Drought Plan option	**Media/Water Efficiency Campaign** **This option comprises wide-scale media activity and advertising to encourage voluntary reduction in water usage. The demand savings that are likely to accrue from a media campaign are very difficult to estimate. TWUL has implemented media campaigns in 2003 and 2005/6, and the data obtained over that period has been analysed. The assumption included in the LTOA / FCD as part of the savings achieved when the trigger is reached is that there would be saving of between 0 and 2.2% for London and 0 and 3.9% for Thames Valley. This figure is based on information gained in the 2005 and 2006 drought periods.**																						
Summary commentary of scheme adverse effects	**No adverse impacts have been identified for this drought plan option.**																						
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Beneficial impacts include reducing demand for water, securing supply of water for customers/businesses. Reducing the demand for water will also have beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstractions and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.**																						
SEA Objectives Beneficial Effects Assessment Summary		**None**		**None**		**None**								**None**	**None**	**None**	**None**	**None**			**None**		

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The media/water efficiency campaign is assumed to be communicated through radio and newspaper advertisements. Such methods of publicity are considered to have no impact on biodiversity, flora or fauna, or designated sites of nature conservation interest other than the potential to reduce consumer demand for water and subsequent reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow sensitive habitats/species).	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	There is the potential for the media/water efficiency campaign to raise awareness of the importance and value of water environment for biodiversity and ecosystem services.	Low (beneficial)	Medium	Medium	Low	Short-term	Temporary	None	Minor beneficial
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The media/water efficiency campaign is assumed to be communicated through radio and newspaper advertisements. Such methods of publicity are considered to have no impact on avoiding the introduction or spreading of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The media/water efficiency campaign will result in water savings which will contribute towards improving the security of supply for customers in TWUL's supply region. There is potential for the media/water efficiency campaign to raise awareness of the importance and value of water environment for health and well-being.	Low (beneficial)	High	Medium	High	Short-term	Temporary to permanent	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	No impacts on recreation, tourism or navigation are anticipated as a result of the media/water efficiency drought option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The media/water efficiency campaign will result in water savings which will contribute towards improving the security of supply for businesses in the region.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	The media/water efficiency campaign is assumed to be communicated through radio and newspaper advertisements and as such will not involve any increased material resource use. This option will reduce the amount of water used in the region. It will not involve any increased waste production.	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	The media/water efficiency campaign is assumed to be communicated through radio and newspaper advertisements and as such will result in promoting the sustainable management of natural resources including efficient and sustainable use of water, ensuring a supply of water to homes/businesses.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The media/water efficiency campaign is assumed to be communicated through radio and newspaper advertisements. Such methods of publicity are considered to have beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source, minimising impacts on levels and flows.	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Reductions in demand for water would result in reduced requirement for increased abstraction at source, avoiding associated impacts on surface water and groundwater quality.	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The media/water efficiency campaign is assumed to be communicated through radio and newspaper advertisements. Such methods of publicity are considered to have beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source.	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	The media/water efficiency campaign is assumed to be communicated through radio and newspaper advertisements. Such methods of publicity are considered to have beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source. This may have long term impacts on consumer water usage.	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	No impacts on geology, geomorphology and quality/quantity of soils are anticipated as a result of the media/water efficiency campaign.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	No impacts on air quality are anticipated as a result of the media/water efficiency drought option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	The media/water efficiency campaign is assumed to be communicated through radio and newspaper advertisements and as such will not involve any increased resource use, or increased greenhouse gas emissions.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Demand management measures are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The media/water efficiency campaign is considered to have no direct impact on the historic environment, heritage assets and their settings and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing any impacts of drought related archaeology and cultural heritage impacts.	Low (beneficial)	Low	Medium	Moderate	Short-term	Temporary	None	Negligible beneficial
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The media/water efficiency campaign is considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing any impacts of drought related landscape or visual impacts. There is the potential for the media/water efficiency campaign to raise awareness and understanding of natural occurrence of drought its impacts and function on the countryside or wildlife compared to those of unsustainable abstraction during times of drought.	Low (beneficial)	Low	Medium	Moderate	Short-term	Temporary	None	Negligible beneficial

Drought Plan option	**Leakage Reduction:** **Thames Water maintains an ongoing leakage activity and network pressure management programme. In addition to a find and fix' approach to leak repair, Thames Water is working to replace many old water mains in order to make long-term, sustainable leakage reductions.**																						
Summary commentary of scheme adverse effects	**Minor adverse effects identified are associated with emissions to air (air pollutants and greenhouse gas emissions) as a result of construction activities and vehicle movements. All other adverse effects identified are negligible.**																						
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**	**None**		**None**	**None**		**None**	**None**		**None**	**None**		**None**	**None**			**None**		**None**		
Summary commentary of scheme beneficial effects	**Minor to moderate beneficial effects have been identified with respect to sustainable provision of water through water savings that would have otherwise been lost to leakage after having been abstracted at source. These effects are generally considered to be long term and permanent in nature.**																						
SEA Objectives Beneficial Effects Assessment Summary		**None**	**None**	**None**		**None**								**None**	**None**	**None**	**None**			**None**	**None**	**None**	

SEA topics and objectives	Assessment methodology	Assessment of option								
Objective	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Construction activities associated with leakage detection and repair activities may result in disturbance to local habitats and species during the works. The majority of works are anticipated to be in an urban setting. Assuming best practice construction methods, impacts of the construction phase are anticipated to be negligible. The reduction in water lost through leakage will result in reduced requirement for abstraction at source and therefore, potential for positive impacts on flow and sensitive habitats/species.	Low (adverse) Low (beneficial)	Low (adverse) Medium (beneficial)	Medium	High	Long term	Permanent	Negligible adverse	Minor beneficial
1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives	Assessment methodology	Assessment of option								
1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Leakage detection and repair activities will not affect the spread of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The drought option will help to ensure levels of service are maintained through enabling provision of water that would have otherwise been lost to leakage. Construction activities associated with leakage detection and repair activities may result in nuisance effects associated with traffic and noise. However, these will be short term at any one location (likely to be urban) and assuming best practice construction methods, effects will be minimal.	Low (beneficial) Low (adverse)	High (beneficial) Low (adverse)	Medium (beneficial) Small (adverse)	Medium	Long-term (beneficial) Short-term (adverse)	Permanent (beneficial) Temporary (adverse)	Negligible adverse	Moderate beneficial
2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	It is assumed that public rights of way will be maintained during repair activities and there will be no effects on recreational opportunity.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	Low	Long-term	Temporary	None	Moderate beneficial

SEA topics and objectives	Assessment methodology	Assessment of option								
3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increased leakage detection and repairs and network pressure management ('fix and find') will result in the reduction of water lost in the supply network and therefore the energy and chemicals used to treat it. It utilises existing infrastructure. Repairs may require raw materials. It has been assumed that any materials required would be obtained locally.	Low (beneficial) Low (adverse)	Low	Medium	High	Long-term	Permanent	Negligible adverse	Negligible beneficial
3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	Increased leakage detection and repairs and network pressure management ('fix and find') will result in the reduction of water lost in the supply network , reduce the requirement for abstraction at source and therefore enable more efficient water resource management and ensure maintenance of supply.	Low (beneficial)	High	Medium	High	Long-term	Permanent	None	Moderate beneficial
4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The drought option will not directly result in, or modify any abstraction (surface water or groundwater) and therefore will not effect surface water or groundwater levels. However, the reduction in water lost through leakage will result in reduced requirement for abstraction at source.	Low (beneficial)	Medium	Medium	Moderate	Long-term	Permanent	None	Minor beneficial

SEA topics and objectives	Assessment methodology	Assessment of option								
4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Construction activities associated with leakage detection and repair activities may result in the potential for impacting on local surface and groundwater quality. Assuming best practice construction methods, impacts of the construction phase are anticipated to be negligible. The reduction in water lost through leakage will result in reduced requirement for abstraction at source, and therefore also mitigate any surface water quality effects associated with abstraction.	Low (beneficial) Low (adverse)	Low	Medium	High	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (long term)	Negligible adverse	Negligible beneficial
4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The option will contribute to more sustainable abstractions by reducing the amount of water already abstracted that is lost through leakage.	Low (beneficial)	Medium	Medium	High	Long-term	Permanent	None	Minor beneficial
4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	The option will improve the efficiency of the water supply network. There may be some effect on customer water use if it is seen that leakage 'find and fix' is being undertaken.	Low (beneficial)	Medium	Medium	Medium	Long-term	Permanent	None	Minor beneficial

SEA topics and objectives	Assessment methodology	Assessment of option								
5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Construction activities associated with leakage 'find and fix' activities may result in localised disturbance to geology and land use. However, repair activity will be on pipelines which are already in situ.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	Vehicle trips necessary for leakage detection and repair will cause emissions affecting air quality, including some within the London Low Emissions Zone.	Low (adverse)	High	Small	Low	Short-term	Temporary	Minor adverse	None
6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Vehicle trips necessary for leakage detection and repair will cause emissions of greenhouse gas emissions. Leakage detection and repairs will result in the reduction of water lost in the supply network and long term energy savings associated with this reduction (decreased greenhouse gas emissions associated with decreased need for water treatment and pumping).	Low (beneficial) Low (adverse)	Medium	Medium	Moderate	Short-term (adverse) Long-term (beneficial)	Temporary (adverse) Permanent (beneficial)	Minor adverse	Minor beneficial

SEA topics and objectives	Assessment methodology	Assessment of option								
6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus?	Demand management measures are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Long-term	Permanent	None	Minor beneficial
7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	Leakage 'find and fix' activity will be on pipelines which are already in situ, and as such, it is not anticipated that any sites of archaeological or cultural heritage importance will be affected. The setting of any surrounding heritage assets may be impacted for the short term, however, considering the option is an acceleration of ongoing leakage reduction activity this is considered negligible.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives	Assessment methodology	Assessment of option								
8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The majority of works are anticipated to be in an urban setting. Assuming best practice construction methods, impacts of the construction phase are anticipated to be negligible. The scheme will have no direct effect on landscape and visual amenity in operation.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None

Drought Plan option	**Sprinkler Ban and Unattended Hosepipe Ban.** **Overview: Demand savings that are likely to accrue from a sprinkler and unattended hosepipe ban are difficult to estimate. TWUL had not had a hosepipe ban since 1990 prior to 2006. The assumption included in the LTOA / FCD for the savings achieved when the measure is implemented is that there would be saving of between 0 and 7% for London and 0 and 9.4% for Thames Valley, depending on the time of year. This figure is based on information gained in the 2005 and 2006 drought periods.**																						
Summary commentary of scheme adverse effects	**No major adverse effects have been identified for this option. A minor adverse effect has been identified in terms of promoting a sustainable economy due to the sprinkler ban affecting some businesses that rely on sprinklers/hosepipes in their line of work (e.g., landscaping/horticulture).**																						
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Beneficial impacts include reducing the demand for water, securing supply of water for customers/businesses. Reducing the demand for water will also have beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstractions and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.**																						
SEA Objectives Beneficial Effects Assessment Summary		**None**	**None**	**None**		**None**	**None**							**None**	**None**	**None**	**None**	**None**			**None**		

Sprinkler Ban and Unattended Hosepipe Ban - 1

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	A sprinkler ban is considered to have no impact on biodiversity, flora and fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow, sensitive habitats/species etc.).	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The sprinkler ban is likely to have no impact on avoiding the introduction or spreading of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	A sprinkler ban will provide water savings which will contribute towards improving security of supply of water in the TWUL's supply region. Drinking water quality will not be affected by the restrictions.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Reducing the demand for water is unlikely to have any adverse impacts for recreation, tourism and navigation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	There are likely to be impacts on domestic customers as the ban would preclude the use of sprinklers or unattended hosepipes to water private gardens or wash cars. The option carries the risk of economic impact on businesses that benefit directly or indirectly from sprinkler systems. For example, landscape companies that work on private gardens will be banned from using sprinklers or unattended hosepipes, and so may suffer some loss. There may be some impact on the horticultural business sector in general as plant buying patterns change during a drought.	Low (adverse)	High	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	A sprinkler ban will reduce the demand for water in the region, improving the efficiency of existing resource use. It will not result in any increase in the generation of waste.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	A sprinkler ban will reduce the demand for water in the region, promoting sustainable resource use.	Low (beneficial)	High	Moderate	High	Short-term	Temporary	None	Moderate beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	This option will not directly result in, or modify any abstraction (surface water or groundwater). Reduction in demand for demand for water will result in reduced requirement for abstraction at source, minimising impacts on levels and flows.	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Reductions in demand for water would result in reduced requirement for increased abstraction at source, avoiding associated impacts on surface water and groundwater quality.	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial

Sprinkler Ban and Unattended Hosepipe Ban - 2

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	This option will not directly result in, or modify any abstraction (surface water or groundwater), Reduction in demand for demand for water will result in reduced requirement for abstraction at source	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	This option will have a beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source. This may have medium to long-term impacts on consumer water usage.	Low (beneficial)	Medium	Medium	Moderate	Medium term	Temporary to permanent	None	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	No impacts on geology, geomorphology and quality/quantity of soils are anticipated as a result of the sprinkler ban.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	No impacts on air quality are anticipated as a result of the sprinkler ban.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	The sprinkler ban will not involve any increased resource use, or increased greenhouse gas emissions.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Demand management measures are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The sprinkler ban is considered to have no direct impact on the historic environment, heritage assets and their settings and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing any impacts of drought related archaeology and cultural heritage impacts.	Low (beneficial)	Low	Medium	Moderate	Short-term	Temporary	None	Negligible beneficial
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The sprinkler ban is considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing any impacts of drought related landscape or visual impacts.	Low (beneficial)	Low	Medium	Moderate	Short-term	Temporary	None	Negligible beneficial

Drought Plan option	**Temporary Use Ban.** **The demand savings that are likely to accrue from a temporary use ban are very difficult to estimate. The assumption included in the LTOA / FCD for the savings achieved when the measure is implemented is that there would be saving of between 0 and 4.2% for London and 0 and 4.7% for Thames Valley, depending on the time of year. This figure was reviewed and updated based on information gained in the 2005 and 2006 drought periods.**																						
Summary commentary of scheme adverse effects	**No major adverse effects have been identified. A minor adverse effect has been identified in terms of promoting a sustainable economy due to the temporary use ban affecting some businesses that rely on sprinklers/hosepipes in their line of work (e.g., landscaping/horticulture).**																						
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Beneficial impacts include reducing the demand for water, resulting in securing the supply of water for customers/businesses. Reducing the demand for water will also have beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstractions and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.**																						
SEA Objectives Beneficial Effects Assessment Summary		**None**	**None**	**None**		**None**	**None**				**None**			**None**	**None**	**None**	**None**	**None**			**None**	

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	A temporary use ban is considered to have no impact on biodiversity, flora and fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow, sensitive habitats/species etc.).	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The temporary use ban is likely to have no impact on avoiding the introduction or spreading of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	A temporary use ban will provide water savings which will contribute towards improving security of supply of water in the TWUL's supply region. Drinking water quality will not be affected by the restrictions.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Reducing the demand for water is unlikely to have any impacts for recreation, tourism and navigation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The principal impact will be on domestic customers as the ban would preclude use of hosepipes for those use categories set out under the temporary ban powers. The temporary use ban would include an exemption for commercial businesses in respect of the washing of private cars and washing of windows. The elderly and disabled would also be exempted from the measures imposed under the temporary use ban. There may be some impact on the horticultural business sector in general, as plant buying patterns have the potential to change during the imposition of a temporary use ban.	Low (adverse)	High	Medium	Moderate	Short to medium-term	Temporary	Minor adverse	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling?	A sprinkler ban will reduce the demand for water in the region, improving the efficiency of existing resource use. It will not result in any increase in the generation of waste.	Low (beneficial)	High	Medium	Moderate	Medium-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	A temporary use ban will reduce the demand for water in the region.	Low (beneficial)	High	Moderate	High	Medium-term	Temporary	None	Moderate beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	This option will not directly result in, or modify any abstraction (surface water or groundwater). Reduction in demand for demand for water will result in reduced requirement for abstraction at source, minimising impacts on levels and flows.	Low (beneficial)	Medium	Medium	Moderate	Medium-term	Temporary	None	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Reductions in demand for water would result in reduced requirement for increased abstraction at source, avoiding associated impacts on surface water and groundwater quality.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	This option will not directly result in, or modify any abstraction (surface water or groundwater), Reduction in demand for demand for water will result in reduced requirement for abstraction at source	Low (beneficial)	Medium	Medium	Moderate	Medium-term	Temporary	None	Minor beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	This option will have a beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source. This may have medium to long-term impacts on consumer water usage.	Low (beneficial)	Medium	Medium	Moderate	Medium-term	Temporary	None	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	No impacts on geology, geomorphology and quality/quantity of soils are anticipated as a result of the temporary use ban.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	No impacts on air quality are anticipated as a result of the temporary use ban.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	The temporary use ban will not involve any increased resource use, or increased greenhouse gas emissions .	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Demand management measures are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Long-term	Permanent	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The temporary use ban is considered to have no direct impact on the historic environment, heritage assets and their settings and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing the magnitude of any drought related archaeology and cultural heritage impacts.	Low (beneficial)	Low	Medium	Moderate	Medium-term	Temporary	None	Negligible beneficial
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The temporary use ban is considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing the magnitude of any drought related landscape or visual impacts.	Low (beneficial)	Low	Medium	Moderate	Medium-term	Temporary	None	Negligible beneficial

Drought Plan option	**Ordinary Drought Order to ban Non-Essential Use:** **Application to Defra to grant Non Essential Use Bans, as part of an ordinary drought order application. Savings of between 5 and 8% are predicted to be possible depending on the time of year. A conservative estimate of savings between 2.5 and 4% are assumed as part of TWUL's drought planning process.**																					
Summary commentary of scheme adverse effects	**No major adverse effects are predicted relating to the implementation of the ordinary drought order. Adverse effects associated with restriction of water use and impacts on recreation and tourism assets, and businesses/economy, may be minor and moderate respectively. They may also be minor adverse effects on heritage assets, such as visual impacts on parks and gardens and/or grounds of listed buildings. All adverse impacts identified are short-term and temporary.**																					
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**
Summary commentary of scheme beneficial effects	**Beneficial effects include a reduction in the demand for water and associated efficient resource use, maintenance of water flows/levels, maintenance of supply to consumers, and improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary		**None**	**None**	**None**		**None**	**None**				**None**			**None**	**None**	**None**	**None**	**None**			**None**	

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The use of an ordinary drought order to ban non-essential use is considered to have no impact on biodiversity, flora and fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow, sensitive habitats/species etc.).	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The use of an ordinary drought order to ban non-essential use is likely to have no impact on avoiding the introduction or spreading of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The use of an ordinary drought order to ban non-essential will provide water savings which will contribute towards improving security of supply of water in the TWUL's supply region. Drinking water quality will not be affected by the restrictions.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	There may be potential for minor impacts upon recreational opportunity due to any restrictions on filling of swimming pools, watering of sports pitches etc. There may be minor impacts associated with the setting of tourist attractions for example visual impacts on the grounds of popular tourist sites.	Low (adverse)	High	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option carries the risk of economic impact on businesses that benefit directly or indirectly from water usage (e.g. window cleaning businesses, sports and leisure facilities, garden and landscape orientated businesses.	Low (adverse)	High	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An ordinary drought order to ban non-essential use will reduce the demand for water in the region. It will not result in any increase in the generation of waste.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	The use of an ordinary drought order to ban non-essential use will reduce the demand for water in the region.	Low (beneficial)	High	Moderate	High	Short-term	Temporary	None	Moderate beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	This option will not directly result in, or modify any abstraction (surface water or groundwater). Reduction in demand for water will result in reduced requirement for abstraction at source, minimising impacts on levels and flows.	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The reduction in demand for water will result in reduced requirement for abstraction at source and therefore any water quality impacts associated with surface water quality.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	This option will not directly result in, or modify any abstraction (surface water or groundwater), Reduction in demand for demand for water will result in reduced requirement for abstraction at source	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	This option will have a beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source. This may have long term impacts on consumer water usage.	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	No impacts on geology, geomorphology and quality/quantity of soils are anticipated as a result of the ordinary drought order to ban non-essential use.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	No impacts on air quality are anticipated as a result of an ordinary drought order to ban non-essential use.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	The use of an ordinary drought order to ban non-essential use will not involve any increased resource use, or increased greenhouse gas emissions.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Demand management measures are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There may be minor impacts associated with the setting of heritage assets, for example, visual impacts on registered parks and gardens and /or the grounds of listed buildings. Notwithstanding these impacts, an ordinary drought order to ban non-essential use is considered to have no direct impact on the historic environment, heritage assets and their settings and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing the magnitude of any drought related archaeology and cultural heritage impacts.	Medium (adverse) Low (beneficial)	Low (Adverse) Low (beneficial)	Medium	Moderate	Short-term	Temporary	Minor adverse	Negligible beneficial
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	An ordinary drought order to ban non-essential use is considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing the magnitude of any drought related landscape or visual impacts. This option is not anticipated to have any implications for access to the countryside.	Low (beneficial)	Low	Medium	Moderate	Short-term	Temporary	None	Negligible beneficial

Drought Plan option	**Emergency Drought Order:** **An Emergency Drought Order will be used as a last resort, when all other reasonable drought options have been implemented. The demand savings that are likely to accrue from an emergency drought order are very difficult to estimate. TWUL has not yet implemented an Emergency Drought Order.**																					
Summary commentary of scheme adverse effects	**Significant adverse effects are predicted relating to the implementation of the emergency drought order, restricting water use with impacts for recreation and tourism assets, and businesses/economy (population and human health. Other adverse effects include potential minor impacts on heritage assets (e.g. visual impacts on parks and gardens and/or grounds of listed buildings).**																					
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**
Summary commentary of scheme beneficial effects	**Beneficial effects include a reduction in the demand for water and associated efficient resource use, maintenance of water flows/levels, maintenance of supply to consumers, and improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary		**None**	**None**	**None**		**None**	**None**				**None**			**None**	**None**	**None**	**None**	**None**			**None**	

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	An emergency drought order is considered to have no impact on biodiversity, flora and fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow, sensitive habitats/species etc.).	Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	None	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will work with catchment groups in the long term to collaborate on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	An emergency drought order is likely to have no impact on avoiding the introduction or spreading of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	An emergency drought order will provide water savings which will contribute towards improving security of supply of water in the TWUL's supply region. Drinking water quality will not be affected by the restrictions.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Depending on the scale of the requirements of the required demand and supply restrictions, there could potentially be significant impacts on recreation and tourism, particularly activities that may benefit directly or indirectly from water usage (e.g. swimming pools, sports pitches, the setting of tourist attractions and visual impacts on the grounds of popular tourist sites). In the worst case scenario, publicity regarding water restrictions may cause a loss of tourism revenue, as tourists delay or cancel trips to the affected area.	Medium (adverse)	High	Medium	Moderate	Short-term	Temporary	Major adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Depending on the scale of the requirements of the required demand and supply restrictions, there could potentially be significant impacts on businesses/economy, particularly those that benefit directly or indirectly from water usage (e.g. window cleaning businesses, sports and leisure facilities, garden and landscape orientated businesses.	Medium (adverse)	High	Medium	Moderate	Short to medium-term	Temporary to Permanent	Major adverse	None
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An emergency drought order to ban non-essential will reduce the demand for water in the region. It will not result in any increase in the generation of waste.	Low (beneficial)	Medium	Medium	Moderate	Medium-term	Temporary to permanent	None	Minor beneficial

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	The use of an emergency drought order will reduce the demand for water in the region.	Low (beneficial)	High	Moderate	High	Medium-term	Temporary to permanent	None	Moderate beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	This option will not directly result in, or modify any abstraction (surface water or groundwater). Reduction in demand for water will result in reduced requirement for abstraction at source, minimising impacts on levels and flows.	Low (beneficial)	Medium	Medium	Moderate	Medium-term	Temporary	None	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The reduction in demand for water will result in reduced requirement for abstraction at source and therefore any water quality impacts associated with surface water quality.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	This option will not directly result in, or modify any abstraction (surface water or groundwater), Reduction in demand for demand for water will result in reduced requirement for abstraction at source.	Low (beneficial)	Medium	Medium	Moderate	Medium-term	Temporary	None	Minor beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	This option will have a beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source. This may have medium to long-term impacts on consumer water usage.	Low (beneficial)	Medium	Medium	Moderate	Medium-term	Temporary to permanent	None	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	No impacts on geology, geomorphology and quality/quantity of soils are anticipated as a result of the use of an emergency drought order.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	No impacts on air quality are anticipated as a result of the use of an emergency drought order.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	The use of an emergency drought order use will not involve any increased resource use, or increased greenhouse gas emissions.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Demand management measures are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There may be minor impacts associated with the setting of heritage assets, for example, visual impacts on registered parks and gardens and /or the grounds of listed buildings. Notwithstanding these impacts, an ordinary drought order to ban non-essential use is considered to have no direct impact on the historic environment, heritage assets and their settings and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing the magnitude of any drought related archaeology and cultural heritage impacts.	Medium (adverse) Low (beneficial)	Low (Adverse) Low (beneficial)	Medium	Moderate	Medium-term	Temporary	Minor adverse	Negligible beneficial
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	An ordinary drought order to ban non-essential use is considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing the magnitude of any drought related landscape or visual impacts. This option is not anticipated to have any implications for access to the countryside.	Low (beneficial)	Low	Medium	Moderate	Medium-term	Temporary	None	Negligible beneficial

Drought Plan option	**North London Artificial Recharge Scheme:** **Artificial recharge (AR) is the technique of increasing the rate of recharge of an aquifer which generally contains reasonably good quality water and from which groundwater abstraction already occurs. Treated water is pumped into the aquifer and stored for use at a later date, when it is abstracted either at or downstream from the recharge site. AR is based on overall catchment water balances, and is used to prevent over-abstraction of native groundwater. Together with Chingford Artificial Recharge scheme (CHARS), which is essentially a subset of NLARS with slightly different operational rules) 48 boreholes along the Lee Valley are involved. The current peak yield for NLARS is 190Ml/d, however, after sustained use yield would be reduced. Over extended periods of use (more than 16 months) the scheme will require extended periods of recharge. Therefore yield is vulnerable to severe multi-year droughts or successive droughts.**																					
Summary commentary of scheme adverse effects	**Adverse effects identified are associated with energy use and materials required for the re-abstraction of stored water and its treatment. Adverse effects are also likely with respect to emissions to air (air pollutants and greenhouse gas emissions) as a result of the additional pumping and treatment requirements.**																					
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**		**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Major beneficial effects are identified with respect to sustainable provision of a large quantity of water (at a rate of up to 190Ml/d) during periods of drought, and improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**		**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives	Assessment methodology	Assessment of option							
Objective	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The drought option abstracts from the confined aquifer under north London and so has no impact on surface water levels. No operational impacts on SSSIs, other designated or undesignated habitats or species have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The artificial recharge option will not introduce or affect the spread of INNS, as it involves clean treated water pumped and stored in groundwater for re-abstraction.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The drought option will help to ensure levels of service are maintained through provision of up to 190Ml/d of water.	High (beneficial)	High	Medium	High	Short-term	Temporary	None	Major beneficial
2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	No impacts on recreation, tourism and navigation, or green infrastructure are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	High (beneficial)	High	Medium	High	Short-term	Temporary	None	Major beneficial
3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	The option utilises existing infrastructure. An increase in energy use is envisaged due to re-abstraction of aquifer-stored water. Materials would be required outside of the environmental drought period associated with the treatment of water for recharge.	Medium (adverse)	Low	Medium	High	Short-term	Permanent	Minor adverse	None
3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	Groundwater levels will be drawn down during the operation of this scheme. However, the drought option abstracts from the confined aquifer and so no impact on surface water levels are anticipated. Recharge to the aquifer is made during times of surplus water supply, which is drawn from multiple sources including surface water from Rivers Lee and Thames and groundwater from New River wells. Water is drawn at times when the abstraction will cause no significant impact on surface water flows.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	AR at sites where the chemistry of the recharge water and the groundwater are compatible should not have adverse effects on groundwater quality. There is a low risk of groundwater deterioration during extended pumping under severe drought conditions. Recharge to the aquifer is made during times of surplus water supply. No impacts on water quality downstream of abstraction points are anticipated. Recharge water would be potable water sourced from local WTW.	Low (adverse)	Low	Medium	Low	Short-term	Temporary	Negligible adverse	None
4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The option will contribute to more sustainable abstractions by undertaking recharge to the aquifer during times of surplus water supply, to allow for re-abstraction during times of drought with no significant impacts on surface water WFD status.	Low (beneficial)	Medium	Medium	High	Long-term	Permanent	None	Minor beneficial

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Objective	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	With no land take and no identified hydrological impacts no effects on geology, geomorphology or soils are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	An increase in emissions is envisaged due to the re-abstraction of aquifer-stored water. The boreholes associated with the drought option are located in the London Boroughs of Enfield and Haringey, both of which have declared AQMAs for nitrogen dioxide and particulate matter. The local area surrounding some of the boreholes may be urban.	Medium (adverse)	Medium	Small	Low	Short-term	Temporary	Moderate adverse	None
6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	An increase in emissions is envisaged due to the re-abstraction of aquifer-stored water. Therefore there will be a associated short term increase in greenhouse gas emissions associated with the additional pumping and treatment requirements. An increase in energy use, emissions and CO_2 are also envisaged outside of the environmental drought period associated with the provision, treatment and storage of water for recharge.	Medium (adverse)	Low	Medium	High	Short-term	Temporary	Minor adverse	None
6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Supply-side measures are a key component of Thames Water's Drought Plan. The Drought Plan aims to ensure resilience of water supplies to drought.	High (beneficial)	High	Medium	High	Short-term	Temporary	None	Major beneficial
7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	Abstraction from the boreholes is within existing licence limits. In order for the drought option to be feasible requires maintaining groundwater levels at the abstraction locations via Artificial Recharge. Over the long term the option is not anticipated to adversely effect the historic environment, sites of archaeological or cultural heritage importance or palaeo-environmental remains or their setting.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	With no construction requirements, long term adverse hydrological effects there will be no adverse effects to the quality or access to designated or undesignated landscapes, townscapes and the countryside.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Thames Gateway Water Treatment Works (TGWTW):** **TGWTW is a desalination plant that uses brackish water abstracted from the Thames Tideway and treats the water to potable standard. The source has an abstraction licence for 200 Ml/d peak and 200 Ml/d average, and the water treatment plant has a maximum output of 150 Ml/d. There is an Operating Agreement governing use of the scheme. The TGWTW would take between 4-6 weeks to ramp up to full output, however the scheme is maintained in a state of readiness so it does not need to be increased to full output from zero output.**																					
Summary commentary of scheme adverse effects	**The scale of water abstraction, treatment including RO, and waste stream pumping required for implementation of this option will have moderate adverse effects on air emissions, moderate effects on resource consumption, and minor effects on greenhouse gas emissions. The treatment process would also have minor waste management impacts, due to discharge of brine from the desalination plant and generation of sludges from clarification and filtration units and RO membranes. Impacts should be short term and temporary, assuming the plant was only ramped up to full output in drought situations.**																					
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**	**None**	**None**					**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Use of the TGWTW would have major beneficial effects regarding maintenance of supply reliability in drought conditions through provision of up to 150Ml/l supply, the availability of which is not influenced by the effects of drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology		Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	No operational impacts of the option on European designated sites have been identified. Impacts on flows are negligible and the waste stream is released via STW effluent outfall so that it is diluted by the effluent from Beckton STW before discharge to the Thames. Dilution and dispersion were appropriately considered in the design of the TGWTW, and the discharge is a small volume when compared to that in the tideway. Compliant intake screens are in place. Therefore no operational impacts on SSSIs, other designated or undesignated habitats or species have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The desalination option will not introduce or affect the spread of INNS, as impacts on flows are negligible and the waste stream is released via STW effluent outfall so that it is diluted by the effluent from Beckton STW before discharge to the Thames. Dilution and dispersion were appropriately considered in the design of the TGWTW.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being?	The drought option will help to ensure levels of service are maintained through enabling provision of 150Ml/d of water.	High (beneficial)	High	Medium	High	Short-term	Temporary	None	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	The drought option is not expected to impact on other users, including recreation, tourism and navigation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	High (beneficial)	High	Medium	High	Short-term	Temporary	None	Major beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Energy use required for water abstraction, treatment including RO, and waste stream pumping is considered significant.	High (adverse)	Low	Medium	Medium	Short-term	Temporary	Moderate adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	The RO process would produce a waste stream of approximately one third (75Ml/d) of the initial intake (200Ml/d), which would be composed of a high concentration of salts and other contaminants removed from the raw water. The clarification and filtration units and RO membranes would be backwashed periodically to prevent clogging. Sludges produced by this process would require disposal.	Low (adverse)	Low	Medium	High	Short-term	Temporary	Negligible adverse	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	There is the potential for changes to estuarine flow, including at low water spring tides. However, any potential impacts are considered negligible.	Low (adverse)	Low	Low	Medium	Short-term	Temporary	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	There is the potential for a change in estuarine water quality due to discharge of the concentrated waste stream. However this is mitigated through the release of the waste stream via STW outflows so that it is diluted by the effluent from Beckton STW before discharge to the Thames. Dilution and dispersion were appropriately considered in the design of the TGWTW and therefore adverse effects to the Tideway and WFD status are considered negligible.	Low (adverse)	Low	Low	Medium	Short-term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The option will not affect the sustainability of other surface water or groundwater abstractions.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	No impacts on land use and geology are anticipated. The plant has already been commissioned.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	An increase in air emissions is envisaged due to the amount of power required for water abstraction, treatment including RO, and waste stream pumping. TGWTW is in relatively close proximity (less than 2km) to Newham AQMA, declared with respect to nitrogen dioxide and particulate matter (therefore considered of medium sensitivity to the effects). However, there is an agreement with London Borough of Newham, as part of the planning conditions, to buy the same amount of energy used at	Medium (adverse)	Medium	Small	Low	Short-term	Temporary	Moderate adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	There will be a significant volume of greenhouse gas emissions associated with this drought option due to the amount of power required for water abstraction, treatment including RO, and waste stream pumping. However, the fuel will be derived from renewable source and electricity generated on site.	Medium (adverse)	Low	Medium	Medium	Short-term	Temporary	Minor adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Supply-side measures are a key component of Thames Water's Drought Plan. The Drought Plan aims to ensure resilience of water supplies to drought.	High (beneficial)	High	Medium	High	Short-term	Temporary	None	Major beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The drought option is not anticipated to impact any sites of archaeological or cultural heritage importance or palaeo-environmental remains.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No impacts on landscape and visual amenity are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Hoddesdon Transfer Scheme (River Lee Flow Augmentation):** **The Hoddesdon Transfer Scheme is an indirect re-use scheme that involves transferring flow from Deephams STW to Rye Meads STW for treatment via an 18.9km, 600mm diameter pipeline and a new sewage pumping station. Treated water would be discharged to augment flow in the River Lee, which will increase the volume of water in the River Lee diversion channel and allow increased abstraction during periods of drought. It has an estimated net benefit to the London water resource system of 12.5Ml/d in any month. The implementation time for this supply-side measure is between 14-28 days.**																					
Summary commentary of scheme adverse effects	**There is potential for a minor reduction in flow in this reach. All other adverse effects identified were negligible in significance, and all adverse effects are short-term and temporary.**																					
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**	**None**	**None**					**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are associated with maintenance of water supply, and minor beneficial effects are expected with regard to promotion of sustainable management of water resources by enabling reuse of treated water, and improved resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**		**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	No operational impacts of the option on European designated sites were identified. No operational impacts on SSSIs, other designated or undesignated habitats or species have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The scheme is unlikely to have an impact on introduction or spread of INNS, as any present would be removed during water treatment.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The drought option will help to ensure levels of service are maintained through enabling provision of 12.5Ml/d of water in any month.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	The additional effluent discharge from Rye Meads STW would be small relative to that that would already be being discharged . No impacts on recreation are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An minor increase in energy use is envisaged due to pumping required to transfer effluent from Deephams STW to Rye Meads STW.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	An negligible increase in production of waste associated with additional abstraction and treatment of water may occur. This has been assessed as negligible considering TWUL send the majority of water treatment waste to beneficial use.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The effluent discharge from Rye Meads would be enhanced by a relatively small volume in comparison with the volume that is discharged under normal operating conditions. However, there would be a minor reduction in flow in the lower River Lee downstream of the Deephams discharge, due to transfer of 12.5Ml/d of effluent.	Low (adverse)	High	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The effluent discharge from Rye Meads would be enhanced by a relatively small volume in comparison with the volume that is discharged under normal operating conditions. However, there is potential for adverse water quality impacts in the lower River Lee downstream of Deephams discharge as a result of reduced flows and dilution of other water quality pressures.	Low (adverse)	Low	Medium	Low	Short-term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The option will contribute to sustainable management of water resources by enabling reuse of treated water in times of drought.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Moderate beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	With no land take and no identified hydrological impacts no effects on geology, geomorphology or soils are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	Small increases in air emissions are envisaged due to pumping and water treatment. However, the area of influence does not include any AQMAs, so effects are expected to be negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	A small increase in energy use and greenhouse gas emissions is envisaged due to pumping and water treatment.	Low (adverse)	Low	Medium	High	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Supply-side measures are a key component of Thames Water's Drought Plan. The Drought Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The Rye House moated enclosure and gatehouse scheduled monument is within the area of influence. However, the scheme does not require any construction (the pipeline has already been constructed) and effects on flow in surface water resources are no more than minor, thus no archaeology and cultural heritage are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The area of influence is within the London Area Greenbelt. However, the scheme does not require any construction (the pipeline has already been constructed) and effects on flow in surface water resources are no more than minor, thus no impacts on landscape and visual amenity are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Chingford Artificial Recharge Scheme (CHARS):** **Artificial recharge (AR) is the technique of increasing the rate of recharge of an aquifer which generally contains reasonably good quality water and from which groundwater abstraction already occurs. Treated water is pumped into the aquifer and stored for use at a later date, when it is abstracted either at or downstream from the recharge site. AR is based on overall catchment water balances, and is used to prevent over-abstraction of native groundwater.** **The Chingford Artificial Recharge Scheme is a similar scheme to North London Artificial Recharge Scheme (NLARS) North London Artificial Recharge Scheme but on a smaller scale. It is not restricted to use under the NLARS Operating Agreement but can be used under any conditions although its use is primarily to meet peak demands and drought demands. CHARS which is essentially a subset of NLARS with slightly different operational rules. The scheme is licensed for 16Ml/d maximum abstraction from four boreholes in the Lee Valley. The normal operating strategy for CHARS is to support meeting peak demands in non-drought periods, but it is also a source that would be used in the event of drought. The implementation time for this supply-side measure is 7-14 days.**																						
Summary commentary of scheme adverse effects	**Minor adverse effects may occur due to air emissions associated with energy use for the re-abstraction of stored water and its treatment. Negligible adverse impacts are possible with respect to greenhouse gas emissions, material use and groundwater quality. However, all adverse effects identified are short term and temporary.**																						
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**		**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are identified with respect to sustainable provision water (up to 12Ml/d), thus providing improvements in the resilience of water supplies to drought.**																						
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**		**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**	

