This could result in a significant effect.	No additional measures identified as management of buildings and land outside the boundary of the proposed scheme are not with the control of this project.
			Hotter and wetter conditions	This can lead to an increase in the growing season which will lead to an increase rate of growth of vegetation. The landscape setting will therefore be either positively or negatively affected.	No change to significance.	No additional measures required.
	Temporary/permanent disruption to historic	Planting trees/vegetation to screen site.	Hotter and wetter conditions	This can lead to an increase in the growing season	No change to significance.	No additional measures required.

	landscape setting during operation.			<p>which will lead to an increase rate of growth of vegetation. The landscape setting will therefore be either positively or negatively affected.</p> <p>Better weather could draw people out toward the site more to visit the area and appreciate the setting and buildings. This results in even more drive to protect the surrounding views and cultural heritage.</p>			
			Increased wind speed* and drier/drought conditions	<p>There could be an impact on the designed landscape due to trees lost from variation in wind patterns.</p>			<p>Anglesey Abbey is 5km away from the site, if all vegetation died between the two the view from the Abbey would be impacted, damaging the landscapes of the Abbey. This is a significant impact however the likelihood of this occurring is low.</p>
	Temporary/permanent disruption to designed landscape during operation.	Planting trees/vegetation to screen site.	Hotter and wetter conditions	<p>This can lead to an increase in the growing season which will lead to an increase rate of growth of vegetation. The landscape setting will therefore be either positively or negatively affected.</p>			<p>No additional measures identified as management of buildings and land outside the boundary of the proposed scheme are not with the control of this project.</p>
			Increased wind speed*	<p>Impact on settings due to trees lost.</p>			

			and drier/drought conditions			
Designed landscapes	Potential temporary adverse effects on landscape settings (local flora and fauna) during construction.	Planting trees/vegetation to screen site and hoarding to screen site.	Hotter and wetter conditions	Leads to longer growing season – increase rate of growth of vegetation.	Anglesey Abbey is 5km away from the site, if all vegetation died between the two the view from the Abbey would be impacted, damaging the landscapes of the Abbey. This has the potential to result in a significant effect however the likelihood of this occurring is low.	No additional measures identified as management of buildings and land outside the boundary of the proposed scheme are not with the control of this project.
			Increased wind speed* and drier/drought conditions	Impact on settings due to trees lost.		
	Significant change in setting during operation.	Planting trees/vegetation on the site boundary to screen the site.	Hotter and wetter conditions	Leads to longer growing season – increase rate of growth of vegetation. Potential of positive effect. More flora and fauna will protect the view of the designed landscapes. Visibility will decrease which is a positive impact.	No change to significance.	No additional measures required.
Potential temporary adverse effects on landscape settings (local flora and fauna) during operation.	Increased wind speed* and drier/drought conditions		Impact on settings due to trees lost.	Potential impacts on three conservation areas surrounding the site. Including Fen Ditton, Bateswite Lock, and Stourbridge Common, which circle the site, all along the riverbank. Significant impacts will occur on		

					these sites if loss of vegetation occurs due to climate change as views will not be preserved. Visual impact on these areas must be considered in order to mitigate significance, coinciding with Landscape chapter.	
Conservation areas	Potential temporary adverse effects on landscape settings (local flora and fauna) during construction.	Planting trees/vegetation to screen site.	Hotter and wetter conditions	Leads to longer growing season – increase rate of growth of vegetation.	Potential impacts on three conservation areas surrounding the site. Including Fen Ditton, Bateswite Lock, and Stourbridge Common, which circle the site, all along the riverbank. Significant impacts will occur on these sites if loss of vegetation occurs due to climate change as views will not be preserved. Visual impact on these areas must be considered in order to mitigate significance, coinciding with Landscape chapter.	No additional measures identified as management of buildings and land outside the boundary of the proposed scheme are not with the control of this project.
	Significant change in setting during operation.		Increased wind speed* and drier/drought conditions	Impact on settings due to trees lost.		
Ecology						
Habitats and wildlife species	Stress on habitats during construction and operation, including disruption to breeding, feeding and migration patterns of	Ensure planting is diverse and accounts species that can deal with extreme climates (drought, high winds and flooding),	Drier/drought conditions and variation in temperature	The site is comprised of open mosaic habitat which is very nutrient poor and stressed, and is and prone to drought	No change in significance.	No additional mitigation required.

	<p>species. Potential decline on species populations, as well as permanent loss, removal, and degradation of habitats.</p>	<p>including native species.</p>	<p>and rainfall patterns</p>	<p>conditions and extremes of hot and cold. Therefore the more stressed the environment becomes, the better is for the species in the area.</p> <p>It is likely that there will be drier/drought conditions as a result of climate change which will have a positive impact by increasing the existing stress on habitats, which will then favour more specialist species rather than generalist. This will help maintain ecological interest of the site.</p> <p>Low flows and decrease in water levels will also provide an enhanced opportunity allowing species to adapt and move more freely across the site.</p>		
			<p>Increased wind speed*</p>	<p>Increased tree loss, habitat loss and/or fragmentation.</p> <p>Impact on habitats established on rooftops resulting in habitat loss. High</p>	<p>No change in significance</p>	<p>Some micro-climates will be introduced on the roof top planting spaces, to provide shelter for invertebrates during high winds. This will include increasing both</p>

				wind events are likely to be infrequent enough that habitats will be able to recover. Species in the area are already adapted to climate extremes and stressed environments.		the height and the number of the deadwood piles and bee bank features and making sure the alignments are orientated to the SE and not the SW so there is shelter from the prevailing wind direction.
			Increase in frequency and intensity of heavy rainfall events/ flooding	Increased frequency of intense heavy rainfall events and rainfall are likely and could lead to a change in habitat resulting in a positive impact making the habitats more suitable for specialist species in the area.	No change in significance	Ensure planting accounts for the inundation zone and is planted out with the right balance of species that can deal with drought and flooding.
			Increase in frequency of extreme weather events (e.g. drought, flooding, heat waves)	Increased frequency and intensity of storm events lead to destruction of trees and affect nesting birds by disturbance and reduce availability of nesting habitat. The bird assemblage on the site is not big at present this is therefore a low value receptor.	No change in significance	No additional mitigation required.
			Increased temperatures and	Increased temperature may change the suitability	No change in significance	No additional mitigation required.

			occurrence of heat waves	of habitat conditions, potential for increase in spread of non-native species if native species/plants can't survive. Invertebrate study of the site found non-native species on the site including wasps and bees, that are associated with continental climate change. Increases in temperatures and heat waves associated with climate change will bring across other new species, but this will not consequently push out species in the area that have already adapted to the stressed Breckland environment. The warmer winters will mean there are more species to come across. Native and on-native species coexist in other similar locations.		
Carbon						
Carbon emissions	Carbon emissions resulting from construction works	None	Increase in frequency of extreme	Loss of material due to extreme weather such as high	No impact	No additional mitigation required.

	including energy and new materials for the construction of the Proposed Development.		weather events e.g. drought flooding heatwaves.	temperatures, drought, flooding, can damage material during construction. Thus, more material required and more carbon associated with this.		
	Energy needed to maintain necessary environmental conditions for suitable materials storage.	None	Increase in frequency of extreme weather events e.g. drought flooding heatwaves.	Variation in temperatures may require more or less energy to maintain environmental conditions depending on season, and may affect carbon emissions.	No impact	No additional mitigation required.
	Carbon emissions resulting from activities related to any works and new materials for the maintenance, repair, replacement, and refurbishment of the Proposed Development during the use stage.	None	Variation in temperature and rainfall patterns.	Weathering of material due to extreme weather may cause additional material requirements, therefore more maintenance, repair and replacement and carbon emissions.	No impact	No additional mitigation required.
	Carbon emissions resulting from the energy used by the Proposed Development infrastructure and building integrated systems (e.g. fans, pumps, lights).	None	Increased temperatures	Increased summer cooling demand in buildings etc.	No impact	No additional mitigation required.