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to	The drought option abstracts from the confined aquifer under north London and so has no impact on surface water levels. No operational impacts on SSSIs, other designated or undesignated habitats or species have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The artificial recharge option will not introduce or affect the spread of INNS, as it involves clean treated water pumped and stored in groundwater for re-abstraction.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health	The drought option will help to ensure levels of service are maintained through provision of up to 16Ml/d of water.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	No impacts on recreation, tourism and navigation, or green infrastructure are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	The option utilises existing infrastructure. An increase in energy use is envisaged due to re-abstraction of aquifer-stored water. Materials would be required outside of the environmental drought period associated with the treatment of water for recharge.	Low (adverse)	Low	Medium	High	Short-term	Permanent	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	Groundwater levels will be drawn down during the operation of this scheme. However, the drought option abstracts from a confined aquifer and so no impact on surface water levels are anticipated. Recharge to the aquifer is made during times of surplus water supply, which is drawn from multiple sources including surface water from Rivers Lee and Thames and groundwater from New River wells. Water is drawn at times when the abstraction will cause no significant impact on surface water flows.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	AR at sites where the chemistry of the recharge water and the groundwater are compatible should not have adverse effects on groundwater quality. There is a low risk of groundwater deterioration during extended pumping under severe drought conditions. Recharge to the aquifer is made during times of surplus water supply. No impacts on water quality downstream of abstraction points are anticipated. Recharge water would be potable water sourced from local WTW.	Low (adverse)	Low	Medium	Low	Medium-term	Temporary	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The option will contribute to more sustainable abstractions by undertaking recharge to the aquifer during times of surplus water supply, to allow for re-abstraction during times of drought. Abstraction during drought events will be from the confined chalk aquifer, so no adverse effects on other water resources are anticipated.	Low (beneficial)	Medium	Medium	High	Short-term	Permanent	None	Minor beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	With no land take and no identified hydrological impacts no effects on geology, geomorphology or soils are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	An increase in emissions is envisaged due to the re-abstraction of aquifer-stored water. The boreholes associated with the drought option are located in the London Boroughs of Enfield and Haringey, both of which have declared AQMAs for nitrogen dioxide and particulate matter. The local area surrounding some of the boreholes may be urban.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	An increase in emissions is envisaged due to the re-abstraction of aquifer-stored water. Therefore there will be a associated short term increase in greenhouse gas emissions associated with the additional pumping and treatment requirements. An increase in energy use, emissions and CO_2 are also envisaged outside of the environmental drought period associated with the provision, treatment and storage of water for recharge.	Low (adverse)	Low	Medium	High	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Supply-side measures are a key component of Thames Water's Drought Plan. The Drought Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	Abstraction from the boreholes is within existing licence limits. In order for the drought option to be feasible requires maintaining groundwater levels at the abstraction locations via Artificial Recharge. Over the long term the option is not anticipated to adversely effect the historic environment, sites of archaeological or cultural heritage importance or palaeo-environmental remains or their setting.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	With no construction requirements, long term adverse hydrological effects there will be no adverse effects to the quality or access to designated or undesignated landscapes, townscapes and the countryside.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Reduction in the Lowest residual flow (300Ml/d to 200Ml/d):** **To reduce the minimum pass-forward flow over Teddington Weir to 200Ml/d.** **The Lower Thames Operating Agreement (LTOA) provides a guide to day-to-day operational decisions on Thames Waters abstraction from the lower River Thames. The agreement is based on ensuring that sufficient flow passes over Teddington weir, relative to the prevailing seasonal reservoir storage of the Thames Valley and Lee Valley reservoir groups. Four pass-forward flow values are included in the LTOA, known as Teddington Target Flows (TTF) . Under normal periods, the LTOA conditions mean that Tames Water's abstractions cannot cause the pass-forward flow to drop below the TTF agreed for that day. Normally there is a minimum residual flow of 800Ml/d. However, as the volume of available reservoir storage reduces, this triggers reductions in the TTF in a stepwise fashion. Each step requires the implementation of greater demand control measures by TWUL, for example, hosepipe bans. This stepwise reduction progresses from 800Ml/d to 600Ml/d, followed by further reductions to 400Ml/d and then 300Ml/d . In advance of a drought permit application, which would be to reduce the TTF to 200Ml/d, TWUL would agree with the Environment Agency to adopt the lower TTF of 200Ml/d as set out in the M2 licence.**																					
Summary commentary of scheme adverse effects	**If implemented, the drought option would have moderate adverse effects on flows in the lowest reaches of the fluvial Thames, mainly in terms of velocity reduction. Freshwater flows to the upper Thames Tideway will reduce. Moderate adverse effects are predicted on water quality in the fluvial Thames (reduced dissolved oxygen saturation and reduced phosphate dilution), which may exacerbate water quality issues in the upper Tideway with the potential for moderate adverse effects. Moderate adverse effects are expected on a range of aquatic ecological receptors, such as macroinvertebrates, macrophytes and fish. The adverse effects include those associated with fish, including migration. Moderate adverse effects may occur on navigation.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**				**None**			**None**	**None**		**None**	**None**			**None**		**None**	**None**
Summary commentary of scheme beneficial effects	**If implemented, the drought option would have a major beneficial effects for populations and human health in terms of ensuring supply of water and other customers/businesses. Major beneficial effects are also expected in regard to improved resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Moderate to major hydrological reductions in velocity upstream of Teddington Weir are expected, as are moderate water quality effects in the tideway (forms part of the Thames Estuary Marine Conservation Zone). The result is a wide range of effects on a large number of ecological receptors. Designated sites identified as potentially impacted at lower pass forward flows (Langham Pond SSSI, Dumsey Meadow SSSI and Syon Park SSSI) are identified as of low sensitivity in the Lower Thames EAR and therefore are considered to be of even lower sensitivity with respect to this drought option. Adverse effects relating to freshwater species of the lowest reaches of the fluvial River Thames and the transitional species of the Tideway range from minor to moderate. The types of effects are greatest regarding fish communities. Moderate temporary adverse effects include localised water quality deterioration, increased predation, habitat fragmentation and impacts on migration affecting species such as migratory salmonids, European eel, lamprey and brown trout. Moderate adverse effects to fish communities relate to a moderate risk of deterioration regarding the fish component of the WFD waterbody GB530603911403 Thames Upper. Moderate adverse effects to macroinvertebrates are also identified.	Moderate (adverse)	Moderate	Large	Moderate	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The changes to flow velocity and water quality as result of the drought option are considered likely to have minor effects on the distribution of a wide range of INNS, including zebra mussel, Chinese mitten crab and spionid worm (*Marenzelleriawiréni sp.)*	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and	Implementation of the drought option will help to maintain essential public water supplies (provision of up to an additional 100Ml/d of water) during drought conditions and therefore help maintain public health.	High (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	The River Thames is highly valued for its navigational and recreational uses. In the fluvial River Thames, restrictions on lock use would be imposed both as a result of natural drought conditions (to maintain critical water levels) and the requirements to keep Moseley Weir and Teddington Weir closed (at least for most of the time) in order for the drought option to operate effectively. There may be impacts on boats that are navigating between the Tideway and the lower freshwater River Thames. There is also potential for additional risks to navigation as a result of increased sedimentation in the navigation channel in the upper Tideway as fewer and fewer vessels use the navigation channel, with implications on manoeuvrability for larger boats. Overall, impacts on navigation are considered moderate adverse. Anglers may be affected by any reduction in the presence of fish species as a result of the adverse impacts to fish communities.	Moderate (adverse)	Medium	Large	Moderate	Short-term	Temporary	Moderate adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Implementation of the drought option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. However, adverse impacts to navigation are expected, which may present temporary adverse effects to the businesses such as marinas, passenger boats and hire boat operators.	Medium (adverse) High (beneficial)	Medium (adverse) High (beneficial)	Medium	Moderate	Short-term	Temporary	Moderate adverse	Major beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling?	An increase in abstraction (100Ml/d) is likely to result in a proportional increase in the use of energy, chemicals and generation of waste. However, this is a temporary increase in abstraction that occurs at high volumes under normal operating conditions.	High (adverse)	Low	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The drought option would have a moderate to major hydrological impact. The lowest reaches of the River Thames (Datchet abstraction to Teddington Weir) would experience a reduction in river flow during natural low flow periods. As the river is impounded with river levels (and wetted area) maintained for navigation, the flow reduction would only lead to a reduction in velocity, which is considered major from Penton Hook lock to Teddington Weir. The drought option would result in a major reduction in freshwater flow that enters the Upper Tideway over Teddington Weir. This would have limited impact on river levels, however, due to the reduction in freshwater flow, there would be estuarine water quality implications (decreasing with distance downstream to London Bridge). Overall significance is considered to be moderate as implementation of the option is within normal licensed operations.	Moderate (adverse)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	In the adversely impacted reach of the fluvial River Thames there would be a minor to moderate water quality risk for dissolved oxygen concentration (increasing downstream) during drought option implementation. Implementation of the drought option could have moderate risk of short-term deterioration to related freshwater WFD waterbodies (GB106039023231 and GB106039023232) in terms of the macroinvertebrate community. The drought option would result in a major reduction in freshwater flow that enters the Upper Tideway over Teddington weir, resulting in estuarine water quality implications, however, some flows would be maintained. The risk to dissolved oxygen is considered moderate to in the impacted reach of the Thames Tideway. Consented discharges to the River Thames and its tributaries are considered to present moderate pressures in the lowest reaches of the fluvial Thames (ammonia and dissolved oxygen) and upper Tideway (dissolved oxygen).	Moderate (adverse)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. However, the drought option will not reduce the amount of water available for other licence holders to abstract in the freshwater River Thames and it is not anticipated that the drought option will limit the feasibility of other abstractors in the Tideway.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and	Minor impacts on geomorphology are anticipated with respect to in-channel structures, such as weirs/locks, and their influence on sediment dynamics by creating ponded areas upstream of structures. It is anticipated that there would be low amounts of sediment in transport during a drought.	Low (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No impacts on land use or soil are anticipated, and no opportunities to enhance ecosystem services have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	This measure would cause temporary increases in emissions associated with the abstraction and treatment of water (up to 100Ml/d). The option is in close proximity (or within) a number of AQMAs, including Spelthorne AQMA and Richmond AQMA.	Medium (adverse)	Medium	Small	Low	Short-term	Temporary	Moderate adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced	This measure would cause temporary increases in energy use and greenhouse gas emissions associated with the abstraction and treatment of water (up to 100Ml/d).	Medium (adverse)	Low	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage	Supply-side measures are a key component of Thames Water's Drought Plan. The Drought Plan aims to ensure resilience of water supplies to drought.	High (beneficial)	High	Small	High	Short-term	Temporary	None	Major beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits?	The length of the impacted reach of the River Thames includes a wealth of archaeology and cultural heritage assets. However, water levels will not be significantly affected adjacent to these assets due to the requirement to maintain levels for navigation. Assuming water levels are maintained, the potential impact of this drought option on the setting of the heritage assets associated with the Thames, including sub-surface water dependent heritage assets, is considered negligible.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No designated landscape areas are within the area of influence, and no effects on non-designated areas of natural beauty or access to values areas of landscape character are anticipated. There is no land take associated with the scheme.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Earlier reduction in residual flow on the LTCD:** **The Lower Thames Operating Agreement (LTOA) provides a guide to day-to-day operational decisions on Thames Waters abstraction from the lower River Thames. The agreement is based on ensuring that sufficient flow passes over Teddington weir, relative to the prevailing seasonal reservoir storage of the Thames Valley and Lee Valley reservoir groups. Four pass-forward flow values are included in the LTOA, known as Teddington target flows (TTF) . Under normal operation, the LTOA conditions mean that Tames Water's abstractions cannot cause the pass-forward flow to drop below the TTF agreed for that day. Normally there is a minimum residual flow of 800Ml/d. However, as the volume of available reservoir storage reduces, this triggers reductions in the TTF in a stepwise fashion. Each step requires the implementation of greater demand control measures by TWUL, for example, hosepipe bans. This stepwise reduction progresses from 800Ml/d to 600Ml/d, followed by further reductions to 400Ml/d and then 300Ml/d .** **The Earlier reduction in residual flow on the LTCD drought option provides gain in abstraction capability that would be equal to the difference in reduction agreed at each stage on the LTCD, for the period when that flow band is operable.**																					
Summary commentary of scheme adverse effects	**If implemented, the measure would result in minor adverse effects due to reduced flows passed forward over Teddington Weir earlier and for longer than would be the case without implementation of the measure. Therefore, all identified effects are extensions of what could occur under baseline conditions. In addition to the flow impacts (mainly in the form of velocity reduction) in the fluvial Lower Thames, minor adverse effects relate to the reduction in freshwater flows to the upper Thames Tideway. As a result there is potential for minor adverse effects regarding extended periods of water quality impacts in the fluvial Thames (reduced dissolved oxygen saturation and reduced phosphate dilution), which may exacerbate water quality issues in the upper Tideway. Minor adverse effects are expected on a range of aquatic ecological receptors, such as macroinvertebrates, macrophytes and fish, as a result of the extended periods of flow and water quality impacts. Minor adverse effects may occur on navigation as a result of extended periods of restrictions on lock use than would have occurred without the option.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**				**None**			**None**	**None**		**None**	**None**			**None**		**None**	**None**
Summary commentary of scheme beneficial effects	**If implemented, the measure would have a moderate beneficial effects regarding ensuring supply of water to customers and businesses. Minor beneficial effects are also expected through improved resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological	The measure would allow greater abstraction from the Lower River Thames to be brought forward by a short period. Changes in abstractions and resulting effects on hydrology (velocities and water quality) have the potential to impact on macroinvertebrates, macrophytes and fish for a slightly longer duration than would have occurred without this drought option. Considering the effects are limited to an extension of what would occur without the option the sensitivity of the system is considered moderate and overall effects are considered minor adverse.	Low (adverse)	Moderate	Large	Moderate	Short-term	Temporary	Minor adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	As the anticipated effects of the measure are limited to extended durations of each step reduction in TTF, which would occur anyway, potential effects regarding INNS are considered to be negligible.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality?	Implementation of the drought option will help to maintain essential public water supplies (earlier availability of increased abstraction rates).	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	The River Thames is highly valued for its navigational and recreational uses. In the fluvial River Thames, restrictions on lock use would be imposed as a result of natural drought conditions (to maintain critical water levels). The drought option would extend the duration of these impacts on navigation. Considering effects are limited to an extension of what would occur without implementation of the measure, the sensitivity of navigation related receptors to the effects is considered low.	Moderate (adverse)	Low	Large	Moderate	Short-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Implementation of the drought permit will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. However, there is potential for minor adverse impacts to navigation which may present temporary adverse effects to the businesses such as marinas, passenger boats and hire boat operators.	Moderate (adverse) Low (beneficial)	Low (adverse) High (beneficial)	Medium	Moderate	Short-term	Temporary	Minor adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and	The earlier increase in abstraction is likely to result in a small proportional increase in the use of energy, chemicals and generation of waste. However, this is a temporary increase in abstraction that occurs at high volumes under normal operating conditions.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The drought option would extend the duration of hydrological effects associated with each step-wise reduction of pass-forward flows over Teddington Weir. Therefore, periods of reduced velocity in the lowest reaches of the River Thames (Datchet abstraction to Teddington Weir) would be extended, as would reduced freshwater flows into the Upper Tideway over Teddington Weir.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	In the adversely impacted reach of the fluvial River Thames, there would be extensions to the duration of water quality effects associated with each step-wise reduction in TTF. At the lowest TTFs (300Ml/d) there could be increased risk of short-term deterioration to related freshwater WFD waterbodies (GB106039023231 and GB106039023232) in terms of the macroinvertebrate community. The drought option would result increased duration of reduced freshwater flows into the Upper Tideway over Teddington weir, resulting in extended periods of estuarine water quality implications.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The measure will not reduce the amount of water available for other licence holders to abstract in the freshwater River Thames, and the measure is not expected to limit the feasibility of other abstractors in the Tideway.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and	Extended periods of minor impacts on geomorphology are anticipated, these relate to in-channel structures, such as weirs/locks and their influence on sediment dynamics. It is anticipated that there would be low amounts of sediment in transport during a drought.	Low (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No impacts on land use or soil are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and there are no opportunities for catchment-wide approach to land management.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	Temporary emissions would be associated with the additional abstraction and treatment of water. The option is in close proximity to or within a number of AQMAs, including Spelthorne AQMA and Richmond AQMA. However, considering the drought option only extends the period of increased abstraction, overall effects are considered negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced	Temporary energy use and greenhouse gas emissions would be associated with the abstraction and treatment of water.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage	Supply-side measures are a key component of Thames Water's Drought Plan. The Drought Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits?	The length of the impacted reach of the River Thames includes a wealth of archaeology and cultural heritage assets. However, water levels will not be significantly affected adjacent to these assets due to the requirement to maintain levels for navigation. Assuming water levels are maintained, the potential impact of this drought option on the setting of the heritage assets associated with the Thames, including sub-surface water dependent heritage assets, is considered negligible.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features	No designated landscape areas are within the area of influence, and no effects on non-designated areas of natural beauty or access to values areas of landscape character are anticipated. There is no land take associated with the scheme.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**East London Resource Development (ELRED):** **ELRED comprises a number of groundwater abstraction locations along the route of the Channel Tunnel Rail Link which can be used to meet water supply demand in London, as well as contribute to the management of groundwater level rises. Demand saving/deployable output 18Ml/d average and 20.57Ml/d peak.**																					
Summary commentary of scheme adverse effects	**Negligible adverse effects identified are associated with energy use and materials required for the re-abstraction of stored water and its treatment. Adverse effects are also likely with respect to emissions to air (air pollutants and greenhouse gas emissions) as a result of the additional pumping and treatment requirements. There is also the potential for minor, temporary adverse effects on other abstractors, however, these effects are uncertain. All adverse effects are short to medium-term and temporary.**																					
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**		**None**		**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are identified with respect to sustainable provision of a moderate quantity of water (at a rate of up to 21Ml/d) during periods of drought, and minor improvements in the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The scheme abstracts from the confined chalk aquifer under north London and so has no impact on surface water levels. No operational impacts on SSSIs, other designated or undesignated habitats or species have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Abstraction from the confined aquifer has no impact on surface waters and therefore will not introduce or affect the spread of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The drought option will help to ensure Levels of Service are maintained through enabling provision of 18Ml/d of water. There are no construction requirements.	Low (beneficial)	High	Medium	Moderate	Medium-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	There are no construction requirements and no effects anticipated on surface water flows. No impacts of the drought option on other users of the water environment are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	Moderate	Medium-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An increase in energy use and chemicals for water treatment is envisaged due to increased water abstraction. An increase in production of waste associated with additional abstraction and treatment of water would also occur.	Low (adverse)	Low	Medium	High	Medium-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	Groundwater levels will be drawn down during the operation of this scheme. As the scheme abstracts from the confined chalk aquifer no impact on surface water levels are anticipated.	Low (adverse)	Low	Small	Moderate	Medium-term	Temporary	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	There is a low risk of the scheme resulting in saline intrusion into the chalk aquifer, however, considering the distance to saline sources, no effects are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	As groundwater levels will be drawn down during the operation of this option. It is noted that the option would be operating within licence and therefore any potential impacts on other licences have been assessed, with none impacts on other licences identified	Low (adverse)	Medium	Small	Low	Medium-term	Temporary	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	As no impacts on surface waters are anticipated, no impacts on geomorphology are anticipated. No construction is required for implementation of this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take or construction is required for the option, and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	There would be increases in air emissions associated with abstraction of water. The option is within close proximity of Newham AQMA.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	There would be small, short-term increases in greenhouse gas emissions associated with abstraction of water. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions. The sensitivity to this effect is rated as low due to the short term and temporary effect.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Supply-side measures are a key component of Thames Water's Drought Plan. The Drought Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are no construction requirements. Abstraction from the borehole is within existing licence limits and from the confined chalk aquifer with no effects on surface water levels anticipated. Therefore effects on the historic environment, heritage assets or their setting are not expected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	There are no construction requirements. Abstraction from the borehole is within existing licence limits and from the confined chalk aquifer with no effects on surface water levels anticipated. Therefore no potential for effects on landscape and visual amenity are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Stratford Box:** **Stratford Box is a groundwater source in East London which is run at low level of baseload output in order to keep groundwater levels suppressed to protect Stratford International Station. Demand savings/deployable output Up to 5Ml/d average, 5Ml/d peak. The scheme is licensed for 8Ml/d but it is operated at a baseload abstraction of approximately 3Ml/d to control groundwater levels at Stratford Box. The option available during a drought is to increase the output from 3Ml/d to 8Ml/d.**																						
Summary commentary of scheme adverse effects:	**Minor adverse, temporary effects identified are associated with emissions to air (air pollutants) as a result of the additional pumping and treatment requirements and proximity to sensitive receptors (AQMAs).**																						
SEA Objectives Adverse Effects Assessment Summary [completes automatically]	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**		**None**		**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**	
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are identified with respect to sustainable provision of water (at a rate of up to 5Ml/d) during periods of drought, and minor improvements in the resilience of water supplies to drought.**																						
SEA Objectives Beneficial Effects Assessment Summary [completes automatically]	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**

SEA topics and objectives		Assessment methodology		Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	No operational impacts of the option on European designated sites were identified by the Review of Consents. The scheme abstracts from the confined chalk aquifer under north London and so has no impact on surface water levels. No operational impacts on SSSIs, other designated or undesignated habitats or species have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Abstraction is from the confined aquifer has no impact on surface waters and therefore will not introduce or affect the spread of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes	The drought option will help to ensure Levels of Service are maintained through enabling provision of 8Ml/d of water. There are no construction requirements.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	There are no construction requirements and no effects anticipated on surface water flows. No impacts of the drought option on other users of the water environment are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An increase in energy use and chemicals for water treatment are envisaged due to increased water abstraction. An increase in production of waste associated with additional abstraction and treatment of water.	Low (adverse)	Low	Medium	High	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	Groundwater levels will be drawn down during the operation of this scheme. As the scheme abstracts from the confined chalk aquifer, no impact on surface water levels are anticipated. It is noted that the option would be operating within licence and therefore any potential impacts on other licences associated with groundwater levels have been assessed, with no impacts on other licences identified.	Low (adverse)	Low	Small	Moderate	Medium term	Temporary	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	No adverse effects on surface water or groundwater quality are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	As groundwater levels will be drawn down during the operation of this option groundwater abstractions in the vicinity of the abstraction could be temporarily impacted. Further information on location and depth of abstractions would be required for a better estimate of impact. However, it is noted that the option would be operating within licence.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	As no impacts on surface waters are anticipated, no impacts on geomorphology are anticipated. No construction is required for implementation of this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take or construction is required for the option, and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	There would be increases in air emissions associated with abstraction of water. The option is within close proximity of Newham AQMA.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	There would be small, short-term increases in greenhouse gas emissions associated with abstraction of water. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions. The sensitivity to this effect is rated as low due to the short term and temporary effect.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Supply-side measures are a key component of Thames Water's Drought Plan. The Drought Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Medium-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are no construction requirements. Abstraction from is within existing licence limits and from the confined chalk aquifer with no effects on surface water levels anticipated. Therefore no potential for effects on the historic environment, heritage assets or their setting.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	There are no construction requirements. Abstraction is within existing licence limits and from the confined chalk aquifer with no effects on surface water levels anticipated. Therefore no potential for effects on landscape and visual amenity are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Old Ford:** **Old Ford is a groundwater source in East London which abstracts from the confined chalk aquifer. Demand savings/deployable output: 4.5Ml/d average, 4.5Ml/d peak. This source is operated in conjunction with Stratford Box. The implementation time is 7-14 days.**																						
Summary commentary of scheme adverse effects	**Minor adverse, temporary effects identified are associated with emissions to air (air pollutants) as a result of additional pumping and treatment requirements and proximity to sensitive receptors (AQMAs). There is also the potential for minor, temporary adverse effects on other abstractors, however, these effects are uncertain.**																						
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**		**None**		**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are identified with respect to maintaining public health and sustaining the economy, as are minor benefits due to improved resilience of water supplies to drought.**																						
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	No operational impacts of the option on European designated sites were identified. The scheme abstracts from the confined chalk aquifer under north London and so has no impact on surface water levels. No operational impacts on SSSIs, other designated or undesignated habitats or species have been identified. .	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified for this option, however Thames Water will work with catchment groups in the long term to collaborate on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Abstraction is from the confined aquifer has no impact on surface waters and therefore will not introduce or affect the spread of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The drought option will help to ensure Levels of Service are maintained through enabling provision of 4.5Ml/d of water. There are no construction requirements.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	There are no construction requirements and no effects anticipated on surface water flows. No impacts of the drought option on other users of the water environment are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An increase in energy use and chemicals for water treatment are envisaged due to increased water abstraction and the potential for the requirement to treat water of poor water quality. An increase in production of waste associated with additional abstraction and treatment of water. This has been assessed as negligible considering that the majority of water treatment waste is sent to beneficial use.	Low (adverse)	Low	Medium	High	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	Groundwater levels will be drawn down during the operation of this scheme. As the scheme abstracts from the confined chalk aquifer, no impact on surface water levels are anticipated. It is noted that the option would be operating within licence and therefore any potential impacts on other licences associated with groundwater levels have been assessed, with no impacts on other licences identified.	Low (adverse)	Low	Small	Moderate	Medium-term	Temporary	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Monitoring of the groundwater quality is required around the site to assess whether the site is at risk from contamination arising from the contaminated land around the site. This is principally for source protection rather than environmental impact.	n/a						None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	As groundwater levels will be drawn down during the operation of this option groundwater abstractions in the vicinity of the abstraction could be temporarily impacted. Further information on location and depth of abstractions would be required for a better estimate of impact. However, it is noted that the option would be operating within licence.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	As no impacts on surface waters are anticipated, no impacts on geomorphology are anticipated. No construction is required for implementation of this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take or construction is required for the option, and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	There would be increases in air emissions associated with abstraction of water. The option is within close proximity of a number of AQMAs (e.g. Tower Hamlets AQMA).	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	There would be small, short-term increases in greenhouse gas emissions associated with abstraction of water. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions. The sensitivity to this effect is rated as low due to the short term and temporary effect.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Supply-side measures are a key component of Thames Water's Drought Plan. The Drought Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Medium-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are no construction requirements. Abstraction is within existing licence limits and from the confined chalk aquifer with no effects on surface water levels anticipated. Therefore no for effects on the historic environment, heritage assets or their setting are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	There are no construction requirements. Abstraction is within existing licence limits and from the confined chalk aquifer with no effects on surface water levels anticipated. Therefore no potential for effects on landscape and visual amenity are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**West Berkshire Groundwater Scheme (WBGWS):** **The WBGWS is a strategic drought scheme under which groundwater is discharged into tributaries of the River Thames (including the River Lambourn an upstream tributary of the River Kennet) in order to increase the flow to the West London reservoir abstraction locations.** **The WBGWS is owned and operated by the Environment Agency in accordance with the West Berkshire Groundwater Scheme Agreement (2015) between TWUL and the Environment Agency. TWUL may request the Environment Agency to switch on and operate the scheme once reservoir storage has drawn down to the Level 2 control curve on the Lower Thames Control Diagram. The option provides up to 66Ml/d benefit to London. The implementation time for full operation is between 14-21 days. The scheme also provides benefit to the Fobney abstraction during a severe drought.**																					
Summary commentary of scheme adverse effects	**Minor adverse short-term effects associated with extensive pumping is likely to lead to suppressed groundwater levels in the months following the drought, which might cause a reduction in groundwater levels at some sites, and discharge of groundwater may cause impacts to river water quality. Moderate adverse affects associated with the potential to impact on other abstractors. Negligible adverse impacts are anticipated on biodiversity, flora and fauna, as it was considered in the HRA Screening Report, that the drought option is unlikely to have a significant effect on the designated features of the Kennet and Lambourn Floodplain SAC and the River Lambourn SAC as water levels could be maintained more effectively during drought conditions with the reduction of an existing licence and a new sluice to maintain flows to the SAC. Minor adverse effects due to air emissions associated with additional abstraction and proximity to nature conservation sites. All adverse effects are temporary.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**	**None**	**None**	**None**	**None**		**None**				**None**	**None**	**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Moderate beneficial effects on population and human health are anticipated due to maintenance of water supplies for customers and economic activity. Maintaining flow in watercourses during a prolonged drought may have a minor beneficial effect, and may also avoid declines in water quality in affected resources.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**				**None**	**None**			**None**	**None**	**None**	**None**	**None**	**None**	**None**			**None**	

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The WBGWS comprises seven separate wellfields located in the Kennet and Pang Valleys. Without mitigation there is the potential to affect the Kennet and Lambourn Floodplain SAC and River Lambourn SAC. For the Kennet and Lambourn Floodplain SAC this was due to the lowering of groundwater levels under the Thatcham Reedbeds, with the potential for adverse impact on the surface water regime on which the habitat assemblage in the reedbeds is dependent. The Appropriate Assessment identified two measures to avoid or mitigate this impact. The first was the reduction of the Speen licence, which has been implemented by Thames Water. The second was augmenting the groundwater supply to Thatcham Reedbeds. Thames Water have now implemented the latter being in the form of sluice to allow a small offtake from the Kennet into the Kennet and Lambourn Floodplain SAC. The HRA Screening Report concluded that once the operational licence is in place it is considered unlikely that the drought option would have a significant effect on the designated features of the sites as water levels could be maintained more effectively during drought conditions.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The option comprises abstractions from a series of well fields and water is discharged to watercourses in Berkshire during times of drought, therefore will not introduce INNS and is unlikely to result in the spread of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 66Ml/d of water) during drought conditions and therefore help maintain public health. Regarding nuisance, there is no construction proposed for this option therefore no adverse effects are expected to public health.	Medium	High	Small	High	Short-term	Temporary	None	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	This option supplements flows in a number of watercourses in Berkshire during times of drought, therefore there is potential for beneficial effects with respect to recreation (e.g. angling) and enjoyment of local public rights of way.	Low (beneficial)	Medium	Medium	Low	Short-term	Temporary	None	Minor beneficial
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	Medium (beneficial)	High	Medium	Medium	Short-term	Long	None	Major beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (66 Ml/d) will likely result in proportional increases in energy use and waste generation.	Medium (adverse)	Low	Medium	Medium	Short-term	Temporary	Minor adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The scheme abstracts from a series of well fields and water is discharged to watercourses in Berkshire and so has a beneficial environmental impact on these watercourses during a prolonged drought. However, the impact of extensive pumping is likely to lead to suppressed groundwater levels in the months following the drought which might cause adverse environmental impact through reduction in groundwater levels at some sites.	Low (adverse) Low (beneficial)	High	Medium	Low	Short-term	Temporary	Minor adverse	Minor beneficial