Human health						
People and communities	<p>Neighbourhood quality; life, mental health and wellbeing of residents i.e. visual and noise impacts, loss of property, disturbance from construction traffic.</p> <p>Access to services, health and social care; including direct and indirect impacts of services and community facilities and reduced access from changes in journey times.</p> <p>Access to green space and physical activity.</p> <p>Social capital; including changes in community connectivity from road diversions, creation of barriers between communities, direct impacts on community facilities and impacts to construction workforce.</p> <p>Housing.</p>	Environmental management plan contains measures to prevent construction impacts.	<p>Increase in frequency of extreme weather events (e.g. drought, flooding, heat waves)</p>	<p>This is likely to lead to additional stress for people during construction. Mitigation outlined in the EMP is likely to cover measures as the climate is not likely to change much in the short timeframe.</p>	No change in significance.	No additional measures required.
	<p>Hotter and drier/drought conditions</p>		<p>May exacerbate loss of grassland/green space, reduced health and wellbeing of communities, during construction. Mitigation outlined in the EMP is likely to cover measures as the climate is not likely to change much in the short timeframe.</p>	No change in significance.	No additional measures required.	

	Health effects from noise	Mitigation against noise impacts has been summarised in the noise and vibration assessment, including update to building regulations part O.	Changes in humidity and increases in temperature	Greater number of people sleeping with windows open, may alter propagation characteristics of sound through air, during operation. Climate change has been considered in the noise mitigation proposed.	No change in significance.	No additional measures required.
	Possible impact on health due to altered landscape caused by changed perception of the local environment.	Altered landscape will be adapted to climate change, refer to landscape chapter mitigation techniques, which include planting of drought tolerant, heat tolerant, as well as hardy specialised species and species which provide year-round coverage.	Increase in frequency of extreme weather events and hotter and drier/drought conditions	May create stress for people, during operation. There is some landscaping on the development which has been incorporated in the design. Planting strategy and mitigation has considered climate change. Statistically few extreme heat days predicted.	No change in significance	Outside furniture (benches, floor surfaces and handrails etc) should be suitable for changing temperatures for example they not be metal which could overheat.
Older people	Vulnerability to fluctuations in temperature (heat waves or extended cold periods)	Internal spaces to be built into buildings where socialisation can happen (informally and formally), providing more sheltered environments to meet people. Incorporation of water features will	Increased temperatures and occurrence of heat waves	Extreme heat events to cause increased morbidity and mortality in elderly residents (note also potential opportunity: reduction in excess winter deaths)	No change in significance.	Ensure there is connectivity to outside spaces within the boundary of the site. Connect into routes to get to buildings when weather outdoors becomes uncomfortable/extreme.

		lead to more evaporation on site, allowing for mitigation of the heat effect locally.				
Landscape and visual						
Landscape character and visual receptors	<p>Visibility of the Proposed Development at construction and/or operation. And Character of landscape within and surrounding the Proposed Development site.</p> <p>Viewpoint 8 and 15 have the potential for significant effects.</p>	<p>Visual screening planting has been incorporated into the design.</p> <p>Ensure planting is diverse and accounts for species that can deal with extreme climates (drought, high winds and flooding), pests and diseases, including native species following British standards.</p> <p>Planting of vegetation on the car park and on the facade nearest the railway may lead to softening of the view to receptors in the neighbouring residential area. Relying on the maintenance plan for general upkeep. This includes increasing</p>	Drier/drought conditions and variation in temperature and rainfall patterns	<p>An increase in drier/drought conditions and variation in rainfall is likely to lead to loss of vegetation and receptors becoming more vulnerable to stress. This could further disrupt views to and from the site. Drought tolerant trees may become more prevalent (therefore also changing landscape character) and certain soil types may be less readily available. The site is comprised of open mosaic habitat which is very nutrient poor and stressed, and is and prone to drought conditions and extremes of hot and cold. Therefore the more stressed the environment</p>	No change in significance	<p>Potential to include deeper soil profiles or more moisture retentive textures to mitigate longer term drought effects on soils and associated tree species or vegetation. The current good practice is to separate different soil types during the restoration process; however this measure may not be sufficient following any potential Climate Change impacts therefore to combat this, soil types may be mixed to provide greater flexibility for plant and trees species to be more resilient to drought.</p>