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The option is likely to have beneficial effect as a result of the option supplementing flows with local groundwater over the short term which will reduce the potential water quality impacts that can be exacerbated during low flows. Discharging groundwater into river water bodies could impact upon the water quality of the rivers, however the impact is considered to be minor as the groundwater is unlikely to be of lesser quality. This would be subject to further study and therefore is assessed with low certainty.	Low (adverse) Low (beneficial)	Medium	Medium	Low	Short-term	Temporary	Minor adverse	Minor beneficial
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The impact of extensive pumping is likely to lead to suppressed groundwater levels in the months following the drought which might cause adverse environmental impact through reduction in groundwater levels at some sites. This may mean other groundwater abstractors may find that their ability to abstract is affected if groundwater levels fall to very low levels.	Medium (adverse)	Medium	Medium	Low	Short-term	Temporary	Moderate adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Impacts on geomorphology are unlikely if the option is operated carefully.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required, and no opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase air emissions associated with abstraction and treatment of water (up to 66 Ml/d). However, no AQMA are in proximity to the option.	Medium (adverse)	Low	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Medium (adverse)	Low	Medium	Moderate/high	Short-term	Temporary	Minor adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Supply-side measures are a key component of Thames Water's Drought Plan. The Drought Plan aims to ensure resilience of water supplies to drought.	Medium (beneficial)	High	Small	Medium	Short-term	Temporary	None	Major beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are a number of heritage assets in close proximity to the watercourse that would receive flow form this option during times of drought (numerous Listed Buildings and Donnington Grove Registered Park and Garden). Therefore there is the potential for small scale temporary beneficial effects regarding their character and appearance. However, the impact of extensive pumping is likely to lead to suppressed groundwater levels in the months following the drought may delay the recovery in flows. Overall the sensitivity of the assets to these effects is considered to be low.	Low (beneficial) Low (adverse)	Low	Medium	Low	Short-term	Temporary	Negligible adverse	Negligible beneficial

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Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	During operation water is discharged to watercourses in Berkshire and so may be considered to enhance visual amenity in the North Wessex Downs AONB. However the impact of extensive pumping may lead to suppressed groundwater levels in the months following the drought and may delay the recovery in flows which could impact on visual amenity. Overall the impacts are considered to be negligible as the local distinctiveness is unlikely to be affected.	Low (beneficial) Low (adverse)	Low	Medium	Low	Short-term	Temporary	Negligible adverse	Negligible beneficial

Drought Plan option	**Sundridge 1: Water is abstracted by Thames Water from boreholes drilled into the Hythe Aquifer at Sundridge The current licence (Licence number 9/40/1/123/GR) allows an annual average abstraction rate of 1.36Ml/d (equivalent to 489Ml/y) with a maximum daily peak of 8Ml/d.** **The drought order involves relaxing the annual average licence rate so that for the 6 months of the drought order, 8Ml/d could be abstracted each day (1,470Ml over 6 months). Benefit of up to 8Ml/d.**																				
Summary commentary of scheme adverse effects:	**Major adverse short-term effects are predicted due to reduced of flows, velocities and levels in three reaches of the River Darent (Impacts are major on one reach, minor on one reach and negligible on one reach). This would result in minor adverse effects to water quality, as one reach has more variable dissolved oxygen saturations with a clear association between low concentrations and low river flows. The feasibility of the surface water abstraction at Sevenoaks Wildfowl Reserve may being limited with the drought order in place, a moderate adverse short-term impact. Moderate adverse short term effects are anticipated on the Sevenoaks Gravel Pits SSSI due to reduction in lake levels, potential impacts on breeding birds, and potential reduction in suitability or distribution of habitats which support Cordulia aenea. The significance of impacts on NERC fish species were identified as moderate for brown/sea trout and eels based on fragmentation of habitats, with reduced river flows inhibiting migration. Moderate adverse impacts on WFD status are likely based on the impact of the drought option on fish. Major adverse effects due to increased distribution of the invasive species signal crayfish in the catchment, increasing the likelihood of interaction between signal and the native white clawed crayfish (NERC species), resulting in a high magnitude impact that is considered irreversible. Minor adverse short term effects may occur on landscape values, as a significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers.**																				
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**				**None**				**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Beneficial effects associated with the maintenance of essential public water supplies and improved resilience of water supplies to drought.**																				
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

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Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies moderate adverse effects on a national designated site. The impact of a reduction in lake levels on the Sevenoaks Gravel Pits SSSI is likely to be of low magnitude for breeding birds as the extent of the hydrological impact will be small and the impacts will not extend outside of the drought implementation period. Impacts on the ecological integrity of the site is not likely to occur as the ponds will not dry up completely. There is potential for a reduction in suitability or distribution of habitats which support Cordulia aenea, for which the site is designated, causing a decline in ecological status of the site. Moderate adverse effects are expected to aquatic habitats and species including NERC habitats/species and ecologically significant species. The significance of impacts on NERC fish species were identified as a moderate for brown/sea trout and eels based on the fragmentation of habitats, with reduced river flows inhibiting migration. The EAR identifies moderate impact on WFD status based on the impact of the drought option on fish, and minor for macroinvertebrates and macrophytes.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The EARs assessed the impact of the drought option on the distribution of invasive non-native flora and fauna species including Signal crayfish, Spiny-cheeked crayfish, Zebra mussel, Australian swamp stonecrop, Floating pennywort and Parrot's feather. The sensitivity of the river reaches to INNS overall is considered to be medium as there are a number of invasive species known to be present in the catchment. Implementation of a drought order could encourage movement of crayfish in the catchment increasing the likelihood of interaction between signal and white clawed crayfish (NERC species), resulting in a high magnitude impact that is considered irreversible. Due to the permanence of this effect the overall assessment is major adverse. Mitigation includes direct removal and appropriate disposal of invasive species if identified during monitoring.	High (adverse)	Medium	Small	Moderate	Long-term	Permanent	Major adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to an additional 8 Ml/d of water) during drought conditions, and therefore help maintain public health.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	A significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers. It is unlikely that bird information sites and hides would be removed or lead to a reduction in bird watchers to the area. The river or lakes will not dry out as a result of the drought order, therefore, there will be a minor impact on recreation. The Darent contains a wide diversity of coarse fish including roach, chub, perch, pike, eels, gudgeon, carp and tench. The close proximity to central London makes the catchment very popular with anglers. Any impacts of the drought order on fish population or distribution may impact anglers and therefore impacts on angling are considered to be minor adverse.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Impacts of the drought order on navigation are unknown, but would be of major significance if there was a reduction in lake level that considerably disrupted sailing activity, particularly on Chipstead Lake. this impact is assessed as moderate adverse based on navigation having medium sensitivity. Implementation of the drought option may restrict the feasibility of the surface water abstraction at Sevenoaks Wildfowl Reserve. This has been assessed as a moderate adverse based on the abstractor having medium sensitivity. The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. This is considered a moderate beneficial effect as people and businesses have a high sensitivity to access to water during times of drought.	Medium (adverse) Low (beneficial)	Medium (adverse) High (beneficial)	Small	Low	Short-term	Temporary	Moderate adverse	Moderate beneficial

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Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (up to 8 Ml/d) over and above what occurs under normal operation will typically result in proportional increases in energy use and waste.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies a major impact on one reach of the River Darent which will remain drier for longer based on reduced groundwater levels, and a minor and negligible effects on two other reaches of the river. The impact would be limited to the duration of the drought order only (which can theoretically be implemented at any time year). The impact would manifest as reductions in water flows, velocities and levels.	High (adverse)	High	Medium	Moderate	Short-term	Temporary	Major adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The risk of the drought order to dissolved oxygen saturation levels has been assessed as low in one reach and medium in the second reach of the River Darent. The second reach has more variable dissolved oxygen saturations with a clear association between low concentrations and low river flows. The risk of the drought order to total ammonia concentration levels was identified as negligible. The reaches are considered to be medium sensitivity to changes in water quality and therefore the overall risk is minor adverse.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing' by the EA. The feasibility of surface water abstraction at the Sevenoaks Wildfowl Reserve may be limited with the drought order in place. This has been assessed as a moderate impact.	Medium (adverse)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR suggests major temporary impacts to geomorphology in one reach and negligible in other reaches, overall assessed as moderate adverse. This is due to reductions in flow and potentially large changes in wetted width and depth. No land take is required for the option and therefore there is no impacts on land use, soil or geology are anticipated as a result of the operation of this option.	Medium (adverse)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutants.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will result in minor increases in air emissions associated with abstraction and treatment of water (up to 8 Ml/d). The drought option is located less than a 1km from the M25 AQMA, therefore the sensitivity to changes in air quality is medium and the overall significance is assessed as minor adverse with low certainty.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	None	Minor beneficial

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are heritage assets in proximity to the option and zone of influence, including the Scheduled Ancient Monuments A major Roman Villa, an Anglo-Saxon settlement and prehistoric remains 600m SSE of Darent Court Farm - A Preceptory of the Knights Hospitallers, known as St. John's Jerusalem, and an associated fish pond at Sutton-at-Hone and the registered park and garden Combe Bank. However they are unlikely to be impacted over the duration of the drought permits' implementation and therefore the impact is considered negligible. The EARs have assessed the impacts on unknown water dependent assets as negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No construction activities are required for this option. The option is located within the Kent Downs AONB and a significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers. However, the river or lakes will not dry out as a result of the drought order, therefore there will be a minor impact on landscape.	Low (adverse)	High	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Sundridge 2: Water is abstracted by Thames Water from boreholes drilled into the Hythe Aquifer at Sundridge. TWUL are licensed to abstract, from the ground, at an annual average rate of 1.36Ml/d (equivalent to 489Ml/y) with a maximum daily peak of 8Ml/d.** **The drought order involves relaxing the annual average licence rate and increasing the peak licence rate so that for the 6 months of the drought order, 12Ml/d could be abstracted each day. The Sundridge 2 drought order is anticipated to be in place for up to six consecutive months consequent to the Sundridge 1 Drought Order. Benefit of up to 12Ml/d.**																				
Summary commentary of scheme adverse effects:	**Major short-term hydrological effects may occur due to reductions in flows, velocities and levels in three reaches of the River Darent (Impacts are major on one reach and minor on two other reaches). This would also result in minor adverse effects to water quality, as one reach may have higher SRP concentrations associated with low river flow. A moderate short-term impact on the feasibility of surface water abstraction at Sevenoaks Wildfowl Reserve may occur with the drought order in place. Moderate adverse short-term effects associated with reduced lake levels on the Sevenoaks Gravel Pits SSSI are possible, as are impacts on breeding birds and a reduction in suitability or distribution of habitats which support Cordulia aenea. The significance of impacts on NERC fish species are likely to be moderate for brown/sea trout and eels based on the fragmentation of habitats, with reduced river flows inhibiting migration. Moderate adverse impacts may occur on WFD status due to the impact of the drought option on fish. Major adverse effects due to the possibility that an implementation of the drought order could encourage movement of the invasive species signal crayfish in the catchment, increasing the likelihood of interaction between signal and the native white clawed crayfish (NERC species), resulting in a high magnitude impact that is considered irreversible. Minor adverse short term effects may occur on landscape values, as a significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers.**																				
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**				**None**				**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Beneficial effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to the drought effects.**																				
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies moderate adverse effects a national designated site. The impact of a reduction in lake levels on the Sevenoaks Gravel Pits SSSI is likely to be of medium magnitude for breeding birds as the extent of the hydrological impact will be small and the impacts will not extend outside of the drought implementation period. Impacts on the ecological integrity of the site are not likely as the ponds will not dry up completely, and it is considered likely that mitigation can be easily implemented to control the level of the small lake. There is potential for a reduction in suitability or distribution of habitats which support Cordulia aenea, for which the site is designated, causing a decline in ecological status of the site. Moderate adverse effects to aquatic habitats and species including NERC habitats/species and ecologically significant species. The significance of impacts on NERC fish species were identified as a moderate for brown/sea trout and eels based on the fragmentation of habitats, with reduced river flows inhibiting migration. The EAR identifies moderate impact on WFD status based on the impact of the drought option on fish, and minor for macroinvertebrates and macrophytes.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The EARs assessed the impact of the drought option on the distribution of invasive non-native flora and fauna species including signal crayfish, zebra mussel, Australian swamp stonecrop and parrot's feather. The sensitivity of the river reaches to INNS overall is considered to be medium as there are a number of invasive species known to be present in the catchment. The assessment results of the drought option noted the possible spread of INNS with the impact ranging from negligible to major. Implementation of a drought order could encourage movement of crayfish in the catchment increasing the likelihood of interaction between signal and white clawed crayfish (NERC species), resulting in a high magnitude impact that is considered irreversible. Due to the permanence of this effect the overall assessment is major adverse. Mitigation includes direct removal and appropriate disposal of invasive species if identified during monitoring.	High (adverse)	Medium	Small	Moderate	Long-term	Permanent	Major adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to an additional 12 Ml/d of water) during drought conditions and therefore help maintain public health.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	A significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers. It is unlikely that the bird information sites or hides would be removed or lead to a reduction in bird watchers to the area. The river or lakes will not dry out as a result of the drought order, therefore impacts on recreation should be no more than minor. The Darent contains a wide diversity of coarse fish including roach, chub, perch, pike, eels, gudgeon, carp and tench. The close proximity to central London makes the catchment very popular with anglers. Any impacts of the drought order on fish population or distribution may impact anglers and therefore impacts on angling are considered to be minor adverse.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Impacts of the drought order on navigation are unknown, but would be of major significance if there was a reduction in lake level that considerably disrupted sailing activity, particularly on Chipstead Lake and is assessed as moderate adverse based on navigation having medium sensitivity. Implementation of the drought may restrict the feasibility of the surface water abstraction at Sevenoaks Wildfowl Reserve may be limited with the drought order in place. This has been assessed as a moderate adverse effect, based on the abstractor having medium sensitivity. The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. This is considered a moderate beneficial effect as people and businesses have a high sensitivity to access to water during times of drought.	Medium (adverse) Low (beneficial)	Medium (adverse) High (beneficial)	Small	Low	Short-term	Temporary	Moderate adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (up to 12 Ml/d) over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies a major impact on one river reach and minor impacts on two other reaches. The impact would be limited to the duration of the drought order only (which can theoretically be implemented at any time year). The impact would manifest as reduction of flows, velocities and levels.	High (adverse)	High	Small	Moderate	Short-term	Temporary	Major adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	In the absence of significant water quality pressures within the study area, the risk to water quality from the drought order is considered negligible in all reaches for dissolved oxygen. In one reach higher SRP concentrations are associated with lower river flow so the risk is to water quality is medium from the drought option but low in the other reaches. The reaches are considered to have medium sensitivity to changes in water quality and the overall effect is minor adverse.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing' by the EA. The feasibility of the surface water abstraction at Sevenoaks Wildfowl Reserve may be limited with the drought order in place. This has been assessed as a moderate impact.	Medium (adverse)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR suggests minor temporary impacts to geomorphology in one reach and negligible in other reaches, overall assessed as minor adverse. This is due to the reductions in flow and potentially large changes in wetted width and depth. No land take is required for the option and therefore no impacts on land use, soil or geology are anticipated as a result of this option.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutants.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase emissions associated with abstraction and treatment of water (up to 12 Ml/d). The drought option is located less than a 1km from the M25 AQMA, therefore the sensitivity to changes in air quality is medium and the overall significance is assessed as minor adverse with low certainty.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are heritage assets in proximity to the option and zone of influence including 12 Scheduled Ancient Monuments and the registered park and garden Combe Bank. However they are unlikely to be impacted during drought permit implementation, and therefore the impact is considered negligible. The EARs have assessed the impacts on unknown water dependent assets as negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No construction activities are required for this option. The option is located within the Kent Downs AONB and a significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers. However, the river or lakes will not dry out as a result of the drought order, therefore there will be a minor impact on landscape.	Low (adverse)	High	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Lower Thames:** **To reduce the minimum pass-forward flow over Teddington Weir to 100Ml/d or 0Ml/d depending on agreement with the Environment Agency.** **The Lower Thames Operating Agreement (LTOA) provides a guide to day-to-day operational decisions on Thames Waters abstraction from the lower River Thames. The agreement is based on ensuring that sufficient flow passes over Teddington weir, relative to the prevailing seasonal reservoir storage of the Thames Valley and Lee Valley reservoir groups. Four pass-forward flow (Teddington target flows, TTF) values are included in the LTOA. Under normal periods, the LTOA conditions mean that Tames Water's abstractions cannot cause the pass-forward flow to drop below the TTF agreed for that day. Normally there is a minimum residual flow of 800Ml/d. However, as the volume of available reservoir storage reduces, this triggers reductions in the TTF in a stepwise fashion. Each step requires the implementation of greater demand control measures by TWUL, for example, hosepipe bans. This stepwise reduction progresses from 800Ml/d to 600Ml/d, followed by further reductions to 400Ml/d and then 300Ml/d . In advance of a drought permit application, which would be to reduce the TTF to 100Ml/d or 0Ml/d, TWUL would agree with the Environment Agency to adopt the lower TTF of 200Ml/d as set out in the M2 licence.** **The assessment is based on the worst case – Scenario 2: Reduction in pass forward flows from 200Ml/d to 0Ml/d.**																					
Summary commentary of scheme adverse effects	**If implemented, the drought permit would have major adverse effects on flows in the lowest reaches of the fluvial Thames, mainly in terms of velocity reduction. Freshwater flows to the upper Thames Tideway will reduce, potentially completely. Adverse effects are predicted on water quality in the fluvial Thames (reduced dissolved oxygen saturation and reduced phosphate dilution) which may exacerbate water quality issues in the upper Tideway with the potential for major adverse effects. Moderate to major adverse effects are expected on a range of aquatic ecological receptors, such as macroinvertebrates, macrophytes, fish and algae. The major adverse effects are predominantly associated with adverse effects to fish, including migration. Adverse effects also identified with respect to Langham Pond SSSI, Dumsey Meadow SSSI and Syon Park SSSI. Major adverse effects may occur on navigation. The combination of maintenance of water levels, restrictions on lock use, and small restrictions regarding navigability in the Thames Tideway would result in major adverse effects on boats that are navigating between the Tideway and the fluvial River Thames.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**						**None**			**None**	**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**If implemented, the drought permit would have a major beneficial effects for populations and human health in terms of ensuring supply of water and other customers/businesses. Major beneficial effects are also expected in regard to improved resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance (those likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (those likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The key hydrological impacts of the Lower Thames drought permit relate to moderate to major effects on velocity upstream of Teddington Weir, and major water quality effects in the tideway (forms part of the Thames Estuary Marine Conservation Zone). The result is a wide range of effects on a large number of ecological receptors, which include a number of designated sites (Langham Pond SSSI, Dumsey Meadow SSSI and Syon Park SSSI). Adverse effects relating to the freshwater species of the lowest reaches of the fluvial River Thames and the transitional species of the Tideway range from minor to major. The types of effects are greatest regarding fish communities. Major, temporary adverse effects include those that relate to localised water quality deterioration, increased predation, habitat fragmentation and impacts on migration affecting species which include migratory salmonids, European eel, lamprey and brown trout. Major adverse effects to fish communities relate to a moderate risk of deterioration regarding the fish component of the WFD waterbody GB530603911403 Thames Upper. Moderate to major adverse effects to macroinvertebrates are also identified, and include major adverse effects with respect to depressed river mussel (NERC Section 41 Species). The effects associated with the small construction requirements (generators, submersible pumps and pipes) are considered to be limited.	Major (adverse)	High	Large	Moderate	Short-term	Temporary	Major adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The changes to flow velocity and water quality as result of the drought permit are considered likely to have minor adverse effects associated with the spreading a wide range of INNS including for example Zebra mussel, Chinese mitten crab and spionid worm (*Marenzelleriawiréni.)*	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Implementation of the drought permit will help to maintain essential public water supplies (provision of up to an additional 200Ml/d of water) during drought conditions and therefore help maintain public health. Some construction is required for option implementation, therefore there may be negligible effects on human health (e.g., noise and dust nuisance).	Low (adverse) High (beneficial)	Low (adverse) High (beneficial)	Small (adverse) Medium (beneficial)	Moderate	Short-term	Temporary	Negligible adverse	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	The River Thames is highly valued for its navigational and recreational uses. The EAR identifies impacts of the drought option on navigation and recreation. In the fluvial River Thames, restrictions on lock use would be imposed both as a result of natural drought conditions (to maintain critical water levels) and the requirements to keep Moseley Weir and Teddington Weir closed (at least for most of the time) in order for the drought permit to operate effectively. The reduction in pass forward flows over Teddington Weir would result in impacts due to insufficient working navigable depth at some locations in the Thames Tideway (Richmond, Brentford and Kew), these are considered small in the context of existing restrictions. However, when considering the further restrictions on navigation imposed at Teddington and other locks upstream as a result of drought conditions, there will be impacts on boats that are navigating between the Tideway and the lower freshwater River Thames. There is also the potential for additional risks to navigation as a result of increased sedimentation in the navigation channel in the upper Tideway as fewer and fewer vessels use the navigation channel, with implications on manoeuvrability for larger boats. Overall, impacts on navigation are considered major adverse. Anglers may be affected by any reduction in the presence of fish species as a result of the adverse impacts to fish communities identified. The requirement for back-pumping may present some disruption to the public rights of way in proximity to Molesey weir and Teddington weir.	Major (adverse)	High	Large	Moderate	Short-term	Temporary	Major adverse	None

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Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance (those likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (those likely to remain after reasonable mitigation)**
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Implementation of the drought permit will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. However, significant adverse impacts to navigation are expected, which may present temporary adverse effects to the business of a number of the marina, passenger boat and hire boat operators.	Medium (adverse) High (beneficial)	Medium (adverse) High (beneficial)	Medium	Moderate	Short-term	Temporary	Moderate adverse	Major beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An increase in abstraction (200Ml/d) is likely to result in a proportional increase in the use of energy, chemicals and generation of waste. However, this is a temporary increase in abstraction that occurs at high volumes under normal operating conditions. Construction activities will likely generate some waste as well.	High (adverse)	Low	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The drought permit would have a major hydrological impact. The lowest reaches of the River Thames (Datchet abstraction to Teddington Weir) would experience a reduction in river flow during natural low flow periods. As the river is impounded with river levels (and wetted area) maintained for navigation, the flow reduction would only lead to a reduction in velocity as a result of the drought permit, the reduction in velocity is considered major from Penton Hook lock to Teddington Weir. The drought permit would result in a major reduction in freshwater flow that enters the Upper Tideway over Teddington Weir. This would have limited impact on river levels, however, due to the reduction in freshwater flow associated with the drought permit, there would be estuarine water quality implications (decreasing with distance downstream to London Bridge).	High (adverse)	Medium	Small	Moderate	Short-term	Temporary	Major adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	In the adversely impacted reach of the fluvial River Thames there would be a minor to moderate water quality risk for dissolved oxygen concentration (increasing downstream) during drought permit implementation. Implementation of the drought permit would have moderate (GB106039023231) and major risk (GB106039023232) of short-term deterioration to related freshwater WFD waterbodies in terms of the macroinvertebrate community. The drought permit would result in a major reduction in freshwater flow that enters the Upper Tideway over Teddington weir, resulting in estuarine water quality implications (but decreasing with distance downstream to London Bridge). The risk to dissolved oxygen is considered major in the impacted reach of the Thames Tideway. The impact of consented discharges to the River Thames and its tributaries is considered to present moderate and major pressures in the lowest reaches of the fluvial Thames (ammonia and dissolved oxygen) and upper Tideway (dissolved oxygen) respectively.	Major (adverse)	Medium	Small	Moderate	Short-term	Temporary	Major adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. However, the drought permit for both scenarios will not reduce the amount of water available for other licence holders to abstract in the freshwater River Thames and it is not anticipated that the drought permit will limit the feasibility of other abstractors in the Tideway.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR identifies minor impacts on geomorphology that relate to in-channel structures, such as weirs/locks and their influence on sediment dynamics by creating ponded areas upstream of the structure. It is anticipated that there would be low amounts of sediment in transport during a drought.	Low (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No impacts on land use or soil are anticipated as the construction requirements are limited to the use of submersible pumps, barges and temporary pipes.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

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Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and there are no opportunities for catchment-wide approach to land management.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	In addition to the temporary emissions associated with the abstraction and treatment of water (up to 200Ml/d), the option will result in temporary emissions as a result of the back-pumping component of the option. The option is in close proximity (or within) a number of AQMAs, including Spelthorne AQMA and Richmond AQMA.	Medium (adverse)	Medium	Small	Low	Short-term	Temporary	Moderate adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	In addition to the temporary energy use associated with the abstraction and treatment of water (up to 200Ml/d). The option will involve additional temporary energy use and therefore greenhouse gas emissions to enable the back-pumping component of the option.	Medium (adverse)	Low	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	High (beneficial)	High	Small	High	Short-term	Temporary	None	Major beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The length of the impacted reach of the River Thames includes a wealth of archaeology and cultural heritage assets. However, water levels will not be significantly affected adjacent to these assets due to the requirement to maintain levels for navigation. Assuming water levels are maintained, the potential impact of this drought permit on the setting of the heritage assets associated with the Thames, including sub-surface water dependent heritage assets, is considered negligible.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No designated landscape areas in proximity. Temporary minor adverse effects as a result of the visual intrusion of the construction and decommissioning activities, primarily to local residents or walkers using public rights of way. No significant effects on non-designated areas of natural beauty or access to values areas of landscape character. There is no land take associated with the scheme.	Moderate (adverse)	Low	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Crayford:** **Water is abstracted from the Kent Chalk at Crayford. TWUL are licensed to abstract, from the ground, at an annual average rate of 13.6Ml/d (working out at than 4,964Ml/year). Implementation of the drought permit would provide a 2.8Ml/d increase in abstraction beyond existing licence limit. The drought permit is anticipated to be applied for up to 6 consecutive months between May and December inclusive.** **There is no construction phase associated with the Crayford drought permit, only a change to operating pumping regime, specifically the force pumps (that are already installed) that boost treated water off site. A temporary generator may be required.** **TWUL is also licensed to abstract from the North Kent Chalk aquifer for public water supply at Wansunt approximately 1km away from the Crayford abstraction.**																					
Summary commentary of scheme adverse effects:	**Hydrological impacts on two reaches of the River Cray are considered to be negligible, as no reduction in the surface (fresh) water contribution to the tidal reaches of the lower Cray are expected as a result of increased abstraction. Other effects associated with the drought plan option are also largely negligible, excluding a minor, short-term effect associated air emissions due to increased energy use, given the area of influence is within an AQMA.**																					
SEA Objectives Adverse Effects Assessment Summary *[completes automatically]*		**None**	**None**		**None**	**None**			**None**				**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Moderate beneficial impacts are expected with regard to ensuring supply of water to local population and other customers/businesses. There is also likely to be beneficial impacts associated with improved resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary *[completes automatically]*	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

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Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	There are no designated sites within the area of influence of the drought permit, either in relation to impacts on groundwater levels and flows, or river flows. The closest site is Footscray Meadow Local Nature Reserve, but this is outside the area of influence, upstream from the Shuttle confluence. There are a number of NERC sites for which the hydrological impact is negligible for all. There is one SSSI (Wansunt Pit) outside the area of influence but within 1km. However there are negligible effects on the reaches and no construction, therefore impacts are not anticipated further afield.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	There is uncertainty surrounding the likely effect of flow and level impacts on the ability of invasive species to distribute further within the watercourse. Hydrological effects are negligible, thus impacts on INNS are also assumed to be negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to 2.8Ml/d of water) during drought conditions and therefore help maintain public health. No construction is proposed, and therefore no effects on human health (e.g., noise and dust nuisance) are expected.	Low (beneficial)	High	Small	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	Hydrological impacts associated with implementation of the drought option are assumed to be negligible, thus no impacts on other users of the water environment (e.g., anglers) are expected. No construction is proposed, so no impacts on terrestrial recreational resources area anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. The only identified groundwater abstraction in the area of influence is a TWUL abstraction (Wansunt), and impacts on this abstraction are expected to be negligible.	Low (adverse) Low (beneficial)	Low (adverse) High (beneficial)	Medium	Medium	Short-term	Temporary	Negligible adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An increase in abstraction is likely to result in a proportional increase in the use of energy and generation of waste. However, existing infrastructure would be used, minimising such increases.	Low (adverse)	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR reports the effect on Reach 1, River Cray from Bexley Pumping Station to weir in Hall Place Gardens as uncertain (assumed negligible), and the effect on flows in Reach 2, River Cray from weir in Hall Place Gardens to tidal limit is also negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Water quality within the catchment consistently achieves High WFD status for temperature, pH, Ammonia (NH3) and DO. The exception to this is phosphate which consistently achieves Good WFD status. Hydrological and water quality effects associated with drought permit implementation are expected to be negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing'. Howvver, given that there is no adverse surface water hydrological impact associated with the drought permit, there would be no impact on surface water abstractions. The only identified groundwater abstraction in the area of influence is a TWUL abstraction (Wansunt), and effects on this abstraction are expected to be negligible.	Low (adverse)	Low	Small	Low	Short	Temporary	Negligible adverse	None

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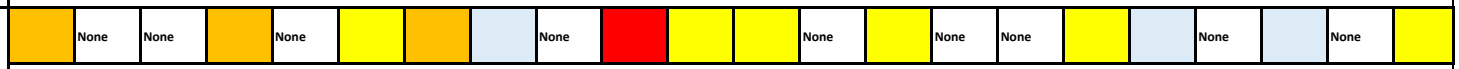
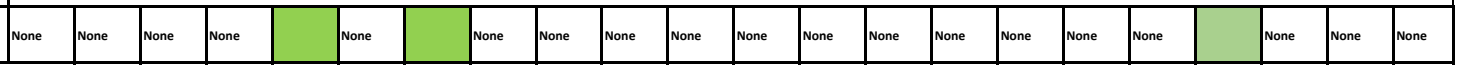
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	No soils or geological SSSIs are reported as being impacted in the EAR. There is one geological SSSI beyond the zone of influence but within 1km. There is no construction proposed and negligible effects hydrological effects are anticipated. Impacts on geology, geomorphology and soils are not expected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take or construction is required for the option, and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	There is no construction, although increased abstraction would cause a small increase in energy use and associated air emissions. The option is located within an AQMA and therefore has high sensitivity to emissions.	Low (adverse)	High	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	There is no construction although increased abstraction would cause a small increase in energy use and associated greenhouse gas emissions.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The Hall Place Scheduled Ancient Monument and Gardens are within the drought plan area of influence. However, no construction is proposed and hydrological effects will be negligible, therefore these sites will not be affected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The London Loop Public Right of Way runs in close proximity to the River Cray. The river forms part of the landscape setting of the trail. However, anticipated hydrological impacts are negligible therefore landscape values would not be affected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Horton Kirby: This drought permit is for abstraction from the Lower Greensand aquifer at Horton Kirby using a borehole drilled for an Aquifer Storage and Recovery (ASR) scheme which is not yet licensed. The option would be to bring forward the Aquifer Storage and Recovery (ASR) scheme which abstracts from the Greensand aquifer. Benefit of up to 2.6 Ml/d.** **There is a construction phase associated with this drought permit, which includes connecting a pipeline from the boreholes to the Horton Kirby Water Treatment Works (WTW) and adjustments made to the WTW for water quality purposes. Note the drought permit does not apply to the Horton Kirby abstraction from the chalk aquifer.**																					
Summary commentary of scheme adverse effects:	**Negligible adverse hydrological effects are predicted as recharge and abstraction would be from the heavily confined Greensand aquifer, and it is anticipated that there is no hydraulic link with surface water features. The construction phase is restricted to the area within the existing site, and as such, it is not anticipated that any impacts associated with construction. Minor adverse short-term air quality effects are possible, as the option will increase emissions associated with abstraction and treatment of water and the drought option is located less than 1km from the M20 AQMA.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Beneficial effects comprise maintenance of essential public water supplies during times of drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**

SEA topics and objectives		Assessment methodology									
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	All construction will take place on site. This disturbance is anticipated to be short term, temporary and reversible and is therefore expected to be of negligible impact. As no hydrological impact of the drought permit is predicted there is no impact on designated sites, NERC species, or WFD status.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The EARs conclude that there will be impact no impact on the distribution of invasive non-native flora and fauna species, as there are no hydrological impacts.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to an additional 2 Ml/d of water) during drought conditions and therefore help maintain public health.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Angling and the Darent Valley Path National Trail are unlikely to be impacted over the duration of drought permit implementation, therefore there will be no impact on recreation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Due to the negligible hydrological impact, there will be no impact on navigation. The underlying aquifer is confined in this location and so the drought permit would not impact on abstractions from the chalk aquifer (at Horton Kirby). The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity . This is considered a moderate beneficial effect as people and businesses have a high sensitivity to access to water during times of drought.	Low (beneficial)	High (beneficial)	Small	Low	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	The construction phase will involve additional use of materials and energy. It is assumed that materials and equipment required during construction will be sourced locally to minimise transport. Increases in abstraction (up to 2 Ml/d) over and above what occurs under normal operation will typically result in proportional increases in energy use and waste.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The hydrological impact of the drought permit has been assessed as negligible, as recharge and abstraction would be from the heavily confined Greensand aquifer, and it is anticipated that there is no hydraulic link with surface water features.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Given that there is no adverse hydrological impact associated with the drought permit, water quality would not be affected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing' by the EA. However, the underlying aquifer is confined in this location and so the drought permit would not impact on abstractions from the chalk aquifer (at Horton Kirby). No other public water supply abstractions will be derogated by the drought permit.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology									
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Given that there is no adverse hydrological impact associated with the drought permit, geomorphology would not be affected. All construction will take place on site. This disturbance is anticipated to be short term, temporary and reversible and is therefore expected to be of negligible impact on land use, soil or geology are anticipated as a result of the operation of this option.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option, and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towardsa catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutants.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	Assuming best practice construction methods, impacts of the construction phase on air quality are anticipated to be negligible. The option will increase the emissions associated with the abstraction and treatment of water (up to 2 Ml/d). The drought option is located less than 1km from the M20 AQMA, therefore the sensitivity to changes in air quality is medium and the overall significance is assessed as minor adverse with low certainty.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Construction will involve the delivery of materials and equipment to the site. It is assumed that materials will be sourced locally to minimise transport requirements, and therefore CO2 emissions. Increased water abstraction would cause an increase in energy use in the short term.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The construction phase is restricted to the area within the existing site, and as such, it is not anticipated that any sites of archaeological or cultural heritage importance will be affected. There are heritage assets in proximity to the option, including Scheduled Ancient Monument, Medieval moated site and associated fish pond, Franks Hall and the registered park and garden Franks Hall. However they are unlikely to be impacted over the duration of the drought permits' implementation and therefore the impact is considered negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	There may be a negligible adverse impact to landscape and visual amenity during construction, due to plant and vehicles on site. The Darent Valley Path National Trail is unlikely to be impacted over the duration of drought permit implementation.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None