		the timing of the grassland cut if there are extended droughts/heatwaves anticipated. Much of the understory planting is herbaceous and it will respond to drought by limiting its vegetative growth. In extreme situations the vegetation could be cut without severe detriment to the planting. Rain garden 'hit and miss' kerbs are used to employ passive irrigation from hard surface run-off.:		becomes, the better is for the species in the area.		
		Monitor trees and embed reporting processes for catching pest and disease early	Heatwaves and draught/dry conditions	Could delay implementation of tree planting.	Potential change in significance as trees are required for screening of the site and could die if planted too soon.	Schedule construction phasing so that trees are planted in early winter, November to January, so that roots can establish.
		Species within swales and ponds are not wetland species but will tolerate being underwater for a few days.	Hotter and wetter conditions	Could lead to an increase in pests and diseases, leading to loss of vegetation and defoliation making species more susceptible to external stress. The site is comprised of open mosaic habitat which is very nutrient poor and stressed, and is and prone to drought conditions and extremes of hot and cold. Therefore the more stressed the environment becomes, the better is for the species in the area.	This may result in loss of trees and vegetation, so this mitigation relies on existing vegetation outside of the site in order to hide the development and enclose conservation areas surrounding. This could result in a significant effect.	Source trees from British nurseries wherever possible to avoid import of pest and disease. The scale of the residual effect on viewpoint 8 and 15 is unmitigable, however, existing planting will soften some of the effects. No additional measures identified as management of buildings and land outside the boundary of the proposed scheme are not with the control of this project.
		Mulch is used to reduce water loss	Drier/drought conditions	Wetlands may disappear (also dependent on elevation and spilt type) and certain soil types may be less readily available.	No change in significance	No additional mitigation required

		<p>from soil. Watering will also be scheduled early or late in the day to reduce transpiration.</p> <p>Underground tree guying specified is robust to withstand variations in windspeed</p>	<p>Increase in frequency and intensity of heavy rainfall events/ flooding</p>	<p>Loss of species in certain areas, because soils become water-saturated and can no longer support existing species. The site is comprised of open mosaic habitat which is very nutrient poor and stressed, and is prone to drought conditions and extremes of hot and cold. Therefore the more stressed the environment becomes, the better is for the species in the area.</p>	<p>No change in significance</p>	<p>No additional mitigation required</p>
			<p>Hotter and wetter conditions</p>	<p>Potential for longer growing season.</p> <p>A longer growing season could result in greater screening/filtering effect of planting due to faster growth and extended period of leaf cover. Leads to a longer growing season – increased rate of growth of vegetation. Could lead to increased maintenance - cut/trim more often.</p>	<p>No change in significance</p>	<p>No additional mitigation required</p>

			Increased wind speed*	Impact on landscape through potential tree losses. Could further disrupt views to and from the site.	Wind may result in loss of trees, so this mitigation relies on existing vegetation outside of the site in order to hide the development and enclose conservation areas surrounding. This could result in a significant effect.	The scale of the residual effect on viewpoint 8 and 15 is unmitigable, however, existing planting will soften some of the effects. No additional measures identified as management of buildings and land outside the boundary of the proposed scheme are not with the control of this project.
Sound, Noise and Vibration						
Future site users (residents)	Airborne noise during construction and operations, impacting local receptors.	All works will be conducted in accordance with a Construction Environmental Management Plan (CEMP), to minimise noise impacts. The noise limit specified within the noise assessment has been applied to the heating and ventilation equipment included in the design.	Changes in humidity and increase in temperature.	Climate change is likely to result in an increase in heat during the hottest months of the year and reduce temperatures during the coldest months of the year. There is therefore potential for an increased demand on heating and cooling systems. Increase temperatures during the warmer times of the year (i.e. summer) will potentially result in future residents of the Proposed Development having	No change to significance.	No additional measures required.