Drought Plan option	Enysford: Thames Water can abstract up to 7.34Ml/d on a particular day and up to an average of 2.09Ml/d for the licencing year (without a drought permit) under the normal operating licence at Eynsford. Eynsford is aggregated with Horton Kirby which allows a total daily abstractions for both sites up to 11.36Ml/day and 2482Ml/year. The baseline reference conditions of this assessment are based on Thames Water abstracting 5 Ml/d from Eynsford during drier months and not abstracting during wetter months. However, this is incorrect and Thames Water are not currently using the Eynsford abstraction. The drought order involves an increase in peak rate of abstraction to 11.6Ml/d and relaxation of annual licence limit to allow 6 months of abstraction at peak daily rate (equating to 2,505.8Ml/y). Benefit of up to 11.6 Ml/d (although expected to be around 6.6Ml/d during drier months). Amendments to this assessment to reflect the correct baseline reference conditions for the Eynsford abstraction licence and proposed drought permit, will be updated between the draft and final submission of the Thames Water Drought Plan.
Summary commentary of scheme adverse effects:	Major adverse short-term effects are predicted on one reach of the River Darrent as part of it could dry up as a result of drought option implementation. This would result in minor, short-term adverse effects to water quality because higher SRP concentrations are associated with lower river flow. Minor short-term impacts may occur on one Southern Water Services abstraction and other smaller abstractors. Moderate short-term effects on navigation associated with lower river levels are possible, through restricting the size of boats able to use the river. Short-term effects are possible on NERC fish species (brown trout and eels - moderate, sea trout - major) due to fragmentation of habitats and reduced river flows inhibiting migration. Moderate adverse impacts on WFD status are anticipated based on the impact of the drought option on fish and macroinvertebrates. Moderate adverse effects associated with the spread of the invasive species (Australian swamp stonecrop, parrots feather and floating pennywort) are possible. Minor adverse short-term visual impact may occur on the landscape setting of the area and the Darent Valley Path National Trail reduction in river level will have, which may be noticeable by walkers.
SEA Objectives Adverse Effects Assessment Summary [completes automatically]	
Summary commentary of scheme beneficial effects	If implemented, the drought permit would have moderate beneficial effects for populations and human health in terms of ensuring supply of water and other customers/businesses. Minor beneficial effects are also expected in regard to improved resilience of water supplies to drought.
SEA Objectives Beneficial Effects Assessment Summary [completes automatically]	

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies no effects a national designated site. Despite its proximity Farningham Wood SSSI and LNR to the River Darent, this site is elevated approximately 40m above the river which suggests that due to the local topography, it will not be in connectivity with either the river or the underlying aquifer. Moderate adverse effects are expected to aquatic habitats and species, including NERC habitats/species and ecologically significant species. Impacts on NERC fish species include moderate impacts on brown trout and eels and a major impact on sea trout. These are based on fragmentation of habitats, and reduced river flows inhibiting migration. Moderate impacts on WFD status are expected based on the impacts on fish and macroinvertebrates.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The sensitivity of the river reaches to invasive non-native flora and fauna species overall is considered to be medium, as there are a number of invasive species known to be present in the catchment. Moderate changes to the distribution and abundance of Australian swamp stonecrop, parrots feather and floating pennywort are anticipated.	Medium (adverse)	Medium	Small	Moderate	Long-term	Permanent	Moderate adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to an additional 11.6 Ml/d of water) during drought conditions, and therefore help maintain public health.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	A significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers. It is unlikely that bird information sites or hides would be removed, or there would be a reduction in bird watchers to the area. The river or lakes will not dry out as a result of the drought order, therefore impacts on recreation are expected to be minor. Any impacts of the drought order on fish population or distribution may impact anglers, and therefore impacts on angling are considered to be minor adverse.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	A significant lowering of lake or river levels may result in impacts to navigation through restricting the size of boats able to use the river, which would result in moderate adverse effects, based on navigation having medium sensitivity. There is low risk to one Southern Water Services abstraction and a negligible risk to other smaller abstractors. This has been assessed as a moderate impact based on the abstractor having medium sensitivity. The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. This is considered a moderate beneficial effect as people and businesses have a high sensitivity to access to water during times of drought.	Medium (adverse) Low (beneficial)	Medium (adverse) High (beneficial)	Small	Low	Short-term	Temporary	Moderate adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (up to 11.6 Ml/d) over and above what occurs under normal operation will likely result in proportional increases in energy use and waste generation.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies a major impact on one reach of the River Darent, where the drought option could potentially cause drying within the reach. The impact would be limited to the duration of the drought order only (which can theoretically be implemented at any time of the year).	High (adverse)	High	Medium	Moderate	Short-term	Temporary	Major adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	In the absence of significant water quality pressures within the study area, the risk to water quality from the drought order is considered negligible in all reaches for dissolved oxygen. SRP concentrations are associated with lower river flow so the risk is to water quality is medium from the drought option. The reaches are considered to have medium sensitivity to changes in water quality and therefore the overall risk is minor adverse.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing' by the EA. There is low risk to one Southern Water Services abstraction and a negligible risk to other smaller abstractors. This has been assessed as a minor impact.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR suggests low risk to geomorphology in one reach and is assessed as minor adverse as it is temporary. The risk is due to the reductions in flow and potentially large changes in wetted width and depth. No land take is required for the option and therefore no impacts on land use, soil or geology are anticipated as a result of the operation of this option.	Low (adverse)	High	Small	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutants.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase emissions associated with the abstraction and treatment of water (up to 11.6 Ml/d). The drought option is located less than 5km from the M25 AQMA, therefore the sensitivity to changes in air quality is medium and the overall significance is assessed as moderate adverse with low certainty.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are heritage assets in proximity to the option and zone of influence, including 10 Scheduled Ancient Monument. However they are unlikely to be impacted during drought permit implementation and therefore the impact is considered negligible. The EARs have assessed the impacts on unknown water dependent assets as negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No construction activities are required for this option. The option is located within the Kent Downs AONB, and a significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers. The river is unlikely to dry out as a result of the drought order, therefore, there will be a minor impact on landscape.	Low (adverse)	High	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Wansunt:** **TWUL are licensed to abstract, from the Chalk aquifer below Wansunt pumping station, at an annual average rate of 13.6Ml/d (4,977Ml/year). The drought permit would comprise a 6.0Ml/d increase in abstraction beyond existing licence limit, and is anticipated to be applied for up to six consecutive months between May and December inclusive.** **The 6Ml/d increase in average licence limit represents the maximum that can be abstracted according to what the network can receive. It is possible that this rate cannot be sustained from the well and borehole at Wansunt for 6 months. Currently it is assumed that there is no construction phase associated with the Wansunt drought permit, however, TWUL have indicated that if groundwater quality deteriorates during implementation additional treatment may be required. TWUL is also licensed to abstract from the North Kent Chalk aquifer for public water supply at Crayford, approximately 1km away from the Wansunt abstraction.**																					
Summary commentary of scheme adverse effects:	**Hydrological impacts on Reach 1 of the River Cray are uncertain and assumed to be negligible, and effects on Reach 2 are also negligible as no reduction in the surface (fresh) water contribution to the tidal reaches of the lower Cray is expected as a result of increased abstraction. Other effects associated with the drought plan option are also largely negligible, excluding a minor, short-term effect associated air emissions due to increased energy use, given the area of influence is within an AQMA.**																					
SEA Objectives Adverse Effects Assessment Summary [completes automatically]		**None**	**None**		**None**	**None**			**None**				**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Moderate beneficial impacts are expected with regard to ensuring supply of water to local population and other customers/businesses. There is also likely to be beneficial impacts for associated with improved resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary [completes automatically]	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR states there are no designated sites within the extent of influence of the drought permit, either in relation to impacts on groundwater levels and flows, or river flows (the closest site is Footscray Meadow Local Nature Reserve, but this is beyond the extent of influence, upstream from the Shuttle confluence, and is not considered further). There are a number of NERC sites within the area of influence and these are identified and assessed as negligible in the EAR. There are two areas of ancient woodland within 1km. However, negligible hydrological effects are expected on the River Cray and there will be no construction, therefore impacts to biodiversity and designated sites are anticipated to be negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	There is uncertainty surrounding the likely effect of flow and level impacts on the ability of invasive species to distribute further within the watercourse. Hydrological effects are negligible, thus impacts on INNS are also assumed to be negligible.	Low (adverse)	Low	n/a	n/a	n/a	n/a	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes,	The option will help to maintain essential public water supplies (provision of up to 6Ml/d of water) during drought conditions and therefore help maintain public health. No construction is proposed, and therefore no effects on human health (e.g., noise and dust nuisance) are expected.	Low (beneficial)	High	Small	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	Hydrological impacts associated with implementation of the drought option are assumed to be negligible, thus no impacts on other users of the water environment (e.g., anglers) are expected. No construction is proposed, so no impacts on terrestrial recreational resources area anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. The only identified groundwater abstraction in the area of influence is a TWUL abstraction (Crayford), and impacts on this abstraction are expected to be negligible.	Low (adverse) Low (beneficial)	Low (adverse) High (beneficial)	Medium	Medium	Short-term	Temporary	Negligible adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An increase in abstraction is likely to result in a proportional increase in the use of energy and generation of waste. However, existing infrastructure would be used, minimising such increases.	Low (adverse)	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR reports the effect on Reach 1, River Cray from Bexley Pumping Station to weir in Hall Place Gardens as uncertain (assumed negligible), and the effect on flows in Reach 2, River Cray from weir in Hall Place Gardens to tidal limit is also negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Water quality within the catchment consistently achieves High WFD status for temperature, pH, Ammonia (NH3) and DO. The exception to this is phosphate which consistently achieves Good WFD status. Hydrological and water quality effects associated with drought permit implementation are expected to be negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. Hower given that there is no adverse surface water hydrological impact associated with the drought permit, there would be no impact on surface water abstractions. The only identified groundwater abstraction in the area of influence is a TWUL abstraction (Crayford), and effects on this abstraction are expected to be negligible.	Low (adverse)	Low	Small	Low	Short	Temporary	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	No specific soils or geological SSSIs are reported as being impacted in the EAR and no construction is proposed. Impacts on geology, geomorphology and soils are not expected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take or construction is required for the option, and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	There is no construction, although increased abstraction would cause a small increase in energy use and associated air emissions. The option is located within an AQMA and therefore has high sensitivity to emissions.	Low (adverse)	High	Small	Low	Short-term	temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	There is no construction although increased abstraction would cause a small increase in energy use and associated greenhouse gas emissions.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important	The Hall Place Scheduled Ancient Monument and Gardens are within the drought plan area of influence. However, no construction is proposed and hydrological effects will be negligible, therefore these sites will not be affected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The London Loop Public Right of Way runs in close proximity to the River Cray. The river forms part of the landscape setting of the trail. However, anticipated hydrological impacts are negligible therefore landscape values would not be affected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Increase in M2 annual licence (Lower Thames):** **The intention of the increase in M2 annual licence (Lower Thames) drought permit is to enable recovery of storage in the Thames reservoirs after a period of summer drought. This will help ensure that the reservoirs can be full by the end of the calendar year rather than being restricted by the annual total abstraction limit in case there is a drought period following on in the next year. Implementation would increase in the average maximum abstraction permitted under the M2 licence by up to 5%, but abstractions would stay within the daily licence limit. Abstractions would still be restricted when flows are medium to low (as per normal operations).**																						
Summary commentary of scheme adverse effects:	**Adverse effects identified are limited to negligible, temporary adverse effects from emissions of air pollutants and greenhouse gases associated with additional water pumping and treatment requirements.**																						
SEA Objectives Adverse Effects Assessment Summary [completes automatically]	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**	
Summary commentary of scheme beneficial effects	**Major beneficial effects are identified with respect to the population and human health, water and air and climate. These relate to helping with the sustainable provision of a large quantity of water (at a rate of 91Ml/d) during periods of drought. The drought option achieves this by enabling recovery of storage in the Thames reservoirs after a period of summer drought. This will help ensure that the reservoirs can be full by the end of the calendar year rather than being restricted by the annual total abstraction limit, in case there is a drought period following on in the next year. Abstractions would still be restricted when flows are medium to low (as per normal operations) and therefore the benefits are achieved with no adverse effects on environmental features or other abstractors.**																						
SEA Objectives Beneficial Effects Assessment Summary [completes automatically]	**None**	**None**	**None**	**None**		**None**			**None**	**None**	**None**		**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**	

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	There are no designated sites impacted by the operation of the drought option, and there would be no impacts on habitats, species or WFD compliance.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	There are several INNS known to inhabit the section of the Thames River associated with the option. However, with implementation of the option is not expected to influence the distribution or abundance of INNS present, or introduce any new INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The drought option will help to ensure levels of service are maintained through enabling provision of water (at a rate of 91Ml/d), and therefore help maintain public health.	Medium (beneficial)	High	Medium	High	Short term	Temporary	None	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	With no construction requirements and operational hydrological effects assessed as negligible, no effects on other water environment users are likely.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. This will be achieved with no adverse hydrological impacts, and therefore no impacts on other abstractors is anticipated.	Medium (beneficial)	High	Medium	High	Long term	Temporary	None	Major beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Option requires no construction and will use existing infrastructure. Option will result in an increase in annual maximum abstraction by up to 5%. Therefore there will be proportional (minor) increases in energy use and waste for water abstraction and treatment.	Low (adverse) Low (beneficial)	Low	Medium	Medium	Short term	Temporary	Negligible adverse	Negligible beneficial
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies no adverse hydrological impact associated with the drought option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	With no construction requirements and no operational hydrological effects the EAR identifies that water quality would not be affected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The option enables recovery of storage in the Thames reservoirs after a period of summer drought. This will help ensure that the reservoirs can be full by the end of the calendar year rather than being restricted by the annual total abstraction limit, in case there is a drought period following on in the next year. Abstractions would still be restricted when flows are medium to low (as per normal operations). Local resource availability is described as 'Water not available for licensing', however no adverse effects on environmental features or other abstractors have been identified.	Medium (beneficial)	High (beneficial)	Medium	High	Short term	Temporary	None	Major beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it prmote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	As no adverse hydrological impacts have been identified, and no impacts on geomorphology are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	There will be no construction requirements or land take, and no hydrological impacts have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option, and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	The option involves the increase in the annual maximum abstraction permitted under the M2 licence by up to 5%. Therefore there will be a short term increase in emissions associated with the additional pumping and treatment requirements. The option is within 5km of a number of west London AQMAs.	Low (adverse)	Low	Local	Low	Short term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	The option involves the increase in the annual maximum abstraction permitted under the M2 licence by up to 5%. Therefore there will be a associated short term increase in greenhouse gas emissions associated with the additional pumping and treatment requirements.	Low (adverse)	Low	Medium	High	Short term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	The option is likely to be implemented during November and December, during which time flows would be expected to be recovering. The increased abstraction would be limited to when flows are sufficiently high enough in the River Thames. The continued abstraction would result in higher reservoir storage levels going into the following year than would occur without the use of the drought permit. Depending on flows in the subsequent year, this could result in lower abstractions due to decreased need to fill the reservoirs.	Medium (beneficial)	Medium	Medium	Medium	Short term	Temporary	None	Moderate beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	With no construction requirements and no adverse hydrological impacts identified, no adverse effects to heritage assets are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	With no construction requirements and no adverse hydrological impacts identified, no adverse effects to landscape values are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Waddon Drought Permit:** **Water is abstracted from the Chalk Aquifer at Waddon boreholes. The existing abstraction licence (28/39/41/12) permits abstractions from the Chalk Aquifer at Waddon at a peak day rate of 15.5 Ml/d with an average rate per year and month of 7.6 Ml/d (working out at no more than 2,773 Ml/year). The drought permit would be for a 7Ml/d increase in abstraction beyond existing licence limit (average rate per year of 7.6Ml/d) throughout the duration of the drought permit.** **The drought permit could potentially start in any month of the year although it is anticipated to be applied for during the hydrological summer (the months of April to September inclusive). The revised abstraction arrangements would remain in place for 6 months or less if water resources within the TWUL supply area have returned to adequate levels to safeguard future water supplies, as agreed with the Environment Agency. There is no construction activity associated with this drought permit.**																				
Summary commentary of scheme adverse effects	**Under a worst case scenario, Waddon Ponds may dry up (for up to 3 months) when they would otherwise not have without a drought permit (significant adverse effect on water levels/flows). With reduction in through-flow in Waddon Ponds, there is a risk of increased water temperature and reduction in dissolved oxygen saturation. Moderate adverse effects are also identified with respect to the River Wandle downstream of the ponds, where the drought permit would extend the recovery of levels and flows by up to one month. These hydrological affects could result in moderate adverse, short term effects with respect to biodiversity, including moderate to minor adverse effects on the Wilderness Island, Spencer Road Wetlands, and Wandle Valley Wetland LNRs. Overall moderate adverse effects on fish communities are predicted, with potential for major adverse impacts on European eel (NERC fish species) and moderate adverse effects to brown trout and barbel. Minor, temporary adverse effects were identified on the landscape values associated with Waddon Ponds, which form a local amenity feature in the London Borough of Croydon and an essential part of the landscape setting and character of the Wandle trail which is valued by walkers.**																				
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**				**None**				**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are expected due to provision of additional water supply. There are also likely to be minor beneficial impacts associated with improved resilience of water supplies to drought.**																				
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	There is potential for moderate to minor adverse effects on Wilderness Island LNR, Spencer Road Wetlands LNR and Wandle Valley Wetland LNR. Moderate adverse effects on fish communities. Major adverse impacts identified regarding the European eel (NERC fish species) and moderate adverse effects to brown trout/ trout and barbel.	Medium (adverse)	Medium	Small	Moderate	Medium-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Major adverse INNS impacts in the Waddon Ponds may occur as a result of changes in the distribution Chinese mitten crab. Moderate adverse impacts were identified for the River Wandle regarding the distribution and abundance of invasive floral species (between April and September only).	Medium (adverse)	Medium	Small	Moderate	Medium-term	Temporary	Moderate adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Implementation of the drought permit will help to maintain essential public water supplies (provision of up to an additional 7Ml/d of water) during drought conditions and therefore help maintain public health. No construction is proposed, and therefore no effects on human health (e.g., noise and dust nuisance) are expected.	Low (beneficial)	High	Medium	High	Medium-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Waddon Ponds (located within a small urban park) form a local amenity feature in the London Borough of Croydon with significant recreational value. Under a worst case scenario Waddon ponds may dry up (for up to 3 months) when they would otherwise not have without a drought permit.	Medium (adverse)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The drought option will contribute to the maintenance of supply reliability in drought conditions. However, there is some uncertainty regarding the potential for impacts on the feasibility of a nearby groundwater abstraction under operation of the drought option.	Low (beneficial) Low (adverse)	High (beneficial) Medium (adverse)	Medium	Moderate (beneficial) Low (adverse)	Short-term	Temporary	Minor adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Option requires no construction and will use existing infrastructure. Option will result in up to 7Ml/d increase in abstraction beyond its existing licence limit with an associated increases in energy use and waste for water abstraction and treatment.	Low (beneficial)	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	There is potential for major adverse hydrological effects. Under a worst case scenario, Waddon ponds may dry up (for up to 3 months) when they would otherwise not have without a drought permit. Moderate adverse effects were also identified with respect to the River Wandle downstream of the ponds. The drought permit would not affect the lowest flows but median to low flows (approximately Q50-Q90). The drought permit would extend the recovery of levels and flows by up to one month.	High (adverse)	Medium	Small	Moderate	Medium-term	Temporary	Major adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	With reduction in through-flow in Waddon Ponds, there is risk of increased water temperature and a reduction in dissolved oxygen saturation, which would be exacerbated if the ponds dry. In the River Wandle further downstream there is no significant relationship between flow and water quality, and risks to water quality from drought permit implementation are considered minor.	High (adverse)	Low	Small	Moderate	Medium-term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing'. The EAR generally identifies minor risks of short-term deterioration or prevention of the Croydon and Wandsworth water body (GB106039023460) achieving Good Ecological Potential (GEP). Generally negligible to low risks are identified in the EAR with respect to other abstraction pressures.	Medium (adverse)	Low	Small	Moderate	Medium-term	Temporary	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	There are no construction requirements. Implementation of the drought option and a prolonged environmental drought may lead to loss of vegetation, which could leave sediment exposed to erosion upon commencement of higher flows when drought conditions cease. This may be the case in the middle and lower section of the impacted part of the River Wandle, which contains some in-channel macrophytes. The EAR describes geomorphology impacts as minor in this reach (and negligible regarding the upstream reach and Waddon Ponds).	Low	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	There are no construction requirements or land take for this option, which would utilise existing abstraction and water treatment sites. No opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option involves an increase in abstraction of up to 7Ml/d, and there will be an associated short-term increase in air emissions. The option is within Croydon AQMA.	Low (adverse)	Medium	Medium	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	The option involves an increase in abstraction of up to 7Ml/d, and there will be an associated short-term increase in greenhouse gas emissions.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are two Scheduled Ancient Monuments in proximity (Roman Villa East of Beddington Park and Dovecote, Beddington Park), however, as identified by the EAR, impacts are on these heritage assets are unlikely. The presence of springs in chalk catchments and their related surface waters or wetlands can contain important archaeological information, especially palaeo-environmental evidence. The drought option is likely to reduce groundwater levels and have impacts on Waddon Ponds. However, these impacts will be an extension of significant impacts of the natural drought and the groundwater levels are anticipated to respond rapidly to rainfall in subsequent recharge events.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	There are no designated landscape areas in the area of influence. The Wandle Trail runs along the River Wandle from Croydon to the River Thames. The ponds form an essential part of the landscape setting and character of the trail that is valued by walkers. In a worst case scenario, the impact of the proposed drought permit may result in Waddon Ponds drying up when they may not have done so without a drought permit in place. If drying up of the ponds were only to occur with a drought permit in place, this would probably occur during the latter half of the drought permit. Drying out of the ponds would adversely effect the visual amenity value and local distinctiveness of the non-designated landscape.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Bauton 1: Water is abstracted from the Inferior Oolite Aquifer at Baunton from four boreholes. The operation of the existing abstraction licence (28/39/2/63) is determined by the flow conditions in the River Churn at Cirencester Gauging Station. The River Churn flow constraint is at 32 Ml/d. When flow is greater than 32 Ml/d, abstraction is permitted at a rate of up to 21.6Ml/d with an annual average rate equivalent to 16.64Ml/d. No abstraction is permitted when flow in the River Churn is less than 32Ml/d.** **The drought permit would involve a temporary suspension of the 32Ml/d flow constraint on the River Churn at Cirencester. When flows in the River Churn are less than 32Ml/d, abstraction would be permitted to a maximum rate of 6.3Ml/d. Benefit of up to 6Ml/d.**																					
Summary commentary of scheme adverse effects:	**Moderate, adverse, short-term effects are predicted on three reaches of the River Churn, as they may remain dryer for longer as result of the drought option. Moderate, adverse, short-term effects on NERC fish species are possible, as are minor effects on the nationally designated site North Meadow SSSI as offtakes from the River Churn support the macrophyte community at the site (uncertainty surrounds the water level management practice at the site).**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**				**None**				**None**		**None**	**None**				**None**		**None**	
Summary commentary of scheme beneficial effects	**Beneficial effects associated with the drought option include maintaining essential public water supplies during times of drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies minor adverse effects on the nationally designated site North Meadow SSSI. Offtakes from the River Churn appear to provide flow through the central ditch system supporting the sites macrophyte community, but uncertainty surrounds the water level management practice at the site. There are negligible effects on the internationally important site North Meadow and Clattinger Farm SAC as it its hydrologically isolated from the drought option. Moderate adverse effects to aquatic habitats and species including NERC habitats/species and ecologically significant species. The significance of impacts on NERC fish species were identified as a moderate for brown/sea trout and eels based reduction or loss of spawning habitat due to desiccation of habitat and increased stress and predation on species in refuges as a result of delay in recovery of flows. A minor impact on WFD status is predicted based on the impact of the drought option on fish, macroinvertebrates and macrophytes.	Medium (adverse)	Medium	Medium	Low	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The drought permit is likely to have a negligible impact to the distribution of non-native species, such as invasive macroinvertebrates (signal crayfish and zebra mussel) or invasive macrophytes.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to an additional 6 Ml/d of water) during drought conditions, and therefore help to maintain public health.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Due to the natural drying of the reaches in natural drought conditions, it is unlikely that drought permit implementation will have any further impacts on existing trails and footpaths or navigation/angling.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Implementation of the drought permit will have negligible impact on other abstractors. The assessment was constrained by limited information, but no impacts on known abstractors have been identified. No impacts on navigation are likely. Therefore the sensitivity of navigation, tourism and other abstractors is low and the impacts are negligible. The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. This is considered a moderate beneficial effect as people and businesses have a high sensitivity to access to water during times of drought.	Low (adverse) Low (beneficial)	Low (adverse) High (beneficial)	Small	Moderate	Short-term	Temporary	Negligible adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (up to 6Ml/d) over and above what occurs under normal operation will likely result in related and proportional increases in energy use and waste.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies major impact on 1 reach of a watercourse and moderate and minor on 2 others, with them remaining drier for longer based on reduced groundwater levels. Impact anticipated to be limited to during hydrological winter for a short duration of up to 1 month. The impact would also manifest as reduction of flows, velocities and levels. Overall the impacts is assessed as moderate adverse.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The risk of the drought permit to dissolved oxygen saturation levels is considered to be no risk across all hydrological reaches. The risk of the drought permit to total ammonia concentration levels was identified as negligible for all reaches. There is no risk from other discharges. The sensitivity to water quality changes is therefore considered to be low and the overall significance is negligible adverse.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing' by the EA. However, other water company public water supplies and non-public water supply abstractions, were reviewed and it was considered that the implementation of the drought permit will have a negligible impact on other abstractions.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR suggests minor impacts to geomorphology in the impacted reaches. The drought permit may result in a reduction in wetted width and depth than might otherwise be expected under the current hydrological regime. This may result in a potential minor reduction in bank and bed stability. No land take is required for the option and therefore there is no impacts on land use, soil or geology are anticipated as a result of the operation of this option.	Low (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutants.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase air emissions associated with abstraction and treatment of water (up to 6 Ml/d). However, no AQMA are in proximity to the option.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	Heritage assets in proximity to the option and zone of influence including 4 Scheduled Ancient Monuments. However they are unlikely to be impacted over the duration of the drought permit implementation.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No construction activities are required for this option, however there will be changes to water levels in three reaches of the River Churn for a short duration. The option is located in the Cotswolds AONB, but due to the natural drying of the reaches in natural drought conditions, it is unlikely that drought permit implementation will have any impacts on the local distinctiveness of the landscape.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None

Drought Plan option	**Bauton 2:** **Water is abstracted from the Inferior Oolite Aquifer at Baunton from four boreholes. The operation of the existing abstraction licence (28/39/2/63) is determined by the flow conditions in the River Churn at Cirencester Gauging Station. The River Churn flow constraint is at 32 Ml/d. When flow is greater than 32 Ml/d, abstraction is permitted at a rate of up to 21.6Ml/d with an annual average rate equivalent to 16.64Ml/d. No abstraction is permitted when flow in the River Churn is less than 32Ml/d. The drought permit would involve a temporary suspension of the 32Ml/d flow constraint on the River Churn at Cirencester. When flows in the River Churn are less than 32Ml/d, abstraction would be permitted up to a maximum rate of 17Ml/d (compared to the Baunton 1 drought permit maximum rate of 6.3Ml/d). The option would provide a benefit of up to 17Ml/d.** **The drought permit is anticipated to be applied for up to six consecutive months between May and December, although it could be implemented at any time of year. The revised abstraction arrangements would remain in place for 6 months or less if water resources within the TWUL supply area have returned to adequate levels to safeguard future water supplies, as agreed with the Environment Agency.** **There is no construction phase associated with this drought permit.**																				
Summary commentary of scheme adverse effects	**Moderate, adverse, short-term effects are predicted on three reaches of the River Churn, as they may remain dryer for longer as result of the drought option. Moderate, adverse, short-term effects on NERC fish species are possible, as are minor effects on the nationally designated site North Meadow SSSI as offtakes from the River Churn support the macrophyte community at the site (uncertainty surrounds the water level management practice at the site). Negligible, adverse, short-term landscape and visual effects may occur as the drought option is located in Cotswolds AONB. However due to the natural drying of the reaches in natural drought conditions, it is unlikely that drought permit implementation will have significant impacts on the local distinctiveness of the landscape. Effects are similar to those associated with the Baunton 1 option.**																				
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**				**None**				**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Beneficial effects associated with the drought option include maintaining essential public water supplies during times of drought.**																				
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies minor adverse effects on the nationally designated site North Meadow SSSI. Offtakes from the River Churn appear to provide flow through the central ditch system supporting the sites macrophyte community, but uncertainty surrounds the water level management practice at the site. There are negligible effects on the internationally important site North Meadow and Clattinger Farm SAC as it is hydrologically isolated from the drought option. Moderate adverse effects to aquatic habitats and species including NERC habitats/species and ecologically significant species. The significance of impacts on NERC fish species were identified as moderate for brown trout and European eels based on reduction or loss of spawning habitat due to desiccation of habitat and increased stress and predation on species in refuges as a result of delay in recovery of flows. Minor to moderate impacts on WFD status are predicted based on the impact of the drought option on fish, macroinvertebrates and macrophytes.	Medium (adverse)	Medium	Medium	Low	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The drought permit is likely to have a negligible impact to the distribution of non-native species, such as invasive macroinvertebrates (signal crayfish and zebra mussel) or invasive macrophytes. The delay in recovery of flows is unlikely to influence the migration of invasive invertebrate species to previously uncolonised habitats of the Churn catchment, especially when set against baseline conditions of a dry summer.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to an additional 17Ml/d of water) during drought conditions, and therefore help to maintain public health.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Due to the natural drying of the reaches in natural drought conditions, it is unlikely that drought permit implementation will have any further impacts on existing trails and footpaths or navigation. Flows during a drought will be low such that further reduction in flows would not be likely to further reduce the angling quality of the reach.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Implementation of the drought permit will have negligible impact on other abstractors. The assessment was constrained by limited information, but no impacts on known abstractors have been identified. No impacts on navigation are likely. Therefore the sensitivity of navigation, tourism and other abstractors is low and the impacts are negligible. The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. This is considered a moderate beneficial effect as people and businesses have a high sensitivity to access to water during times of drought.	Low (adverse) Low (beneficial)	Low (adverse) High (beneficial)	Small	Moderate	Short-term	Temporary	Negligible adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (up to 17Ml/d) over and above what occurs under normal operation will likely result in related and proportional increases in energy use and waste.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies major, moderate and minor impacts on the three reaches of the River Churn considered, as they will remain drier for longer based on reduced groundwater levels. Impacts anticipated to be limited to during hydrological winter for a short duration of up to 1 month. The impact would manifest as reduction of flows, velocities and levels. Overall the impact is assessed as moderate adverse. Impacts on the Cirencester Watercourses affected by the option are expected to be negligible.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	There is a low risk that oxygen quality will deteriorate in Reach 3 of the River Churn, due to minor hydrological effects on low flows in this reach. However, no risks to water quality are anticipated in the remaining two reaches of the River Churn or the Cirencester Watercourses. There is no risk from other discharges. The sensitivity to water quality changes is therefore considered to be low and the overall significance is negligible adverse.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing' by the EA. However, other water company public water supplies and non-public water supply abstractions were reviewed and it was considered that the implementation of the drought permit will have a negligible impact on other abstractions.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Minor impacts to geomorphology in the three reaches of the River Churn may occur. The drought permit may result in a reduction in wetted width and depth than might otherwise be expected under the current hydrological regime. This may result in a potential minor reduction in bank and bed stability.	Low (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities for protecting or enhancing ecosystem services have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutants.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase air emissions associated with abstraction and treatment of water (up to 17Ml/d). However, no AQMA are in proximity to the option.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	Heritage assets in proximity to the option and zone of influence are unlikely to be impacted over the duration of the drought permit implementation.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are no opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No construction activities are required for this option, however there will be changes to water levels in three reaches of the River Churn for a short duration. The option is located in the Cotswolds AONB, but due to the natural drying of the reaches in natural drought conditions, it is unlikely that drought permit implementation will have any impacts on the local distinctiveness of the landscape.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None

Drought Plan option	Latton: Water is abstracted by Thames Water from boreholes drilled into the Great Oolite Aquifer at Latton. The existing abstraction licence (28/39/2/10) permits abstraction from the Great Oolite at Latton at a peak day rate of 20Ml/d with an average daily licence rate per year and per month of 15Ml/d (and not exceeding 5,475Ml in any year). The drought permit would be for a 5Ml/d increase in the average licence limit (to 20Ml/d) for the duration of the drought permit. The annual licence limit would be increased from 5,475Ml to up to 6,390Ml. Benefit of up to 5Ml/d.																					
Summary commentary of scheme adverse effects:	Minor adverse, short-term effects are predicted on three reaches of river as they may remain dryer for longer as result of the drought option. This would result in moderate adverse effects to water quality, due to reduced dissolved oxygen saturation and increased SRP concentration. Minor adverse, short-term impacts on the feasibility of some other groundwater abstractions in the study area are possible. Moderate adverse, short-term effects on NERC fish species and on the Down Ampney Pits KWS are anticipated due to reduction in abundance or distribution of species supported by the designated site or deterioration in habitat quality, causing a decline in ecological status of the site.																					
SEA Objectives Adverse Effects Assessment Summary		None	None		None				None				None		None	None			None		None	
Summary commentary of scheme beneficial effects	Beneficial effects include those associated with maintaining essential public water supplies during times of drought.																					
SEA Objectives Beneficial Effects Assessment Summary	None	None	None	None		None		None	None	None	None	None	None	None	None	None	None	None		None	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies moderate adverse effects on regional designated sites such as Down Ampney Pits KWS. Reduction in abundance or distribution of species supported by the designated site or deterioration in habitat quality, causing a decline in ecological status of the site. Moderate adverse effects to aquatic habitats and species including NERC habitats/species and ecologically significant species brown trout, bullhead and brook lamprey. The impacts include increased stress and predation on species in refuges as a result of delay in recovery of flows and a reduction in species abundance or distribution as a result of changes in water quality A minor impact on WFD status is predicted based on the impact of the drought option on macroinvertebrates and fish.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The drought permit is considered likely to have a negligible impact as a result of changes in the distribution of non-native species such as Nuttall's pondweed or least duckweed in the impacted reaches.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 5Ml/d of water) during drought conditions and therefore help maintain public health.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Due to the natural drying of the Ampney Brook in natural drought conditions, it is unlikely that drought permit implementation will have any impacts on existing trails and footpaths or navigation/angling.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Implementation of the Latton drought permit may impact on the feasibility of the some of the other groundwater abstractions, this is assessed as minor adverse based on the abstractors having medium sensitivity. No impacts on navigation, therefore no effects on related businesses or tourism are anticipated. The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. This is considered a moderate beneficial effect for people and businesses.	Low (adverse) Low (beneficial)	High	Small	Low	Short-term	Temporary	Minor adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (up to 5 Ml/d) over and above what occurs under normal operation will result in short-term increases in energy use and waste.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies moderate risk of increased duration of watercourses remaining drier for longer based on reduced groundwater levels in one reach and minor for the other for reaches. Impact anticipated to be limited to during hydrological winter for a short duration of approximately 1 month. The reaches are high sensitivity to flow based on historic abstraction effects however, due to the short duration the overall impact significance is assessed as minor adverse. The impact would also manifest as reduction of flows, velocities and levels.	Low (adverse)	High	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The EAR identifies moderate risk due to reduced dissolved oxygen saturation and increased SRP concentration. Also moderate risk from Ampney St Peter STW discharge.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing' by the EA. Implementation of the Latton drought permit may affect the feasibility of some other groundwater abstractions in the study area. There are six groundwater abstractions greater than 0.5Ml/d. Discussion would be required with the individual groundwater abstractors to understand pump depths and other elements of the abstraction facilities. Consequently, the impacts on other abstractors is therefore considered uncertain. There are 3 surface water abstractions below 0.5 Ml/d in the hydrologically impacted areas one of which is located in the reach that drys naturally, therefore discussions with the individual abstractor would be needed during application of the drought permit.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR suggests minor impacts to geomorphology in four reaches. The drought permit may result in a reduction in wetted width and depth, extended drying of a channel, changes in sediment dynamics and potential reductions in bank and bed stability than under the current hydrological regime. No land take is required for the option and therefore there is no impacts on land use, soil or geology are anticipated as a result of the operation of this option.	Low (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option, and no opportunities to enhance ecosystem service functions of land have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option, and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutants.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will cause short-term increases in emissions associated with the abstraction and treatment of water (up to 5Ml/d). However, no AQMA are in proximity to the option, no construction activities are required, and the use of existing infrastructure and treatment facilities will minimise emissions of air pollutants.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are heritage assets in proximity to the option and zone of influence including 3 Scheduled Ancient Monuments. However they are unlikely to be impacted over the duration of the drought permits' implementation and therefore the impact is considered negligible. The EARs have assessed the impacts on unknown water dependent assets as negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No construction is required for this option. There will be a change to water levels in one reach for a short duration. It is not a sensitive landscape and due to the natural drying of the Ampney Brook in natural drought conditions, it is unlikely that drought permit implementation will have any impacts on the local distinctiveness of the landscape.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None

Drought Plan option	**Meysey Hampton:** **Under normal licence conditions water is abstracted from the Inferior Oolite Aquifer at Meysey Hampton. When preceding flow (mean 5 days before) at River Coln at Bibury is greater than 68 Ml/d, abstraction (licence number 28/39/5/45) of up to 10.1Ml/d is permitted from the Inferior Oolite boreholes. When flow is less than 68Ml/d, no abstraction from the Inferior Oolite boreholes is permitted.** **The drought permit would allow abstraction from the Great Oolite boreholes at a rate of 11.37 Ml/d when preceding flow (mean 5 days before) in the River Coln at Bibury is less than 68 Ml/d (i.e. as per the terms of the now revoked 'summer' licence). Benefit of up to 11.37Ml/d.**																					
Summary commentary of scheme adverse effects:	**Major adverse, short-term effects are predicted on four reaches of river as they may remain dryer for longer as result of the drought option. This would result in minor short-term effects to water quality as dissolved oxygen saturation levels may be affected by lower river flow. Moderate adverse, short-term effects on NERC fish species are predicted, comprising increased stress and predation on species in refuges as a result of delay in recovery of flows, reduction in species abundance or distribution as a result of changes in water quality, and impacts on spawning potential. Minor adverse effects on the local designated site Down Ampney Pits KWS may occur, however it is resilient to the impacts of desiccation as movement of water from the aquifer to surface waterbodies often ceases in dry summers.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**				**None**				**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Beneficial effects include maintenance of essential public water supplies during times of drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies minor adverse effects on local designated site (Down Ampney Pits KWS). The local non-statutory designated site is likely to be resilient to some degree to the impacts of desiccation considering the movement of water from the aquifer to surface waterbodies often ceases in dry summers. Moderate adverse effects to aquatic habitats and species including NERC habitats/species and ecologically significant species. The significance of impacts on NERC fish species were identified as moderate for bullhead, brown trout and lamprey species in four reaches and moderate for brown trout and minor for bullhead in one reach. These impacts relate to the risk of increased stress and predation on species in refuges as a result of delay in recovery of flows, reduction in species abundance or distribution as a result of changes in water quality, and those relating to the impact on spawning potential. The EAR identifies moderate impact on WFD status based on the impact of the drought option on fish, and minor for macroinvertebrates.	Medium (adverse)	Medium	Medium	Low	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The drought permit is likely to have a negligible impact on the distribution of invasive non-native flora and fauna species, such as Nuttall's pondweed, least duckweed and signal crayfish. The delay in recovery of flows will not have any influence in the spreading of signal crayfish species beyond that expected under baseline conditions of a dry summer and dry watercourse.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to an additional 11 Ml/d of water) during drought conditions and therefore help maintain public health.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Due to the natural drying of the reaches in natural drought conditions, it is unlikely that drought permit implementation will have any impacts on existing trails and footpaths or navigation/angling.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The sensitivity of tourism in these river reaches is low and therefore there will be negligible adverse effects. No navigation in these reaches. Implementation of the drought permit will not impact on the feasibility of any of the surface water or groundwater abstractions in the reaches considered. The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. This is considered a moderate beneficial effect as people and businesses have a high sensitivity to access to water during times of drought.	Low (adverse) Low (beneficial)	Low (adverse) High (beneficial)	Small	Moderate	Short-term	Temporary	Negligible adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (up to 11 Ml/d) over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies moderate impact on 4 reaches and a minor effect on one reach of watercourse, as there would be a delay in groundwater level recovery with a consequent delay in groundwater contributing to flow within these watercourses. This is considered a large scale effect as total of 49 km (made up of the four river reaches) have the potential to be impacted and therefore the overall magnitude of effect is considered to be major adverse based on the high sensitivity of the river to low flows which is evident from historic effects. However the impact is anticipated to be limited to the hydrological winter for a short duration of approximately 1 month.	Medium (adverse)	High	Large	Moderate	Short-term	Temporary	Major adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/temporary)**	**Residual adverse effect significance likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The risk of the drought permit to dissolved oxygen saturation levels is moderate in one reach and negligible in four others. The risk of the drought permit to total ammonia concentration levels was identified as negligible throughout the hydrological zone of influence of the Meysey Hampton drought permit. The reaches are at good status and therefore considered medium sensitivity to changes and therefore the overall risk is minor adverse. Impacts associated with consented discharges identified a negligible risk in the first reach with respect to water quality and a potential beneficial effect from flow.	Low (adverse)	Medium	Large	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential?	Local resource availability is described as 'Water not available for licensing' by the EA. However, implementation of the drought permit will not impact on other groundwater or surface water abstractions and therefore there will be a negligible adverse impact.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR suggests minor impacts and temporary to geomorphology in the impacted reaches, due to the reduction in wetted width and depth, extended drying of a channel, changes in sediment dynamics and potential reductions in bank and bed stability than under the current hydrological regime. No land take is required for the option and therefore there is no impacts on land use, soil or geology are anticipated as a result of the operation of this option.	Low (adverse)	Medium	Large	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutants.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase the emissions associated with the abstraction and treatment of water (up to 11 Ml/d). No AQMA are in proximity of the option.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are heritage assets in proximity to the option and zone of influence including Scheduled Ancient Monument. However they are unlikely to be impacted over the duration of the drought permits' implementation and therefore the impact is considered negligible. The EARs have assessed the impacts on unknown water dependent assets as negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No construction activities are required for this option. However, there will be changes to water levels in four reaches for a short duration. It is not a sensitive landscape and due to the natural drying of the reaches in natural drought conditions, it is unlikely that drought permit implementation will have any impacts on the landscapes local distinctiveness .	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None

Drought Plan option	**Farmoor:** **The permit involves changes to the conditions associated with the naturalised flows in the River Thames at Farmoor under which normal abstraction is restrained. This results in a benefit of up to 30Ml/d. Surface water is abstracted from the River Thames and transferred to the pumped storage Farmoor Reservoir. Stored water is treated at Farmoor water treatment works (WTW) or Swinford WTW for treatment and public water supply to the SWOX WRZ. As part of the Farmoor drought permit implementation, back-pumping of river flows from further downstream is proposed to help maintain a minimum flow (or level) in sensitive reaches.**																					
Summary commentary of scheme adverse effects	**Moderate adverse, short term effects with respect to Biodiversity, flora and fauna including moderate adverse effects regarding INNS, fish community and moderate risk of short-term deterioration to the fish component of 2 WFD waterbodies. Moderate adverse, short term effects to recreational use of the River Thames due to potential effects to navigation and angling. Major adverse, short term effects to water were identified, including major reductions in velocity and high risk to water quality in both the mainstem of the River Thames and distributaries. Discharge pressures (STW discharges) pose a risk to water quality in both the mainstem of the River Thames and distributaries (this includes risks associated with the back pumping element of the scheme).**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**								**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are expected due to provision of additional water supply, and minor effects are associated with improved resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Moderate adverse effects on national and regional designated sites. Moderate adverse effects to aquatic habitats and species including NERC habitats/species and ecologically significant species such as *Ranunculus* spp. Moderate adverse effects to fish community (including effects on migration) and moderate risk of short-term deterioration to the fish component of 2 WFD water bodies.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The EAR identifies a moderate impact as a result of changes to distribution of invasive species.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 30Ml/d of water) during drought conditions and therefore help maintain public health. Construction activities may affect people living locally (Oxfordshire greenbelt), however these would be small in scale and mitigated and therefore considered negligible.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	Thames Path National Trail. There are a number of marinas located along the impacted stretch of the River Thames. The potential hydrological effects identified in the EAR could result in moderate adverse effects on navigation. Changing distributions and numbers of fish species identified in the EAR may impact anglers who use the river. There are a number of recreational resources in proximity (Oatlands Road Recreation Ground; Queen's College Recreation Ground; University Sports Ground ; Abingdon Vale Cricket and Football Club; and The Springs Golf Club) however, no effects anticipated.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. However, potential for some adverse effects such as businesses associated with navigation e.g. marinas, passenger boat/ hire boat operators.	Low (adverse) Low (beneficial)	Medium (adverse) High (beneficial)	Small	Low	Short-term	Temporary	Minor adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increase in energy use and chemicals for treatment of abstracted water (up to 30Ml/d). The option will make use of existing infrastructure. However, will also require additional equipment and energy use to enable the back-pumping component of the option.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	The flow benefits created as a result of the back-pumping operation at times of very low flow outweigh the adverse effects associated with the poorer water quality being back-pumped into the watercourses. The option will not impact on the feasibility of other abstractions identified in the zone of influence identified above. However, although the drought permit would not impact on the feasibility of the Didcot abstraction occurring it may affect the amount of water that is permitted to be abstracted.	Low (adverse)	Medium	Medium	Medium	Short-term	Temporary	Minor adverse	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	Major reduction in velocities for those watercourses where water levels are controlled including the mainstem of the River Thames. Reduction in velocity and level for distributaries that are not level controlled. No effects on groundwater levels are anticipated.	High (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Major adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it achieve WFD compliance? e.g. prevent deterioration of WFD status between status classes? • Will it present a risk to water quality of groundwater, and surface water or esturine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The EAR identifies a high risk with regard to surface water quality (specifically with regard to SRP) as well as medium risk with regard to dissolved oxygen in the distributaries of the Thames only. Discharge pressures (STW discharges) pose a risk to water quality. No construction impacts on water quality anticipated after mitigation. However, the back pumping operation generations additional water quality risks associated with the recirculation of Oxford STW discharged water to both the distributaries of the Thames.	Medium (adverse)	High	Medium	Moderate	Short-term	Temporary	Major adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. The EAR identifies that the option is unlikely to impact the feasibility of any groundwater or surface water abstractions in the zone of influence (including those for agriculture). However, there are potential short term temporary adverse effects with respect to local WFD waterbodies.	Low (adverse)	Medium	Medium	Medium	Short-term	Temporary	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites?	The EAR identifies minor impacts on geomorphology that relate to reduced velocity, deposition of sediments and their re-suspension in higher flows.	Medium (adverse)	Low	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it protect and enhance geomorphology and geomorphological processes?	No impacts on land use or soil are anticipated as the construction requirements are limited to the use of submersible pumps, barges and temporary pipes.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it ensure efficient use of land (e.g. make use of previously developed land)? • Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and there are no opportunities for catchment-wide approach to land management.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	In addition to the emissions associated with the abstraction and treatment of water (up to 30Ml/d), the option will result in emissions as a result of the back-pumping component of the option. Within proximity to Oxford city council AQMA (4.8km).	Low (adverse)	Low	Small	High	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	In addition to the energy use associated with the abstraction and treatment of water (up to 30Ml/d). The option will involve additional energy use and therefore greenhouse gas emissions to enable the back-pumping component of the option.	Low (adverse)	Low	Medium	High	Short-term	Temporary	Minor adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	Medium	Medium	Medium	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The length of the impacted reach of the River Thames and its location presents a wealth of assets with respect to archaeology and cultural heritage. Assuming water levels are maintained, the potential impact of this drought permit on the setting of the heritage assets associated with the Thames, including sub-surface water dependent heritage assets, is considered negligible.	Low (adverse)	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No designated landscape areas in proximity. Temporary minor adverse effects as a result of the visual intrusion of the construction and decommissioning activities, primarily to local residents or walkers using public rights of way. No significant effects on non-designated areas of natural beauty or access to values areas of landscape character. The option is within greenfield land however, there is no land take associated with the scheme.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Axford 1 Drought Permit:** **As a result of recent investigations by the Environment Agency, from April 2017, the new abstraction licence limit at Axford will be set at an average of 9.34 Ml/d and peak of 13.1 Ml/d with maximum abstraction constrained to 6 Ml/d when flows in the River Kennet at Knighton gauging station are below 100 Ml/d. Therefore the drought permit assessment has been undertaken based on these new licence conditions and the associated drought permit conditions whereby the river flow-related constraint of 6 Ml/d will be removed and the average daily abstraction limit will increase to 13.1 Ml/d. This will provide a benefit of 7.1Ml/d.**																					
Summary commentary of scheme adverse effects	**Moderate adverse, short term reductions in flows in the River Kennet would manifest as a reduction in levels and velocities during drought permit implementation. Under dry weather conditions there would be a subsequent delay in groundwater recovery, but this is unlikely to prevent recovery occurring during the hydrological winter (October to March). Moderate adverse, short-term effects are anticipated with respect to biodiversity, flora and fauna. Impacts regarding River Kennet SSSI Conservation Objectives are considered moderate during drought permit implementation and minor during the period of groundwater recovery. The macroinvertebrate and fish component of the Middle Kennet (Marlborough to Hungerford) water body (GB106039023172) would be at moderate risk from May to December and minor risk from January to March of short-term deterioration or prevention of achieving GES with drought permit implementation. Potential moderate impacts on sea trout and brown trout (NERC Act Section 41 Species) between May and December with drought permit implementation. Potential for minor adverse effects with respect to the change in water levels in the River Kennet and the landscape it flows through, which includes the North Wessex Downs AONB and Ramsbury Manor (Registered Park and Garden).**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**		**None**		**None**				**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Beneficial impacts include ensuring supply of water to local population and other customers/businesses. There are also likely to be beneficial effects through reducing vulnerability to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Adverse effects have been identified in relation to the changes in flow during drought permit implementation. Impacts on the River Kennet SSSI Conservation Objectives are identified as moderate during drought permit implementation and minor during the period of groundwater recovery. The EAR considers the macroinvertebrate and fish component of the Middle Kennet (Marlborough to Hungerford) water body (GB106039023172) to be at moderate risk from May to December and minor risk from January to March of short-term deterioration or prevention of achieving GES with drought permit implementation. Moderate impacts on the NERC Act Section 41 Species are moderate for sea trout and brown trout from May to December.	Medium (adverse)	Medium	Small	Moderate	Medium-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The minor changes in flow and limited effects on water quality are not considered likely to significantly affect distribution and abundance of INNS such as signal crayfish, New Zealand mud snail and European physa. Consequently, drought permit implementation is considered to have a negligible impact as a result of changes in the distribution of the INNS.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 7.1Ml/d of water) during drought conditions and therefore help maintain public health. No construction is proposed, and therefore no effects on human health (e.g., noise and dust nuisance) are expected.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	The fish assessment in the EAR identifies a potential short term alteration to fish community composition as a result of drought permit implementation, therefore there is a potential minor adverse effects on angling.	Low (adverse)	Medium	Small	Moderate	Medium-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions (7.1Ml/d) without impacting on other abstractors, therefore ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Implementation will result in an increase in energy use and chemicals for treatment of abstracted water (7.1Ml/d). The option has the benefit that it will make use of existing infrastructure without the requirement for additional equipment.	Low (adverse)	Low	Medium	Low	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The drought permit would lead to a reduction in flows that would manifest as a reduction in levels and velocities (not considered significant with regard to potential marginal habitats), and impacts are considered moderate adverse. This would be limited to the period of drought permit implementation, which could last for up to 6 consecutive months during the period May to December. Under dry weather conditions, there would be a subsequent delay in groundwater recovery but this is unlikely to prevent recovery occurring during the hydrological winter (October to March).	Medium (adverse)	Medium	Small	Moderate	Medium-term	Temporary	Moderate adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The drought option would not significantly increase risks associated with SRP beyond that occurring under natural drought conditions. The EAR suggests a low risk is associated with dissolved oxygen saturation and negligible risk associated with ammonia.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing'. There is a low risk to river flows associated with the groundwater abstraction licence for the Ramsbury Pumping Station. The EAR identifies that the option is unlikely to impact the feasibility of surface water abstractions in the zone of influence (including those for agriculture).	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Some potential for adverse geomorphological impacts are identified by the EAR. However, due to the presumably low sediment concentrations (characteristic of a chalk fed river) and the relatively low amounts of sediment in transport during a drought, they are considered to be no more than minor.	Low (adverse)	Low	Small	Moderate	Medium-term	Temporary	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide approach have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option involves an increase in abstraction of 7.1Ml/d. There would be a short-term increase in air emissions associated with abstraction and treatment. The option is within 5km of the Marlborough AQMA.	Low (adverse)	Medium	Low	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought, which may become more prevalent due to climate change.	Low (beneficial)	Medium	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are no construction requirements. The potentially impacted reach of the River Kennet flows through Ramsbury Manor (Registered Park and Garden). Therefore there is potential for the drought permit to influence the setting of this heritage asset and any unknown water dependent assets. However, these effects will be short term, temporary and during a time of drought conditions and naturally lower groundwater and river levels.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The option lies within North Wessex Downs AONB. The drought permit would lead to a reduction in flows that would manifest as a reduction in levels which could affect locals and visitors who use the local area. These effects would relate to a short section of river, would be short term and temporary in nature and would occur during a time of naturally low river levels.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Axford 2:** **As a consequence of the Environment Agency's Restoring Sustainable Abstraction investigation, the abstraction licence at Axford has recently been reviewed. As of April 2017, the new abstraction licence limit at Axford will be set at an average of 9.34 Ml/d and peak of 13.1 Ml/d with maximum abstraction constrained to 6 Ml/d when flows in the River Kennet at Knighton gauging station are below 100 Ml/d. When the flow constraint is in force, only 3 Ml/d of the abstracted amount is permitted to leave the Kennet Catchment and feed other parts of the WRZ. The other 3 Ml/d of water must be used to supply Axford and the surrounding villages and returned to the River Kennet via local STWs. The Axford 2 drought permit will effectively remove this flow constraint and increase of the average and peak abstraction to 20 Ml/d (an additional benefit of 14 Ml/d) regardless of the flow as recorded at Knighton gauging station**																					
Summary commentary of scheme adverse effects	**Major adverse, short term effects are expected in relation to a reduction in flows in the River Kennet, that would manifest as a reduction in levels and velocities during drought permit implementation. Under dry weather conditions, there would be a subsequent delay in groundwater recovery, but this is unlikely to prevent recovery occurring during the hydrological winter (October to March). Moderate adverse, short-term effects are anticipated with respect to biodiversity, flora and fauna. Impacts regarding River Kennet SSSI Conservation Objectives are considered moderate during drought permit implementation and minor during the period of groundwater recovery. The macroinvertebrate and fish component of the Middle Kennet (Marlborough to Hungerford) water body (GB106039023172) would be at moderate risk from May to December and minor risk from January to March of short-term deterioration or prevention of achieving GES with drought permit implementation. Potential moderate impacts on sea trout and brown trout (NERC Act Section 41 Species) between May and December with drought permit implementation. Potential for minor adverse effects with respect to the change in water levels in the River Kennet and the landscape it flows through, which includes the North Wessex Downs AONB and Ramsbury Manor (Registered Park and Garden).**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**		**None**		**None**				**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are expected due to provision of additional water supply, and also minor beneficial effects associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (those likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (those likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Major hydrological effects have been identified in relation to the significant changes in flows that would manifest as a reduction in levels and velocities flow during drought permit implementation. Impacts on the River Kennet SSSI Conservation Objectives are identified as moderate during drought permit implementation and during the period of groundwater recovery. The EAR considers the macroinvertebrate, fish and macrophyte component of the Middle Kennet (Marlborough to Hungerford) water body (GB106039023172) to be at moderate risk of short-term deterioration or prevention of achieving GES with drought permit implementation. Impacts on the NERC Act Section 41 Species are moderate for sea trout and brown trout and minor for European eel.	Medium (adverse)	Medium	Small	Moderate	Medium-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	There is uncertainty surrounding the likely effect of flow and level impacts on the ability of invasive macroinvertebrates (e.g., such as signal crayfish, New Zealand mud snail and European physa) to distribute further within the watercourses. However, implementation of the drought permit may increase abundance or range of invasive macrophytes (e.g., Japanese knotweed, giant hogweed, Himalayan balsam and Australian swamp stonecrop) through additional habitat availability, although the level of impact beyond that of natural drought is uncertain.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 14Ml/d of water) during drought conditions and therefore help maintain public health. No construction is proposed, and therefore no effects on human health (e.g., noise and dust nuisance) are expected.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	The River Og and Kennet contain a wide diversity of fish species. The location and surrounding area makes the catchment very popular with anglers. There is a potential short term alteration to fish community composition as a result of drought permit implementation, which may impact anglers. Navigation is not possible within the River Og (Reach 1) and the River Kennet between the River Og confluence and Hungerford (Reach 2). As such, the potential to affect navigation is minor. The North Wessex Downs is a unique and spectacular landscape. The River Og and River Kennet form an essential part of the landscape of the AONB and therefore any impacts of the drought permit on the river could impact walkers and others who visit the area.	Moderate (adverse)	Medium	Small	Moderate	Medium-term	Temporary	Moderate adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions (14Ml/d) without impacting on other abstractors, therefore ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Implementation will result in an increase in energy use and chemicals for treatment of abstracted water (14Ml/d). The option has the benefit that it will make use of existing infrastructure without the requirement for additional equipment.	Low (adverse)	Low	Medium	Low	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The drought permit would lead to a reduction in flows that would manifest as a reduction in levels and velocities (not considered significant with regard to potential marginal habitats), and impacts are considered major adverse. This would be limited to the period of drought permit implementation, which could last for up to 6 consecutive months during the period May to December. Under dry weather conditions, there would be a subsequent delay in groundwater recovery but this is unlikely to prevent recovery occurring during the hydrological winter (October to March).	Major (adverse)	Medium	Small	Moderate	Medium-term	Temporary	Major adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (those likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (those likely to remain after reasonable mitigation)**
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The EAR suggests the drought option would result in moderate risk associated with SRP beyond that occurring under natural drought conditions. A low risk is associated with dissolved oxygen saturation and negligible risk associated with ammonia. Marlborough STW (upstream of the impacted reach) presents a medium risk to water quality in the impacted reach (specifically with regard to ammonia and phosphorous). The risk would also likely be medium without a drought permit in place.	Medium (adverse)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing'. There is a low risk to river flows associated with the groundwater abstraction licence for the Ramsbury Pumping Station. The EAR identifies that the option is unlikely to impact the feasibility of surface water abstractions in the zone of influence (including those for agriculture).	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Overall, geomorphology impacts are assessed as moderate in the reach. Impacts could include changes in wetted width and depth, in-channel structures or macrophytes influencing ponding and sediment dynamics, or declines in bed stability.	Moderate (adverse)	Medium	Small	Moderate	Medium-term	Temporary	Moderate adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide approach have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option involves an increase in abstraction of 14Ml/d. There would be a short-term, temporary increase in air emissions associated with abstraction and treatment. The option is 4.4km from the Marlborough AQMA. Considering the proportional increase in abstraction, the distance to the AQMA and the temporary nature of effects the potential magnitude of effect is considered to be minor.	Low (adverse)	Medium	Low	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	The option involves an increase in abstraction of 14Ml/d. There would be a short-term increase in greenhouse gas emissions associated with abstraction and treatment.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	Medium	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are no construction requirements. The potentially impacted reach of the River Kennet flows through Ramsbury Manor (Registered Park and Garden). Therefore there is potential for the drought permit to influence the setting of this heritage asset and any unknown water dependent assets. However, these effects will be short term, temporary and during a time of drought conditions and naturally lower groundwater and river levels.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The option lies within North Wessex Downs AONB. The drought permit would lead to a reduction in flows that would manifest as a reduction in levels which could affect locals and visitors who use the local area. These effects would relate to a short section of river, would be short term and temporary in nature and would occur during a time of naturally low river levels.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Bibury:** **The drought permit involves additional abstraction from existing boreholes. Current licence (28/39/06/0062) allows for abstraction at a peak daily rate of 6.819Ml/d for public water supply and an arrangement for river flow augmentation as described below.** **The drought permit would increase abstraction at the current boreholes by up to 5Ml/d.** **The arrangement for river flow augmentation would continue.** **Minor construction works are required to bring the option online as a drought permit source. There is limited treatment capability at Bibury and therefore a temporary water treatment facility may be required. No significant construction impacts on the environment are anticipated.**																					
Summary commentary of scheme adverse effects:	**Potential adverse effects identified relate to a minor reduction in flow in the River Coln, and associated minor impacts on NERC species, WFD status and the geomorphology of the reaches. There may also be minor adverse temporary effects related to construction. All impacts identified will be short-term and temporary.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**			**None**	**None**		**None**				**None**		**None**	**None**			**None**	**None**	**None**	
Summary commentary of scheme beneficial effects	**Beneficial impacts have been identified primarily through ensuring supply of water to local population and other customers/businesses. There are also likely to be beneficial impacts associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies negligible effects on nationally designated sites (Winson Meadows SSSI, Whelford Meadows SSSI and Cotswold Water Park SSSI). Minor adverse effects to aquatic habitats and species including NERC habitats/species and ecologically significant species. The EAR predicts a minor impact on WFD status based on the impact of the drought option on macroinvertebrates, macrophytes, fish and diatoms. Minor construction works (temporary water treatment facilities) are required in order to bring the option online. The EAR assessed the impacts associated with construction to be negligible.	Medium	Low	Medium	Moderate	Short term	Temporary	Minor adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Although there is potential for an increase in distribution and abundance of INNS as a result of the drought permit implementation, the impact significance and magnitude is considered to be negligible.	Low	Low	Medium	Moderate	Short term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to 5Ml/d of water) during drought conditions and therefore help maintain public health. Minor construction works are required in order to bring the option online (temporary water treatment facilities) - therefore may result in noise/dust nuisance during construction.	Low (beneficial) Low (adverse)	High (beneficial) Medium (adverse)	Medium	Moderate	Short term	Temporary	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	No impacts on recreation, tourism and navigation are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. No impacts on navigation have been identified, therefore no impacts on related businesses or tourism are anticipated.	Low (beneficial)	High	Small	Moderate	Short Term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. The option will make use of existing infrastructure, with minor construction works required in order to bring the option online (temporary water treatment facilities)	Low (adverse)	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies minor hydrological impact on the two identified reaches based on the predicted reduction flow of 3.5Ml/d.	Low	Medium	Medium	Moderate	Shert term	Temporary	Minor adverse	None

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Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Assuming best practice construction methods, impacts from construction on water are anticipated to be negligible. The EAR identifies that the implementation of the Bibury drought option will have a negligible impact on water quality. The discharge from a local trout farm may be exacerbated by the implementation of the drought option, but it is anticipated to be low localised risk.	Low	Low	Medium	Moderate	Short term	Temporary	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Water resource available is described as "water not available for licencing" by the EA. Implementation of the drought permit will have a negligible impact on other groundwater and surface water abstractions. The 3 surface water abstractions in Reach 1 are for Bibury Trout Farm and are through flows rather than consumptive.	Low	Low	Medium	Moderate	Short term	Temporary	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR suggests minor impacts to geomorphology in the impacted reaches - The evidence of in-channel weirs (in reach 1) and in-channel macrophytes (both reaches) could lead to sediment trapping and deposition but due to the low impact and unlikely impact to sediment transportation this impact would be limited. No impacts on land use, soil or geology are anticipated as a result of the operation of this option.	Low	Medium	Low	Moderate	Short term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option, and no opportunities to enhance ecosystem service functions of land have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for a catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	The option will increase air emissions associated with abstraction and treatment of water (up to 5ml/day), however no AQMAs are in proximity of the option.	Low	Low	Small	Low	Short Term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Increased abstraction would cause an increase in energy use in the short term. Minor construction is anticipated, which would result in energy use/short term increases in greenhouse gas emissions.	Low (adverse)	Low	Small	Low	Short term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought orders/permits are a key componant of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low	High	Small	Moderate	Short term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	Heritage assets in proximity to the option and zone of influence are unlikely to be impacted over the duration of the drought permit implementation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

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Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The drought option is located within AONB (Cotswolds). However, minor impact on water flows/level are expected, and it is not anticipated that this will affect the visual amenity of the area.	Low	Low	Medium	Moderate	Short term	Temporary	Negligible adverse	None