				<p>to rely on either natural ventilation solutions (i.e. openable windows), or mechanical cooling for longer periods of time. The use of natural ventilation solutions could expose the occupants to greater internal noise levels.</p> <p>Ventilation and cooling requirements during the summer, and demand for heating during the cooler months, may require additional or upgraded equipment which, if not appropriately mitigated, would result in greater noise impacts on the surrounding residential receptors.</p> <p>Any building services plant will need to be designed to the same measures that have been outlined in the assessments and therefore the impacts and effects described within the</p>		
--	--	--	--	--	--	--

				assessments will remain the same.		
Socio-economics						
Businesses and community organisations	<p>Suitability of public space for use by the public may vary in different weather conditions and during different events.</p> <p>Public behaviour and the need for public space changing based on different weather conditions and events</p>	<p>The Proposed Site will be designed to be suitable for a range of weather conditions. Vegetation planted will be of a variety of species including drought tolerant species (see more in the landscaping chapter).</p>	<p>Increase in frequency of extreme weather events (e.g. drought, flooding, heat waves)</p>	<p>Could change public behaviour and the pattern of use of public spaces. Based on evidence in other countries such as Italy which already experience these events, this is only likely to be an issue for a month per year, and is likely to be broken up by some cooler days following thunderstorms. The high-rise nature of the Proposed Development will mean that there will be some shade even when the sun is at its highest on the hottest day. Therefore, while a heat wave may change patterns of use, it is highly unlikely to do so significantly.</p>	<p>No change in significance</p>	<p>No additional measures required.</p>
Traffic and Transport						

All forms of motorised traffic and transport	Roads: temporary diversions, closures, alternative routes (Construction).	<p>Travel plan implemented. Improved routes into and around the site to be provided.</p> <p>Construction Traffic Management Plan implemented including routeing strategy for associated construction traffic.</p>	Drier/drought conditions and variation in temperature and rainfall patterns	<p>It is likely that drier/drought conditions will increase the time the public spent outdoors, and public transport use, however the consequence of this is low due to the mitigation outlined. The impact of this could be positive or negative.</p>	No change in significance.	No additional measures required.
		Potential for diversion routes into and around the site provided for access to Cambridge North Station and bus stops.				
	Roads: permanent diversions, closures, alternative routes (Operation).	Flood mitigation outlined in the water chapter.	Increase in frequency of extreme weather events (e.g. drought, flooding, heat waves)	<p>It is unlikely that an increase in the frequency of extreme events will negatively impact the roads because they have been designed with surface drainage systems that have embedded climate change allowances to deal with increased flood risk as described in the Water Chapter. The consequence will</p>	No change in significance.	No additional measures required.