Drought Plan option	**Blewbury** **Overview: The drought permit would require re-commissioning of existing boreholes. The abstraction licence at Blewbury was revoked in 2007 and volumes transferred to Gatehampton. The revoked Blewbury abstraction consisted of 4 boreholes located 600m south of the village, approximately 700m away from the Mill Brook source and 600m away from Blewbury Pond.** **5Ml/d- recommissioning of abstraction from boreholes (revoked 2007).** **Minor construction works would be required to bring this option online as a drought permit source. Operation would involve construction of a temporary water treatment plant; however, pipework would be within the existing site boundary. No significant construction impacts on the environment are anticipated.**																					
Summary commentary of scheme adverse effects:	**Major reductions in flows are likely to occur in Mill Brook and Cholsey Brook during drought option implementation, resulting in major adverse impacts on water quality (in particular south of South Moreton and Cholsey STW), but also resulting in effects on NERC species (spawning fish - brown trout). A further major adverse effect is anticipated in relation to the near-drying out of Blewbury Pond during drought option operation, which has high amenity for local residents and visitors. Other adverse effects relate to the impacts associated with low flow, including increase in invasive flora and geomorphological impacts. All adverse impacts are considered to be short term and temporary.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**				**None**		**None**				**None**		**None**	**None**			**None**	**None**	**None**	
Summary commentary of scheme beneficial effects	**Beneficial impacts comprise ensuring supply of water to local population and other customers/businesses. There are also likely to be beneficial effects associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies no effects on nationally designated sites. Major adverse effects on NERC habitats/species (major impact Brown trout - October to March - affecting spawning fish. Minor impact on European Eel - fragmentation of habitats, May to March) and ecologically significant species. The EAR identifies minor and moderate effects on WFD status based on the impact of the drought option on macroinvertebrates, macrophytes, fish and diatoms. Minor construction works are required in order to bring the option online (temporary plant) - The EAR assessed the impacts associated with construction to be negligible.	High (adverse)	Medium	Medium	Moderate	Short Term	Temporary	Major adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancement of natural capital and ecosystem services were identified, however TW will work with catchment groups in the long term to collaborate on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The EAR identifies that the drought option will result in a reduction in flows, thereby increasing the habitat suitability and distribution of invasive flora (least duckweed) in March to May. There may also be changes to invasive species distribution and abundance due to water quality deterioration.	Low (adverse)	Medium	Medium	Moderate	Short term	Temporary	Minor adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to 5Ml/d of water) during drought conditions and therefore help maintain public health. Minor construction works are required in order to bring the option online (temporary plant), which may result in noise/dust nuisance during construction.	Low (beneficial) Low (adverse)	High (beneficial) Medium (adverse)	Medium	High	Short term	Temporary	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	It is unlikely that drought permit implementation will have any impacts on existing trails and footpaths, navigation or angling. The EAR identifies a negligible adverse effect on other abstractors - they are considered unlikely to present a significant risk to river flows with the drought permit in place, and their operation would not be affected by the drought permit.	Low (adverse)	Low	Medium	Moderate	Short term	Temporary	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. No impacts on navigation have been identified, therefore no impacts on related businesses or tourism are anticipated.	Low (beneficial)	High	Small	Moderate	Short Term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. The option will make use of existing infrastructure, with minor construction works required in order to bring the option online (temporary water treatment plant)	Low (adverse)	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	A major reduction in river low flows (manifesting as a reduction in levels, velocities and wetted widths) is likely in both Mill Brook and Cholsey Brook. The impacts are likely to be limited to the duration of drought permit implementation and subsequent recovery period (that could last up to an additional 3 months).	High (adverse)	Medium	Medium	Moderate	Medium	Temporary	Major adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The EAR identifies a high risk of water quality impacts associated with SRP, due to reduction in buffering capacity of South Moreton (Reach 1) and Cholsey STW (Reach 2) discharges. Also a medium risk associated with dissolved oxygen saturation (downstream of Cholsey STW - Reach 2). Assuming best practice construction methods, impacts from construction on water are anticipated to be negligible.	High (adverse)	Medium	Medium	Moderate	Short term	Temporary	Major adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services	Water resource available is described as "water not available for licencing" by the EA. Implementation of the drought permit will have a negligible impact on other groundwater or surface water abstractions as they are all under 0.5Ml/d.	Low (adverse)	Low	Medium	Moderate	Short term	Temporary	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR suggests minor impacts to geomorphology in the impacted reaches due to changes in wetted width and depth and the impacts of in-channel structures. No impacts on land use, soil or geology are anticipated as a result of the operation of this option, as construction is within existing plant.	Low (adverse)	Medium	Small	Moderate	Short Term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option (construction in existing boundary), and no opportunities to enhance ecosystem service functions of land have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option, and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase air emissions associated with abstraction and treatment of water (up to 5ml/day), however no AQMAs are in proximity of the option. Minor construction is anticipated, which may result in short term increases in dust/air pollutant emissions.	Low (adverse)	Low	Small	Low	Short term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Increased abstraction would cause an increase in energy use in the short term. Minor construction is anticipated, which may result in energy use/short term increases in greenhouse gas emissions.	Low (adverse)	Low	Medium	Moderate	Short term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key componant of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (adverse)	High	Small	Moderate	Short term	Temporary	None	Minor beneficial

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Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	Heritage assets in proximity to the option and zone of influence are unlikely to be impacted over the duration of the drought permit implementation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	There are two AONBs within close proximity to the option, i.e., Chilterns and North Wessex Downs. However, the EAR assesses identifies that the AONBs are unlikely to be impacted over the duration of drought permit implementation. Blewbury Pond has high amenity value for the local residents and visitors (Reach 2). It is likely that there will be a significant reduction in level, almost to the point of complete drying out of the pond in extreme circumstances, as a result of the drought permit. This is seen as having a very significant impact on the landscape and amenity value of this feature.	High (adverse)	Medium	Medium	Moderate	Short term	Temporary	Major adverse	None

Drought Plan option	**Gatehampton:** **Under normal license conditions water is abstracted from the Cretaceous Chalk aquifer at Gatehampton. The Gatehampton abstraction consists of 7 boreholes (4 boreholes are within 100 metres of the River Thames; the other three are approximately 250m from the river). Normal abstraction comprises: The existing abstraction licence (28/39/23/173) permits abstraction from the Chalk aquifer at Gatehampton at a peak day rate of 105Ml/d with an average rate per year and month of 95Ml/d and an annual maximum of 3,4770Ml/ year.** **The operation of the existing abstraction licence is limited by flow conditions in the River Thames at Caversham Gauging Station - when flows are less than 400Ml/d for 5 days, then abstraction must be maintained at or below 101.5Ml/d. Proposed comprises: 3.5Ml/d - continuation of abstraction from boreholes beyond licence conditions. This would provide a benefit of 3.5Ml/d. There is no construction phase associated with this drought option.**																						
Summary commentary of scheme adverse effects:	**There are negligible hydrological impacts associated with Gatehampton drought permit implementation. No impacts on biodiversity, geomorphology, water quality and other abstractors are expected. There may be minor adverse effects due to emissions to air associated with additional abstraction and proximity to nature conservation sites. All adverse effects identified are short-term and temporary.**																						
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Moderate beneficial impacts are expected with regard to ensuring supply of water to local population and other customers/businesses. There are also likely to be beneficial impacts associated with improving the resilience of water supplies to drought.**																						
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Hydrological impacts would be negligible. The EAR reports no significant impacts on designations, or NERC or notable species. Other within a 1km area of influence (e.g., areas of ancient woodland) are unlikely to be affected by implementation of this drought option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The EAR reports the implementation of the drought permit will not increase dispersal of invasive flora species. For other invasive species significant effects are unlikely due to the negligible impact on surface waters.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 3.5Ml/d of water) during drought conditions and therefore help maintain public health. Regarding nuisance, there is no construction proposed for this option therefore no adverse effects are expected to public health.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	There is no hydrological impact on surface water features as a result of drought permit implementation. Therefore, there will be no impact on angling or navigation. The option is within proximity of the Thames Path National Trail however there is no construction proposed and negligible hydrology effects therefore no effects on visual amenity from the path anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	Medium	Short-term	Long	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (3.5 Ml/d) over and above what occurs under normal operation will result in short-term increases in energy use and waste. The option will make use of existing infrastructure, avoiding new construction (and associated use of materials) and minimising additional energy use and waste generation.	Low (adverse)	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The reach addressed in the EAR is the River Thames from Goring Lock to Whitchurch Lock. The course of the River Pang is about 8km away from Gatehampton to the southwest, therefore, significantly outside the drawdown zone identified in the EAR. The drought permit would have a negligible impact on flows in the Rivers Thames and Pang.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution?	There are no additional discharge pressures with a dry weather flow or maximum flow of greater 0.5 Ml/d within the hydrogeological impacted zone of the Gatehampton drought permit, thus no impacts on water quality or WFD status are expected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	There are no additional abstraction pressures greater than 0.5Ml/d within the hydrogeological impacted zone of the Gatehampton drought permit, thus no impacts on other abstractions are expected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	As negligible adverse hydrological impacts were identified, no impacts on geomorphology are anticipated. No construction is required for implementation of this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

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Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take or construction is required for the option, and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	There would be small increases in air emissions associated with abstraction of water. The option is within proximity of sites designated for nature conservation at national level.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	There would be small, short-term increases in greenhouse gas emissions associated with abstraction of water. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions. The sensitivity to this effect is rated as low due to the short term and temporary effect.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	Medium	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	Heritage assets within the area of influence include Grim's Ditch: two sections in Portobello Wood, Holies Shaw and High Holies Wood Gap – Scheduled Ancient Monuments. These are unlikely to be impacted over the duration of drought permit implementation. There is also one listed building within 500m and further listed buildings between 500m and 1km. However there is no construction proposed and negligible hydrological effects, therefore no effects on heritage assets are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The option is within the North Wessex Downs AONB. There is no construction proposed and a negligible hydrological effect predicted therefore no significant effects on landscape are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Ogbourne Energency Boreholes (EBH):** **The Ogbourne groundwater abstraction site comprises ten boreholes constructed between 1970 and 1979. Water would be abstracted from the Berkshire Downs Chalk WFD groundwater body near Ogbourne St George. The Ogbourne EBH are located approximately 1km away from those used for the TWUL normal operating licence. Implementation of the drought permit would involve abstraction of 4 Ml/d from these boreholes. Minor construction works are required to achieve the abstraction from these boreholes. Works will include connection of mobile generators and starters to each borehole pump. The abstracted water will be pumped to Ogbourne WTW for treatment via the existing pipeline from the boreholes to the WTW. No significant construction impacts on the environment are anticipated. The drought permit is anticipated to be applied for up to 6 consecutive months between May and December inclusive, although it could be implemented at any time of year.**																					
Summary commentary of scheme adverse effects	**Moderate adverse, short-term effects are anticipated with respect to biodiversity, flora and fauna. Impacts on fish may occur due to an extension in duration of River Og being dry, and a reduction in flows in the River Kennet. Changes in flow in the River Kennet (a designated SSSI) also have potential for moderate adverse, short-term effects on macroinvertebrates. The Middle Kennet water body is considered at moderate risk of short-term deterioration of WFD status for macroinvertebrates and fish. A minor adverse, short-term effect onangling and recreation relates is posible due to impacts on fish communities. Moderate adverse, short-term effects to water are likely as the abstraction will cause the River Og to remain dry for longer. Flow changes in the River Kennet are considered minor, however there is a high risk to water quality associated with the Marlborough STW discharge due to reduced dilution in the River Kennet during drought permit implementation.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**				**None**		**None**				**None**		**None**	**None**			**None**	**None**	**None**	
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are expected due to provision of additional water supply. Minor beneficial effects are associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Minor construction works required involve connection of mobile generators and starters to each borehole pump, however these are not expected to be significant. The EAR identifies no significant reductions in wetted width or marginal habitats. The extension in duration of River Og being dry may cause moderate impacts on brown trout, bullhead and grayling. As a result of changes to flow, moderate adverse impacts have been identified on macroinvertebrates and fish in the River Kennet (a designated SSSI), including fragmentation of habitats and increased significance of obstacles/barriers to migration, and alteration to community composition as a result of water quality deterioration. The Middle Kennet water body (GB106039023173) would be at moderate risk of short-term deterioration of WFD status for macroinvertebrates and fish.	Medium (adverse)	Medium	Medium	Medium	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Implementation of the option may cause a delay in hydrological, recovery increasing the habitat suitability and therefore distribution of invasive species, however these impacts are expected to be negligible.	Low (adverse)	Low	Medium	Low	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 4Ml/d of water) during drought conditions and therefore help maintain public health. Construction activities (mobile generators connected to borehole pump) are considered very small scale and short term. The Marlborough AQMA lies within 5km of the study area.	Low (adverse) Low (beneficial)	Medium (adverse) High (beneficial)	Medium	Low (adverse) High (beneficial)	Short-term	Temporary	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	The fish assessment in the EAR identifies a potential minor alteration to community composition as a result of drought permit implementation, therefore there is a potential minor impact on angling. The River Og and Kennet contain a wide diversity of fish species. The location and surrounding area makes the catchment very popular with anglers. Any impacts of the drought permit on fish population or distribution may impact anglers. Navigation is not possible within the River Og (Reach 1) and the River Kennet between the River Og confluence and Hungerford (Reach 2). As such, the potential to affect navigation is minor.	Low (adverse)	Medium	Medium	Medium	Short-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions without impacting on other abstractors, therefore ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	Medium	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Implementation will result in an increase in energy use and chemicals for treatment of abstracted water (4Ml/d). The option make use of existing infrastructure. However, will also require additional equipment and energy use to enable pumping from boreholes that are not used in non-drought conditions.	Low (adverse)	Low	Medium	Low	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies moderate risks on the River Og due to increased duration of reach being dry up until annual groundwater recovery occurs, leading to watercourses remaining drier for longer. The impact is anticipated to be up to 2 months (based on data from 4 historic drought periods and acknowledging the details of the proposed drought permit) and limited to during the hydrological winter. There may also be small changes to flow in the River Kennet (within normal range of medium to low flows) around the period when recovery of flow input from the River Og would otherwise have occurred without a drought permit being utilised. Impact anticipated to be up to 2 months, in line with the impact duration for the River Og (Reach 1) and limited to during hydrological winter.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Assuming best practice construction methods, impacts from construction on water are anticipated to be negligible. Care should be taken at the end of the drought option operation to prevent contamination of the groundwater. The EAR identifies a moderate risk to phosphorus concentration, and negligible risks to dissolved oxygen and ammonia concentrations in both reaches. In the River Kennet reach there is a high risk to water quality associated with Marlborough STW due to reduced dilution in the River Kennet during drought permit implementation.	Medium (adverse)	Medium	Medium	Medium	Short-term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. Abstraction will be temporary and short term, however, there is potential for duration of effects on groundwater to extend beyond the drought permit implementation period with potential adverse effects to the local WFD water body . The EAR identifies that the option is unlikely to impact the feasibility of any groundwater or surface water abstractions in the zone of influence (including those for agriculture).	Low (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The minor construction works required (connection of mobile generators) are not anticipated to result in any adverse effects on soils. In operation in-channel structures, such as weirs/sluices, could influence sediment dynamics by creating ponded areas upstream of the structure. These areas will have very low flow velocities and increased depth in relation to other areas of the channel, this is likely to promote the deposition of fine sediment behind the structure. The EAR describes geomorphology impacts as minor in both reaches based on the anticipated low sediment concentrations (characteristic of a chalk fed river) and the relatively low amounts of sediment in transport during a drought. As the Rover Og channel is accustomed to drying up for extended periods, geomorphological impacts related to changes in wetted perimeters are not considered significant.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide approach have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	The option involves abstraction of 4Ml/d of water. There would be a short-term increase in air emissions associated with abstraction and treatment. The option is within 5km of the Marlborough AQMA.	Low (adverse)	Medium	Low	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	The option involves abstraction of 4Ml/d of water. There would be a short-term increase in greenhouse gas emissions associated with abstraction and treatment.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Minor beneficial

Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are number of statutory sites in proximity to the Ogbourne boreholes, including three Scheduled Ancient Monuments and a Conservation Area associated with Ogbourne St. George. However, all are over 1km from minor construction works planned at the boreholes. Hydrological impacts associated with operation of the options are not anticipated to adversely effects these assets or any unknown water-dependent assets.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The option and impacted reaches are within North Wessex Downs AONB. The minor construction works planned are associated with existing borehole sites. The AONB is a unique and spectacular landscape. The River Og and River Kennet form an essential part of the landscape of the AONB. The impacted reach of the River Og is an intermittently flowing river and there are naturally periods of no flow. The impact of the drought permit is to extend the period of recovery between the months of October to March. This delay to the recovery period occurs outside of the summer months when visitors to the North Wessex Downs would be greater. Considering these factors the value/sensitivity of the AONB is considered to be Medium.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Oxford Canal:** **No abstraction usually occurs from the Oxford Canal. The drought permit would involve abstraction of 5 to 10Ml/d from Oxford Canal with the permission of the Canal and River Trust, and transferring it for storage to Grimsbury Reservoir and onwards to supply. The abstraction point would approximate to the closest point of the Oxford Canal to Grimsbury Reservoir. The available resource would be abstracted from boreholes that are currently operational (Bradley and Perry Hills boreholes). Abstractions would be within normal operational volumetric limits and so the drought permit would not have any additional environmental impact at or around these boreholes compared to the normal abstraction situation. Construction activities would be required associated with the installation of pumps and temporary pipe connection across the short distance between the Oxford Canal and Grimsbury Reservoir. The drought permit could be implemented at any time of year although is anticipated to be implemented for up to 6 consecutive months between May and December inclusive.**																				
Summary commentary of scheme adverse effects	**Small changes to flow and velocity in Reach 1 of the Oxford Canal will occur, however the hydrological impact of the drought permit is considered to be minor overall. No impacts on geomorphology, water quality and other abstractors are expected. Short-term effects on public health and air quality due to emissions associated with construction and additional abstraction may occur, and these are considered to be minor overall given proximity to the Cherwell District Council AQMA.**																				
SEA Objectives Adverse Effects Assessment Summary	**None**	**None**	**None**	**None**			**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are expected due to provision of additional water supply. Minor beneficial effects are associated with improving the resilience of water supplies to drought.**																				
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR confirms that no designated sites would be impacted by the drought option and no impacts on habitats, species or WFD compliance are anticipated. It is assumed that the abstraction would be adequately screened to prevent fish entrainment or impingement.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The source of water abstracted is groundwater and therefore there are no perceived risks of introducing INNS. Identified minor, short term increases in flow velocities in the canal as a result of the option is unlikely to result in any effects on the spread of INNS.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 10Ml/d of water) during drought conditions and therefore help maintain public health. Some construction is required for option implementation, therefore there may be minor effects on human health (e.g., noise and dust nuisance).	Low (beneficial) Low (adverse)	High (beneficial) High (adverse)	Medium	Moderate	Short term	Temporary	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	Flows and velocities would be increased slightly within Oxford Canal due to abstraction up to the first lock upstream. The increase would be small given the size of the abstraction with no impacts on fish or angling. The Canal and River Trust will still be able to manage water levels during drought permit implementation. Therefore no impacts on navigation are anticipated.	Low (adverse)	Low	Small	Moderate	Short term	Temporary	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. No impacts on navigation, therefore no effects on essential services are anticipated.	Low (beneficial)	High	Small	Moderate	Short term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An increase in abstraction (5-10Ml/d) is likely to result in a proportional increase in the use of energy, chemicals and generation of waste. However, existing infrastructure would be used, minimising such increases.	Low (adverse)	Low	Small	High	Short term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	There would be no impact around the Bradley and Perry Wells boreholes normal licensed operational limits would not be exceeded. The Canal and River Trust has indicated that it would still be able to manage water levels in the canal during operation . The EAR identifies a minor hydrological impact relating to minor increases in flow velocities in the canal.	Low (adverse)	Medium	Small	High	Short term	Temporary	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The EAR describes no risk to water quality or WFD status as a result of drought permit implementation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Water resource availability is described as "water not available for licencing" by the EA. However, abstraction is within normal operational volumetric limits and so would not have any additional environmental impact compared to the normal abstraction situation. The water would be transferred via the canals therefore minimising energy use for pumping. There are no abstraction licences (>0.5Ml/d) in the zone of impact that could be impacted.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No impacts on land use, soil or geology are anticipated as a result of the operation of this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option, and no opportunities for enhancing the ecosystem services functions of land have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat?	No land take is required for the option, and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant and greenemissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	There would be emissions associated with abstraction and treatment of water. The drought option is in proximity to Cherwell District Council AQMA.	Low (adverse)	Medium	Small	Moderate	Short term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	There would be energy use and emissions associated with the abstraction and treatment of water, however, this is unlikely to be more than would be produced to supply an equivalent quantity of water in non-drought conditions.	Low (adverse)	Low	Small	High	Short term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Short term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are no heritage assets in proximity to the option and zone of influence. The EAR identifies no significant impacts on groundwater levels or water levels in the canal therefore, no adverse effects on the historic environment or water dependant heritage assets.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The Oxford Canal National Trail is within the area of influence. However, construction requirements are limited to installation of pumps and temporary pipe connection across the short distance between the Oxford Canal and Grimsby Reservoir. No impacts to access are anticipated. Loss of local distinctiveness is unlikely as water levels in the canal would be maintained. The trail is unlikely to be impacted over the duration of the drought permit implementation as water levels are only subject to slight change.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Sor Brook** **Overview: The drought permit would involve a reduction in the low flow abstraction constraint to the surface water abstraction (from Sor Brook). A minimum residual flow constraint would be in place to ensure that the brook does not dry up as a result of the drought permit. 4.456Ml/d - direct surface water abstraction. Sor Brook drought permit would be for the continuation of the licensed abstraction from the Sor Brook at Bodicote below the normal HoF of 14Ml/d.** **Abstraction would be permitted down to a new residual gauged flow of 2Ml/d (as measured at Bodicote downstream of the abstraction). Thus if naturalised flow was 5Ml/d only 3Ml/d may be abstracted, whereas if naturalised flow was 10Ml/d the full 4.456Ml/d may be abstracted.**																					
Summary commentary of scheme adverse effects:	**Moderate adverse effects have been identified regarding reductions in velocity and wetted depth downstream of Sor Brook, and associated impacts on NERC species (brown trout, bullhead, European eel, and fine-line pea mussel). Other moderate adverse effects related to this reduction in velocity and wetted depth include the spread of invasive species (signal crayfish, New Zealand mud snail and invasive flora), geomorphological impacts, and effects on feasibility of angling due to impacts on fish communities. Water quality is also likely to be affected, particularly downstream of Heyford STW due to reduced dilution of the STW discharge. All impacts are expected to be short-term and temporary.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**		**None**		**None**				**None**		**None**	**None**			**None**		**None**	**None**
Summary commentary of scheme beneficial effects	**Beneficial impacts include ensuring supply of water to the local population and other customers/businesses. There are also likely to be beneficial effects associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies no effects on designated sites. Moderate to minor adverse effects to aquatic habitats and species including NERC habitats/species and ecologically significant species, including Brown Trout, Bullhead, European Eel, and fine-line pea mussel, due to reductions in velocity and wetted depth. Moderate adverse effects to selected fish community are anticipated, including effects on spawning habitats. The EAR identifies minor to moderate impact on WFD status based on the impact of the drought option on macroinvertebrates, macrophytes, fish and diatoms.	Medium (adverse)	Medium	Medium	Moderate	Medium-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Minor impacts have been identified on the abundance and distribution of the New Zealand mud snail (Reach 1 - May to December and Reach 2 - All year), signal crayfish (Reach 2) and for invasive flora (Reach 2 - May to December). Moderate impacts identified for invasive flora (May to December for reach 1). Major impacts identified for signal crayfish (Reach 1 - May to December).	Medium (adverse)	Medium	Medium	Moderate	Short-Term	Temporary	Moderate adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to existing 4.456Ml/d of water) during drought conditions and therefore help maintain public health.	Low (beneficial)	High	Medium	High	Short-Term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	It is unlikely that drought permit implementation will have any impacts on existing trails and footpaths, angling or navigation.	Low (adverse)	Low	Medium	Moderate	Medium-term	Temporary	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of water supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. No impacts on navigation have been identified, therefore no effects on related businesses or tourism are anticipated.	Low (beneficial)	High (beneficial)	Medium	Moderate	Short-Term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. The option will make use of existing infrastructure.	Low (adverse)	Low	Medium	Medium	Short-Term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources have been identified as part of the option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identified a major hydrological impact of drought permit implementation on Sor Brook (downstream of the abstraction) and a minor hydrological impact on the River Cherwell further downstream. Effects would include reduction in velocities and wetted depth, however would be limited to the period of drought option operation.	Low (adverse)	Medium	Medium	Moderate	Short-Term	Temporary	Moderate adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Both reaches would be exposed to an increased water quality risk. The drought permit would present a medium risk to deterioration in phosphorus concentration in the Sor Brook and a lower risk of deterioration in the River Cherwell. This would be particularly prevalent downstream of Heyford STW in Reach 2 which currently supports good status for fish, moderate status for macrophytes and high status for macroinvertebrates. The drought permit could also influence dissolved oxygen saturation in the River Cherwell, particularly downstream of Heyford STW.	Medium (adverse)	High	Medium	Moderate	Short-Term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The EAR identifies a negligible adverse impact on other surface water abstractors (only one over 0.5Ml/day - The Grounds, Adderbury). Groundwater abstractions have been assessed as neither putting additional pressure on the river or have their operation limited by the implementation of the drought permit.	Low (adverse)	Low	Medium	Moderate	Short-Term	Temporary	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR suggests minor impacts to geomorphology in Reach 1 (Sor Brook from the Bodicote abstraction confluence with the River Cherwell), including changes in wetted width and depth and the impacts on in-channel structures. No impacts on land use, soil or geology are anticipated as a result of the operation of this option.	Low (adverse)	Medium	Medium	Medium	Short-Term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option, and no opportunities to enhance ecosystem service functions of land have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option, and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	The option will increase air emissions associated with abstraction and treatment of water (up to 4.456Ml/day). There is one AQMAs within 5km proximity of the option. There is no construction associated with this option.	Low (adverse)	Low	Small	Low	Short-Term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Increased abstraction would cause an increase in energy use in the short term. There is no construction associated with this option.	Low (adverse)	Low	Medium	Moderate	Short-Term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-Term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important	Heritage assets in proximity to the option and zone of influence are unlikely to be impacted over the duration of the drought permit implementation.	Low (adverse)	Low	Medium	Moderate	Short-Term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No construction will occur for this option, however there will be a change to water levels in two reaches for a short duration. It is not a sensitive landscape and due to the natural drying of the reaches in natural drought conditions, it is unlikely that drought permit implementation will have any impacts on the landscapes local distinctiveness.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Childrey Warren:** **The Childrey Warren abstraction consists of one borehole located approximately 1 km away from the source of Letcombe Brook. From the end of AMP6 Thames Water Utilities Limited will no longer be permitted to abstract from the Childrey Warren boreholes. The licence to abstract will be revoked as a result of the Restoring Sustainable Abstraction programme. The proposed drought permit option is to resume historical abstraction to previous licence limit of 4.5Ml/d**																					
Summary commentary of scheme adverse effects:	**Short-term, temporary effects on water levels and flows are anticipated, comprising a 100% decrease in flow on Reach 1 of Letcombe Brook and associated water quality effects. This is likely to contribute to major short-term, temporary effects on biodiversity, flora and fauna (in particular effects on NERC species - brown trout). Other short-term adverse effects anticipated include changes to the distribution and abundance of invasive species (Canadian pondweed and least duckweed), declines in water quality (with regards to SRP), and geomorphological changes (shallower banks affected by drought action). There will also be minor, short-term drying-up of Letcombe Brook along existing trails and footpaths, and minor increases in energy use and waste generation due to abstraction and treatment of additional water. Negligible, short-term increases in air emissions are expected to accompany increases in energy use.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**		**None**		**None**				**None**		**None**	**None**			**None**	**None**	**None**	
Summary commentary of scheme beneficial effects	**Beneficial effects include ensuring water supply to the local population and other customers/businesses. There are also likely to be beneficial effects associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	No effects on designated sites have been identified within the EAR. Minor to major adverse effects to aquatic habitats and species including NERC habitats/species and ecologically significant species (Brown Trout). Major and moderate adverse effects to fish community in Reaches 1 and 2 respectively, including effects on spawning habitats. A major impact on WFD status is predicted based on the impact of the drought option on macroinvertebrates and macrophytes. Moderate effects are expected on phytobenthos.	High (adverse)	High	Medium	Moderate	Medium term	Temporary	Major adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Adverse impacts are considered likely for invasive flora (Canadian Pondweed Elodea candensis and Least duckweed Lemna minuta), which is likely to be moderate for reach 1 and minor for reach 2.	High (adverse)	Medium	Medium	Moderate	Short term	Temporary	Moderate adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 4.5Ml/d of water) during drought conditions and therefore help maintain public health.	Low (beneficial)	High	Medium	Moderate	Short term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	Impacts on recreation have been identified in relation to the several trails and footpaths that are in place along Letcombe Brook through Wantage and Grove which are frequented by locals. However, as Letchcombe Brook is known to naturally drying, the impact is expected to be minor. No impacts are anticipated for navigation or angling.	Low (adverse)	Low	Medium	Moderate	Short term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. No impacts on navigation have been identified, therefore no effects on related businesses or tourism are anticipated.	Low (beneficial)	High	Medium	Medium	Short term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. The option will make use of existing infrastructure.	Low (adverse)	Low	Medium	Moderate	Short term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies a major impact on one reach and as minor impact on another. For the major impact, this relates to 100% reduction in flow of Letcombe Brook which could last a full year (as a result of decreased groundwater contributions to the river).	Low (adverse)	High	Medium	High	Medium term	Temporary	Moderate adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The EAR identifies moderate risk with regards to SRP and minor risk due to reduced dissolved oxygen and ammonia. Also a low water quality risk associated with Wantage STW discharge (Reach 1).	Moderate (adverse)	Medium	Medium	Moderate	Short term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Water resource available is described as "water not available for licencing" by the EA. The EAR identifies 2 surface water abstractions (Grove, Letcombe Brook Dandridges Mill) that would be impacted if the drought option was implemented. The DP could deplete the flow in Reach 1 by 100% completely limiting the feasibility of the abstraction at Gove (high risk). Although the DP is not expected to severely impact flow in Reach 2, the river is expected to reduce and the abstraction may be limited (high risk).	High (adverse)	High	Medium	Moderate	Short term	Temporary	Major adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The EAR suggests moderate impact on geomorphology in Reach 1, where shallower banks will be affected by the drought action. The banks are generally steep, and variation in wetted width would only occur in the limited shallower sections of the reaches. Minor impacts on geomorphology are anticipated in Reach 2. No impacts on land use, soil or geology are expected as a result of the operation of this option.	Low (adverse)	Medium	Large	Moderate	Short term	Temporary	Moderate adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities to enhance ecosystem service functions of land.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option, and no opportunities for catchment-wide approach to land management were identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	The option will increase air emissions associated with abstraction and treatment of water (up to 4.5ml/day), however no AQMAs are in proximity of the option. There is no construction associated with this option.	Low (adverse)	Low	Small	Low	Short term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Increased abstraction would cause an increase in energy use in the short term. There is no construction associated with this option.	Low (adverse)	Low	Medium	Moderate	Short term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought orders/permits are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (adverse)	High	Small	Moderate	Short term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are no heritage assets in the area of influence, so no effects on the historic environment are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No construction activities would be conducted during implementation of the plan. There will be a change to water levels in two reaches of Letcombe Brook for a short duration. The option is located within the North Wessex Downs AONB. However, Letcombe Brook dries under natural drought conditions and the AONB is therefore unlikely to be impacted over the duration of the drought permit implementation.	Low	Low	Medium	Moderate	Short term	Temporary	Negligible adverse	None

Drought Plan option	**Ogbourne 1:** **The licence to abstract an average of 8 Ml/d and peak of 13.6 Ml/d from the Ogbourne boreholes will be revoked in April 2017 as a result of the Restoring Sustainable Abstraction programme. In a drought, the amount of water available for abstraction was physically limited by groundwater levels therefore the expected deployable output during these periods was 3.5 Ml/d. Therefore, Ogbourne 1 drought permit proposes to use the existing boreholes and abstract 3.5 Ml/d. Minor construction works are required to achieve the abstraction from these boreholes. Works will include connection of mobile generators and starters to each borehole pump.**																					
Summary commentary of scheme adverse effects	**Moderate adverse, short-term effects are anticipated with respect to biodiversity, flora and fauna. Impacts on fish may occur due to an extension in duration of River Og being dry, and a reduction in flows in the River Kennet. Changes in flow in the River Kennet (a designated SSSI) also have potential for moderate adverse, short-term effects on macroinvertebrates. The Middle Kennet water body is considered at moderate risk of short-term deterioration of WFD status for macroinvertebrates and fish. Minor adverse, short-term effects on angling and recreation are possible due to impacts on fish communities. Moderate adverse, short-term effects to water are likely as the abstraction will cause the River Og to remain dry for longer. Flow changes in the River Kennet are considered minor, however there is a high risk to water quality associated with the Marlborough STW discharge due to reduced dilution in the River Kennet during drought permit implementation.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**				**None**		**None**				**None**		**None**	**None**			**None**	**None**	**None**	
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are expected due to provision of additional water supply. Minor beneficial effects are associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

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Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Minor construction works required involve connection of mobile generators and starters to each borehole pump, however these are not expected to be significant. The EAR identifies no significant reductions in wetted width or marginal habitats. The extension in duration of River Og being dry may cause impacts on brown trout, bullhead and grayling. These have been assessed in the EAR as of moderate significance. As a result of changes to flow, moderate adverse impacts have been identified in the River Kennet (a designated SSSI) on macroinvertebrates and fish. The Middle Kennet water body (GB106039023173) would be at moderate risk of short-term deterioration of WFD status for macroinvertebrates and fish.	Medium (adverse)	Medium	Medium	Medium	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Implementation of the option may cause a delay in hydrological, recovery increasing the habitat suitability and therefore distribution of invasive species, however these impacts are expected to be negligible.	Low (adverse)	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 3.5Ml/d of water) during drought conditions and therefore help maintain public health. Construction activities (mobile generators connected to borehole pump) are considered very small scale and short term. The Marlborough AQMA lies within 5km of the study area.	Low (adverse) Low (beneficial)	Medium (adverse) High (beneficial)	Medium	Low (adverse) High (beneficial)	Short-term	Temporary	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	The fish assessment in the EAR identifies a potential minor alteration to community composition as a result of drought permit implementation, therefore there is a potential minor impact on angling. The River Og and Kennet contain a wide diversity of fish species. The location and surrounding area makes the catchment very popular with anglers. Any impacts of the drought permit on fish population or distribution may impact anglers. Navigation is not possible within the River Og (Reach 1) and the River Kennet between the River Og confluence and Hungerford (Reach 2). As such, the potential to affect navigation is minor.	Low (adverse)	Medium	Medium	Medium	Short-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions without impacting on other abstractors, therefore ensuring a resilient supply for customers and economic activity.	Low (beneficial)	High	Medium	Medium	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Implementation will result in an increase in energy use and chemicals for treatment of abstracted water (3.5Ml/d). The option make use of existing infrastructure. However, will also require additional equipment and energy use to enable pumping from boreholes that are not used in non-drought conditions.	Low (adverse)	Low	Medium	Low	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

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Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies short term, moderate adverse effects to the River Og regarding increased duration of the impacted reach being dry until annual groundwater recovery occurs, leading to watercourses remaining drier for longer. There may also be short term minor adverse effects to the River Kennet, with small changes to flow within normal range of medium to low flows around the period when recovery of flow input from the River Og would otherwise have occurred without a drought permit being utilised.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Assuming best practice construction methods, impacts from construction on water are anticipated to be negligible. Care should be taken at the end of the drought option operation to prevent contamination of the groundwater. The EAR identifies a moderate risk to phosphorus concentration and a low risk to dissolved oxygen and ammonia. In the River Kennet reach there is a high risk to water quality associated with Marlborough STW due to reduced dilution in the River Kennet during drought permit implementation.	Medium (adverse)	Medium	Medium	Medium	Short-term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'Water not available for licensing'. Abstraction will be temporary and short term, however, there is potential for duration of effects on groundwater to extend beyond the drought permit implementation period with potential adverse effects to the local WFD water body . The EAR identifies that the option is unlikely to impact the feasibility of any groundwater or surface water abstractions in the zone of influence (including those for agriculture).	Low (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	The minor construction works required (connection of mobile generators) are not anticipated to result in any adverse effects on soils. In operation in-channel structures, such as weirs/sluices, could influence sediment dynamics by creating ponded areas upstream of the structure. These areas will have very low flow velocities and increased depth in relation to other areas of the channel, this is likely to promote the deposition of fine sediment behind the structure. The EAR describes geomorphology impacts as minor in both reaches based on the anticipated low sediment concentrations (characteristic of a chalk fed river) and the relatively low amounts of sediment in transport during a drought.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide approach have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	The option involves the abstraction of 3.5 Ml/d from the existing Ogbourne boreholes used in the revoked licence (from April 2017). There would be a short-term increase in air emissions associated with abstraction and treatment. The option is within 5km of the Marlborough AQMA.	Low (adverse)	Medium	Low	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	The option involves the abstraction of 3.5 Ml/d from the existing Ogbourne boreholes used in the revoked licence (from April 2017). There would be a short-term increase in greenhouse gas emissions associated with abstraction and treatment.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	Medium	Small	High	Short-term	Temporary	None	Minor beneficial

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Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are number of statutory sites in proximity to the Ogbourne boreholes including three Scheduled Ancient Monuments and a Conservation Area associated with Ogbourne St. George. However, all are over 1km from minor construction works planned at the boreholes. Hydrological impacts associated with operation of the options are not anticipated to adversely effects these assets or any unknown water-dependent assets.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The option and impacted reaches are within North Wessex Downs AONB. The minor construction works planned are associated with existing borehole sites. The AONB is a unique and spectacular landscape. The River Og and River Kennet form an essential part of the landscape of the AONB. The impacted reach of the River Og is an intermittently flowing river and there are naturally periods of no flow. The impact of the drought permit is to extend the period of recovery between the months of October to March. This delay to the recovery period occurs outside of the summer months when visitors to the North Wessex Downs would be greater. Considering these factors the value/sensitivity of the AONB is considered to be Medium.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Compton 1** **Overview: Compton (1) abstraction boreholes are located in Berkshire Downs Chalk WFD groundwater body. The option would see re-established abstraction from existing boreholes (previously revoked due to high nitrate concentrations) of up to 5Ml/day.** **Minor construction works are required to bring the option online as a drought source. There is currently limited treatment capability and therefore a temporary water treatment facility may be required.**																				
Summary commentary of scheme adverse effects:	**Moderate adverse effects are identified for biodiversity and on water quality. Effects include low groundwater flows being exacerbated, resulting in the River Pang remaining drier for longer, and resulting impacts on water quality (SRP and dissolved oxygen saturation levels), NERC species (Ranunculus spp. brown trout, fine-lined pea mussel), macroinvertebrates and fish. There is the potential for major adverse impacts in relation to other abstractors, in particular a number of significant groundwater abstractions that are used by the EA for abstraction under the WBGWS (upstream of Compton, totalling 56Ml/d), which may affect the feasibility of the abstraction. Minor effects include those on angling.**																				
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**				**None**		**None**				**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Beneficial impacts include ensuring supply of water to local population and other customers/businesses. There is also likely to be beneficial impacts associated with improving the resilience of water supplies to drought.**																				
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR identifies no impacts on designated sites. Minor to moderate impacts on NERC species have been identified (*Ranunculus* spp., brown trout, fine-lined pea mussel) due to low groundwater flows being exacerbated, resulting in watercourses remaining drier for longer. Moderate impacts are anticipated for macroinvertebrates and fish.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will work with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The EAR identifies a negligible impact on invasive species, due to a delay in hydrological recovery increasing habitat suitability and therefore distribution of invasive species.	Medium (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to 5Ml/d of water) during drought conditions and therefore help maintain public health. Minor construction works are required in order to bring the option online (temporary water treatment facilities) - therefore may result in noise/dust nuisance during construction.	Low (beneficial) Low (adverse)	High (beneficial) Medium (adverse)	Medium	Moderate	Short-term	Temporary	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	No impacts are anticipated in relation to National Trails, or navigation. Although the River Pang is an intermittently flowing river, the expected hydrological impact of the drought permit would likely extend up to 4 weeks (between Oct and March) and recovery period could have a negative impact on angling for up to a month.	Medium (adverse)	Low	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment.	Low (beneficial)	High	Small	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction over and above what occurs under normal operation will typically result in proportional increases in energy use and waste. Minor construction works are required in order to bring the option online as a temporary water treatment facility may be required.	Low (adverse) (energy use) Low (adverse) (construction)	Low (adverse) (energy use) Medium (adverse) (construction)	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	Implementation of the Compton (1) drought permit is likely to exacerbate the low groundwater levels so that the watercourse would remain dry for longer (taking longer to recover/becoming wet later) (River Pang from source until Blue Pool). The impact would likely extend for up to 4 weeks and would likely manifest between October and April. Under extreme circumstance the drought permit would delay groundwater recovery until the following year (so that it, or portions of it, may be dry for consecutive years). If this occurred, it is likely that groundwater would have contributed to flow in the reach for only a short period of time before it ceased again. Furthermore, the system is used to such occurrences (extended periods of drying between consecutive winters) that can happen at times when abstractions do not occur.	Low (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The risk of the drought order to dissolved oxygen saturation levels and SRP has been assessed as medium in one reach (River Pang from source to Blue Pool), and low for ammonia. The reaches are considered to be medium sensitivity to changes in water quality and therefore the overall risk is minor adverse. Water quality pressures are likely to present a low risk to water quality, associated with Hampstead Norreys and Bucklebury Upper Common STWs.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	There are 10 significant groundwater abstractions (over 0.5 Ml/d) within the impacted area of the Compton (1) drought permit. Two of these licenses are owned by the Environment Agency totalling 56 Ml/d and are used for abstraction under the WBGWS. All of the abstractions are located upstream or within area of the Compton (1) impacted reach. As there is a high uncertainty and unknown impacts of the drought permit being implemented when the WBGWS is operating, the WBGWS abstractions are considered to pose a high risk. The operation of the WBGWS may be limited by drought permit operation, but this is currently unknown and further studies are recommended. Two surface water abstractions are assessed to have negligible impacts.	High (adverse)	Medium	Medium	Low	Short-term	Temporary	Major adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Significant impacts on geomorphology are unlikely, as water levels will not be reduced below those already experienced in the River Pang.	Low (adverse)	Medium	Low	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase emissions associated with abstraction and treatment of water (up to 5 Ml/d). There are no AQMAs within 5km.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. Minor construction works may be required in order to bring the drought option online (temporary water treatment facilities may be required) which would also result in short-term increases in greenhouse gas emissions.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Minor beneficial

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Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are heritage assets, including the East Ilsley Down round barrow scheduled monuments, in proximity to the area of influence however they are unlikely to be impacted by drought permit implementation. Effects are considered negligible. The EARs have assessed the impacts on unknown water dependent assets as negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The impacted reaches of the River Pang are within the North Wessex Downs AONB. The hydrological impact of the drought permit would be to exacerbate low groundwater levels so that the watercourse would remain dry for longer, likely to extend for up to 4 weeks (between October and April). However, the impacted reach of the River Pang is an intermittently flowing river and there are natural periods of no flow, resulting in minimal impact on the visual amenity of the AONB from drought permit implementation. It will also occur outside of the summer months when the number of visitors to the North Wessex Downs would be lower.	Low (adverse)	High	Medium	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Compton 2** **Overview: Compton (2) abstraction boreholes are located in Berkshire Downs Chalk WFD groundwater body. The option would extend the abstraction established from Compton 1 to abstract to the maximum possible yield of 13.6Ml/day - an increase of 8.6Ml/day compared to the Compton 1 drought permit.** **No construction works are required to bring the option online, as a temporary treatment facility would already have been installed as part of Compton 1 drought permit.**																					
Summary commentary of scheme adverse effects:	**Moderate adverse effects are identified for biodiversity and on water quality. Effects include low groundwater flows being exacerbated, resulting in the River Pang remaining drier for longer, and resulting impacts on water quality (SRP), NERC species (Brown Trout, Fine-lined pea mussel, European Eel) , macroinvertebrates, macrophytes and fish. There is the potential for major adverse impacts in relation to other abstractors, in particular a number of significant groundwater abstractions that are used by the EA for abstraction under the WBGWS (upstream of Compton, totalling 56Ml/d), which may affect the feasibility of the abstraction. Minor effects include those on angling.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**		**None**		**None**				**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Beneficial impacts include ensuring supply of water to local population and other customers/businesses. There is also likely to be beneficial impacts associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	No impacts on designated sites have been identified. Minor to moderate impacts on NERC species have been identified in Reach 1 (including brown trout, fine-lined pea mussel, and *Ranunculus* spp.) and Reach 2 (brown trout, European eel , fine-lined pea mussel, Thames ram's-horn snail, *Riolus cupreus* and *Riolus subviolaceu*) due to low groundwater flows being exacerbated resulting in the River Pang remaining drier for longer. Moderate to minor impacts are anticipated on macroinvertebrates, fish and macrophytes in both reaches.	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will work with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The EAR identifies a negligible impact on invasive species, due to a delay in hydrological recovery increasing habitat suitability and therefore distribution of invasive species.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to 8.6Ml/d of water) during drought conditions and therefore help maintain public health.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	No impacts are anticipated in relation to National Trails, or navigation. Although the River Pang is an intermittently flowing river, the expected hydrological impact of the drought permit would likely extend up to 3 months (between Oct and March) and recovery period could have a negative impact on angling for up to a month.	Medium (adverse)	Low	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment.	Low (beneficial)	High	Small	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction over and above what occurs under normal operation will typically result in proportional increases in energy use and waste.	Low	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR identifies a moderate impact for the implementation of the Compton (2) drought permit, which could delay recovery of the aquifer and resumption of baseflow in Reach 1 (River Pang from source until Blue Pool) by up to 3 months, most likely to occur between December and April after a summer drought. However, this depends heavily on rainfall and could even be delayed until the next winter. Thus the impact could feasibly manifest at any month between October and April. A minor impact is identified for Reach 2 (River Pang from Blue Pool to confluence with River Thames) due to a reduction in moderately-low flows by up to 25%.	Low	Medium	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The risk of the drought order for SRP has been assessed as moderate in Reach 2 (River Pang from Blue Pool to confluence with River Thames), and minor for dissolved oxygen saturation levels. Water quality pressures are likely to present a low risk to water quality, including those associated with Hampstead Norreys and Bucklebury Upper Common STW discharges in Reach 1 (River Pang from source to Blue Pool).	Medium (adverse)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	There are 10 significant groundwater abstractions (over 0.5 Ml/d) within the impacted area of the Compton (1) drought permit. Two of these licenses are owned by the Environment Agency totalling 56 Ml/d and are used for abstraction under the WBGWS. All of the abstractions are located upstream or within area of the Compton (1) impacted reach. As there is a high uncertainty and unknown impacts of the drought permit being implemented when the WBGWS is operating, the WBGWS abstractions are considered to pose a high risk. The operation of the WBGWS may be limited by drought permit operation, but this is currently unknown and further studies are recommended. Two surface water abstractions are assessed to have negligible impacts.	High (adverse)	Medium	Medium	Low	Short-term	Temporary	Major adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Significant impacts on geomorphology are unlikely, as water levels will not be reduced below those already experienced in the River Pang.	Low (adverse)	Medium	Low	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option, and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option, and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase emissions associated with the abstraction and treatment of water (up to 8.6 Ml/d). There are no AQMAs within 5km.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Minor beneficial

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are heritage assets, including the East Ilsley Down round barrow scheduled monuments, in the area of influence however they are unlikely to be impacted by drought permit implementation. Effects are considered negligible. The EARs have assessed the impacts on unknown water dependent assets as negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are no opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The impacted reaches of the River Pang are within the North Wessex Downs AONB. The hydrological impact of the drought permit would be to exacerbate low groundwater levels so that the watercourse would remain dry for longer, likely to extend for up to 4 weeks (between October and April). However, the impacted reach of the River Pang is an intermittently flowing river and there are natural periods of no flow, resulting in minimal impact on the visual amenity of the AONB from drought permit implementation. It will also occur outside of the summer months when the number of visitors to the North Wessex Downs would be lower.	Low (adverse)	High	Medium	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Fobney Emergency Boreholes:** **Eight abstraction boreholes are located on the grounds of Fobney WTW, licenced for emergency use in case of contamination of the River Kennet at the Fobney intake or failure of pumps, power supplies, pipelines, or other apparatus associated with the WTW. The licence permits emergency abstraction of 30Ml/d for 10 consecutive days or 10Ml/d for 30 consecutive days and requires the boreholes to be rested for at least as many days as they were used before abstraction can resume. The boreholes may not be used, under normal licensed conditions, during times of drought. Proposed abstraction comprises 12-30 Ml/d through manipulation of control mechanisms restricting maximum allowable abstraction. It is anticipated that the maximum yield during a drought will most likely be 25 Ml/d. The boreholes abstract from the Chalk aquifer. There is no construction phase associated with this drought permit.**																				
Summary commentary of scheme adverse effects	**Four reaches will be impacted, three on the River Kennet all identified as having negligible hydrological impacts, and one on Holy Brook, identified as having a minor impact. The impact on Holy Brook would include reductions in levels and wetted width in isolated areas where channel banks are shallower, while this would not occur on the River Kennet as it is level-controlled. Moderate effects on water quality in Holy Brook may occur, comprising elevated SRP concentrations that may downgrade diatom and macrophyte status downstream. The Reading STW may present moderate a water quality pressure to the River Kennet downstream of the confluence with Foudry Brook, due to influences on ammonia, dissolved oxygen saturation and SRP. Minor declines in habitat suitability for sensitive flora and fauna species may occur, as may moderate adverse effects due to air emissions associated with increased abstraction. Moderate effect on air emissions. Holy Brook forms part of the landscape and visual amenity value of Southcote Linear Park, and impacts on river levels may adversely impact the visual amenity of the park for walkers and those who visit the park. However, all adverse effects identified are short-term and temporary, and not expected to extend beyond six months.**																				
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**		**None**		**None**				**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Moderate beneficial effects include ensuring supply of water to local population and other customers/businesses, and minor benefits associated with improving the resilience of water supplies to drought.**																				
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**			**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Negligible hydrological impacts are expected on three reaches of the River Kennet (medium risk to ammonia concentrations and low risk to dissolved oxygen in Reach 2 due to discharges from Reading STW, this has the potential to reduce habitat suitability to sensitive species) and a minor impact on a reach of Holy Brook (could impact spawning, migration, provision of cover, etc.; however hydrological impacts are minor and therefore no impacts are anticipated). Minor risk to NERC fish species at a reach of the River Kennet and Holy Brook. Risk to Reach 2 (River Kennet) for macroinvertebrates due to risk to ammonia concentrations and low risk to dissolved oxygen in Reach 2 due to discharges from Reading STW. This has the potential to reduce habitat suitability for sensitive species. Risk to other notable fish species due to an additional medium risk to ammonia concentrations and low risk to dissolved oxygen in Reach 2 due to discharges from Reading STW.	Low (adverse)	High	Small	Moderate/high	Short	Temporary	Minor adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will work with catchment groups in the long term to collaborate on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Uncertainty remains over the potential for invasive macrophyte species to adversely affect floating pennywort and least duckweed, however hydrological impacts are negligible and therefore no impact is anticipated. For the reaches of the River Kennet there is an additional medium risk to SRP concentrations in Reach 2 due to discharges from Reading STW. This has the potential to increase growth rates of invasive macrophytes increasing abundance and distribution. For the reach of Holy Brook uncertainty remains over the potential presence of invasive macrophyte species, however, hydrological impacts are negligible and therefore no impact is anticipated	Low (adverse)	High	Small	Low	Short	Temporary	Minor adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to an additional 25Ml/d of water) during drought conditions and therefore help maintain public health. No construction is proposed for this option therefore no adverse effects are expected to public health.	Low (beneficial)	High	Small/medium	High	Short	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Holy Brook forms part of the landscape and visual amenity value of the Southcote Linear Park. Any impact of the drought permit on river levels may impact walkers and those who visit the park. The River Kennet contains a number of fish species. The location and surrounding area makes the catchment very popular with anglers. Any impacts of the drought permit on fish population or distribution may impact anglers. Along the impacted reaches of the River Kennet, level is maintained and hydrological impacts manifest as a reduction in velocities only, therefore have minimal impact on navigation. The EAR identifies negligible sensitivity to these three aspects.	Low (adverse)	Medium	Small/medium	Moderate	Short	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. High magnitude is applicable due to the size of the water increase. No impacts on other surface water or groundwater abstractions are expected. There are no effects likely on angling and recreation and therefore no affects on businesses associated with these activities.	Low (beneficial)	High	Medium	Medium	Short	Long	None	Moderate beneficial

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Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (up to 25 Ml/d) over and above what occurs under normal operation will result in short-term increases in energy use and waste. The option will make use of existing infrastructure, avoiding new construction (and associated use of materials) and minimising additional energy use and waste generation.	Medium (adverse) Low (beneficial)	Low	Medium	Medium	Short	Temporary	Minor adverse	Negligible beneficial
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR reports a negligible hydrological impact on three reaches of the River Kennet and a minor impact on a reach of Holy Brook (Holy Brook from 2.5km west of the Fobney Emergency Boreholes to the confluence with River Kennet). The reduction of the Summer Q95 and Summer Q99 flow in the brook as a result of the drought permit would be 5% and 12%, respectively. Due to uncertainty of the interaction between the Holy Brook and chalk aquifer the reach extends from the western limit of the cone of depression to the confluence with the River Kennet. The reduction in flow would manifest itself as a reduction of velocity, wetted width, depth and perimeter.	Low (adverse)	Medium	Small	Moderate	Short	Temporary	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	For the reach on Holy Brook, the EAR reports a medium risk (specifically with regard to SRP concentration). Risks to dissolved oxygen balance and ammonia balance are considered negligible. The Reading STW presents a water quality pressure to the River Kennet downstream of the confluence with Foudry Brook, i.e., a medium risk to ammonia, dissolved oxygen saturation and SRP.	Medium	Medium	Small	Moderate	Short	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	The EAR reports negligible impacts on other abstractions. Implementation of the drought permit could have a minor impact on Kennet and Holy Brook (GB106039023140) with regard to WFD status.	Low (adverse)	Medium	Small	Moderate	Short	Temporary	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

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Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Overall, geomorphology impacts are minor in Reaches 1, 2, 3 and 4. Deposition of fine sediment behind in-channel structures may occur, however reduction in flows during the operation of the drought permit is unlikely to lead to any significant changes in wetted width or wetted perimeter beyond that which is experienced in the normal range of hydrological variation due to the overall steep and managed nature of the reach channel banks.	Low	Medium	Medium	Low	Short	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services function have been identified for this option. There is no requirement for land take and the existing abstraction would be used.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities for catchment-wide approach to land management have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	Construction activities and increased abstraction/treatment would cause an increase in energy use and associated air emissions. The Reading AQMA is in proximity to the affected area.	Medium (adverse)	Medium	Small	Low	Short-term	Temporary	Moderate adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	There would be emissions associated with the abstraction of water. Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions. The sensitivity to this effect is rated as low due to the short term and temporary effect.	Medium (adverse)	Low	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (adverse)	High	Small	High	Long	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are scheduled monuments (High Bridge and Reading Abbey) and listed buildings in the area of influence, however, they are unlikely to be impacted by drought permit implementation.	Low (adverse)	Low	Small	Low	Short	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

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Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	Holy Brook forms part of the landscape and visual amenity value of the Southcote Linear Park. Any impact of the drought permit on river levels may impact walkers and those who visit the park.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	Pangbourne: Water is abstracted from the Chalk aquifer at Pangbourne. The abstraction lies close to the River Pang, Sulham Brook and the River Thames. Normal abstraction comprises a licence to abstract at a peak rate of 38.6Ml/d. When flow in the River Pang, gauged at Pangbourne, is below 18Ml/d for 5 consecutive days, abstraction from two of the boreholes is not permitted. The deployable output from the remaining boreholes is 31.6Ml/d. Proposed abstraction comprises 7Ml/d – remove flow constraint and allow the full amount of the Pangbourne licence to be abstracted from all licenced boreholes. The drought permit is anticipated to be applied for up to 6 consecutive months between May and December inclusive, although the permit could be implemented at any time of the year. There is no construction phase associated with this drought permit.																					
Summary commentary of scheme adverse effects	Negligible hydrological effects are anticipated on the River Pang from the Blue Pool to the confluence with River Thames. However, temporary adverse impacts ranging from major to negligible are anticipated on Sulham Brook. Major adverse hydrological effects are predicted due to extension of the period Sulham Brook would be dry, and major effects on water quality in Sulham Brook are also expected due to low dissolved oxygen saturation and reduced dilution of Pangbourne STW discharges. Sulham Brook has high sensitivity for WFD status. Short-term major impacts on one other abstraction from Sulham Brook are also possible. Moderate impacts on the geomorphology of Sulham Brook are possible, associated with reduced flows in areas where bank slope is shallow. Minor, short-term impacts on the Sulham and Tidmarsh Woods and Meadows SSSI, NERC fish species (brown trout and European eel) and notable county and regional level species (bullhead and brook lamprey) are possible.																					
SEA Objectives Adverse Effects Assessment Summary		None	None		None				None				None		None	None			None		None	
Summary commentary of scheme beneficial effects	Moderate beneficial impacts are expected with regard to ensuring supply of water to local population and other customers/businesses. There is also likely to be a minor beneficial effect associated with improving the resilience of water supplies to drought.																					
SEA Objectives Beneficial Effects Assessment Summary	None	None	None	None		None		None	None	None	None	None	None	None	None	None	None	None		None	None	None

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Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The EAR reports that for the Sulham and Tidmarsh Woods and Meadows SSSI the extension of the recovery of flows will be less than a week (compared to natural drought conditions) and the impact will be observed in the hydrological winter (October to March). As such, the impact on the key features of the designated site (although of national importance) has been assessed of being as low magnitude. The EAR also reports negligible effects on macroinvertebrates, macrophytes, fish and diatoms for WFD status. Minor effect on NERC fish species (brown trout and European eel) is expected. Minor impact on notable species on county and regional level (bullhead and brook lamprey). Additionally, there is ancient woodland on the same site as a SSSI the effects on which are reported in the EAR to be negligible.	Low (adverse)	High	Small	High	Medium-term	Temporary	Minor adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Invasive macroinvertebrates in the study area are not expected to be significantly impacted by the implementation of the drought permit against a baseline of reduced flows characteristic of a drought. Invasive plant species in the study area can utilise flow of the watercourse for dispersal but are not reliant on it, so implementation of the drought permit is unlikely to increase dispersal.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to an additional 7Ml/d of water) during drought conditions and therefore help maintain public health. Magnitude is rated as Medium due to the amount of additional water provided. Regarding nuisance, there is no construction proposed for this option therefore no adverse effects are expected to public health.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	The route of the Thames Path national trail runs in close proximity to the impacted reach of the River Pang and Sulham Brook. The EAR reports that changes to water levels could affect visual amenity for walkers however, considers any changes in river level as a result of the drought permit are considered unlikely to impact this. Sulham Brook can dry up and is considered intermittently-flowing. It is possible that the drought permit could extend upstream the length of Sulham Brook which dries by up to 500m. However, it is unlikely to cause any section of the brook to dry out which has not dried historically. Therefore the magnitude is considered low. In addition, there is minimal boating and angling activity on Sulham Brook in comparison to the nearby River Pang and River Thames. The EAR reports negligible effects for these. Additionally the site is within an AONB, is within 1km (from the central point) of a Registered Park and Garden and a number of listed buildings.	Low (adverse)	High	Small	High	Medium-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. There are no significant groundwater abstractions within the area of influence, however there are three significant surface water abstractions. The drought permit is not anticipated to affect two of these abstractions. However, it may limit the feasibility of a surface water abstraction from Sulham Brook if the river dries up or recovery of flow to the river is extended. Discussion with the licence holder would be required at time of application, and effects on this abstraction are identified as high risk. There are no effects likely on angling and recreation and therefore no effects on businesses associated with these.	Low (beneficial) High (adverse)	High	Medium	Medium	Medium-term	Long	Major adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (up to 7Ml/d) over and above what occurs under normal operation will result in short-term increases in energy use and waste. The option will make use of existing infrastructure, avoiding new construction (and associated use of materials) and minimising additional energy use and waste generation.	Low (adverse)	Low	Medium	Medium	Short	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The EAR reports a negligible hydrological effect on Reach 1 (River Pang from the Blue Pool to the confluence with River Thames). However for Reach 2 (Sulham Brook from the vicinity of Sulham until the confluence with the River Thames) the EAR reports the drought permit is anticipated to increase the duration that the reach would dry by up to a handful of days, as well as extend the length of the intermittently-flowing reach. The impact would be restricted to sometime within the hydrological winter (October to March inclusive) that follows the drought permit being implemented. This is reported as a major impact.	High (adverse)	High	Small	High	Medium-term	Temporary	Major adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	A negligible effect predicted in EAR for reach 1. High effect predicted in EAR for reach 2 with regard to dissolved oxygen saturation and minor with regard to ammonia and SRP. High water quality risk associated with Pangbourne STWs (associated with ammonia and dissolved oxygen saturation). Reach 2 has high sensitivity for WFD status.	High (adverse)	High	Small	Moderate/high	Medium-term	Temporary	Major adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. Negligible effects on surface water abstractions are predicted for Reach 1 (River Pang), however for Reach 2 there is a high risk associated with one abstraction from the Sulham Brook. Effects on groundwater abstractions are expected to be negligible.	High (adverse)	High	Small	Moderate/high	Medium-term	Temporary	Major adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	For reach 1 the EAR reports a negligible effect for geomorphology. For Reach 2 the EAR reports a Moderate effect. The bank slope is generally steep, but impacts of reduced flows on wetted width are likely to be restricted to localised areas where bank slope is shallow.	Medium	Medium	Medium	Low	Medium	Temporary	Moderate adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No opportunities to enhance ecosystem services function have been identified for this option. There is no requirement for land take and the existing abstraction would be used.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities for catchment-wide approach to land management have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	There would be emissions associated with abstraction of water. The option is within proximity of sites designated for nature conservation at national level.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	There would be emissions associated with the abstraction of water. Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions. The sensitivity to this effect is rated as low due to the short term and temporary effect.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	Medium	Small	High	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The EAR reports effects on unknown water dependant assets would be negligible. Also, whilst there are listed buildings and a Registered Park and Garden within 1km there is no construction and therefore no direct effects likely and the drying out of the reach would be short term in terms of effects on settings.	Low (adverse)	Low	Medium	Moderate	Medium-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The River Pang and Sulham Brook is within and forms an essential part of the landscape of the North Wessex Downs AONB and therefore any impacts of the drought permit on the rivers could impact walkers and others who visit the area. Sulham Brook can dry up and this reach is therefore considered intermittently-flowing. It is possible that the drought permit could extend upstream the length of Sulham Brook which dries by up to 500m. However, it is unlikely to cause any section of the brook to dry out which has not dried historically. The EAR reports a negligible effect on the AONB. The option is within the Chilterns NCA. It is a predominantly wooded and farmed landscape with an underlay of chalk bedrock rising from the London Basin and offering wide views over adjacent vales. Parts of this is also AONB and as negligible effects predicted for the AONB similar is expected for the NCA. The magnitude is identified as low due to the sensitivity of the AONB to this particular effect. In this case the Sulham Brook dries out historically.	Low (adverse)	Low	Small	High	Medium-term	Temporary	Negligible adverse	None

Drought Plan option	**Playhatch:** **The abstraction is located in the South-West Chilterns Chalk groundwater body. It consists of two boreholes abstracting from the Chalk. Normal abstraction is annual average abstraction 7.27Ml/d, peak abstraction 8.2Ml/d. Proposed abstraction is 2.8 - 4.1Ml/d - increase in peak abstraction of existing licence from 8.2Ml/d to 12.3Ml/d providing a benefit of 4.1Ml/d.** **The drought permit could be implemented at any time of year, however it is anticipated to be applied for up to 6 consecutive months between May and December inclusive. There is no construction phase associated with this drought permit.**																					
Summary commentary of scheme adverse effects	**Overall, adverse effects associated with this drought option are minor to negligible and temporary. There would be minor adverse effects associated with emissions to air due to the abstraction of an additional 4Ml/d. Remaining adverse effects would be negligible, as they are associated with negligible hydrological effects and the use of energy for the additional abstraction.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**	**None**	**None**	**None**	**None**		**None**			**None**	**None**		**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**There would be moderate beneficial effects associated with provision of water supplies. Also, minor beneficial effects due to improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**

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Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	There is no construction associated with the option. The hydrological impact is reported in the EAR as negligible and the sensitivity of designated sites, NERC species and other notable species within 500m is negligible (due to their susceptibility to flow and level) and no impacts are anticipated. Designated sites, NERC species and other notable species within 1km would be expected to also have negligible sensitivity including the ancient woodland located between 500m and 1km due to the negligible hydrological impact.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The EAR reports for the following invasive flora species Japanese knotweed Fallopia japonica, Giant hogweed Heracleum mantegazzianum, Himalayan balsam Impatiens glandulifera, as these invasive plant species listed can utilise flow of the watercourse for dispersal but are not reliant on it, implementation of the drought permit will therefore not increase dispersal. For other invasive flora species Australian swamp stonecrop Crassula helmsii; parrot's feather Myriophyllum aquaticum; floating pennywort Hydrocotyle ranunculoides; water fern Azolla filiculoides and Nuttall's pondweed Elodea nuttallii, the EAR reports although the species may be susceptible to changes in flow and level, given the negligible impact magnitude on surface waters this is unlikely to occur.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Option will help to maintain essential public water supplies (provision of up to an additional 4.1Ml/d of water) during drought conditions and therefore help maintain public health. Regarding nuisance, whilst there is an AQMA located within 1km there is no construction proposed for this option therefore no adverse effects are expected to public health.	Low (beneficial)	High	Medium	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	There are a number of marinas located along the River Thames and there is the Thames Path National Trail. Due to the negligible hydrological impact, the EAR reports no impact on navigation from the drought permit. Also there would be no impact on angling. No construction is proposed, therefore the Thames Path would not be affected. No significant effects are therefore anticipated on these resources.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. No impacts on navigation are expected, therefore no effects on related businesses or tourism are anticipated.	Low (adverse)	High	Medium	Medium	Short-term	Long	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (4.1Ml/d) will result in short-term increases in energy use and waste generation. However, the option will make use of existing infrastructure, minimising this additional energy use and waste generation.	Low (adverse)	Low (adverse)	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

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Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The River Thames is located 1km south of the abstraction, with a series of lakes formed from disused gravel pits lying between the river and the abstraction. The lakes are connected to the River Thames. The abstraction is located in the South-West Chilterns Chalk groundwater body and there would be an increase in abstraction of 4.1Ml/d. The EAR reports that even if the full amount of the abstraction increase was taken (via increased infiltration) from the River Thames around Playhatch, the impact on summer Q95 and summer Q99 as measured at the nearest upstream gauge at Reading would be 1.0% and 1.2% respectively and therefore the hydrological impact on the River Thames would be negligible. Regarding Berry Brook the EAR reports that given that the groundwater level within the chalk will already be below the level of the Berry Brook by 4-9km, abstraction from the chalk aquifer at Playhatch is unlikely to impact on flow in the Berry Brook therefore, the drought permit would have a negligible impact on it. Flow and water level in the Berry Brook would hence be maintained by the large and level-controlled River Thames and, in the vicinity of Playhatch, the nearby Caversham Lakes which it supports.	Low (adverse)	Low	Medium	Moderate/high	Short-term	Temporary	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	As the hydrological impact in both reaches is negligible there is considered no risk to water quality deterioration. WFD status sensitivity is reported as negligible.	Low (adverse)	Low	Small	Moderate/high	Short-term	Temporary	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. However, as the hydrological impact in both reaches is negligible, there is considered no risk to other abstractors and therefore no significant effects.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	As the hydrological impact in the two reaches is negligible, impacts on geomorphology are also considered negligible.	Low (adverse)	Low	Small	Moderate/high	Short-term	Temporary	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	There are no opportunities to enhance ecosystem services functions have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No opportunities to promote a catchment wide response have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will cause short-term increases in air emissions associated with the abstraction of water (up to 4.1 Ml/d). The abstraction site is in proximity (between 500m and 1km) to an AQMA at Reading, however no construction activities are required, and the use of existing infrastructure and treatment facilities will minimise emissions of air pollutants.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure will minimise increases in greenhouse gas emissions. The sensitivity is rated as low as the impact which be short-term and temporary.	Low (adverse)	Low	Medium	Moderate/high	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Minor beneficial