				therefore also be low.		
Pedestrian routes	Footpaths: diversions, closures, alternative routes – temporary and permanent (Construction)	Travel plan implemented. Improved routes into and around the site to be provided.	Increase in frequency and intensity of heavy rainfall events/ flooding	Increases in rainfall events/flooding is likely. This could result in road/footpath closures. This will be mitigated against via measures outlined in the travel plan.	No change in significance	No additional measures required.
	Footpaths: diversions, closures, alternative routes – temporary and permanent (Operation)				No change in significance	No additional measures required.
Cyclists	Permanent diversions, closures, alternative routes for cycle lanes or road (Operation and construction).	Travel plan implemented to encourage staff/residents/visitors to use sustainable modes of transport to reach the site. Improved routes into and around the site provided	Drier/drought conditions and variation in temperature and rainfall patterns. Increase in frequency of extreme weather events (e.g. drought, flooding and heatwaves).	An increase in hotter and dryer conditions can cause variation in the time spent cycling.	No change in significance	No additional measures required.
				An increase in frequency of extreme weather events can cause variation in the time spent cycling.	No change in significance	No additional measures required.
Water resources, flood risks, and drainage						
Surface water resources	Both during construction and when fully operational, surface water discharge and run off from the development may lead to increased	Adoption of practices detailed in the CEMP and management plans which incorporate relevant pollution prevention guidelines and BS 6031 code of practice	Increase in frequency and intensity of heavy rainfall events/ flooding and variation in temperature	Increased discharge volume of surface water run-off. The consequence of this effect is low Potential impacts of extreme weather and	No change in significance	No additional measures required

	<p>discharge of flow into the drainage system which potentially could be contaminated water and may therefore impact upon surface water bodies downstream.</p>	<p>for earthworks. Use of temporary drainage networks and ditches to intercept overland flow and provide a level of treatment to runoff during construction.</p> <p>New surface water drainage system implemented utilising SuDS to reduce the peak flow discharge from the site to the ordinary watercourse.</p>	<p>and rainfall patterns</p>	<p>climate change on flood risk during construction to be mitigated through resilient design guidelines, presented in the CEMP. Climate change could result in more surface water being generated on the site, which has been accounted for within the design of the drainage system (see the Water Resources EIA chapter).</p>		
			<p>Drier/drought conditions</p>	<p>Reduced rainfall leads to lower flows in watercourses, low river flows, exacerbating the effects of spillages and increasing the concentration of pollutants in surface water resources. This is unlikely and low consequence because sufficient mitigation measures including climate change considerations have been embedded into the design.</p>	<p>No change in significance</p>	<p>No additional measures required</p>

	<p>Run-off from the site resulting in increased flood risk downstream.</p> <p>Impacts on residential receptors, access routes through the site and debris/material causing blockages.</p>	De-silting equipment installed upstream of flow control to reduce the risk of blockage.	Increase in frequency and intensity of heavy rainfall events/ flooding	This is unlikely and low consequence because peak surface water discharge rates will be controlled, reducing the risk of extreme rainfall events leading to Increased flood risk, increased run-off and increased discharge volume. Climate change could result in more surface water being generated on the site, which has been accounted for with the design of the drainage system (see the Water Resources EIA chapter).	No change in significance	No additional measures required
Groundwater	Pollution to groundwater resources during construction	Adoption of practices detailed in the CEMP and management plans.	Drier/drought conditions and variation in temperature and rainfall patterns	Drier drought conditions could result in lower flows in watercourses, reduction in groundwater levels, low river flows and reduced groundwater recharge and levels. This is unlikely and low consequence because annual precipitation has more of an impact on groundwater flows	No change in significance	No additional measures required
	Reduction in total area of permeable zones which will reduce recharge of the aquifer whilst also reducing the risk of groundwater pollution from the site.	Use of de-silting equipment prior to discharge of surface water off-site.			No change in significance	No additional measures required
	Flow may be affected by short-term temporary				No change in significance	No additional measures required

	excavations and temporary dewatering (operation)			and levels than seasonal precipitation. The water assessment has accounted for a 40% increase in peak rainfall intensity associated with climate change in the drainage design strategy when calculating the capacity of the system and how much water would need to be stored (see the Water Resources EIA chapter).		
	Potential for discharge of contaminants into the aquifer (construction).	<p>Use of temporary drainage networks and ditches to intercept overland flow.</p> <p>The drainage networks for the site will separate the surface water from foul drainage at source. The surface water networks will attenuate the peak surface water discharge rate prior to discharge off-site.</p> <p>Petrol interceptors will be installed to separate and remove</p>	Drier/drought conditions and variation in temperature and rainfall patterns	<p>This could result in lower flows in watercourses, reduction in groundwater</p> <p>levels, low river flows leading to further reduced groundwater recharge and levels and increasing the concentration of pollutants in groundwater resources.</p> <p>This is unlikely and low consequence because annual precipitation has more of an impact on</p>	No change in significance	No additional measures required