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Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are listed buildings within 500m and a registered park and garden in the vicinity. However, there is no construction for this option and negligible hydrological effects with the potential to affect setting therefore no significant effects on these heritage assets are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	There are no national designations for landscape in the vicinity, there would be no construction and hydrological effects would be negligible therefore significant landscape effects are not anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Fobney Direct:** **The River Kennet and Holy Brook Operating Agreement specifies use of the Arrowhead control structure to reduce flow in the Holy Brook by gate closure at flows below 195Ml/d and 173Ml/d (River Kennet gauged at Theale). Implementation of the drought permit would allow manipulation of the Arrowhead control structure at extreme low flows (<173Ml/d gauged at Theale) to allow abstraction from River Kennet at expense of flows to Holy Brook, providing a benefit of up to 20Ml/d. Minor construction works would be associated with the drought permit. A temporary structure will be installed in the third opening of the control structure to direct flow away from the Holy Brook. The drought permit is anticipated to be applied for up to 6 consecutive months between May and December inclusive, although it could be implemented at any time of year.** **Only a very severe drought would result in this drought permit being required. The drought permit would only be implemented when flows in the River Kennet at Theale were below 173Ml/d. Only in 1976 have flows this low been recorded.**																					
Summary commentary of scheme adverse effects	**If implemented, the drought permit would have a major hydrological impact on Holy Brook between the Arrowhead control structure and its confluence with the River Kennet. Impacts will manifest as a reduction in lowest flows of up to 40%, along with reductions in velocities, levels and wetted widths. There would be a moderate water quality risk for SRP during the drought permit implementation. Habitat availability would be negatively affected through reductions in loss of marginal habitats in localised areas, adversely affecting macroinvertebrates, macrophytes and phytobenthos, and fish. Holy Brook forms part of the landscape and visual amenity value of Southcote Linear Park, and impacts on river levels may adversely impact the visual amenity of the park for walkers and those who visit the park. However, all adverse effects identified are short-term and temporary, and not expected to extend beyond six months.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**				**None**		**None**			**None**	**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**If implemented the drought permit would have a minor beneficial hydrological impact on the River Kennet from the Arrowhead control structure to the Fobney WTW intake. Flows would be increased by 20 Ml/d for the duration that the drought permit is implemented. Moderate beneficial impacts associated with ensuring supply of water to local population and other customers/businesses. Minor benefits associated with improving the resilience of water supplies to drought. An increase in flow at a time of natural drought will also help to alleviate the impacts of natural drought on macrophytes, fish, mammals and birds in the habitats of the River Kennet.**																					
SEA Objectives Beneficial Effects Assessment Summary		**None**	**None**	**None**		**None**		**None**	**None**			**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	The hydrological impact of the Fobney Direct drought permit is a reduction of flows by up to 40% and consequently a reduction in velocities, water level and wetted width. Moderate impacts ecological features in Holy Brook are anticipated, including changes in habitat availability for brown/sea trout and potential impacts on spawning and migration. Moderate impacts on European eel are expected due to potential impacts on habitat availability and peak elver upstream migration. Impacts on macroinvertebrates will likely be minor. Other environmentally sensitive species that are potentially susceptible to the hydrological impacts of the drought permit comprise *Ranunculus* sp., *Ceraclea senili, Macronychus quadrituberculatu, Atrichops crassipe,* barbel; bullhead and brook lamprey. As the ecological value of the *Ranunculus* community is of district importance, overall the impact significance has been assessed as moderate from May to September and minor from October to December. Minor impacts on ecological features in the River Kennet have been identified. An increase in flow at a time of natural drought will help to alleviate the impacts of natural drought on macrophytes, fish, mammals and birds in the habitats of the River Kennet.	Medium (adverse) Low (beneficial)	Medium	Medium	Moderate	Short-term	Temporary	Moderate adverse	Minor beneficial
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	During low flow conditions it is possible that some invasive flora species will increase in distribution and abundance. This impact is not attributable to the drought permit alone, and may already have been exacerbated by impacts of natural drought. Changes in water quality associated with the drought permit may provide more favourable conditions for the aquatic invasive species that are associated with eutrophic conditions (e.g. floating pennywort). Drought permit implementation is considered to have a minor impact to changes in abundance of invasive flora species (May to August only).	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Implementation of the drought permit will help to maintain essential public water supplies (provision of up to an additional 20Ml/d of water) during drought conditions and therefore help maintain public health. Some construction is required for option implementation, therefore there may be minor effects on human health (e.g., noise and dust nuisance).	Low (adverse) Low (beneficial)	Low (adverse) High (beneficial)	Small	Moderate	Short-term	Temporary	Negligible adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	Holy Brook forms part of the landscape and visual amenity value of Southcote Linear Park. A major impact on river levels will adversely impact the visual amenity of the park for walkers and those who visit the park. Anglers may be affected by any reduction in the presence of fish species in Holy Brook on a temporary basis during drought permit implementation. However there is not expected to be a significant reduction in fish species as such impacts to angling are assessed as minor. There are no significant risks to surface water or groundwater abstractions associated with the impacted reach, and no impacts on navigation are anticipated.	Medium (adverse)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Implementation of the drought permit will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. No impacts on navigation are expected, therefore no effects on essential services are anticipated.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An increase in abstraction (20Ml/d) is likely to result in a proportional increase in the use of energy, chemicals and generation of waste. Construction activities will likely generate some waste as well.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None

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Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The drought permit would have a major hydrological impact on the Holy Brook between the Arrowhead control structure and its confluence with the River Kennet. Impacts will manifest as a reduction in lowest flows of up to 40%, along with reductions in velocities, levels and wetted widths. However, the drought permit would have a beneficial hydrological impact on the River Kennet from the Arrowhead control structure to the Fobney WTW intake. Flows would be increased by 20 Ml/d for the duration that the drought permit is implemented.	High (adverse) Low (beneficial)	Medium	Small	Moderate	Short-term	Temporary	Major adverse	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	In the adversely impacted Holy Brook, there would be a medium water quality risk for SRP during drought permit implementation. In the beneficially impacted River Kennet, there would be a medium water quality risk for SRP during drought permit implementation. The risk is reduced compared to not having a drought permit (high risk associated). There is no risk associated with dissolved oxygen saturation and ammonia concentration in either Holy Brook or the River Kennet, and no risks associated with discharges. Implementation of the drought permit would have medium, short term, temporary, reversible risks to the status of the Kennet and Holy Brook (GB106039023140) WFD with respect to macroinvertebrates, macrophytes and phytobenthos, and fish.	Medium (adverse) Low (beneficial)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	Minor beneficial
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. However, there are no significant risks to surface water or groundwater abstractions associated with the impacted reach.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Sections of Holy Brook are flow sensitive, particularly in the first half of the reach and there is expected to be a moderate geomorphological impact. Hence, habitat availability would be negatively affected through reductions in wetted width and loss of marginal habitats (particularly in the upper part) in localised areas of the brook. As the River Kennet is level-controlled, and managed, reductions in wetted width are unlikely and geomorphological impacts are considered negligible.	Medium (adverse)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option, as construction activities will occur within an already developed site and no opportunities for enhancing the ecosystem services functions of land have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option, and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?	Construction activities and increased abstraction/treatment would cause an increase in energy use and associated air emissions. The Reading AQMA is within 1km of the affected area.	Medium (adverse)	Medium	Small	Low	Short-term	Temporary	Moderate adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Construction activities and increased abstraction/treatment would cause an increase in energy use and associated greenhouse gas emissions.	Medium (adverse)	Low	Medium	Moderate	Short-term	Temporary	Minor adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	High	Long-term	Temporary	None	Minor beneficial

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Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	Some listed buildings are located within 500m and 1km of the affected area. However, construction activities will be minor and impacts on these buildings are expected to be negligible.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	Holy Brook forms part of the landscape and visual amenity value of Southcote Linear Park. Impacts on river levels may have minor adverse impacts on the visual amenity of the park for walkers and those who visit the park.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None

Drought Plan option	**Albury:** **The Albury abstraction consists of four boreholes (one disused) in the vicinity of Law Brook; a tributary of the River Tillingbourne which is itself a tributary of the River Wey. The abstraction is from the Hythe aquifer of the Lower Greensand group. The licence includes a flow constraint whereby abstraction must cease if flow in Law Brook as gauged at Albury falls below 2.27Ml/d, however, such low flow has never been recorded and this licence condition has never moderated the abstraction. During normal abstraction, TWUL may abstract 6.8Ml/d (peak and annual average) at Albury (licence number 28/39/30/0209) except when flows in Law Brook as gauged at Albury fall below 2.27Ml/d. Proposed drought option is extension of abstraction beyond a lower limit of flow in associated Law Brook. It is anticipated the drought permit could be applied for six consecutive months between May to December inclusive, although it could be implemented at any time of year. Benefit of 6.8Ml/d. No construction works are required in order to implement the drought permit. This drought permit is unlikely to be required but if it is required it would be at a time of exceptional drought.**																					
Summary commentary of scheme adverse effects:	**Moderate adverse effects on water quality may occur due to elevated SRP concentrations, and moderate adverse hydrological effects are expected on the two reaches of Law Brook. Moderate adverse effects on NERC species (brown trout) are anticipated, as are minor adverse effects due to an increase in invasive macroinvertebrates. There would be minor impacts on angling at ponds along Law Brook, and minor adverse effects associated with air and greenhouse gas emissions. Minor geomorphological changes are also expected. Adverse effects are largely limited to Reach 2 (Law Brook from Ford Cress Beds to confluence with River Tillingbourne), and are predominantly short-term and temporary.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**				**None**				**None**		**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Moderate beneficial effects are expected due to provision of additional water supply. Minor beneficial effects associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

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Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	A moderate hydrological impact is predicted for both reaches of Law Brook. Impacts on designated sites due to deterioration in habitat quality and extent/distribution of qualifying features are expected to be negligible. There is also an ancient woodland within 500m of the brook and further areas of ancient woodland within 1km and effects on these areas are also anticipated to negligible. Impacts on NERC species for reach 1 are negligible, whereas minor and moderate adverse effects are likely on white clawed crayfish and brown trout respectively in reach 2. Impacts on other notable species for reach 1 are negligible, whereas negligible impacts on *Ranunculus* sp. and minor impacts on *Rhyacophila septentrioni* due to a reduction in abundance or distribution associated with geomorphological changes in reach 2. Minor adverse effects are expected on the macroinvertebrate community.	Low (adverse)	High	Small	Low	Medium-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	An increase in the distribution of invasive macro-invertebrates and competition with/predation of the native white-clawed crayfish may occur, resulting in a minor impact. An increase in suitable habitat availability may occur for the New Zealand mud snail, European physa and *Cheliocorophium curvispinum* due to delays in the recovery of flow velocity and river level, resulting in a minor impact. Negligible impacts are expected for invasive flora.	Low (adverse)	High	Small	Low	Medium-term	Temporary	Minor adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being?	Option will help to maintain essential public water supplies (provision of up to an additional 6.8Ml/d of water) during drought conditions and therefore help maintain public health.	Low (adverse)	High	Small	High	Medium-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	Law Brook forms part of the setting of the Downs Link National Trail. Changes to water levels or delays to recovery in Law Brook is anticipated to have minor impacts on the setting of Downs Link National Trail. There are a number of ponds potentially used for fishing along the impacted reach of Law Brook. It is anticipated that there will be minimal disruption to angling. No boating activity takes places on Law Brook, and as such no impact on navigation from drought permit implementation is anticipated.	Low (adverse)	Medium	Small	Moderate/high	Medium-term	Temporary	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity. There may also be minor disruption to angling and associated businesses.	Low (beneficial) Low (adverse)	High (beneficial) Medium (adverse)	Medium	Medium	Medium-term	Long	Minor adverse	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction (up to 6.8 Ml/d) will typically result in proportional increases in energy use and waste.	Low (adverse)	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	Hydrological effects on Law Brook from Pursers Farm to Ford Cress Beds (Reach 1) and Law Brook from Ford Cress Beds to confluence with River Tillingbourne (Reach 2) are both are identified as moderate. Reach 1 would be dry prior to a drought permit being required. The abstraction could delay recovery of the aquifer by up to a month (occurring sometime between October and March), i.e. delaying the time until groundwater would contribute to flow in the brook. There would be a short period after the resumption of baseflow when groundwater would not contribute as much flow to the river as it would without drought permit implementation, but this flow reduction would not be associated with reductions in levels, velocities, wetted width and wetted perimeter beyond those experienced in the normal range of hydrological variation. For Reach 2, there would result in a reduction in extreme low flows, most likely to occur around September, and unlikely to last for more than a month. The drought permit would be associated with a reduction in flows, velocities, levels and wetted widths. This would potentially pose a threat to marginal habitats, as parts of the reach are flow sensitive.	Medium (adverse)	Medium	Small	Moderate/high	Medium-term	Temporary	Moderate adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	A major effect with regard to SRP is expected for Reaches 1 and 2, however SRP is a risk in Law Brook even without implementation of the drought permit. Minor impacts for dissolved oxygen and ammonia concentrations are also expected in both reaches. Law Brook is not classified as a WFD waterbody, however is a tributary of the River Tillingbourne which is a WFD waterbody. This has moderate sensitivity and is reported as requiring further assessment, hence effects on WFD status are uncertain.	High (adverse)	Medium	Small	Low	Medium-term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. However effects on other surface and groundwater abstractions are expected to be negligible.	Low (adverse)	Low	Small	Moderate/high	Medium-term	Temporary	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	Overall, geomorphology impacts are expected to be minor in both reaches of Law Brook. There is some uncertainty associated with the availability of information about geomorphology, therefore a high sensitivity has been applied to take a precautionary approach.	Low (adverse)	High	Small	Low	Short	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will result in minor increases in air emissions associated with abstraction and treatment of water (up to 6.8 Ml/d). The option is within proximity of sites designated for nature conservation at national level.	Low (adverse)	Medium	Small	Low	Medium	Temporary	Minor adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure will minimise increases in greenhouse gas emissions. The sensitivity to this effect is rated as low due to the short term and temporary effect.	Low (adverse)	Low	Medium	Moderate/high	Short-term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	Medium	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The Chilworth Gunpowder Works is unlikely to be impacted over the duration of the drought permit implementation. There is also a Registered Park and Garden (Albury Park) and a scheduled monument (Bowl Barrow on Shere Heath) within 500m and listed buildings between 500m and 1km. These are unlikely to be significantly affected as there will be no construction. Impacts on setting are also unlikely as flow reductions would not cause reductions in levels, velocities, wetted width and wetted perimeter beyond those experienced in the normal range of hydrological variation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	The option is within the Surrey Hills AONB. The EAR reports that Law Brook forms part of the setting of this AONB. Changes in water levels in Law Brook (Reach 2) and a delay to recovery (Reach 1) are expected to be negligible, Landscape values are unlikely to be affected as there will be no construction, and flow reductions would not cause reductions in levels, velocities, wetted width and wetted perimeter beyond those experienced in the normal range of hydrological variation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Shalford:** **Under normal conditions, the abstraction comprises 30Ml/d from the River Wey (licence number 28/39/30/0066, aggregated with abstraction from the Tillingbourne licence 28/39/30/319). Implementation of the drought permit would involve an increase to the existing surface water abstraction from the River Wey, and removing the licence aggregates. The benefit would be 5Ml/d. The drought permit may be implemented for up to 6 consecutive months between May and December inclusive, although it could be implemented any time of year. The River Wey is a mainly rural catchment of mixed geology, with baseflow originating from both the Chalk and Lower Greensand aquifers. Shalford Water Treatment Works (WTW) treats surface water abstracted from both the River Wey and River Tillingbourne just upstream of their confluence.**																					
Summary commentary of scheme adverse effects	**Flow reductions associated with implementation of the drought permit on the River Wey upstream of the River Tillingbourne will be negligible. Downstream impacts would be proportionally less with flow contributions coming from the River Tillingbourne and Guildford STW. Negligible adverse hydrological impacts were identified, impacts on geomorphology, water quality and other abstractors are also expected to be negligible.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**	**None**	**None**	**None**	**None**		**None**		**None**		**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Moderate beneficial impacts are expected with respect to ensuring supply of water to local population and other customers/businesses. There is also likely to be minor beneficial impacts associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Effects on designations within 500m are reported in the EAR as negligible for all sites. There is ancient woodland within 1km however as the hydrological impacts are reported in the EAR as negligible, effects on sites further from the permit area of influence are unlikely. Similarly designations beyond the 500m addressed in the EAR are unlikely to be affected.	Low (adverse)	High	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Given the negligible magnitude of impacts of the drought permit on hydrology and water quality, no impacts in invasive species are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to 5Ml/d of water) during drought conditions and therefore help maintain public health. No construction is proposed, and therefore no effects on human health (e.g., noise and dust nuisance) are expected.	Low (adverse)	High	Small	Moderate	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as National Trails public rights of ways, including navigation? • Does it protect and enhance the green infrastructure network?	There is no hydrological impact on surface water features as a result of drought permit implementation. Therefore, there no impacts on recreation, angling or navigation are expected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Given that there is no adverse surface water hydrological impact associated with the drought permit, there would be no impact on other surface water abstractions. The option will contribute to the maintenance of supply reliability in drought conditions (benefit of up to 5Ml/d), ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment.	Low (beneficial)	High	Medium	Medium	Short-term	Permanent	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An increase in abstraction is likely to result in a proportional increase in the use of energy and generation of waste. However, existing infrastructure would be used, minimising such increases.	Low (adverse)	Low	Medium	Medium	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The reach of the River Wey from Shalford WTW to the River Tillingbourne confluence is approximately 1.73km. The reduction in flow at the River Wey is reported in the EAR as negligible, as are expected effects on habitats and navigation.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	Adverse hydrological impacts are expected to be negligible, thus no effects on water quality are anticipated.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. However as negligible adverse hydrological impacts were identified, no impacts on other abstractors are anticipated. Effects on the WFD status for the Wey is are expected to be negligible.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	As negligible adverse hydrological impacts were identified, no impacts on geomorphology are anticipated. No construction is required for implementation of this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take or construction is required for the option, and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	No construction is required for implementation of this option, although increased abstraction would cause a small increase in energy use and associated air emissions. The site is not within an AQMA.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	No construction is required for implementation of this option, although increased abstraction would cause a small increase in energy use and associated greenhouse gas emissions.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (adverse)	High	Small	High	Short-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There is no construction proposed and negligible effects on hydrology are expected. St Catherine's Chapel is within the area of influence, however is not expected to be affected by implementation of the option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	There will be no hydrological impact from drought permit implementation, therefore, there will be no impact on the amenity of Surrey Hills AONB.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**New Ground:** **The New Ground boreholes abstract from the unconfined Chalk aquifer and are located 1.2km northwest of the normal source of River Bulbourne at Dudswell. The boreholes were historically licenced for 6.5Ml/d until the abstraction rate was reduced in 2005. The abstraction was due to cease entirely in summer 2008 but continued at a reduced rate under an emergency licence until summer 2011. The proposed drought permit at New Ground is to resume historical abstraction from boreholes currently operating through an emergency licence (10 days only at a rate of 8.138Ml/d through agreement with the Environment Agency), with a benefit of 6.5 Ml/day. The drought permit could be implemented for up to 6 consecutive months between May and December inclusive, although it could be implemented at any time of the year. No construction works are envisaged.** **From its source, the River Bulbourne flows through the town of Berkhamsted along the course of the Grand Union Canal, entering and exiting it on two occasions, until the river joins the River Gade in Hemel Hempstead.**
Summary commentary of scheme adverse effects	**No major adverse impacts have been identified for implementation of the New Ground drought permit. Moderate adverse impacts have been identified with regard to reduced flow/levels, as the abstraction is likely to delay groundwater recovery. Minor water quality effects on dissolved oxygen quality, ammonia and reactive phosphorus may occur in Reach 1 (River Bulbourne (source at Dudswell) to confluence with Grand Union Canal). Minor impacts on macroinvertebrates, fish and bullhead are also possible due to the alteration to community composition and the reduction/loss of spawning habitat and increased stress/predation on species. There are also likely to be minor impacts on geomorphology in Reach 1, and on material assets/resource use due to increases in energy use in the increased abstraction and treatment of water. Adverse impacts are negligible to absent in the remaining reaches of the River Bulbourne, and all adverse effects identified are short-term and temporary.**
SEA Objectives Adverse Effects Assessment Summary	None None None None None None None None None None None None None None None None None None None None
Summary commentary of scheme beneficial effects	**Beneficial impacts have been identified primarily through ensuring supply of water to local population and other customers/businesses. There is also likely to be beneficial impacts associated with improving the resilience of water supplies to drought.**
SEA Objectives Beneficial Effects Assessment Summary	None None None None None None None None None None None None None None None None None None None None None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (those likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (those likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	No impacts on designated sites have been identified. Minor impacts on macroinvertebrates and fish may occur between December and April due to the alteration to community composition as a result of delayed recovery of flow in the watercourse. A minor impact has also been identified for bullhead (fish) due to the reduction/loss of spawning habitat and increased stress/predation on species as a result of delay in recovery of flows.	Medium (adverse)	Low	Small	Moderate	Short-term	Temporary	Minor adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will work with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Negligible impacts on invasive macroinvertebrates and invasive flora in Reach 1 (River Bulbourne - source (at Dudswell) to confluence with Grand Union Canal) due to a delay in hydrological recovery, increasing the habitat suitability and therefore distribution of invasive species.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	Implementation of the drought permit will help to maintain essential public water supplies (provision of up to an additional 6.5Ml/d of water) during drought conditions and therefore help maintain public health.	Low (beneficial)	High (beneficial)	Medium	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	No impacts have been identified regarding recreation, tourism and/or navigation	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Implementation of the drought permit will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. No impacts on navigation are expected, therefore no effects on essential services are anticipated.	Low (beneficial)	High (beneficial)	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	An increase in abstraction (6.5Ml/d) is likely to result in a proportional increase in the use of energy, chemicals and generation of waste.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	There would be a moderate hydrological impact on the seasonal (intermittently-flowing) River Bulbourne from its source (at Dudswell) to its first confluence with the Grand Union Canal. This reach would experience reduced flows associated with a delay in groundwater contributing to flow within the watercourse. This would occur for around one month at any time of year, depending on the timing and duration of drought conditions in the catchment. The abstraction is likely to delay groundwater recovery (so that groundwater would be contributing to flow in the river). Under rare circumstances the drought permit may result in the watercourse, or upper portions of it, being dry for consecutive seasons (acknowledging that this has occurred at the watercourse in recent years anyway). Historically, recovery with the abstraction in use usually occurred between December and April, therefore, the impact of the drought permit would likely manifest within this period. There would be a negligible hydrological impact on flow in Reaches 2, 3 and 4.	Low	High	Small	Moderate	Short term	Temporary	Moderate adverse	None

Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	There is a minor risk in Reach 1 (River Bulbourne - source (at Dudswell) to first confluence with Grand Union Canal) associated with oxygen quality and ammonia as a result of low flows in this reach. There is also a minor risk nutrient quality but no risk associated with reactive phosphorus. There is no water quality risk anticipated in Reach 2, 3 and 4. STWs do not pose a risk to water quality within Reach 1.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives.	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Water resource available is described as "water not available for licencing" by the EA. Although there are four licences for groundwater abstraction over 0.5Ml/d, the EAR has assessed the implementation of the New Ground drought permit as posing no risk to the feasibility of other abstractors.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	There would be minor geomorphological impacts, comprising reductions in wetted width, in Reach 1 (River Bulbourne - source (at Dudswell) to first confluence with Grand Union Canal) due to the drought permit compared to the natural river regime. As the channel is accustomed to drying up for extended periods, geomorphological impacts of the drought permit related to wetted perimeters are considered minor.	Low (adverse)	Moderate	Small	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase air emissions associated with the abstraction and treatment of water (up to 6.5 Ml/d). There is an AQMA within 5km, however emissions will be energy related and possibly not close to the abstraction site, and no construction is planned. Overall effects are thus assessed to be negligible.	Low (adverse)	Low	Local	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Construction activities and increased abstraction/treatment would cause an increase in energy use and associated greenhouse gas emissions.	Low (adverse)	Low	Small	High	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High (beneficial)	Small	High	Short term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The Roman settlement at the Cow Roast Inn scheduled monument is in the area of influence, however it is unlikely to be impacted by drought permit implementation. Effects are considered negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No impacts have been identified relating to landscape and/or visual amenity.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

Drought Plan option	**Pann Mill:** **Water is abstracted from the South West Chilterns Chalk WFD groundwater body at Pann Mill. From April 2017, the TWUL licence will be revised whereby the average and peak abstraction will decrease from 22.273 Ml/d to 9.5 Ml/d (revised as a result of the Restoring Sustainable Abstraction programme). Drought permit implementation would see an increase from the revised licence of 9.5 M/l up to the old deployable output of 16.8Ml/d (providing a 7.3 Ml/d benefit).**																					
Summary commentary of scheme adverse effects	**Major adverse effects have been identified in relation to a reduction in flow in the River Wye (Reach 2 - from Pann Mill PS to Little Marlow STW discharge) to its lowest level during drought permit operation. Moderate adverse effects relate to the impacts of this low flow on biodiversity (including loss of habitat and spawning areas affecting Brown Trout), and water quality (with risks for SRP in Reach 2). Minor adverse impacts have also been identified in relation to non-native invasive species (low flows and loss of habitat), and geomorphology (effects in shallow sections of reaches). However, all adverse effects identified are short-term and temporary, and not expected to extend beyond six months.**																					
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**		**None**		**None**			**None**	**None**		**None**	**None**			**None**		**None**	
Summary commentary of scheme beneficial effects	**Beneficial impacts include ensuring supply of water to local population and other customers/businesses. There is also likely to be beneficial impacts associated with improving the resilience of water supplies to drought.**																					
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**		**None**	**None**	**None**

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	No impacts on designated sites have been identified. The EAR identifies a moderate impact on NERC species (brown trout), including reduced habitat availability and loss of spawning areas, and increased mortality die to lack of flow. Moderate impacts on macroinvertebrates and fish are predicted, due to reduced habitat as a result of reduced flows, including loss of spawning habitat	Medium (adverse)	Medium	Small	Moderate	Short-term	Temporary	Moderate adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will work with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing the connections between people and nature have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	Implementation of the drought permit may increase the abundance or range of some invasive flora and fauna species, although the level of impact beyond that of natural drought is uncertain. Invasive fauna potentially affected include the signal crayfish, New Zealand mud snail, flatworm, acute bladder snail and freshwater shrimp. Affected flora includes Canadian pondweed and least duckweed.	Low (adverse)	Medium	Small	Low	Short-term	Temporary	Minor adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to 7.3Ml/d of water) during drought conditions and therefore help maintain public health. No construction is proposed, and therefore no effects on human health (e.g., noise and dust nuisance) are expected.	Low (beneficial)	High	Small	High	Short-term	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	The area is considered to be a built-up area with few trails and footpaths associated with the impacted reaches. Despite the major impact in Reach 2 and the moderate impact in Reach 3, the impact on recreation is considered to be negligible. The diversity of the fish community is limited within the River Wye and the Wycombe Marsh Brook. Trout is the most dominant species, but due to the built up nature of the area, angling will probably be limited.	Low (adverse)	Low	Small	Moderate	Short-term	Temporary	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment.	Low (beneficial)	High	Medium	Moderate	Short-term	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction over and above what occurs under normal operation will typically result in proportional increases in energy use and waste generation. Existing infrastructure will bemused to abstract water, maximising the resource efficiency of the drought option.	Low (adverse)	Low (adverse)	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	The implementation of the Pann Mill drought permit is likely to result in flow in the River Wye (Reach 2 - from Pann Mill PS to Little Marlow STW discharge) to be at its lowest, resulting in a major impact. A moderate impact is expected for the same reasons during implementation in Reach 3 (Wycombe Marsh Brook 1km downstream from Pann Mill PS to confluence with River Wye).	Low	High	Small	Moderate	Short-term	Temporary	Major adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	The risk of the drought order to SRP has been assessed as moderate and dissolved oxygen saturation as minor in reach 2 (River Wye from Pann Mill PS to Little Marlow STW discharge). There is a minor risk to SRP in reach 3 (Wycombe Marsh Brook from 1km downstream of Pann Mill PS to its confluence wit the River Wye).	Medium (adverse)	Medium	Small	Moderate	Short term	Temporary	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Water resource availability is described as "water not available for licencing" by the EA. There are no significant surface water or groundwater abstractors (over 0.5Ml/day) within the area of influence.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	A moderate impact on geomorphology is expected in Reach 2, where variation in wetted width would occur in the limited shallower sections of the reach. Minor impacts are also identified for Reach 1 (River Wye from it culverted section in High Wycombe to Pann Mill PS) where the steep banks and managed nature of the reach limit the impact of flow.	Low (adverse)	Medium	Small	Moderate	Short-term	Temporary	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option, and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will increase the emissions associated with the abstraction and treatment of water (up to 7.3 Ml/d). There is one AQMA within 2.5km of the site. However, no construction is required.	Low (adverse)	Low	Low	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction.	Low (adverse)	Low	Medium	Moderate	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High (beneficial)	small	High	Short term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	The St John the Baptist's Hospital scheduled monument is in the area of influence, however it are unlikely to be impacted by drought permit implementation. Effects are considered negligible.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None

SEA topics and objectives		Assessment methodology	Assessment of option							
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (low/medium/high)**	**Value/ sensitivity of receptor (low/medium/ high)**	**Scale of effect: geographical &/or population affected (small/medium/large)**	**Certainty of effect (low/moderate/high)**	**Short-term/medium-term/long-term**	**Permanence of effect (permanent/ temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	No impacts on landscape and/or visual amenity have been identified. The area of influence is built-up area with few trails and footpaths associated with the impacted reaches.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None

Drought Plan option	**Harpsden Sheepland:** **The Harpsden abstraction consists of three boreholes abstracting from the unconfined chalk aquifer (that is overlain by superficial gravels). The River Thames is located about 750m east of the abstraction, with the settlement Lower Shiplake lying between the river and the abstraction. The abstraction is licenced in aggregate with the Sheeplands abstraction, a group of three boreholes, also abstracting from the Chalk. The Sheeplands boreholes are located 3km southeast of Harpsden, on the other side of the River Thames to the Harpsden boreholes. The proposed drought option will be to relax the aggregate condition of the current abstraction licence and increase total abstraction from both locations to 27.9 Ml/d. Abstraction at Sheeplands will continue to be pumped at 11.4 Ml/d which is within the boundaries of the normal operating license. Typically, 10.5 Ml/d of water is abstracted from the Harpsden boreholes under the normal operating license therefore an increase of 6 Ml/d during drought would be taken, amounting to a total output of 16.5 Ml/d.**																						
Summary commentary of scheme adverse effects	**Negligible adverse effects are predicted for this drought option and no construction is proposed.**																						
SEA Objectives Adverse Effects Assessment Summary		**None**	**None**		**None**	**None**	**None**		**None**			**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**	**None**
Summary commentary of scheme beneficial effects	**Beneficial effects include maintained of essential public water supplies during times of drought. There is also likely to be beneficial impacts associated with improving the resilience of water supplies to drought.**																						
SEA Objectives Beneficial Effects Assessment Summary	**None**	**None**	**None**	**None**		**None**		**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**	**None**			**None**	**None**	**None**

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Biodiversity, flora and fauna	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species).	• Will it protect and enhance the most important sites for nature conservation? • Will it protect and enhance aquatic, transitional and terrestrial species and habitats? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities taking into account climate change adaptability? • Will it affect WFD compliance e.g. good ecological potential/status? • Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?	Hydrological impacts associated with drought plan implementation are expected to be negligible, as are effects on the Harpsden Wood SSSI, ancient woodland and NERC species within the area of influence. There is no construction associated with this option and negligible effects on sites within proximity.	Low (adverse)	Low	Small	Moderate	Short	Temporary	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.	• Will it protect or enhance natural capital and ecosystem services?	No opportunities for enhancement of natural capital and ecosystem services were identified, however Thames Water will collaborate with catchment groups on climate change resilience.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.	• Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it engage more people in biodiversity issues and strengthen their connections with nature?	No opportunities for enhancing connections between people and nature were identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Biodiversity, flora and fauna	1.4 To avoid introducing or spreading INNS.	• Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?	The negligible hydrological impact of drought permit implementation is unlikely to result in any change to the potential spread or dispersal of invasive species.	Low (adverse)	Low	Small	Moderate	Short	Temporary	Negligible adverse	None
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	• Will it help to ensure provision of access to a secure resilient access to a secure and affordable supply of drinking water? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?	The option will help to maintain essential public water supplies (provision of up to an additional 6Ml/d of water) during drought conditions, and therefore help maintain public health. No construction is required, so no adverse effects associated with construction activities will occur.	Low (beneficial)	High	Small	Moderate	Short	Temporary	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	• Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? • Does it protect and enhance the green infrastructure network?	There will be no impact on navigation from drought permit implementation.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Population and human health	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it assist in ensuring provision of essential services to support health and well-being?	The option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity with no permanent adverse effects on the environment. Hydrological impacts are negligible, so no impacts on other abstractors or businesses are expected.	Low (beneficial)	High	Medium	Moderate	Short	Temporary	None	Moderate beneficial
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	• Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it encourage the productive reuse of waste including energy recovery?	Increases in abstraction over and above what occurs under normal operation will typically result in proportional increases in energy use and waste generation.	Low (adverse)	Low	Medium	Medium	Short	Temporary	Negligible adverse	None
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient and sustainable use of water; ensure resilient water supplies for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it enable efficient water resource management and ensure maintenance of water supplies?	No opportunities to promote the sustainable management of natural resources have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.	• Will it lead to a change in river flows, wetted width or river level? • Will it alter the flow regime or residence time of surface waters? • Will it lead to changes in groundwater levels and recharge?	Option involves groundwater abstraction of an additional 6 Ml/d. The reach potentially affected is Reading gauging station to Newtown. The EAR reports that even if the full additional abstraction was assumed to be at the expense (via increased infiltration) of the River Thames around Harpsden, the impact on summer Q95 and summer Q99 as measured at the nearest upstream gauge at Reading would be 1.5% and 1.8% respectively, and therefore a negligible impact on the River Thames. During a dry period, water level in the river gravels would be maintained by the large and level-controlled River Thames. Surface water features would also be maintained by the river, and therefore, the drought permit would have a negligible impact.	Low (adverse)	Low	Small	Moderate	Short	Temporary	Negligible adverse	None

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Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	• Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • Will it minimise impacts on, or contribute to achievement of, RBMP objectives? • Will it present a risk to water quality of groundwater, and surface water or estuarine waters? • Will it prevent water pollution? • Will it affect water quality compliance?	No water quality impacts or risks have been identified in the EAR. Negligible impacts on WFD status are identified in EAR.	Low (adverse)	Low	Small	Moderate	Short	Temporary	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions that rely on water resources including contributing to the achievement of WFD objectives	• Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it affect WFD protected areas? • Will it prevent the introduction of impediments to the attainment of WFD good status or potential? • Will it achieve an appropriate balance of supply with other functions and services (including agriculture)?	Local resource availability is described as 'water not available for licensing'. However, no impacts on other abstractions within the area of influence are expected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • Will it protect and enhance geological SSSIs or similar nationally protected sites? • Will it protect and enhance geomorphology and geomorphological processes?	No specific soils or geological SSSIs are reported as being impacted in the EAR and no construction is proposed. Adverse hydrological effects are expected to be negligible, and no geomorphological risks have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services functions of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	• Will it ensure efficient use of land (e.g. make use of previously developed land)?	No land take is required for the option and no opportunities to enhance ecosystem services have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	• Will it contribute towards a catchment-wide approach to land management?	No land take is required for the option and no opportunities for catchment-wide approach to land management have been identified.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	• Will it reduce or minimise air pollutant emissions? • Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat)?	The option will result in small increases in air emissions associated with abstraction and treatment of water.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.2 To reduce greenhouse gas emissions.	• Will it reduce or minimise and greenhouse gas emissions? • Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (adverse)	Low	Small	Low	Short-term	Temporary	Negligible adverse	None
Air and climate	6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?	Drought permits/orders are a key component of Thames Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	Medium	Small	Moderate	Long-term	Temporary	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are no heritage assets within the area of influence, so no impacts on the historic environment are expected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None

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Archaeology and Cultural Heritage	7.2 To protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place.	• Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? • Will it maintain and enhance the historic environment, including palaeo-environmental deposits? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	No opportunities to improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets have been identified for this option.	n/a	n/a	n/a	n/a	n/a	n/a	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it improve access to valued areas of landscape character?	There is no construction proposed and negligible effects on hydrology reported in the EAR. Therefore landscape would not be affected.	n/a	n/a	n/a	n/a	n/a	n/a	None	None