		contaminants from service yards and car parks where there is an increased risk of contamination originating.		<p>groundwater flows and levels than seasonal precipitation.</p> <p>The assessment has included 40% more water as a result of climate change in the drainage design strategy when calculating the capacity of the system and how much water we would need to store (see the Water resources EIA chapter).</p> <p>This effect is unlikely, and the consequence is low.</p>		
Flood risk and land drainage	Surcharging and flooding leading to exceedance of sewers resulting in combined sewer effluent escaping from the system and flooding on site. Releasing contaminants into the water environment (construction)	Adoption of practices detailed in the CEMP, which incorporate relevant content of pollution prevention guidelines and BS 6031 code of practice for earthworks.	Increase in frequency and intensity of heavy rainfall events/ flooding.	This effect is unlikely, and the consequence is low because potential impacts of extreme weather and climate change on flood risk during construction is to be mitigated through resilient design guidelines, presented in the CEMP.	No change in significance	No additional measures required
	Surcharging and flooding leading to exceedance of	Surface Water to be attenuated on site. Surface Water	Increase in frequency and intensity of	The likelihood of this effect is likely, but the consequence is	No change in significance	No additional measures required

	sewers resulting in combined sewer effluent escaping from the system and flooding on site. Releasing contaminants into the water environment (operation)	discharge rates to be restricted to 2.0 l/s/hectare in accordance with Local Policy,	heavy rainfall events/ flooding	low because the receiving ordinary watercourse is typically dry in short duration high intensity rainfall events therefore an excess of drainage capacity is available. Potential climate change impacts on flood risk and land drainage during operation works have been mitigated through a 40% climate change allowance in the drainage design strategy when calculating the capacity of the system and how much water is attenuated (see the Water Resources EIA chapter).		
	Increase discharge and run-off from site resulting in increasing flood risk downstream. Impacts on residential receptors, access routes through the site and debris/material	Adoption of practices detailed in the CEMP, which will incorporate relevant content of pollution prevention guidelines and application of the BS 6031 code of practice for the Contractor to prepare a surface water management plan for	Increase in frequency and intensity of heavy rainfall events/ flooding	This effect is unlikely, and the consequence is low because potential impacts of extreme weather and climate change on flood risk during construction is to be mitigated through resilient design guidelines,	No change in significance	No additional measures required

	causing blockages (construction)	the construction phase. Contractor to programme construction works to minimise the duration of open excavations in so far as practicable. Use of temporary drainage networks and ditches to intercept overland flow.		presented in the CEMP.		
	Increase discharge and run-off from site resulting in increasing flood risk downstream. Impacts on residential receptors, access routes through the site and debris/material causing blockages (operation).	Surface Water discharge rates to be restricted to 2.0 l/s/hectare in accordance with Local Policy. Surface Water to be attenuated on site.	Increase in frequency and intensity of heavy rainfall events/ flooding	The likelihood of this effect is likely but the consequence is low because the receiving ordinary watercourse is typically dry in short duration high intensity rainfall events therefore an excess of drainage capacity is available Potential climate change impacts on flood risk and land drainage during operation works have been mitigated through a 40% climate change allowance in the drainage design strategy when calculating the capacity of the system and how much water is to be	No change in significance	No additional measures required

				attenuated. A Flood Risk Assessment has also been completed. For more detail see the Water Resources EIA chapter.		
--	--	--	--	---	--	--

*There is considerable uncertainty in projecting wind changes, from wind speed to wind direction, and studies show statistically insignificant variation in wind speed.